Stemming the Tide of Teacher Attrition

How Working Conditions Influence Teacher Career Intentions and Other Key Outcomes in Arizona

By
Barnett Berry and Ed Fuller
with Alice Williams

CENTER FOR TEACHING QUALITY
where teachers are central to improving schools

November 30, 2007

Stemming the Tide of Teacher Attrition

How Working Conditions Influence Teacher Career Intentions and Other Key Outcomes in Arizona

By
Barnett Berry and Ed Fuller
with Alice Williams

November 30, 2007

The Center for Teaching Quality improves student learning through developing teacher leadership, conducting practical research and engaging various communities. To accomplish this mission, the Center for Teaching Quality strives to shape policies that ensure:

- **Students**, no matter what their background or where they go to school, are ready to learn; with
- **Teachers** who are caring, qualified, and competent with vast content knowledge and the ability, through quality preparation and ongoing development and support, to ensure that all children can learn; in
- **Classrooms** that have adequate resources and provide environments conducive to student learning; in
- **Schools** that are designed to provide teachers with sufficient time to learn and work together in collaboration with a principal who respects and understands teaching; in
- **Districts** that have policies and programs that support the recruitment, retention and development of high quality teachers in every school; in
- **States** that have well-funded systems that include rigorous preparation and licensing with evaluation tools that ensure performance based standards are met; in a
- **Region** that works collaboratively, using common teaching quality definitions, sharing data, and working across state lines to recruit, retain and support high quality teachers; in a
- **Nation** that views teaching as a true profession and values teachers as one of its most important resources.

Table of Contents

List of Figures and Tables

Figures

Tables

Executive Summary

Over the last two decades, researchers have presented convincing evidence that teachers are an important key to school improvement and to closing the student achievement gap. However, ensuring that all students are taught by quality teachers—those with the right talent, skills, and experience—is not enough. Teachers—even the best of them—must have the right resources, tools, and supports in place in order for them to be effective over time.

In 2007, under the leadership of Governor Janet Napolitano and the Arizona Education Association (AEA), all of the state's school-based licensed educators were asked to respond to a series of survey questions about five aspects of their working conditions—time, professional development, leadership, empowerment, and facilities and resources. Nearly 32,000 educators (about 53 percent of eligible respondents) completed the survey. The Center for Teaching Quality, a non-profit research-based advocacy organization, has worked closely with the Governor's Office and the AEA to assemble the results, conduct statistical analyses of the relationships between teacher working conditions and teacher and student outcomes, and develop tools based on those results that practitioners can use to improve the conditions that make quality teaching possible. This report outlines many important connections revealed by our analyses, provides considerable information upon which policymakers and educators can act, and offers suggestions for more refined future analyses.

General Findings

Our analyses of the 2007 Arizona Teacher Working Conditions Survey reveal several important findings:

- Arizona educators are generally positive about their working conditions.
- Teachers and administrators have very different impressions of the state of teacher working conditions.
- Arizona teachers are somewhat involved in classroom-level decisions, but not in broader, school-level decisions.
- Teachers clearly express a need for more time to collaborate.

What We Know About Teachers' Career Intentions

Teacher responses to survey questions were disaggregated and analyzed based on each teacher's declared career intentions (*i.e.*, stay in current school, move to another school or district, or leave teaching entirely). Key results include the following:

- Teachers who plan to change schools or districts (movers) or leave the teaching profession entirely (leavers) are most dissatisfied with the quality of school leadership and with their perceived levels of empowerment.

- Financial considerations play a larger role in the career decisions of early career leavers (a critical teacher attrition sub-group) than they do for retirement-age leavers or for school movers.

What We Know About Mentoring and Induction

Teacher responses to survey questions also were disaggregated and analyzed based on each teacher's declared participation in a mentoring program, whether as a mentor or as a teacher who received mentoring in her or his early career. Results from these analyses are revealing:

- Many Arizona novice teachers are not mentored at all, mentored by other novice teachers, or mentored by teachers with heavy mentoring loads.

- When it is available, mentoring may help to buttress teacher working conditions that improve the likelihood that novice teachers will remain in teaching.

Domain-Specific Findings

Several relevant patterns also emerged in analyses of the five teaching and learning conditions domains:

- ***Leadership***—Educators are most positive about the ways in which leadership impacts individual faculty members, but their overall impressions of school leadership are muted by perceptions of problems with the broader school atmosphere established by principals and other administrators.

- ***Empowerment***—Arizona educators' sense of personal empowerment ranges from marginally positive to very negative, with many expressing deep concerns about the availability of opportunities to lead and to influence school policies and practices.

- ***Time***—Time appears to be a major missing commodity in the eyes of most educators, and administrators appear to be at least somewhat aware of this problem.

- ***Facilities and Resources***—In almost all areas, Arizona educators are generally positive about their facilities and resources, and most Arizona educators report feeling that their schools are safe.

- ***Professional Development***—Arizona educators express marginally positive support for the current availability of professional development opportunities, but fewer than half of all

teachers report receiving substantial amounts of professional development in most teaching areas (including many areas in which they need the most support and preparation).

Analyses of Teacher Working Conditions Impacts on Teacher Attrition and Student Achievement

Statistical regression analyses revealed important relationships between several teaching and learning conditions, teacher career intentions, and student achievement gains:

- Teacher perceptions of their overall school environment, the presence of school-wide problem-solving strategies, and the degree to which they believe that they are respected as professionals are directly related to their intent to stay at their current schools.

- Results of analyses of the relationships between elementary, middle, and high school teacher perceptions of their working conditions and single-year *gains in student achievement*[1] are mixed and suggest a need for multiple-year gains analyses to better understand several possible connections.

- In elementary schools, participation in the Arizona Career Ladder program appears to have a significant and positive impact on student achievement gains. Interviews with state and local officials suggest that differences in how school districts implement their career ladder models may explain the differential impact of this reform effort on student achievement.

Looking Ahead

Arizona teachers and administrators already have begun to use teacher working conditions data and are most concerned about how to best act on the problematic issues of teacher time and empowerment. At an October 2007 Teacher Working Conditions workshop sponsored by the Arizona Education Association, teachers and administrators suggested that they want to find ways to engage more of their colleagues and build awareness among parents in their communities regarding the multiple impacts of teacher working conditions. In addition, they suggested expanding future surveys and creating additional tools to help educators and policymakers to understand better how teachers in different subject areas and grade levels perceive their working conditions. Teachers and administrators alike believe that now is also the time to begin to assess principals' working conditions. In addition, they want access to information on how data are being implemented locally to improve teacher working conditions and student learning.

Both the research findings and educator feedback suggest the following recommendations:

- Invest in a separate administrator working conditions survey that examines links between administrator characteristics (such as preparation and length of tenure) and teacher perceptions of working conditions at their schools to help determine what principals need in order to support teacher leadership and effectiveness.

- Develop statewide teacher, student, and administrator data systems that can track teacher and administrator working conditions survey responses longitudinally and link these data with actual teacher turnover figures and robust measures of student achievement.

- Conduct case studies in districts and schools where educators respond most favorably to their working conditions to determine how such conditions are developed and sustained over time.

- Conduct case studies of effective mentoring practices in Arizona.

- Investigate several different models for offering new teachers the kinds of mentoring and induction support that make a difference in teacher retention, and translate these findings into new teacher induction reform statewide.

- Establish an Arizona clearinghouse for results, strategies, and best practices for ensuring positive teacher and principal working conditions.

- Develop communications strategies to better inform policymakers, practitioners, and the public about what is known about teacher working conditions in Arizona and the relationships between those conditions and closing the state's achievement gap.

Introduction

Over the last two decades, researchers have presented convincing evidence that teachers are an important key to school improvement and to closing the student achievement gap. However, ensuring that all students are taught by quality teachers—those with the right talent, skills, and experience—is not enough. Teachers—even the best of them—must have the right resources, tools, and supports in place in order for them to be effective over time.

Indications from research continue to build the case that teacher working conditions can impact student learning, both directly through their impact on instructional practice and indirectly through their contribution to teacher attrition. For example, Eric Hanushek and Steven Rivkin, economists and research associates at the National Bureau of Economic Research, have noted that "variations in salaries and working conditions can contribute to unequal school quality."[2] In addition, recent Center for Teaching Quality (CTQ) working conditions surveys of teachers in North Carolina, Kansas, and Nevada found strong connections between several teaching and learning factors—including the time that teachers have to plan, the extent to which they feel empowered, and the quality of their school leaders—and student achievement.[3]

Teachers also indicate that a positive, collaborative school climate and support from colleagues and administrators are the most important factors influencing whether they stay in a school. Susannah Loeb and Linda Darling-Hammond have found that teachers' self-reports of their working conditions can predict teacher attrition,[4] and Richard Ingersoll has shown that many teachers leave their schools because of conditions such as low salaries, lack of support from the school administration, student discipline problems, and lack of teacher influence over decision-making.[5]

The importance of working conditions is familiar to many educators and policymakers in Arizona. In 2006, the state, with the help of CTQ, conducted a pilot survey of teaching and learning conditions in 18 districts with more than 5,200 respondents. Analyses of those results suggested that there were connections between the presence of positive working conditions, Arizona Instrument to Measure Standards (AIMS) results, and the future employment plans of teachers. Based on these initial findings, CTQ recommended expanding the survey initiative statewide so that all Arizona schools and districts would have the opportunity to hear from their educators about whether or not critical conditions of work were present in their schools.[6]

In the spring of 2007, under the leadership of Governor Janet Napolitano and the Arizona Education Association (AEA), CTQ conducted a web-based population study of all Arizona school-based licensed educators that asked them to respond to a series of questions about time, professional development, leadership, empowerment, and facilities and resources in their schools. As the Governor noted in her message on the Arizona Teacher Working Conditions homepage, "To prepare students for a world of competition and innovation, Arizona needs to ensure that

there is a qualified teacher in every classroom. Ensuring working conditions that support teachers' efforts will be critical to their success."[7]

By hearing directly from school-based educators who intimately experience and understand working conditions issues, policymakers have the opportunity to make data-driven policies that will make Arizona schools better places to work and learn.

About the 2007 Survey

In Spring 2007, educators in over 200 participating Arizona school districts across the state spoke out on working conditions in their schools by participating in a web-based survey that addressed key teaching and learning conditions related to time, empowerment, school leadership, professional development, and facilities and resources. Thanks to the efforts of the AEA and the Arizona Department of Education, as well as the Arizona Governor's Office and the Arizona School Administrators Association, nearly 32,000 educators (about 53 percent of eligible respondents) responded to the latest Arizona Teacher Working Conditions survey.

Working with Department and AEA officials, the Center for Teaching Quality assembled individual school and district response reports, which were released publicly only if at least 50 percent of a school faculty's or district's school-based licensed educators responded. These reports are now available online[8] for almost 700 schools, providing critical information for making local and state-level decisions about policies and practices that affect teaching and learning conditions in Arizona. The Center for Teaching Quality's *Teaching and Learning Toolkit Framework™* (available from the Arizona Education Association) provides a strong platform on which schools and districts can develop understandings based on these data.

Because not every school in participating Arizona districts met the school-level response rate threshold of 50 percent,[9] it is important to bear in mind the degree to which the respondents reflect the diversity of the entire population of Arizona educators before making statements about how survey responses inform our understanding of teaching and learning conditions across the state. While there are some areas in which the survey respondents as a group appear to be somewhat different from the full complement of Arizona educators, in many respects the survey response group is reflective of Arizona educators as a whole. For example:

- The racial representation among Arizona educators statewide is about 82 percent white and 11 percent Hispanic; about 82 percent of the survey group are white, and about 10 percent are Hispanic.[10] Gender representation was also similar: 72 percent of all teachers statewide are female and about 79 percent of survey respondents are female.

- The proportion of respondents who were prepared in a traditional teacher licensure program is around 89 percent, compared to a statewide average of about 82 percent.

However:

- A much larger proportion of survey respondents were early career (0 to 10 years of experience) teachers (79 percent versus 55 percent statewide).

- Survey respondents were more likely to have earned a post-graduate degree (55 percent versus 45 percent).

Consequently, readers of this report are encouraged to exercise caution when attributing the results presented herein to the entire population of Arizona educators.

About the Report

This report is the final of two reports to be released that contain analyses of trends and patterns in the responses of Arizona educators in 2007. The first report presented an overview of initial findings based on a preliminary scan of survey responses. This second report supplements these findings (reiterated in an updated form here) with an overview of educator responses in each of the five aforementioned teacher working conditions domains. Additional sections included here for the first time are a summary of survey response patterns based on a disaggregation of the data by teacher career intentions and teacher participation in mentoring programs, as well as analyses of teacher working conditions impacts on teacher attrition and student achievement. Unlike analyses in the 2006 Arizona Teacher Working Conditions report, the 2007 student achievement analyses presented here examine the relationships between working conditions factors and *gains* on the AIMS assessments, a more rigorous approach to analyzing linkages between the two. Some of the patterns revealed are intriguing and suggest directions for further analyses in subsequent years.

Definitions Used in this Report

Educator

Most questions on the survey were answered by every respondent, regardless of her or his position in a school. Survey respondents identified themselves as either being teachers, principals, assistant principals, or other education professionals, such as school counselors or social workers. In this document, when we refer to *educators*, we are talking about people in all four of these categories.

Teacher

In some cases, we draw distinctions between what classroom teachers report and what principals or educators as a whole report. The bulk of the survey respondents (over 90 percent) were teachers, so in many cases, teacher responses and responses for all educators (responses from teachers and from all others surveyed) will be very similar, but they are not exactly the same; in some cases, they are quite different.

Teacher Career Intentions

An important goal for the interim report and for this final report is to begin to understand some of the reasons why teachers leave schools. Only classroom teacher respondents were asked about their future employment intentions, and based on their responses they are categorized as being either:

- *Stayers*, or teachers who intend to continue working at their current school;
- *Movers*, or teachers who intend to continue teaching but who plan to move to another school within their district or to another school district altogether; or
- *Leavers*, or teachers who plan to leave teaching entirely.

Domain

Questions in the survey instrument primarily are organized into *domains*, a term we use throughout this report to designate a specific aspect of teacher working conditions. The domains addressed in the Arizona Teacher Working Conditions Survey include time, facilities and resources, empowerment, school leadership, and professional development. We define these major concepts in the following ways:

- *Time* refers to the opportunities teachers have to meet the needs of their students given school schedules, non-instructional duties, paperwork, and availability (or inaccessibility) of structured venues to collaborate with colleagues.

- *Facilities and Resources* refer to teachers' access to the people, materials, and tools they need to teach effectively, as well as to the extent to which their school is safe and well-maintained.

- *Empowerment* refers to opportunities for teachers to develop as professionals, receive recognition as instructional experts, and utilize their unique skills to solve educational problems. This concept is not about developing teacher power at the expense of administrative authority, but about professionalizing teaching and effectively using teachers' expertise.

- *School Leadership* refers to how administrators and other school leaders shape a shared vision for success, enhance school climate, enforce norms, and recognize good teaching.

- *Professional Development* refers to the quality and quantity of teachers' formal opportunities to learn what they need to know and do in order to be effective with the students they teach.

Survey Results

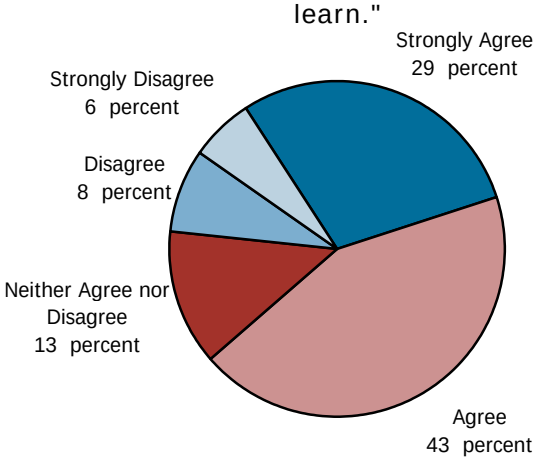
The following findings are updated from the 2007 Interim Report on the Arizona Teacher Working Conditions Survey (released in August 2007), and they also now include references to issues influenced by the state's specific teacher supply and demand dynamics. We begin with general findings, followed by findings specific to teachers' different career intentions. Next, we address how Arizona teachers with different mentoring and induction experiences view their teaching and learning conditions. In the last section, we present brief analyses of the domain-specific responses that inform these findings.

General Findings

1. Arizona educators are generally positive about their working conditions.

More than seven out of ten Arizona educators (72 percent) agree that their schools are good places to work and learn, and well over one-quarter (29 percent) of educators strongly agree with that statement (Figure 1).

Figure 1: "Overall, my school is a good place to work and learn."



In addition, nearly 80 percent of all Arizona educators intend to remain in their current schools. Educators are positive about teaching and learning conditions in several specific areas as well:

- Arizona educators are generally positive about their facilities and resources. A majority of Arizona educators note they have sufficient access to materials and resources such as com-

munications technology (83 percent), instructional materials (61 percent), office equipment (65 percent), and instructional technology (59 percent). Additionally, 64 percent agree that they have adequate professional space, and a very large proportion (78 percent) agree that their school environment is safe. Only about one out of eight educators in Arizona (12 percent) believes that her or his school is unsafe.

- Educators also are generally positive about faculty dedication in their schools. Seventy percent of educators believe the faculty are committed to helping every student learn, and almost two-thirds (62 percent) believe that steps are made in their schools to solve problems.

There are, however, some areas of disagreement among different groups of educators about the quality of working conditions.

- For example, educators with more years of experience are less likely than their less-experienced peers to agree that their schools' teaching and learning conditions are positive. In their responses to most of the Arizona Teacher Working Conditions Survey questions, the impressions of first-year educators about time, empowerment, leadership, and professional development issues are more positive than are the impressions of their more experienced colleagues. As educators become more experienced, they are less likely to believe critical working conditions are present in their schools.

- Also, elementary school educators are more likely to note the presence of important teaching and learning conditions in their schools than are middle and high school educators. They are much more satisfied with the quality of professional development, faculty standards, and overall faculty commitment than are their secondary school peers, and, while approximately seven out of ten elementary school educators (71 percent) believe that professional development has changed their practice, only about half (52 percent) of high school teachers report that their professional development has been effective. Additionally, elementary educators are more likely to report working in an environment with strong school leadership (Table 1).

Table 1: Educators' Impressions of Teacher Working Conditions

	Percent Agreeing:			
Selected Teacher Working Conditions Survey Item	Elem	Middle	High	Overall
All of the faculty are committed to helping every student learn	80%	64%	57%	70%
The school leadership consistently enforces rules for student conduct	63%	48%	43%	54%
Professional development has provided you with strategies that you have incorporated into your instructional delivery methods	71%	62%	52%	63%
The faculty has an effective process for making group decisions and solving problems	53%	44%	34%	46%
Professional development provides teachers with the knowledge and skills most needed to teach effectively	64%	53%	45%	56%
Teachers are held to high professional standards for delivering instruction	87%	77%	69%	80%

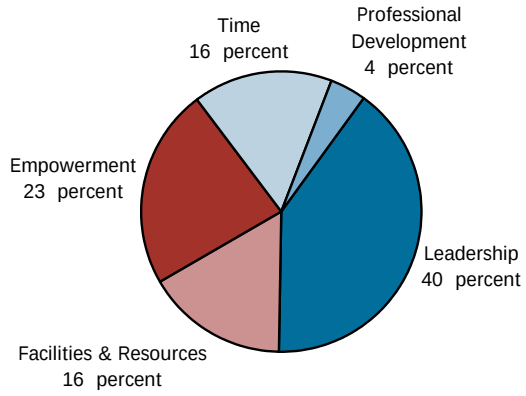
Relevant Domain Analyses: Leadership (p. 19), Empowerment (p. 20), Facilities and Resources (p. 24), Professional Development (p. 25)

2. Teachers and administrators have very different impressions of the state of teacher working conditions.

One expects some differences in any industry in "supervisor" and "employee" perceptions of working conditions; even so, the disparities between Arizona principals and teachers in their perceptions of teacher working conditions are very large. On nearly every survey question, principals are much more likely than are teachers to indicate that they believe that positive working conditions are in place and that leadership makes efforts to improve them.

The gaps in perception between teachers and principals appear to be greatest in the areas of leadership and empowerment, the two working conditions domains most important to teachers when making their future career plans (Figure 2).

Figure 2: Relative Importance of Factors in Teacher Career Decisions



In the area of empowerment, principals are far more likely than are teachers to believe that teachers are integrally involved in making collaborative decisions. For example, while only about one-third (35 percent) of teachers believe they are centrally involved in decision-making on educational issues, 84 percent of principals believe this is true in their school—one of the largest gaps in perception between the two groups. Furthermore, principals are almost twice as likely as teachers to agree that there is an effective school-wide process for making decisions and solving problems. Gaps are also evident in principal and teacher perceptions of leadership in several other areas, including the creation of environments of trust and respect and the consistent enforcement of student conduct rules (Table 2).

Table 2: Teachers' and Principals' Perceptions of Selected Teacher Working Conditions

Teacher Working Conditions Survey Item	Percent Agreeing: Teachers	Principals	Difference in Percentage Points Between Teachers and Principals
Teachers are centrally involved in decision-making about educational issues	35%	84%	49
The school leadership consistently enforces rules for student conduct	52%	94%	42
The faculty has an effective process for making group decisions and solving problems	45%	85%	40
Teachers feel comfortable raising issues and concerns that are important to them	52%	91%	39
Teachers are recognized as educational professionals	57%	94%	37
Professional development provides teachers with the knowledge and skills most needed to teach effectively	55%	92%	37
There is an atmosphere of trust and mutual respect within the school	56%	92%	36

Principals are far more likely to believe not only that positive working conditions are present, but also that school leadership makes a sustained effort to address teacher concerns (Table 3).

Table 3: Teachers' and Principals' Perceptions of Efforts to Address Concerns

School leadership makes a sustained effort to address teacher concerns about:	Percent Agreeing: Teachers	Principals	Difference in Percentage Points Between Teachers and Principals
Leadership issues	40%	91%	51
Empowering teachers	45%	93%	48
The use of time in my school	44%	90%	46
Classroom management of today's students	51%	94%	43
Facilities and resources	52%	92%	40
Professional development	54%	93%	39

Relevant Domain Analyses: Leadership (p. 19), Empowerment (p. 20), Professional Development (p. 25); see also a complete table of teacher and principal responses in **Appendix A.**

3. Arizona teachers are somewhat involved in classroom-level decisions, but not in broader, school-level decisions.

Research has demonstrated the important role that teacher empowerment plays in teacher retention.[11] Among other things, teachers want to play a role in classroom and school decisions to ensure that decisions are made that improve their ability to have an impact on students. A sizeable but not overwhelming proportion of Arizona educators report that teachers play a large role in decisions about classroom issues such as devising teaching techniques (55 percent), setting grading and student assessment practices (49 percent), and selecting instructional materials and resources (35 percent); however, educators are even less likely to report that teachers play a large role in school-level decisions such as budgeting (4 percent), hiring (11 percent), determining the content of professional development (13 percent), school improvement planning (20 percent), and setting student discipline policies (22 percent; Table 4).

Furthermore, more than one-quarter (27 percent) of educators report that teachers play no role in selecting the professional development opportunities available to them, and three in five educators (60 percent) say teachers play no more than a small role. Additionally, teachers are not engaged in school improvement planning (more than half of all educators report that teachers play no more than a small role) or school budgeting (49 percent report that teachers have no role, and an additional 32 percent report that teachers play only a small role; Table 4).

Table 4: Educators' Impressions of Teachers' Roles in Decision-Making

Please indicate how large a role teachers have at your school in each of the following areas:	No role at all	Small role	Moderate role	Large role	Primary role
Devising teaching techniques	4%	14%	27%	38%	17%
Setting grading and student assessment practices	7%	17%	28%	35%	14%
Selecting instructional materials and resources	6%	24%	35%	27%	8%
Establishing and implementing student discipline policies	19%	31%	28%	19%	3%
School improvement planning	19%	32%	29%	18%	2%
Site council planning/decision-making	20%	33%	31%	15%	2%
Determining the content of professional development	27%	34%	27%	12%	1%
The hiring of new teachers	37%	32%	21%	10%	1%
Deciding how the school budget will be spent	49%	32%	14%	4%	0%

Not surprisingly, this lack of participation has led educators to feel separated from decision-making. Only one-third (36 percent) of educators agree that they are centrally involved in decision-making about educational issues. Part of the problem could lie in the processes through which school-wide decisions are made. Less than half (46 percent) of educators agree that there is an effective process for making decisions and solving problems in their schools. Not surprisingly, only about half (52 percent) of educators agree that site councils provide an opportunity to participate in decision-making and half (53 percent) report that teachers play no more than a small role in site council activities.

Relevant Domain Analysis: Empowerment (p. 20)

4. Teachers clearly express a need for more time to collaborate.

In many of their survey responses, teachers in Arizona express concern about the amount of time they have available to teach, plan, and collaborate with colleagues. Less than one-third (31 percent) of teachers agree that the non-instructional time they receive is sufficient—only 15 percent report receiving at least an hour a day, without student contact, to plan and collaborate, and almost half (45 percent) receive no more than three hours per week. The problem is particularly acute at the elementary level, where more than half (54 percent) receive less than three hours of weekly non-instructional time (compared to about one-third of middle school [37 percent] and high school [34 percent] teachers; Table 5).

Table 5: Non-Instructional Time Available to Teachers

Amount of Non-Instructional Time Available During an Average Week:	Elem	Middle	High	Overall
No Time to Less Than Three Hours	54%	37%	34%	45%
More Than Three but Less Than Five Hours	35%	46%	43%	40%
More Than Five Hours	11%	17%	23%	15%

As a result of this lack of planning time, most teachers are working outside of the regular school day on school-related activities. More than one-third (39 percent) report working, on average, more than 10 hours a week outside of regular work hours, and 70 percent report working at least an additional hour a day beyond their contracted time on school-related activities. Other factors also influence the time available for teachers to focus on teaching: less than one-third of educators believe efforts are made to minimize administrative paperwork (30 percent) and that class sizes are reasonable (32 percent); additionally, less than half (44 percent) agree that they can focus on educating students with minimal interruptions.

Relevant Domain Analysis: Time (p. 22)

Findings from Analyses of Responses of Teacher Stayers, Movers, and Leavers

As is true in many other states, one of the greatest challenges Arizona faces is stemming the tide of teacher attrition, especially in hard-to-staff schools. A recent report that examined turnover in five school districts across the nation representing a range of urban and rural communities of varying size found that it costs as much as $18,000 to replace a teacher who leaves a classroom.[12] In addition to the monetary costs of attrition, data from the New Teacher Center reveal that well-designed novice teacher induction programs not only contribute to higher teacher retention rates but also can dramatically increase student achievement.[13] With so much at stake—both in terms of the quality of the induction of new teachers and the cost associated with replacing them—policymakers would be well-served to consider the factors that impact retention rates.

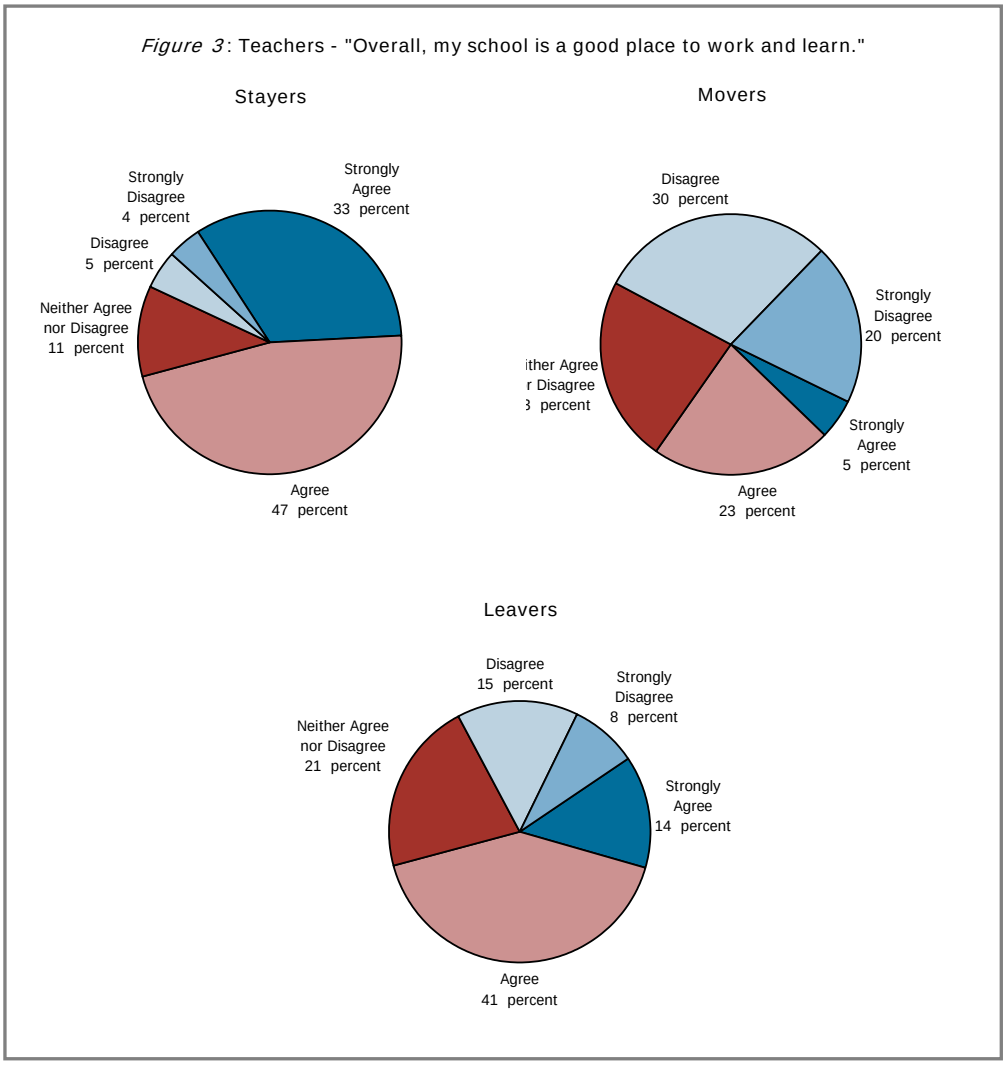
As noted above and elsewhere in this report, many Arizona teachers are satisfied with several aspects of their current working conditions, and these positive feelings are reflected in the fact that about four out of five (79 percent) of the respondents on the 2007 Arizona Teacher Working Conditions Survey intended to stay in their current schools at the end of the school year ("stayers"). Similar numbers of respondents indicated that they would either move to another school or district ("movers," 11 percent) or leave teaching entirely ("leavers," 9 percent).[14] Contrary to what might be expected, these breakdowns are relatively consistent across gender lines (with 77 percent of all male teachers and 80 percent of all female teachers reporting that they would stay) as well as across racial lines (with 80 percent of all white teachers and 81 percent of all Hispanic teachers reporting that they would stay), offering evidence that the decisions of Arizona teachers to move or leave may not be strongly related to social factors outside of school control.

Instead, survey results suggest that teachers who want to continue to teach in their current schools generally have more positive perceptions about their working conditions than do movers and leavers. Furthermore, school movers tend to have lower perceptions of their schools than do leavers (but this discrepancy is due in part to the fact that not all leavers leave as a result of dissatisfaction with the work environment alone[15]). This section of the report begins the process of understanding differences in perceptions of teacher working conditions across all three groups, with an eye toward helping policymakers and school leaders address issues that could help to reduce teacher attrition. That there are differences in opinion across these three groups about teacher working conditions is not surprising; what may be more important is an analysis of areas in which those differences are largest, relative to other differences in opinion.

5. Teacher movers and leavers are most dissatisfied with the quality of leadership and with their perceived levels of empowerment.

The single greatest disagreement among stayers and non-stayers is on the issue of whether or not their schools are good places to work and learn. While 80 percent of stayers agree with this statement, only about half (55 percent) of leavers agree. The largest gap, however, is between stayers and school movers, a mere 28 percent of whom report that their schools are good places to work and learn (Figure 3).

Figure 3: Teachers - "Overall, my school is a good place to work and learn."



Survey responses suggest that this dissatisfaction appears to be a result of lower opinions across *all* areas of teacher working conditions, but movers and leavers appear to be most dissatisfied with what they perceive to be problems in the areas of empowerment and leadership.

On more than a half-dozen empowerment questions, movers and leavers express noticeably lower opinions than do stayers. One area of empowerment that is of great concern to movers and leavers appears to be their treatment as professionals. While more than 60 percent of all stayers believe that they are trusted to make sound professional decisions about instruction and that they are recognized as education professionals, leavers and movers are much less positive, with no more than 43 percent of leavers and a scant 32 percent of movers agreeing with these statements. The empowerment issue about which they have the greatest concern, however, is the degree to which they perceive that steps are taken to solve problems in their schools. Two-thirds of all stayers believe that such steps are taken, but only 47 percent of leavers and 30 percent of movers agree (Table 6).

There is even stronger disagreement among stayers, movers, and leavers about the quality of leadership in their schools. In their assessments of over a dozen different leadership issues (a higher number than for any other domain), movers and leavers are much less positive than are stayers, and their strongest reservations are about their own levels of comfort within their schools. For example, movers and leavers are much less likely to sense that they work in an atmosphere of trust and mutual respect (with only 41 percent of leavers and 22 percent of movers agreeing, compared to 63 percent of stayers), and they do not feel comfortable raising issues of concern to them (38 percent of leavers, 21 percent of movers, and 59 percent of stayers). Part of that discomfort may stem from a belief that overall leadership in their schools is not effective: 63 percent of stayers agree that school leadership is effective, but only 43 percent of leavers and 23 percent of movers agree (Table 6).

Table 6: Teacher Impressions of Empowerment and Leadership, by Career Intent

	Percent Agreeing: Stayers	Movers	Leavers
Empowerment Issues			
Teachers are trusted to make sound professional decisions about instruction	63%	32%	43%
In this school we take steps to solve problems	68%	30%	47%
Teachers are recognized as educational professionals	61%	29%	36%
Leadership Issues			
There is an atmosphere of trust and mutual respect within the school	63%	22%	41%
Teachers feel comfortable raising issues and concerns that are important to them	59%	21%	38%
Overall, the school leadership in my school is effective	63%	23%	43%

The disparities between stayers and movers are not just reflective of whether working conditions are present, but also whether school leadership makes efforts to improve them. Teachers who want to stay in their schools are far more likely to believe leadership is working to improve teaching and learning conditions than are those who want to move to another school. While about half of stayers believe that leadership makes a sustained effort to address teacher concerns about empowerment (51 percent) and leadership issues (45 percent), less than one-sixth of movers agree with the same statements (16 percent). In addition, around one-half or more of those who want to stay in their current schools believe leadership supports concerns about improving other working conditions, versus only about one-fifth to one-quarter of movers (Table 7).[16]

Table 7: Teacher Impressions of Leadership Efforts to Address Working Conditions, by Career Intent

School leadership makes a sustained effort to address teacher concerns about:	Percent of Teachers Agreeing: Stayers	Movers	Leavers	Difference in Percentage Points Between Stayers and Movers
Empowering teachers	51%	16%	28%	35
New teacher support	57%	25%	37%	32
The use of time in the school	49%	18%	29%	31
Facilities and resources	57%	26%	39%	31
Professional development	59%	29%	40%	30
Leadership issues	45%	16%	27%	29

When asked to select which of the general teaching and learning conditions most influenced their future career intentions, leadership is by far the most common response (40 percent; Figure 2, above). The second most frequently cited condition is empowerment, but little more than half as many respondents (23 percent) indicate that it plays a primary role in their career decisions.

Leadership also plays a central role in teachers' thinking about the *specific* factors that influence their career intentions. Sixty percent of teachers report that support from school leadership is an extremely important influence, outpacing factors more commonly assumed to matter, like salary (cited by 49 percent of all teachers; Table 8).

Table 8: Specific Factors Influencing Teacher Career Decisions

	Factor is Extremely Important
Adequate support from school leadership	60%
Effectiveness with the students I teach	54%
Salary	49%
Collegial atmosphere amongst the staff	47%
Teaching assignment (subject, students)	46%
Empowerment to make decisions that affect school/classroom	43%

6. Financial considerations play a larger role in the career decisions of early career leavers (a critical teacher attrition sub-group) than they do for retirement-age leavers or for school movers.

It is perhaps tempting to review the numbers above and decide that dissatisfaction is stronger across the board for movers than it is for all leavers, but readers are reminded to bear in mind that, compared to movers and stayers, the population of leavers is a very diverse and mixed group, due to the multiple and diverse reasons behind their career intentions. Part of the population of leavers is comprised of teachers who are dissatisfied with their schools and with education in general, but it is also made up of teachers who leave for personal reasons (such as pregnancy or out-of-state relocation) and retirement (more than 31 percent of all leavers had 20 or more years of teaching experience). Also, leavers tend to be older than movers (only about 14 percent of leavers have three or fewer years of experience, while 26 percent of movers have three or fewer years of experience; by comparison, about 20 percent of stayers are in their first three years). When survey responses for leavers are disaggregated by years of teaching experience, a few important differences are revealed between the responses of those who leave the profession before reaching retirement age ("early career leavers"), those who leave at around retirement age ("retirement-age leavers"), and the general population of movers.

Early career leavers and other non-stayers express similar opinions about most survey items, but they do diverge on a few critical issues. First, retirement-age leavers are more likely than are early career leavers to believe that they have sufficient access to appropriate instructional materials (55 percent versus 46 percent), while the early career leavers feel more empowered to make professional decisions about instruction (44 percent versus 37 percent) and setting grading and student assessment practices (44 percent versus 34 percent; Table 9).

Table 9: Differences in Perceptions, Early Career Leavers versus Retirement-Age Leavers

Selected Teacher Working Conditions Survey Question	Percent Agreeing: Early Career Leavers	Retirement-Age Leavers
Teachers have sufficient access to appropriate instructional materials and resources.	46%	55%
Teachers are trusted to make sound professional decisions about instruction.	44%	37%
Teachers play a large or primary role in setting grading and student assessment practices	44%	34%

Early career leavers are also more likely than school movers to cite an emphasis on testing and accountability as a reason for leaving (43 percent versus 33 percent).

Perhaps most importantly, however, and consistent with some recent research on reasons for teacher attrition,[17] early career leavers are more likely than their retirement-age leaver peers to cite monetary reasons (salary and cost of living) as factors that influence their decision to leave

(78 percent cite salary, compared to 70 percent of retirement-age leavers; 48 percent cite cost of living, compared to 38 percent of retirement leavers). The difference in the importance of financial issues is about the same or even greater between early career leavers and school movers, who are otherwise much more negative about most teacher working conditions than are the early career leavers; only 65 percent of movers cite salary and 39 percent cite cost of living (Table 10).

Table 10: Importance of Financial Situation, Early Career Leavers, Retirement-Age Leavers, and Movers

	Percent Agreeing:		
	Early Career Leavers	Retirement-Age Leavers	Movers
Salary influenced my future career plans.	78%	70%	65%
Cost of living of the commnity in which my school is located influenced my future career plans.	48%	38%	39%

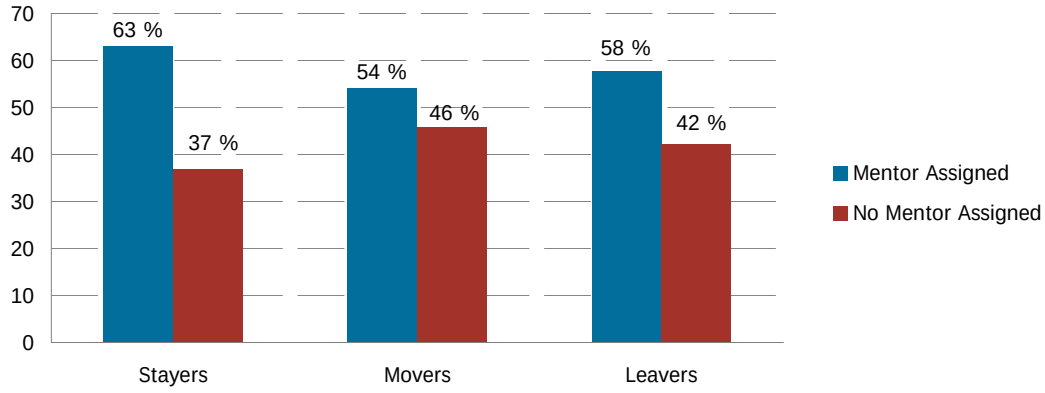
Findings from Analyses of Responses to Mentoring and Induction Issues

In addition to some of the factors associated with teacher retention discussed in the previous section, another critical component of the teacher retention puzzle is the quality and availability of mentoring and induction for new teachers. The importance of addressing this issue in Arizona is suggested by the imbalance in mentoring and induction available to all new Arizona teachers.

7. Many Arizona novice teachers are not mentored at all, mentored by other novice teachers, or mentored by teachers with heavy mentoring loads.

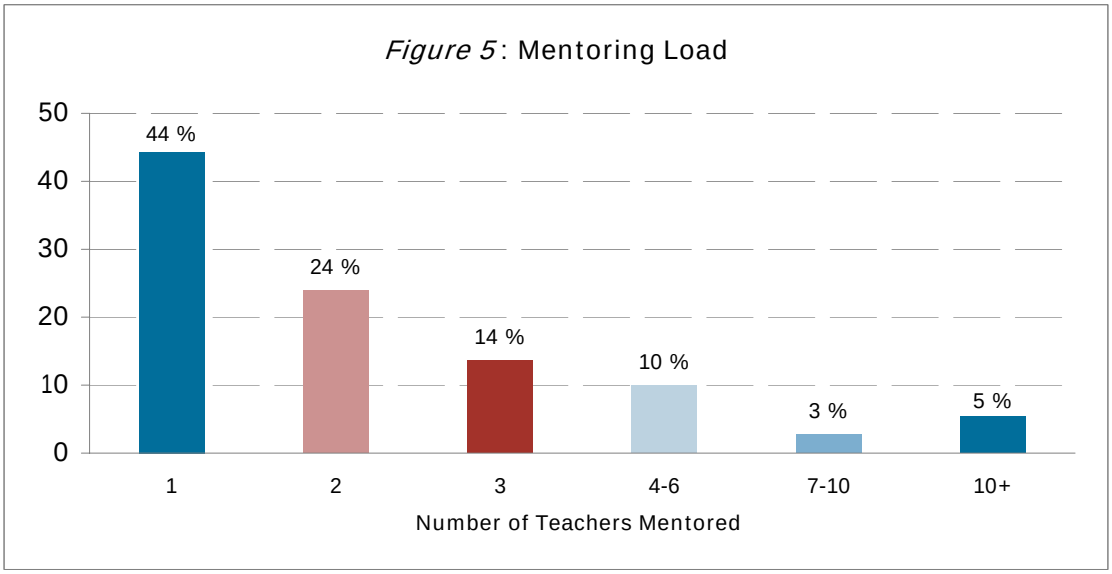
While almost two-thirds (63 percent) of early career stayers (teachers in their first three years who indicate that they intend to stay at their current school) report having been assigned a mentor, a slightly smaller proportion of early career leavers (58 percent) and even fewer early career movers (54 percent) indicate that they were assigned a mentor (Figure 4). These apparent differences in the availability of mentoring may contribute to the overall teacher attrition rate.

Figure 4: Exposure to Mentoring, by Career Intent, Early Career Teachers



Also contributing may be the relative inexperience of some of the teachers who are asked to serve as mentors. Though the numbers are small, some early career teachers who are themselves eligible for a mentor are also asked to serve as mentors. Nearly 300 teachers with less than three full years of experience report serving as mentors in the 2006-2007 school year, and they mentored at least 450 other novice teachers.

Beyond the value of having a mentor, the amount of attention each mentor provides is also important. Though most mentors (68 percent) report being given responsibility for only one or two novice teachers, almost one in five (18 percent) are responsible for four or more; five percent even report being given responsibility for more than ten mentees each (Figure 5).



8. When it is available, mentoring may help to buttress teacher working conditions that improve the likelihood that novice teachers will remain in teaching.

There is some indication that first-year teachers in Arizona sense a higher overall level of collegial support than do their more experienced colleagues, and that higher level of support may be attributable to mentoring. While only around half (51 percent) of all educators with at least one year of experience believe that they have opportunities to learn from one another, almost two-thirds (63 percent) of first-year teachers report having those opportunities. Similarly, though only about 36 percent of experienced educators think they have adequate time to collaborate with colleagues, 50 percent of first-year teachers believe that they are afforded such time. These declines in the number of teachers who sense some degree of collegial support begin early in their careers, too; as soon as their second or third year, only 56 percent of teachers believe that they are provided opportunities to learn from one another, and a mere 42 percent believe that they have adequate time to collaborate (Table 11). These patterns parallel the fact that the proportion of early career teachers who are assigned mentors drops off after their first year of teaching (from 66 percent of first-years with mentors to 59 percent of second- and third-years with mentors).

Table 11: Collaboration and Collegial Interaction, First-Year versus Experienced

	Percent Agreeing:		
	First-Year Educators	Second- and Third-Year Educators	All Experienced Educators
Teachers are provided opportunities to learn from one another.	63%	56%	51%
Teachers have time available to collaborate with their colleagues.	50%	42%	36%

Domain-Specific Findings

The findings for this report were generated after careful consideration of educator responses to questions about the five different teaching and learning condition domains addressed in the survey. Presented here—in their order of importance to teachers with respect to their future career decisions—are more detailed assessments of the stories the data in these domains tell. In this section, we also begin the process of unpacking how different educators—defined by their positions (*e.g.*, teachers and principals) and by other characteristics (*e.g.*, experience, school level, *etc.*)—view specific teacher working conditions.

Of particular interest are the differences between classroom teacher and principal perceptions of working conditions, as well as between elementary and secondary teachers. As noted above in the **General Findings** section, in every domain and on every topic within a domain, teacher impressions are less positive than are principal impressions, and sometimes dramatically so. In fact, though Arizona classroom teacher perceptions of various working conditions range from very positive to very negative, depending upon the issue, principals expressed favorable views of *almost every aspect of teacher working conditions*.[18] **Appendix A**, an extension of Table 2 (above), contains a complete table of teacher and principal responses to all of the major survey questions, and that table is referred to throughout this section. At the least, the state should consider taking steps to better understand the reasons behind this clear and sometimes pronounced disconnect.

Differences between elementary and secondary teachers are not always as dramatic, but there is a relatively consistent pattern, with elementary teachers expressing positive impressions of their working conditions much more often than do their middle and high school colleagues. In some instances, differences in the proportion of teachers with positive perceptions of a given teacher working condition are as great as twenty percentage points or more. Particularly notable differences are highlighted below.

Leadership

Overall impressions of leadership in Arizona are positive, though not overwhelmingly so, with only about 57 percent of all respondents indicating that they think that leadership at the school level is effective. Educators are most positive about leadership issues from an individual faculty member perspective—a large majority of respondents are inclined to approve of their leadership's efforts to hold teachers to high professional standards (80 percent of respondents agree that leadership does so) and to evaluate teachers fairly (73 percent), and a healthy 70 percent believe that all faculty are committed to helping every student learn. It is worth noting, however, that the proportion of educators who believe that all faculty are committed drops from around 80 percent among teachers at the elementary level to a much less positive 57 percent at the high school level, and the proportion of educators who believe that teachers are held to high professional standards drops from 87 percent at the elementary level to only 69 percent at the high school level (Table 1, above).

Perceptions of the overall impression of the quality of leadership are muted, however, by the generally lower impressions that educators have of the broader school atmosphere established by their leaders. For example, only a slim majority (54 percent) believe that leaders enforce rules for student conduct consistently, and about the same proportion (53 percent) believes that all teachers feel comfortable raising issues and concerns. Differences in opinion about enforcement of rules are strongest between elementary and secondary educators, with only 48

percent of middle school educators and 43 percent of high school educators expressing positive impressions of leadership in this area, as compared to 63 percent of elementary educators (Table 1, above). In addition, less than half of all educators feel that their leaders are responsive to concerns raised about their leadership (41 percent), the use of time in school (45 percent), and teacher empowerment issues (46 percent; Table 12).

Table 12: Educators' Perceptions of Leadership's Efforts to Address Concerns

The school leadership makes a sustained effort to address concerns about:	Percent Agreeing:
Professional development	55%
Facilities and resources	53%
Empowering teachers	46%
The use of time in my school	45%
Leadership issues	41%

Arizona educators' concerns about their leadership's willingness to address issues of time are particularly interesting, given their generally unfavorable impression of the amount and quality of time available to them (see **Time**, below).

More troubling are the vast disparities between teacher and principal impressions of leadership. Teacher impressions of leadership issues range from very positive (with a high of 80 percent agreeing or strongly agreeing that they are held to high professional standards) to negative (with a low of only 40 percent agreeing or strongly agreeing that leadership is willing to address issues raised by faculty about their leadership), but a large majority of principals agree or strongly agree with every statement in the leadership domain. In fact, their lowest level of agreement is with regard to the issue of faculty commitment to student learning, but even here, a full 84 percent agree or strongly agree that their faculty are committed (compared to 70 percent of teachers; see **Appendix A**). Clearly, teacher and principal perceptions of leadership are different (vastly so at times), and these differences between leadership and faculty may be an important influence on overall teacher perceptions of their working conditions.

Empowerment

Educators' sense of empowerment in Arizona ranges from marginally positive to very negative, with a majority expressing positive assessments of empowerment on only a few issues. The empowerment issue about which Arizona educators feel most positive is the belief that their schools take steps to solve problems, but even here less than two-thirds (63 percent) agree, and the gap between elementary educators and high school educators is relatively large (69 percent versus 53 percent). Furthermore, while a small majority of Arizona educators believe that teachers are recognized as educational professionals (58 percent), that recognition is not consistent across all areas of teacher professionalism. For example, 58 percent also believe that teachers are trusted to make sound professional decisions about instruction, and 55 percent believe that

teachers play an important role in devising teaching techniques, but fewer than half believe that this type of classroom-level teacher empowerment includes involvement in selecting instructional materials (35 percent) or setting grading and student assessment practices (48 percent; 58 percent of high school educators express positive impressions of teacher involvement in this area, but only 40 percent of elementary educators feel the same way; Table 13).

Table 13: Educators' Perceptions of Teacher Empowerment, by School Level

	Percent Agreeing:			
Empowerment Issue:	Elem	Middle	High	Overall
In this school we take steps to solve problems	69%	61%	53%	63%
Teachers are trusted to make sound professional decisions about instruction	59%	60%	55%	59%
Teachers are recognized as education professionals	61%	58%	52%	58%
Site councils provide teachers opportunities to participate in school planning and decisionmaking	57%	51%	42%	52%
Opportunities for advancement within the teaching profession (other than administration) are available to me	49%	45%	43%	46%
The faculty has an effective process for making group decisions and solving problems	53%	44%	34%	46%
Parents and community members support teachers, contributing to their success with students	51%	38%	37%	44%
Teachers are centrally involved in decisionmaking about educational issues	40%	38%	28%	36%
Teachers play a large or primary role in:				
Devising teaching techniques	51%	57%	62%	55%
Setting grading and student assessment practices	40%	55%	58%	48%
Selecting instructional materials and resources	30%	37%	44%	35%
Establishing and implementing policies and student discipline	28%	20%	13%	22%
School improvement planning	24%	22%	15%	21%
Site council planning/decisionmaking	20%	17%	11%	16%
Determining the content of in-service professional development programs	15%	13%	11%	13%
The hiring of new teachers	16%	9%	5%	11%
Deciding how the school budget will be spent	5%	4%	3%	4%

With regard to empowerment matters outside of the classroom, impressions are even less positive. Low impressions of teacher involvement in such decisions as budget-setting (4 percent) are perhaps not unexpected, but of more concern may be the impressions most educators have of teacher involvement in hiring (only 11 percent believe that teachers are significantly involved), determination of professional development content (13 percent), site council planning (16 percent), school improvement planning (21 percent), and establishment and implementation of student discipline policies (22 percent; Table 13, above). Two of those areas—professional development and student discipline—are particularly noteworthy in light of the generally low impressions most educators have of leadership's enforcement of student discipline policies (only about 54 percent agree that leaders enforce rules for student conduct consistently) and of the quality and content of much of their professional development (see **Professional Development**, below).

As is true with regard to leadership issues, teacher and principal impressions of empowerment are quite different. The largest gaps are in the area of overall school planning, with only 35 percent of teachers believing that teachers are centrally involved in decision making about educational issues (compared to 84 percent of principals), and a mere 19 percent of teachers indicating that teachers play a large or primary role in school improvement planning (compared to 76 percent of principals). Educators' sense of empowerment also appears to decline over time; first-year teachers are much more likely than are their older colleagues to believe that they are recognized as education professionals, trusted to make sound professional decisions, and empowered to set grading and assessment practices (Table 14).

Table 14: Educators' Perceptions of Teacher Empowerment by Position and Experience

	Percent Agreeing:			
Empowerment Issue:	Teachers	Principals	First-Year Educators	All Experienced Educators
Teachers are centrally involved in decisionmaking about educational issues	35%	84%	39%	36%
Teachers are recognized as education professionals	57%	94%	74%	57%
Teachers are trusted to make sound professional decisions about instruction	58%	94%	71%	58%
Teachers play a large or primary role in:				
School improvement planning	19%	76%	16%	21%
Setting grading and student assessment practices	49%	70%	59%	48%

Time

More so than perhaps any other domain of teacher working conditions, time appears to be a major missing commodity in the eyes of most educators; however, unlike their colleagues in many other states that have administered working conditions surveys, Arizona administrators appear to be at least partially aware of this deficiency. The strongest overall positive assessment of a time issue is of the degree to which interruptions to the school day are kept to a minimum, but even for this issue, fewer than half of all educators (43 percent) agree that this condition is met. In all other areas—class sizes that afford adequate time with students, time for collaboration, non-instructional time, and minimization of paperwork and non-instructional duties—only around a third or fewer of all educators agree that time is managed or protected sufficiently well. While the teacher-principal gap persists in this domain as it does in others, it is worth noting that overall principal responses are less positive here than elsewhere (for instance, barely half of all principals believe that teachers have sufficient non-instructional time), indicating greater awareness of the need for more and better usage of time for teachers (Table 15).

Table 15: Time Pressures, Overall Impressions and Teachers versus Principals

Time Pressure:	Percent Agreeing: Overall	Teachers	Principals
Efforts are made to minimize the amount of routine administrative paperwork I am required to do	30%	30%	46%
The non-instructional time provided for teachers in my school is sufficient	30%	30%	53%
Teachers have reasonable class sizes, affording them time to meet the educational needs of all students	32%	31%	58%
Teachers have time available to collaborate with their colleagues	37%	36%	62%
Teachers are protected from duties that interfere with their essential role of educating students	38%	37%	68%
Teachers are allowed to focus on educating students with minimal interruption	43%	42%	75%

The vast majority of teachers (85 percent) report having less than an hour a day available for non-instructional work, and nearly 40 percent work more than ten hours a week outside of their regular school hours. In addition, teachers indicate that most of their non-instructional time is not dedicated to either remediation work with students (on which 69 percent of teachers report spending less than three hours a week) or to volunteer activities such as coaching and tutoring (with over 75 percent reporting spending less than three hours a week), a finding that parallels the concerns educators express about the amount of time lost to paperwork and non-instructional duties. Again, many administrators appear to be aware of these time issues, with over half (55 percent) acknowledging that their faculty spend five or more hours a week on school work outside of school hours (Table 16).

Table 16: Usage of Time, Overall Impressions and Teachers versus Principals

	Hours per Week: Teachers					Principals				
In an average week of teaching:	0	< 3	3-5	5-10	10+	0	< 3	3-5	5-10	10+
How much in-school non-instructional time do you / do teachers have available?	5%	40%	40%	14%	1%	2%	34%	40%	21%	2%
How many hours do you / do teachers spend on school-related activities outside the regular school work day?	1%	10%	19%	31%	39%	1%	18%	25%	32%	22%
How many of these hours are typically spent on remediation efforts with students (tutoring, academic coaching, etc.)?	24%	46%	20%	8%	3%			---		
How many of these hours are typically spent on voluntary activities (coaching, club sponsorship, etc.)?	40%	35%	12%	7%	6%			---		

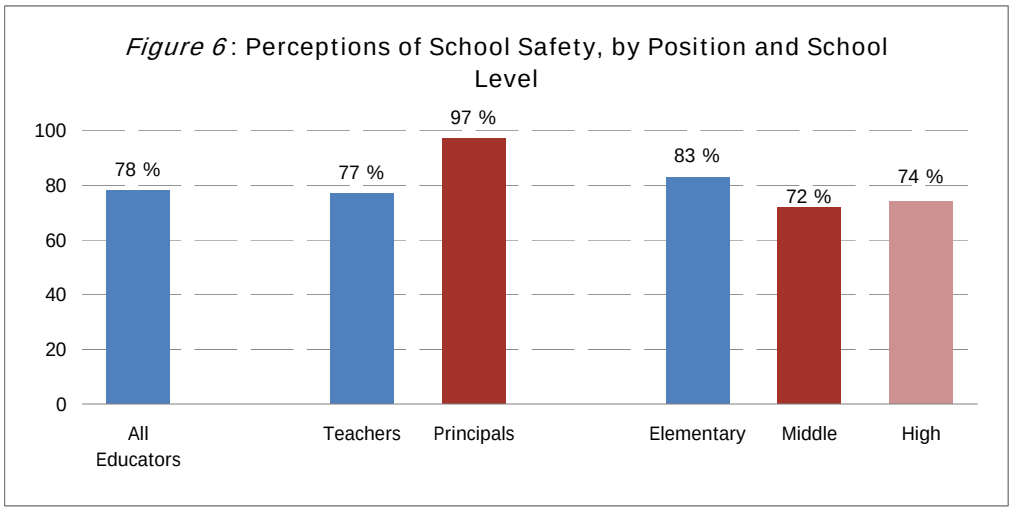
Facilities and Resources

In almost all areas, Arizona educators are generally positive about their facilities and resources. In particular, there is strong agreement about the availability of communications technology (83 percent of educators agree that they have sufficient access). Respondents are less enthusiastic but still positive overall about the availability of office equipment and supplies (65 percent), professional workspace (64 percent), and instructional materials (61 percent). Educators expressed less confidence, however, in the availability of professional support personnel (59 percent) and sufficient training and support to take advantage of instructional technology (a low for this domain of only 46 percent; Table 17).

Table 17: Overall Impressions of Facilities and Resources

Facilities and Resources Issue:	Percent Agreeing
Teachers have sufficient access to communications technology, including phones, faxes and email	83%
Teachers have sufficient access to office equipment and supplies such as copy machines, paper, chalk, etc.	65%
Teachers have adequate professional space to work productively	64%
Teachers have sufficient access to appropriate instructional materials and resources	61%
Teachers have sufficient access to instructional technology	59%
Teachers have sufficient access to a broad range of professional support personnel	59%
Teachers have sufficient training and support to fully utilize the available instructional technology	46%
Teachers and staff work in a school environment that is safe	78%

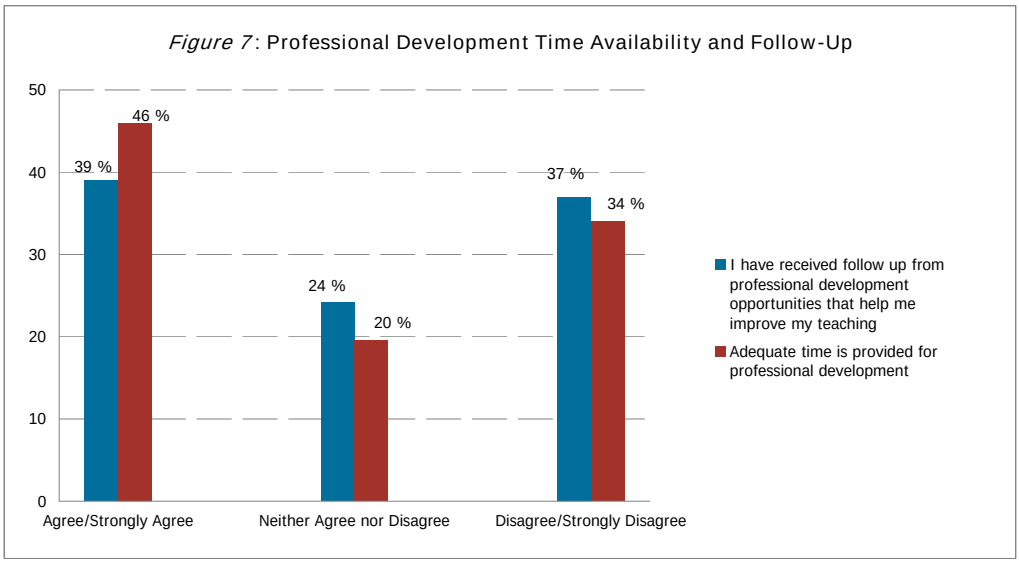
Most importantly, most Arizona educators report feeling that their schools are safe (78 percent; Table 17), but there is a substantial difference in principal and teacher perceptions of safety, with 77 percent of teachers indicating that they feel that their schools are safe, compared to an almost unanimous 97 percent of principals. Differences in perceptions of safety are less pronounced across school levels, but in general more elementary educators report feeling safe than do their middle and high school peers (83 percent versus 72 percent and 74 percent, respectively; Figure 6).



Professional Development

In general, Arizona educators express positive but lukewarm support for the current availability of professional development opportunities, with a small majority of respondents noting favorable impressions of the availability of professional development for every educational topic covered in the survey. Arizona educators are most pleased with the strategies that their professional development has provided for them with regard to instructional delivery, with over 63 percent expressing favorable views of the professional development offered in this area.

Most notable, however, are educator responses to a question about whether they received follow-up from professional development opportunities. Only a little more than one-third of all respondents (39 percent) indicate that they have received such follow-up, and almost the same number (37 percent) indicate that they have not. There is similar concern about the amount of time available for professional development, with fewer than half (46 percent) agreeing and over one-third (34 percent) disagreeing that enough time is provided (Figure 7).



As in other domains, teacher and principal impressions of professional development are very different on most counts, but both groups appear to agree that the time provided for professional development is lacking (58 percent of principals and only 46 percent of teachers believe that adequate time is provided for professional development). More interesting than the overall disagreements between teachers and principals in this area, however, are the differences of opinion about specific professional development offerings. While teachers and principals tend to agree on the *order of importance* of certain professional development activities, principals tend to believe that the needs are greater than do their teachers. And yet, even in areas in which principals detect a pronounced need, teachers indicate that they have received little in the way of professional development over the past two years. Beyond Limited English Proficiency professional development, fewer than half of all teachers indicate receiving 10 or more hours over the past two years in any area. Strikingly, only 15 percent of teachers indicate a need for subject matter-focused professional development, and yet more than forty percent report receiving a substantial amount of such training (Table 18).

Table 18: Perceived Professional Development Needs and Availability, Teachers versus Principals

	Percent indicating a need:		Percent of teachers receiving 10+ clock hours, past 2 years:
Support Area:	Teachers	Principals	
Special Education (Students with Disabilities)	50%	78%	21%
Closing the Achievement Gap	46%	66%	15%
Limited English Proficiency (LEP)	44%	69%	80%
Special Education (Academically Gifted Students)	29%	58%	7%
Reading	29%	55%	49%
Classroom Management	21%	49%	25%
Student Assessment	20%	50%	36%
Methods of Teaching	17%	48%	49%
Content-Area Professional Development	15%	25%	41%

Analysis of Teacher Working Conditions Impacts on Teacher Attrition and Student Achievement

As the data suggest, working conditions can and do matter to teachers, and they also appear to contribute to their career decisions. In this section of the report, we carry our analyses one step further by constructing statistical models that unpack these effects more precisely. The first set of models helps to draw clearer connections between teacher working conditions and teacher career decisions, factoring in several additional variables not included in the Teacher Working Conditions Survey itself, such as district career ladder status and student body characteristics. The second set of models begins the longer and more difficult task of connecting the impact of teacher working conditions to student learning in the form of annual achievement test gains. Due to data limitations and the short length of the timeframe under scrutiny (one academic year), this second set of models cannot fully estimate the impact of teacher working conditions on student learning, but it does lay the groundwork for future in-depth studies of this vital connection.

Teacher Working Conditions and Teacher Attrition

The first set of analyses for this final part of the study is based on a statistical procedure that is designed to help uncover the degree to which several potential influences on a teacher's decision to stay at a school actually impact that decision. Because the outcome that the procedure attempts to explain is binary (*i.e.*, the outcome for any given teacher is one of two choices: stay at the current school versus move to another school or leave teaching entirely), the specific procedure used is a logistic regression model. Logistic regressions help to examine the apparent relative impact of multiple factors on a binary outcome. The regression procedure was applied to three different groups of teacher respondents—elementary school teachers, middle school teachers, and high school teachers—as well as to all teachers, regardless of school level. A full explanation of this procedure, along with all of the numerical results, can be found in **Appendix B: Methodology.**

Results

Impact of Teacher Perceptions of Teacher Working Conditions

Teacher perceptions of many teacher working conditions appear to have an impact—and sometimes powerfully so—on career intentions. Teacher responses to representative survey questions from each domain were included in our analyses, and at every school level, several of them were significantly associated with career intent. Results discussed below are summarized in Table 19 at the end of the section.

Of particular note are the consistent and strong associations between three teacher working conditions areas—school environment, school-level problem-solving, and professionalism—and teacher career intentions. Least surprising of all is the finding that teacher perceptions of their school environment—including school safety, the level of trust and respect in the school, and the presence of support from parents and the community—are positively associated with career intent. Teachers who believe that their schools are safe places to work and learn are between 32 percent (middle school) and 43 percent (high school) more likely to say that they intend to stay at their schools. In addition, when teachers sense that there is an atmosphere of trust and respect in their schools, they are between 23 percent (middle school) and 53 percent (elementary) more likely to intend to stay. This finding corresponds to a growing theoretical and empirical research base that shows that trust and respect are critical factors in improving schools.[19]

The existence of key relationships, both inside and beyond the school walls, also emerges as an important factor in teacher career intentions. Perceptions of parent and community support are associated with a likelihood for staying that is between 12 percent (elementary) and 22 percent (middle school) greater than for teachers who believe otherwise. In a related vein, teachers who sense a willingness and an ability to address and solve problems in their schools are also more likely to express an intention to stay. Teachers who believe that their faculty has an effective process for making decisions are between 20 and 25 percent more likely to intend to stay, and those who feel comfortable raising concerns are between 21 and 33 percent more likely.

Finally, at every school level, teachers who sense a greater degree of acknowledgment that they are and should be treated as professionals are much more likely to indicate that they will return to their schools the following year. Whether it is a result of receiving fair evaluations, of being allowed to play a significant role in developing instructional techniques, of being recognized for accomplishments, or just of having the feeling that she or he is recognized as a professional, feelings of professionalism are consistently associated with a greater likelihood for an Arizona teacher to intend to stay at her or his current school. Recognition of professionalism appears to have the strongest effect on career intent for high school teachers, who were 66 percent more likely to stay when they had positive impressions of this condition, while being recognized for accomplishments resonated strongest for elementary teachers, who were 32 percent more likely to stay when they felt so acknowledged. Developing instructional techniques and receiving fair performance evaluations were more important to middle school teachers than to teachers at other levels, resulting in a 27 to 28 percent increase (respectively) in their likelihood to stay. Such findings support a strong body of qualitative research that consistently has found that teachers want to be treated as professionals, especially in terms of being entrusted to make important educational decisions about their schools and classrooms.[20]

Impact of Other Teacher and School Characteristics

The main focus of this section of the report is the impact of teacher working conditions on teacher attrition, but several outcomes associated with some of the non-working conditions variables are also worth noting here. Most of the results in this section are also summarized in Table 19. First, it is interesting to note that, in an aggregated analysis (see full results in **Appendix B**), middle school teachers are less likely to express an intent to stay than elementary school teachers (only 88 percent as likely), while high school teachers are more likely to indicate that they will stay (about 30 percent more likely), after controlling for other factors. Second, and perhaps not surprisingly, when compared to mid-career teachers, novice teachers (teachers with three or fewer years of experience) are less likely to indicate that they intend to stay in their

current schools, a finding that is consistent across all three school levels. These findings are statistically significant at all three levels, but the association between experience and career intent is strongest at the middle school level (where novice teachers are about 76 percent as likely as experienced teachers to stay) and high school level (where novice teachers are about 82 percent as likely to stay).

Several other factors also are significantly associated with career intentions, but not consistently across all levels. For example, while a school's participation in the Career Ladder program appears to be significant in the analysis that includes all teachers (**Appendix B**), this variable is positively associated only with the decisions of elementary school teachers to remain in their current schools when the analyses are disaggregated by school level (increasing the likelihood by about 20 percent). Career Ladder participation may matter at higher school levels, too, but for this analysis the positive results for middle and high school teachers were not statistically significant. Also impacting elementary career intent decisions is overall school size, with teachers at larger schools (schools with 750 or more students) being only 85 percent as likely to stay as teachers at smaller schools.[21] One final earlier-grade (elementary and middle school) result stands out. Female elementary and middle school teachers appear to be more likely to intend to stay in their current schools than are their male counterparts, all else being equal. This finding is consistent with research that suggests that male teachers are more likely to pursue and be awarded non-teaching administrative promotions, [22] or even to leave the profession altogether to seek greater remuneration in other fields or administrative positions.

A Note on Likelihoods and Probabilities

All of the results above are reported in terms of the change in the *likelihood*—or the change in the *odds*—that a teacher intends to stay, given a change in a certain condition or characteristic. Changes in likelihood can be quite large, but the reader is cautioned to note that a change in likelihood is not the same as a change in *probability* (see **Appendix B** for more explanation of the difference). All changes in likelihood discussed above are converted into changes in probability in Table 19.

Table 19: Changes in Likelihood of Staying and in Probability of Staying

	Increase or decrease in likelihood of staying, controlling for other			Probability of staying, controlling for other variables		
	Elementary	Middle	High	Elementary	Middle	High
Overall Probability of Staying →				82%	76%	79%
Factor or Characteristic:						
Teacher Characteristics						
Female (vs male)	1.286 *	1.227 *	1.040	85%	79%	80%
Novice (vs. mid-career)	0.875 *	0.762 *	0.822 *	80%	71%	76%
Student Characteristics						
School smaller than 500	0.886	1.058	0.787 *	80%	77%	75%
School larger than 750	0.845 *	1.091	0.998	79%	77%	79%
Career Ladder School	1.197 *	1.172	1.035	84%	79%	80%
Accountability Rating: Excelling	1.046	0.678 *	1.215 *	82%	68%	82%
Urbanicity (vs. Towns and Rural Areas)						
Large City	1.206 *	1.142	1.084	84%	78%	80%
Teaching and Learning Conditions (Positive vs. Negative Impression)						
Parents & community support teachers	1.119 *	1.216 *	1.191 *	83%	79%	82%
Safe school environment	1.356 *	1.319 *	1.428 *	86%	81%	84%
Teachers play sig.role in discipline policies	1.031	1.270 *	1.387 *	82%	80%	84%
Rules for student conduct consistently enforced	1.109	1.252 *	0.990	83%	80%	79%
Paperwork is minimized	1.278 *	1.260 *	1.039	85%	80%	80%
Teachers recognized as educ. professionals	1.559 *	1.445 *	1.659 *	87%	82%	86%
Teachers play sig. role in devel. instr. techniques	1.141 *	1.272 *	1.149 *	84%	80%	81%
Atmosphere of trust and respect	1.530 *	1.233 *	1.515 *	87%	79%	85%
Teachers feel comforrtable raising concerns	1.207 *	1.328 *	1.224 *	84%	81%	82%
Performance evaluations are fair	1.247 *	1.276 *	1.204 *	85%	80%	82%
Teachers are recognized for accomplishments	1.318 *	1.183 *	1.175 *	85%	79%	82%
Teachers receive feedback that improves instr.	1.273 *	1.071	1.452 *	85%	77%	84%
Fac. has effective process for making decisions	1.240 *	1.250 *	1.191 *	85%	80%	82%

* = result is statistically significant

Teacher Working Conditions and Student Achievement

The second set of analyses for this final part of the study is designed to identify some of the links between multiple school factors (including teacher working conditions) and student achievement. It is relatively common to encounter studies of this kind in which student achievement is represented by a single achievement score for the year of interest; however, such studies often confuse a strong *relationship* between such scores and various explanatory factors with some degree of *causal explanation for* those scores.[23]

Consequently, when studying the relationship between teacher assessment of their working conditions and the achievement scores of the students in their schools, it is not at all surprising to find a strong positive relationship between high working conditions ratings and high student scores. Such a relationship does not mean, however, that one factor (good teacher working conditions) *causes* the other (high student scores). It is equally as plausible, for example, that teachers who work with higher-achieving students tend to rate their working conditions more favorably than do teachers who work with lower-achieving students, which would imply that the achievement scores might be causing the working conditions ratings, instead of the other way around.

To counter this potential misinterpretation, the analyses below examine the relationship between student achievement *gains*, teacher working conditions, and other factors. In other words, the analyses attempt to make links between the degrees of change in overall student achievement from year to year and several factors that might make those gains more likely, including working conditions. The analyses are based on a statistical procedure that is designed to help uncover whether a factor is clearly related to the variable of interest (in this case, to gains in student achievement). Unlike the analyses employed for examining a binary choice of staying or leaving, the outcomes these analyses attempt to explain are continuous (*i.e.*, the outcome for any given school is any point along a range of possible negative or positive gains in scores from one year to the next), and the specific procedure used is called a multiple regression. This regression procedure was applied to math gain scores at three different school levels—elementary schools, middle schools, and high schools. A full explanation of this procedure, along with an explanation of the choice to use math instead of reading scores and all of the numerical results, can be found in **Appendix B: Methodology**.

Results

The proxy for teacher working conditions used for these analyses is the proportion of teachers in a school who indicate that they will return to their school the following year. Because it distinguishes between an individual complaint or concern and a more general feeling of comfort at a school, this variable captures well a sense of the overall teacher satisfaction with working conditions at a school.[24] At the elementary and high school levels, the apparent impact of working conditions on student achievement is positive; however, only at the elementary level is the impact both positive and statistically significant. Curiously, the impact at the middle school level appears to be somewhat negative, but, as with the high school results, these results are not statistically significant and are therefore inconclusive. Similarly, whether a school participates in the Career Ladder program appears to have a significant and positive impact on student gains only at the elementary level.

What do these mixed results tell us? At best, they suggest a link between teacher working conditions and student achievement at one level of schooling (elementary); at the least, they offer directions for critical future research. Our preceding analyses and analyses conducted for other research projects both suggest that teacher working conditions do indeed have an impact on student achievement, but such an impact is not likely to be detectable in a single-year, snapshot study such as this one, especially when the overall number of schools in two of the three samples (middle and high school) is so low (in both cases, no more than 150 schools). A more sophisticated, longitudinal study that accounts for gradual changes in school working conditions over time, that factors in other time-sensitive variables (such as administrator turnover and relative changes in student demographics), and that includes a larger pool of schools is necessary to allow for the possibility of identifying these important but often indirect or gradual effects.[25]

A Note on Career Ladder Districts

As noted in the previous analyses, school participation in the Arizona Career Ladder program appears to have a significant and positive impact on student gains and teacher attrition, though only at the elementary level. For over twenty years, Arizona has been a national pioneer in its support of the concept of a career ladder approach to teacher compensation. The state's Career Ladder program is a voluntary program offering teachers recognition and compensation through a pay for performance program based on the concept of "equal pay for equal work." The program, open to all teachers in twenty-eight districts across the state, provides opportunities for teachers to advance, both monetarily and professionally, without leaving the classroom or profession. It is characterized by a compensation system that recognizes and rewards their excellence. One of the goals of the program is to attract and retain talented and well-trained teachers, and this analysis of teacher working conditions across districts provides an excellent opportunity to investigate not only the degree to which that goal is being met but also the level of impact the program is having on student outcomes.

To help buttress the promising but statistically inconclusive associations between Career Ladder status, teacher attrition, and student achievement presented above, we offer here a brief overview of some of the differences in responses on the Arizona Teacher Working Conditions survey between teachers who work in career ladder districts and teachers who do not work in these districts, which may be more useful than the preceding analyses.

Teachers in career ladder districts generally hold more favorable views of many leadership components. In particular, they are more likely to indicate that teachers are held to high expectations (+5 percentage points), that they are given more feedback (+5 percentage points), and that they are recognized for their accomplishments (+6 percentage points)—all hoped-for components of a functioning career ladder system. On average, teachers in career ladder districts also give a higher rating to the general "quality of life" at their school (+6 percentage points), and there also appears to be a greater sense of faculty commitment to helping all students to learn in career ladder districts (+5 percentage points; Table 20).

In addition, teachers in career-ladder districts feel a greater sense of support from the community (+7 percentage points), though it should be noted that, at least in part, this difference may be a reflection of pre-existing differences between career ladder and non-career ladder districts. For instance, there is some indication that career ladder districts benefit from a generally higher level of community affluence, based on the more favorable views of the availability of various supplies and support (between +7 and +10 percentage points; Table 20).

Table 20: Difference in Perceptions of Working Conditions, Career Ladder versus Non-Career Ladder Districts

Selected Teacher Working Conditions Survey Item	Career Ladder Districts	Non-Career Ladder Districts	Difference in Percentage Points
Teachers are held to high professional standards for delivering instruction	83%	78%	5
Overall, the school is a good place to work and learn	76%	70%	6
All of the faculty are committed to helping every student learn	73%	68%	5
Teachers receive feedback that can help them improve teaching	71%	66%	5
Teachers are recognized for accomplishments	61%	55%	6
Parents and community members support teachers, contributing to their success with students	48%	41%	7
Teachers have sufficient access to office equipment and supplies such as copy machines, paper, chalk, etc.	71%	62%	9
Teachers have sufficient access to a broad range of professional support personnel	65%	55%	10
Sufficient resources are available to allow teachers to take advantage of professional development activities	63%	56%	7

In general, then, even though the statistical analyses summarized above do not reveal conclusive and across-the-board impacts of the Career Ladder system, many of the things one would hope to see as a result of career ladder programs (higher expectations for teachers, more involved leadership, higher ratings of work and learning environments) appear to be present in these districts, although there are also some indications that career ladder districts might be different from non-career ladder districts even in the absence of a career ladder system. In addition, our interviews with state and local officials suggest that differences in how school districts are implementing their career ladder models may best explain the differential impact of this reform effort on student achievement across participating districts. These data may provide a useful context for interpreting the findings in the previous analyses.

Looking Ahead

The survey data and analyses presented in this report suggest that Arizona has a solid foundation of committed educators, and comprehensive, sustained efforts to improve teaching and learning conditions will ensure that the state's educators are able to help every child in Arizona learn.

However, several patterns in the data point to areas in which the state and individual school leaders should turn their focus in order to improve working conditions in Arizona schools. The first is the major disconnect between teachers and their principals with respect to issues of empowerment and leadership. Consider these three related indicators:

- Teachers indicate that leadership and empowerment factors are the most critical influences on future employment plans;
- Teachers believe that efforts by school leaders to address teacher concerns about working conditions are least likely to occur in the areas of leadership, time, and empowerment; and
- The largest gaps between Arizona teachers' and principals' perceptions of teacher working conditions appear in their perceptions of leaders' efforts to improve conditions in the leadership and empowerment areas.

These data suggest a need to focus attention not only on leadership and empowerment issues in the abstract but also—and perhaps more importantly—on the different ways in which those issues are understood by teachers and school leaders. Until educators at all levels are able to understand each others' perceptions of working conditions, generating buy-in for sustained reforms to improve those conditions will be difficult at best.

Second, Arizona teachers are somewhat involved in classroom-level decisions, but not in broader, school-level decisions, such as ways to influence positively the quality and quantity of their professional development and ways in which time can be used better to improve student achievement. Time appears to be a major missing commodity in the eyes of most teachers, with many clearly expressing a need for more time to collaborate, and administrators appear to be only partially aware of this problem. In addition, fewer than half of all teachers report receiving substantial professional development in most teaching areas (including areas in which they need the most support and preparation).

Third, the data indicate that financial considerations play a larger role in the career decisions of teachers who choose to leave the profession before retirement than they do for retirement-age leavers or for school movers. However, because the current teacher working conditions survey includes only a few questions that directly address the links between salaries and perceptions of working conditions, the issue may deserve more attention in the future.

Fourth, the data suggest that many Arizona novice teachers are not mentored at all, mentored by other novice teachers, or mentored by teachers with heavy mentoring loads. However, when mentors are available, novice teachers report more favorable working conditions and are more likely to report that they will remain in teaching.

Fifth, in almost all areas, Arizona educators are generally positive about their facilities and resources, and most Arizona educators report feeling that their schools are safe. However, there are vast differences in how secondary and elementary school teachers view facilities and resources.

Sixth, teacher perceptions of their overall school environment, the presence of school-wide problem-solving strategies, and the degree to which they believe that they are respected as professionals are directly related to their intent to stay at their current schools. While the regression analyses also suggest relationships between teaching and learning conditions and *gains in student achievement*—especially at the elementary school level—more complete data and better data systems are needed to describe and understand fully the extent and nature of these relationships.

Finally, participation in the Arizona Career Ladder program appears to have a significant and positive impact on student achievement gains, but only at the elementary school level. Interviews with state and local officials suggest that differences in the ways in which participating school districts implement their career ladder models may best explain the differential impact of their reform efforts on student achievement.

Recommendations

Arizona teachers and administrators already have begun to use the data presented here and are most concerned about how to best act on the problematic issues of teacher time and empowerment. At an October 2007 Teacher Working Conditions workshop sponsored by the Arizona Education Association, using the Center for Teaching Quality's *Teaching and Learning Toolkit Framework™* (available from the Arizona Education Association), teachers and administrators suggested that they want to find ways to engage more of their colleagues and build awareness among parents in their communities regarding the multiple impacts of teacher working conditions. In addition, they suggest expanding future surveys and creating additional tools to help educators and policymakers to understand better how teachers in different subject areas and grade levels perceive their working conditions. Teachers and administrators alike believe that now is the time to begin to assess principals' working conditions. In addition, they want access to information on how data are being implemented locally to improve teacher working conditions and student learning.

Both the research findings and educator feedback suggest the following recommendations:

- Invest in a separate administrator working conditions survey that examines links between administrator characteristics (such as preparation and length of tenure) and teacher perceptions of working conditions at their schools to help determine what principals need in order to support teacher leadership and effectiveness.

- Develop statewide teacher, student, and administrator data systems that can track teacher and administrator working conditions survey responses longitudinally and link these data with actual teacher turnover figures and robust measures of student achievement.

- Conduct case studies in districts and schools where educators respond most favorably to their working conditions to determine how such conditions are developed and sustained over time.

- Conduct case studies of effective mentoring practices in Arizona.

- Investigate several different models for offering new teachers the kinds of mentoring and induction support that make a difference in teacher retention, and translate these findings into new teacher induction reform statewide.

- Establish an Arizona clearinghouse for results, strategies, and best practices for ensuring positive teacher and principal working conditions.

- Develop communications strategies to better inform policymakers, practitioners, and the public about what is known about teacher working conditions in Arizona and the relationships between those conditions and closing the state's achievement gap.

Moving forward on these strategies will help to establish a robust support system for schools and districts as they seek to reform their teacher working conditions, bringing Arizona one step closer to ensuring a positive working environment for all of its dedicated teachers and a quality learning environment for all of its students.

Appendix A. Teacher Perceptions vs. Principal Perceptions of Teacher Working Conditions

	Percent Agreeing		Difference in Percentage Points (Princ.-Tchr.)
Time:	Teacher	Principal	
Teachers have reasonable class sizes, affording them time to meet the educational needs of all students.	31%	58%	26
Teachers have time available to collaborate with their colleagues.	36%	62%	26
The non-instructional time provided for teachers in my school is sufficient.	30%	52%	23
Teachers are protected from duties that interfere with their essential role of educating students.	37%	68%	31
Efforts are made to minimize the amount of routine administrative paperwork I am required to do.	30%	46%*	16
Teachers are allowed to focus on educating students with minimal interruption.	42%	75%	32
Facilities and Resources:			
Teachers have sufficient access to appropriate instructional materials and resources.	60%	89%	29
Teachers have sufficient access to instructional technology.	59%	71%	13
Teachers have sufficient training and support to fully utilize the available instructional technology.	46%	54%	8
Teachers have sufficient access to communications technology, including phones, faxes and email.	83%	90%	8
Teachers have sufficient access to office equipment and supplies such as copy machines, paper, chalk, etc.	64%	90%	26
Teachers have sufficient access to a broad range of professional support personnel.	58%	67%	9
Teachers and staff work in a school environment that is safe.	77%	97%	20
Teachers have adequate professional space to work productively.	64%	80%	16

Appendix A. Teacher Perceptions vs. Principal Perceptions of Teacher Working Conditions (continued)

Empowerment:			
Teachers are recognized as educational professionals.	57%	94%	37
Opportunities for advancement within the teaching profession (other than administration) are available to me.	46%	60%	14
Teachers are centrally involved in decision making about educational issues.	35%	84%	49
Teachers are trusted to make sound professional decisions about instruction.	58%	94%	36
In this school we take steps to solve problems.	62%	97%	35
The faculty has an effective process for making group decisions and solving problems.	45%	85%	41
Parents and community members support teachers, contributing to their success with students.	43%	72%	29
Site councils provide teachers opportunities to participate in school planning and decision making.	51%	75%	24
Please indicate how large a role teachers have at your school in each of the following areas:			
Selecting instructional materials and resources	34%	66%	32
Devising teaching techniques	55%	78%	23
Setting grading and student assessment practices	49%	70%	21
Determining the content of in-service professional development programs	12%	45% *	33
Establishing and implementing policies and student discipline	22%	53%	31
Deciding how the school budget will be spent	4%	18% *	14
School improvement planning	19%	76%	56
The hiring of new teachers	11%	39% *	29
Site council planning/decision making	15%	52%	36

Appendix A. Teacher Perceptions vs. Principal Perceptions of Teacher Working Conditions (continued)

Leadership:			
There is an atmosphere of trust and mutual respect within the school.	56%	92%	36
School leadership communicates clear expectations to students and parents.	60%	96%	36
All of the faculty are committed to helping every student learn.	70%	84%	14
Teachers feel comfortable raising issues and concerns that are important to them.	52%	91%	38
The school leadership consistently enforces rules for student conduct.	52%	94%	42
School leaders effectively communicate policies.	57%	93%	36
Teacher performance evaluations are fair in my school.	73%	96%	23
Teachers receive feedback that can help them improve teaching.	67%	96%	29
Teachers are recognized for accomplishments.	56%	91%	35
Teachers are held to high professional standards for delivering instruction.	80%	94%	14
The school leadership makes a sustained effort to address teacher concerns about:			
Leadership issues	40%	91%	51
Facilities and resources	51%	94%	42
The use of time in my school	44%	90%	46
Professional development	54%	93%	39
Empowering teachers	45%	93%	48
New teacher support	52%	91%	40
Overall, the school leadership in my school is effective.	56%	90%	34

Appendix A. Teacher Perceptions vs. Principal Perceptions of Teacher Working Conditions (continued)

Professional Development:

Sufficient resources are available to allow teachers to take advantage of professional development activities.	58%	81%	24
Professional development provides teachers with the knowledge and skills most needed to teach effectively.	55%	92%	38
Teachers are provided opportunities to learn from one another.	51%	86%	35
Adequate time is provided for professional development.	46%	58%	12
Professional development offerings are data-driven.	51%	82%	31
Professional development has provided you with strategies that you have incorporated into your instructional delivery methods.	64%	84%	20
I have received follow up from professional development opportunities that help me improve my teaching.	38%	74%	35
Professional development has proved useful to you in your efforts to improve student achievement.	58%	89%	31

* One of only four items for which fewer than half of all principal responses were positive; see text, pp.7, 19.

Appendix B. Methodology

Teacher Working Conditions and Teacher Attrition

The logistic regression model for the teacher attrition component of this study was applied to four different groups of teacher respondents—elementary school teachers (n = 12,414), middle school teachers (n = 4,485), high school teachers (n = 7,243), and all teachers (n = 29,316)[26]—and is specified as follows. Let the conditional probability of a teacher's intention to stay at her or his current school be represented by P. The logistic regression model predicts the logarithm of the ratio of this probability and its reciprocal (the odds ratio)—which for this study is defined as $\ln(P/(1-P))$—as a function of independent variables. Thus, a generic equation for this model looks like:

$$\ln(P/(1-P)) = \alpha + \beta_1(T) + \beta_2(S) + \beta_3(UR) + \beta_4(TWC)$$

where P = the probability of staying, α = a constant, T = several teacher characteristics variables, S = several school characteristics variables, UR = urbanicity (or rurality) of the school, and TWC = perceptions of various teaching and learning conditions. In non-mathematical terms, this equation reads as:

> *A teacher's future career intentions are influenced by that teacher's personal characteristics, characteristics of her or his school, school locale, and that teacher's perceptions of teacher working conditions at her or his school.*

Because P represents the probability that a teacher intends to stay in her or his school, results are reported for each independent variable such that coefficients for each variable that are greater than 1 suggest a contribution to an intention to stay, while coefficients less than 1 suggest a contribution to an intention not to stay.

Data

All data for these analyses were obtained from two sources: the 2007 Arizona Teacher Working Conditions Survey; and a school-level data set comprised of demographic information about each school that was prepared specifically for this study by the Arizona Department of Education. Since this analysis focused on factors that impact an *individual* teacher's decision to stay at a school, all teachers were included in the analysis, regardless of the overall survey response rate of the school that employed the teacher.[27] The independent variables included in the model are:

Individual Teacher Characteristics (obtained from survey responses):

- Ethnicity (non-white = 1; all other = 0)
- Gender (female = 1)
- Preparation route (alternative certification program = 1; traditional = 0)
- Experience (novice [<4 years], experienced [>20 years]; mid-career [4-20 years] is excluded category)
- National certification (Teacher is National Board Certified = 1)

School Characteristics (obtained from the Arizona Department of Education):

- Percent of economically disadvantaged students at the school
- Student mobility—percent of students who leave a school during the school year
- Percent of white students at the school
- School size (small [<500], large [>750]; school size between 500 and 750 students is the excluded category)
- Career Ladder school (=1)
- Student-Teacher Ratio
- Arizona Leading Education through the Accountability and Results Notification System (AZ LEARNS) Rating (1=Excellent; 0=all other ratings)

Urbanicity (National Center for Education Statistics Locale Codes):

- School located in large city (1/0)
- School located in urban fringe of a large city (1/0)
- School located in a midsize city (1/0)
- [Due to minimal representation in each of the remaining National Center for Education Statistics (NCES) locale classifications, the contrast urbanicity category is all other NCES locales: urban fringe of a midsize city, large town, small town, and rural areas within and outside of Consolidated Statistical Areas]

Perceptions of Teacher Working Conditions (obtained from survey responses):
A teacher response of "agree" or "strongly agree" for each of the Arizona Teacher Working Conditions Survey items below was coded as a 1; responses of "neither disagree nor agree," "disagree," and "strongly disagree" were coded as 0:

- "Teachers are supported by the community in which they teach."
- "Teachers and staff work in a school environment that is safe."
- "Teachers play a large or primary role in establishing and implementing policies and student discipline."
- "The school leadership consistently enforces rules for student conduct."
- "Efforts are made to minimize the amount of routine administrative paperwork they are required to do."
- "Teachers are recognized as education professionals."
- "Teachers are centrally involved in decision making about educational issues."
- "Teachers are trusted to make sound professional decisions about instruction."
- "There is an atmosphere of trust and mutual respect within the school."
- "All of the faculty are committed to helping every student learn."
- "Teachers feel comfortable raising issues and concerns that are important to them."
- "Teacher performance evaluations are fair in her or his school."
- "Teachers are recognized for accomplishments."
- "Teachers receive feedback that can help them improve teaching."
- "The faculty has an effective process for making group decisions and solving problems."

Variables—including survey prompts—were included in the model if they previously have been found to be related to teacher attrition in previous Center for Teaching Quality analyses of teacher working conditions across the country.

Output

In most educational research, a significance value of 0.05 or less indicates strong significance for the result, and a significance value of between 0.10 and 0.05 indicates less certain but still suggestive significance. For dichotomous variables (such as gender), the value *Exp(B)* indicates either the increase (if the value is greater than 1) or the decrease (if the value is less than 1) of the *odds* that a teacher will intend to stay if she or he is represented by that variable, relative to the other value for the variable. For example, in this study, a significant value of *Exp(B)* of 1.286 for the variable "Female" indicates that the odds of a female choosing to stay are 1.286 times greater than they are for a male with otherwise similar characteristics. For categorical variables (such as urbanicity), the value *Exp(B)* indicates the increase or decrease in the odds of staying for a teacher characterized by that categorical variable *as compared to the excluded variable*. For example, in this study, a significant value of *Exp(B)* of 1.206 for the variable "Large Urban" indicates that the odds that a teacher who teaches in a school located in a major urban area will stay in her or his school are 1.206 times greater than the odds of a teacher in a comparison district type (in this case, non-urban districts). Interpretation of continuous variables, or variables that can take on any value, in logistic regression is not as straightforward, but in general the value *Exp(B)* indicates the increase or decrease in the odds for a teacher staying *for every unit change in the variable*. For example, in this study, a significant value of *Exp(B)* of 0.990 for the variable "Student-Teacher Ratio" means that for every unit (whole number) increase in the size of the student-teacher ratio in a school, the *odds* of staying for an individual teacher decrease by 1 percent.

Likelihoods versus Probabilities

In none of these cases, however, can an increase or decrease in likelihood be read as a similarly-sized increase or decrease in *probability*. One way to think about the difference is as follows: a person may be *twice as likely* to vote if she knows one of the candidates, but if she usually votes anyway (say, 75 percent of the time), the change in the corresponding *probability* that she will vote will not be as dramatic (because the new probability is limited to a range between her original probability of 75 percent up to 100 percent). Based on responses to the Arizona Teacher Working Conditions Survey, the overall probability that an Arizona teacher chosen at random is a "stayer" is already close to 80 percent (8 out of 10 report that they will stay); therefore, a positive change in the likelihood of staying only impacts the probability range between 80 and 100 percent. The regression equations provide a way for adjusting those probabilities, given certain individual teacher conditions or opinions. See Table 19, above, for conversion of some of the changes in odds reported in the tables below to changes in probability.

Elementary School (n = 12,414)

	B	S.E.	Wald	Sig.	Exp(B)	
Constant	-0.292	0.25	1.4	0.244	0.747	
Teacher Characteristics						
Minority	0.048	0.07	0.4	0.522	1.049	
Female	0.251	0.08	9.1	0.002	1.286	**
Alternative Teacher Preparation	0.043	0.11	0.2	0.688	1.044	
Less than 4 years of experience	-0.134	0.07	3.6	0.059	0.875	*
More than 20 years of experience	-0.092	0.07	2.0	0.162	0.912	
National Board Certified†	0.243	0.09	7.3	0.007	1.275	**
Student Characteristics						
Percent economically disadvantaged students	-0.001	0.00	0.1	0.771	0.999	
Percent mobile students	0.004	0.01	0.2	0.644	1.004	
Percent non-minority students	0.001	0.00	0.3	0.615	1.001	
School smaller than 500	-0.121	0.09	1.6	0.200	0.886	
School larger than 750	-0.168	0.07	6.5	0.011	0.845	**
Student-Teacher Ratio	-0.009	0.01	1.9	0.173	0.991	
Career Ladder School	0.180	0.06	8.6	0.003	1.197	**
Accountability Rating: Excelling	0.045	0.08	0.3	0.595	1.046	
Urbanicity (Excl. Cat. = Towns/Rural Areas)						
Large City	0.187	0.08	5.1	0.024	1.206	**
Urban Fringes of Large City	0.140	0.09	2.3	0.126	1.150	
Midsize City	0.022	0.11	0.0	0.837	1.023	
Teacher Working Conditions						
Parents & community support teachers	0.112	0.06	3.4	0.064	1.119	*
Safe school environment	0.304	0.07	21.4	0.000	1.356	**
Teachers play sig. role in discipline policies	0.031	0.07	0.2	0.671	1.031	
Rules for student conduct consistently enforced	0.103	0.06	2.6	0.110	1.109	
Paperwork is minimized	0.246	0.07	11.8	0.001	1.278	**
Teachers recognized as educ. professionals	0.444	0.07	43.7	0.000	1.559	**
Teachers centrally involved in decisionmaking	0.092	0.07	1.6	0.213	1.096	
Teachers play sig. role in devel. instr. techniques	0.132	0.06	4.9	0.028	1.141	**
Atmosphere of trust and respect	0.425	0.08	30.0	0.000	1.530	**
Teachers believe all students can learn	0.083	0.06	1.7	0.189	1.086	
Teachers feel comfortable raising concerns	0.188	0.08	5.7	0.017	1.207	**
Performance evaluations are fair	0.221	0.07	10.0	0.002	1.247	**
Teachers are recognized for accomplishments	0.276	0.07	17.4	0.000	1.318	**
Teachers receive feedback that improves instr.	0.241	0.07	11.9	0.001	1.273	**
Faculty has effective process for making decisions	0.215	0.07	9.0	0.003	1.240	**

* p<0.10

** p<0.05

† The National Board for Professional Teaching Standards (NBPTS) lists only about 350 National Board Certified teachers in Arizona, but over 3,000 survey respondents indicated that they were National Board Certified. Relative unfamiliarity with the certification may have led many teachers to incorrectly indicate that they have this certification. Therefore, results associated with this variable are suspect at best.

Middle School (n = 4,458)

	B	S.E.	Wald	Sig.	Exp(B)	
Constant	-0.072	0.40	0.0	0.857	0.931	
Teacher Characteristics						
Minority	-0.002	0.10	0.0	0.983	0.998	
Female	0.204	0.09	5.3	0.022	1.227	**
Alternative Teacher Preparation	-0.104	0.12	0.7	0.397	0.902	
Less than 4 years of experience	-0.271	0.10	6.9	0.009	0.762	**
More than 20 years of experience	-0.078	0.10	0.6	0.446	0.925	
National Board Certified†	0.252	0.15	3.0	0.085	1.286	*
Student Characteristics						
Percent economically disadvantaged students	-0.003	0.00	0.9	0.330	0.997	
Percent mobile students	-0.013	0.01	1.2	0.276	0.987	
Percent non-minority students	0.000	0.00	0.0	0.882	1.000	
School smaller than 500	0.056	0.16	0.1	0.733	1.058	
School larger than 750	0.087	0.10	0.8	0.372	1.091	
Student-Teacher Ratio	-0.007	0.01	0.3	0.568	0.993	
Career Ladder School	0.159	0.11	2.3	0.133	1.172	
Accountability Rating: Excelling	-0.389	0.15	6.6	0.010	0.678	**
Urbanicity (Excl. Cat. = Towns/Rural Areas)						
Large City	0.133	0.13	1.0	0.320	1.142	
Urban Fringes of Large City	0.170	0.15	1.3	0.247	1.185	
Midsize City	0.269	0.17	2.5	0.117	1.309	
Teacher Working Conditions						
Parents & community support teachers	0.196	0.10	4.2	0.041	1.216	**
Safe school environment	0.277	0.09	9.0	0.003	1.319	**
Teachers play sig. role in discipline policies	0.239	0.13	3.2	0.073	1.270	
Rules for student conduct consistently enforced	0.225	0.10	4.8	0.029	1.252	**
Paperwork is minimized	0.231	0.10	5.2	0.022	1.260	**
Teachers recognized as educ. professionals	0.368	0.10	13.8	0.000	1.445	**
Teachers centrally involved in decisionmaking	0.134	0.11	1.4	0.234	1.143	
Teachers play sig. role in devel. instr. techniques	0.241	0.09	7.6	0.006	1.272	**
Atmosphere of trust and respect	0.210	0.12	3.2	0.072	1.233	*
Teachers believe all students can learn	0.130	0.09	2.3	0.133	1.138	
Teachers feel comfortable raising concerns	0.284	0.11	6.1	0.014	1.328	**
Performance evaluations are fair	0.244	0.10	5.6	0.018	1.276	**
Teachers are recognized for accomplishments	0.168	0.10	3.0	0.084	1.183	*
Teachers receive feedback that improves instr.	0.068	0.10	0.4	0.507	1.071	
Faculty has effective process for making decisions	0.223	0.11	4.1	0.044	1.250	**

* p<0.10

** p<0.05

† The NBPTS lists only about 350 National Board Certified teachers in Arizona, but over 3,000 survey respondents indicated that they were National Board Certified. Relative unfamiliarity with the certification may have led many teachers to incorrectly indicate that they have this certification. Therefore, results associated with this variable are suspect at best.

High School (n = 7,243)

	B	S.E.	Wald	Sig.	Exp(B)	
Constant	0.057	0.30	0.0	0.850	1.059	
Teacher Characteristics						
Minority	0.068	0.09	0.6	0.438	1.071	
Female	0.040	0.07	0.4	0.552	1.040	
Alternative Teacher Preparation	-0.047	0.09	0.3	0.617	0.954	
Less than 4 years of experience	-0.196	0.09	4.6	0.033	0.822	**
More than 20 years of experience	-0.054	0.08	0.5	0.494	0.947	
National Board Certified†	0.049	0.11	0.2	0.645	1.050	
Student Characteristics						
Percent economically disadvantaged students	0.002	0.00	0.6	0.447	1.002	
Percent mobile students	0.002	0.01	0.0	0.899	1.002	
Percent non-minority students	0.001	0.00	0.2	0.689	1.001	
School smaller than 500	-0.239	0.11	4.9	0.026	0.787	**
School larger than 750	-0.002	0.08	0.0	0.981	0.998	
Student-Teacher Ratio	-0.005	0.01	0.4	0.540	0.995	
Career Ladder School	0.034	0.08	0.2	0.659	1.035	
Accountability Rating: Excelling	0.194	0.11	3.4	0.065	1.215	*
Urbanicity (Excl. Cat. = Towns/Rural Areas)						
Large City	0.081	0.13	0.4	0.537	1.084	
Urban Fringes of Large City	-0.001	0.12	0.0	0.993	0.999	
Midsize City	-0.112	0.13	0.7	0.399	0.894	
Teacher Working Conditions						
Parents & community support teachers	0.175	0.08	4.7	0.029	1.191	**
Safe school environment	0.357	0.08	22.4	0.000	1.428	**
Teachers play sig. role in discipline policies	0.327	0.13	6.0	0.014	1.387	**
Rules for student conduct consistently enforced	-0.010	0.08	0.0	0.901	0.990	
Paperwork is minimized	0.038	0.09	0.2	0.659	1.039	
Teachers recognized as educ. professionals	0.506	0.08	36.0	0.000	1.659	**
Teachers centrally involved in decisionmaking	0.014	0.11	0.0	0.892	1.014	
Teachers play sig. role in devel. instr. techniques	0.139	0.07	3.9	0.047	1.149	**
Atmosphere of trust and respect	0.415	0.10	18.2	0.000	1.515	**
Teachers believe all students can learn	-0.090	0.07	1.7	0.191	0.914	
Teachers feel comfortable raising concerns	0.202	0.10	4.4	0.035	1.224	**
Performance evaluations are fair	0.185	0.08	5.3	0.021	1.204	**
Teachers are recognized for accomplishments	0.161	0.08	4.3	0.039	1.175	**
Teachers receive feedback that improves instr.	0.373	0.08	20.7	0.000	1.452	**
Faculty has effective process for making decisions	0.174	0.10	3.0	0.082	1.191	*

* p<0.10

** p<0.05

† The NBPTS lists only about 350 National Board Certified teachers in Arizona, but over 3,000 survey respondents indicated that they were National Board Certified. Relative unfamiliarity with the certification may have led many teachers to incorrectly indicate that they have this certification. Therefore, results associated with this variable are suspect at best.

All School Levels (n = 29,316)

	B	S.E.	Wald	Sig.	Exp(B)	
Constant	-0.219	0.146	2.269	0.132	0.803	
Teacher Characteristics						
Minority	0.064	0.045	2.042	0.153	1.066	
Female	0.178	0.041	18.818	0.000	1.195	**
Alternative Teacher Preparation	-0.030	0.055	0.290	0.590	0.971	
Less than 4 years of experience	-0.188	0.044	18.651	0.000	0.829	**
More than 20 years of experience	-0.026	0.041	0.385	0.535	0.975	
National Board Certified†	0.154	0.055	7.907	0.005	1.166	**
Student Characteristics						
Percent economically disadvantaged students	0.001	0.001	1.382	0.240	1.001	
Percent mobile students	-0.002	0.005	0.205	0.651	0.998	
Percent non-minority students	0.001	0.001	0.629	0.428	1.001	
School smaller than 500	-0.117	0.072	2.667	0.102	0.889	
School larger than 750	-0.086	0.050	2.964	0.085	0.917	*
Student-Teacher Ratio	-0.010	0.003	8.349	0.004	0.990	**
Career Ladder School	0.126	0.038	11.107	0.001	1.134	**
Accountability Rating: Excelling	0.127	0.052	5.869	0.015	1.135	**
Urbanicity (Excl. Cat. = Towns/Rural Areas)						
Large City	0.119	0.056	4.526	0.033	1.126	**
Urban Fringes of Large City	0.044	0.057	0.605	0.437	1.045	
Midsize City	0.030	0.070	0.189	0.664	1.031	
Teacher Working Conditions						
Parents & community support teachers	0.162	0.039	17.705	0.000	1.176	**
Safe school environment	0.287	0.039	54.038	0.000	1.332	**
Teachers play sig. role in discipline policies	0.136	0.051	7.091	0.008	1.146	**
Rules for student conduct consistently enforced	0.147	0.041	12.947	0.000	1.159	**
Paperwork is minimized	0.166	0.043	14.833	0.000	1.181	**
Teachers recognized as educ. professionals	0.424	0.041	104.880	0.000	1.528	**
Teachers centrally involved in decisionmaking	0.115	0.048	5.878	0.015	1.122	**
Teachers play sig. role in devel. instr. techniques	0.132	0.036	13.311	0.000	1.141	**
Atmosphere of trust and respect	0.339	0.048	50.194	0.000	1.403	**
Teachers believe all students can learn	0.050	0.037	1.902	0.168	1.052	
Teachers feel comfortable raising concerns	0.245	0.048	26.381	0.000	1.278	**
Performance evaluations are fair	0.251	0.042	35.814	0.000	1.285	**
Teachers are recognized for accomplishments	0.242	0.040	36.532	0.000	1.274	**
Teachers receive feedback that improves instr.	0.225	0.042	28.512	0.000	1.253	**
Faculty has effective process for making decisions	0.178	0.046	15.141	0.000	1.195	**
School Level (Excl. Cat. = Elementary School)						
Middle Schools	-0.130	0.051	6.593	0.010	0.878	**
High Schools	0.260	0.052	24.704	0.000	1.297	**
Mixed Grade Schools	-0.218	0.050	18.694	0.000	0.804	**

* p<0.10

** p<0.05

† The NBPTS lists only about 350 National Board Certified teachers in Arizona, but over 3,000 survey respondents indicated that they were National Board Certified. Relative unfamiliarity with the certification may have led many teachers to incorrectly indicate that they have this certification. Therefore, results associated with this variable are suspect at best.

Important Caveats

The dependent variable for these analyses is based on teacher responses to the following survey question:

What BEST DESCRIBES your future intentions for your professional career? (Select one.)

- Continue working at my current school as long as I am able
- Continue working at my current school until a better opportunity comes along
- Continue working in education, but leave this school as soon as I can
- Continue working in education, but leave this district as soon as I can
- Leave education altogether

As such, it is a measure of teacher *intentions* and not of actual teacher decisions (*i.e.*, a teacher could report on the survey that she or he intended to leave her or his school and teach somewhere else, while in actuality she or he ended up leaving teaching entirely or remaining at her or his current school), and that is potentially an important difference. For instance, in other states in which the Center for Teaching Quality has administered Teacher Working Conditions surveys and has also had access to actual teacher attrition data, teachers who indicated that they would move outnumbered teachers who indicated that they would leave the profession entirely by as much as 7 to 2, but the *actual* ratio ended up being an almost mirror opposite of 1 to 9. It is plausible that, in many states, teachers who intend to move rather than leave teaching entirely find that such a move is difficult to make and in the end opt to leave teaching rather than to stay at their current school (which would explain the difference between the intent and the reality ratios). Readers of these analyses are encouraged to keep these distinctions between intent and action in mind and to exercise caution when interpreting these results.

In addition, one key variable associated with teacher turnover—teacher academic ability—is not included because proxy variables for this characteristic were not available at the time of this analysis. It is important to note that research has shown that teachers with higher academic ability are more likely to leave the profession.

Teacher Working Conditions and Student Achievement

While it is reasonable to make direct links between a teacher's responses to survey questions and to her or his individual declared career intention—between personal perceptions of working conditions and subsequent personal career decisions—the same cannot be said for making direct links between individual teacher responses and school-wide student achievement. Hence, rather than trying to link individual teacher perceptions of working conditions with school-wide achievement gains, our approach for this part of the analysis was to include a working conditions explanatory variable that best approximates the ultimate impact of those working conditions on students—teacher turnover.

We use here as one of our independent variables the proportion of teachers who indicate that they will stay at their current school as our measure of teacher turnover. The measure is not a perfect proxy of teacher working conditions for several reasons, not the least of which may be the fact (as explained above) that the variable is teacher *intent* and not actual teacher *action* (or inaction). In addition, turnover is also reflective in part of the relative age and experience of the workforce at a given school (also explained above). On the other hand, the variable does help to distinguish among school working conditions in a way that actual turnover figures cannot. The variable allows us to compare the general *desire* of teachers at schools, regardless of opportunities or likelihood of actually being able to act on those desires, whereas comparing their eventual actions may be more reflective of the availability of other options (working or otherwise) in their respective geographic areas, which could understate teacher perceptions of their working conditions, independent of other options.

Our dependent variable for all three models is the residual gain score estimate generated by a linear regression in which 2007 math scaled scores (the "post-test") are the dependent variable and 2006 math scaled scores (the "pre-test") are the predictor variable. For elementary and middle schools, the 2007 scale scores are from grades 5 and 8, respective, while the 2006 scale scores are from grades 4 and 7, respectively. For high schools, 2007 and 2006 scale scores are both from grade 10 (see **Important Caveats and Limitations**, below). As some psychometricians have noted, when conducting gain-score analyses, "residual gain scores are more likely to be preferable [than raw or estimated 'true' gain scores] when the pre- and post-test score distributions can be expected to have equal variability,"[28] an assumption we make here about 2006 and 2007 Arizona achievement math test score distributions. We use math scores rather than reading scores because math scores tend to be less "noisy"; reading scores are "noisier" in that they tend to reflect as much home impact as they do school impact, often because reading is taught at varying levels in different homes, while math is generally taught less frequently across most homes.[29]

The ordinary least squares regression model for the student achievement component of this study was applied to three different groups of schools—elementary schools (n = 470), middle schools (n = 132), and high schools (n = 150)—and is specified as follows. Let the school-wide average scaled-score gains between 2006 and 2007 scores on standardized, state-administered math tests (Arizona Instrument to Measure Standards, or AIMS, tests) be represented by Y. The regression model estimates the significance of the contribution of certain independent variables to these gains as a linear function of those variables. Thus, a generic equation for this model looks like:

$$Y_i = \alpha_0 + \alpha_1(S_i) + \alpha_2(SCH_i) + \alpha_3(T_i) + \alpha_4(TWC_i) + \alpha_5(Y^{css}_{i-1}) + e_i$$

where Y_i = the composite math gain score for school *i*, α_0 = a constant, S_i = student population characteristics variables for school *i*, SCH_i = school characteristics variables for school *i*, T_i = teacher population characteristics variables for school *i*, TWC_i = the proportion of teachers who indicate that they intend to stay at school *i*, Y^{css}_{i-1} = the composite math scale score from the previous year, and *e* is an error term. In non-mathematical terms, this equation reads as:

> *Gains in a school's standardized math scores from one year to the next are influenced by characteristics of the students at the school, characteristics of the school, characteristics of teachers at the school, the overall teacher working conditions at the school (as estimated by teacher career intent), and math scores from the previous year.*

Data

All data for these analyses were obtained from three sources: the 2007 Arizona Teacher Working Conditions Survey; a school-level data set comprised of demographic information about each school that was prepared specifically for this study by the Arizona Department of Education; and school-level AIMS results that are publicly available at the Arizona Department of Education website.[30] Since this analysis focused on factors that impact *school-level* gain scores, only schools with a minimum response rate of 40 percent were included in the analysis.[31] The independent variables included in the model (all of which are continuous unless otherwise noted) are:

Student Population Characteristics (obtained from the Arizona Department of Education):
- Percent of economically disadvantaged students at the school
- Percent of non-minority students at the school

School Characteristics (obtained from the Arizona Department of Education):
- School size
- Career Ladder school (=1)

Teacher Population Characteristics (obtained from survey responses):
- Percent of teachers intending to stay
- Percent of minority teachers
- More than 10 percent of teachers at school earned their licensure through alternative programs (=1)

AIMS Math Scaled Scores (obtained from the Arizona Department of Education):
- 2006 school composite math scale score (4th, 7th, and 10th grades)
- *Dependent Variable*—school-wide average scaled-score math gain, 2007 (gain derived from 2006 4th grade and 2007 5th grade math scores, 2006 7th grade and 2007 8th grade math scores, and 2006 10th grade and 2007 10th grade math scores)

Output

Elementary

	B	Std. Error	Beta	t	Sig.	
(Constant)	7.371	1.412		5.222	0.000	
Percent teachers intending to stay	0.823	0.411	0.101	2.005	0.046	**
Percent economically disadvantaged students	-0.007	0.003	-0.198	-2.159	0.031	**
Percent non-minority students	0.008	0.004	0.244	2.254	0.025	**
School size	0.000	0.000	-0.107	-2.153	0.032	**
Percent minority teachers	-0.571	0.329	-0.114	-1.737	0.083	*
More than 10% of teachers hold alternative certification?	-0.017	0.102	-0.008	-0.171	0.864	
Career Ladder school?	0.240	0.099	0.121	2.425	0.016	**
2006 4th grade math scale score	-0.016	0.003	-0.399	-5.516	0.000	**

Dependent Variable: Standardized residual gain score estimate, 2007 5th grade math

* p<0.10
** p<0.05

Middle School

	B	Std. Error	Beta	t	Sig.	
(Constant)	0.788	4.327		0.182	0.856	
Percent teachers intending to stay	-0.505	0.696	-0.074	-0.725	0.470	
Percent economically disadvantaged students	-0.011	0.006	-0.331	-1.903	0.060	*
Percent non-minority students	-0.009	0.008	-0.266	-1.102	0.273	
School size	-0.001	0.000	-0.192	-1.677	0.096	*
Percent minority teachers	0.131	0.811	0.023	0.162	0.872	
More than 10% of teachers hold alternative certification?	-0.169	0.191	-0.085	-0.889	0.376	
Career Ladder school?	-0.170	0.220	-0.078	-0.772	0.442	
2006 7th grade math scale score	0.002	0.008	0.050	0.237	0.813	

Dependent Variable: Standardized residual gain score estimate, 2007 8th grade math

* p<0.10
** p<0.05

High School

	B	Std. Error	Beta	t	Sig.	
(Constant)	10.580	4.620		2.290	0.024	
Percent teachers intending to stay	0.565	0.731	0.073	0.772	0.441	
Percent economically disadvantaged students	-0.016	0.005	-0.391	-2.956	0.004	**
Percent non-minority students	0.001	0.006	0.038	0.240	0.811	
School size	0.000	0.000	0.068	0.606	0.546	
Percent minority teachers	1.331	0.848	0.184	1.569	0.119	
More than 10% of teachers hold alternative certification?	0.400	0.196	0.182	2.037	0.044	**
Career Ladder school?	0.044	0.199	0.019	0.220	0.826	
2006 10th grade math scale score	-0.016	0.007	-0.321	-2.241	0.027	**

Dependent Variable: Standardized residual gain score estimate, 2007 10th grade math

* p<0.10
** p<0.05

Important Caveats and Limitations

The reader may be puzzled by the positive and significant impact of a relatively large population of alternatively licensed teachers on math score gains at the high school level, while the same variable appears to have a negative (but non-significant) effect on score gains at both the elementary and middle school levels. There may be some temptation to conclude that these results offer evidence that non-traditional teacher licensure routes may be one way to address teacher attrition at the high school level without adversely affecting student achievement. It should be noted, however, that more than twice as many high schools in our sample are characterized by a popula-

tion of teachers in which at least 10 percent are alternatively licensed (104 high schools versus 46 high schools, or 69 percent), whereas at elementary and middle school levels, the number of schools with such a teacher population characteristic are either in the minority (128 versus 342 at the elementary level) or are equally represented (66 versus 66 at the middle school level). In other words, the significance may be due more to the fact that most high schools in the sample are characterized by a relatively large population of alternatively licensed teachers and less to the fact that alternatively licensed teachers have a greater impact. That said, the results do suggest an additional strand of research for Arizona that may be worth following.

There are several other levels of imprecision with respect to our regression analysis that bear noting. First, individual student scores were not available, which means that all regression estimates are based on school-level averages. In some cases, these averages could hide significantly different variations in individual student scores within and across schools. Second, there is little guarantee in the cases of the elementary and middle school tests that tests for different grades measure similar skills; for instance, 4th grade math tests (the "pre-test" for our elementary analyses) might focus on multiplication while 5th grade math tests (the "post-test") might focus on fractions and decimals. Third, while it is *generally* likely that students in 4th grade or 7th grade at one school are the same students in 5th and 8th grade at the same school on the following year, there is little guarantee that the proportion of test-takers at each school who took the pre-test at the same school is equivalent in any way; some schools experience more student mobility than others. A fourth and final caveat to bear in mind is that, because there is no true 9th grade pre-test for 10th grade math scores, and because 8th grade math scores from middle schools cannot be equitably associated with 10th grade math scores from high schools, the use of prior-year 10th grade scores as pre-test scores for the 2007 10th grade math scores also carries a host of problems, not the least of which is that the students taking the two tests are two very distinct cohorts of students.

Notes

Executive Summary

1. In the 2006 Arizona Teacher Working Conditions pilot, the relationship between working conditions and student achievement was measured by looking only at correlations between survey items and absolute performance on Arizona Instrument to Measure Standards (AIMS) assessments in math, reading, and writing.

Introduction

2. Hanushek, E. A., and Rivkin, S. G. (2007). "Pay, working conditions, and teacher quality." *The Future of Children*, 17(1): 69-76; 71.

3. Hirsch, E. & Emerick, S. (2006). *Teacher working conditions are student learning conditions: A report on the 2006 North Carolina teacher working conditions survey.* Chapel Hill, N.C.: Center for Teaching Quality; Hirsch, E. & Emerick, S. (2006). *Teaching and learning conditions are critical to the success of students and the retention of teachers: Final report on the 2006 Clark County teaching and learning conditions survey.* Chapel Hill, N.C.: Center for Teaching Quality; Hirsch, E. & Emerick, S. (2007). *Creating conditions for student and teacher success: A report on the 2006 Kansas teacher working conditions survey*. Chapel Hill, N.C.: Center for Teaching Quality.

4. Loeb, S. and Darling-Hammond, L. (2005). "How teaching conditions predict teacher turnover in California schools." *Peabody Journal of Education*, 80(3): 44–70.

5. Ingersoll, R. (2001). "Teacher turnover and teacher shortages: An organizational analysis." *American Educational Research Journal*, 38(3): 499–534.

6. Hirsch, E. & Emerick, S. (2007). *Arizona teacher working conditions: Designing schools for educator and student success.* Chapel Hill, N.C.: Center for Teaching Quality.

7. www.aztwc.org

8. www.aztwc.org

9. In keeping with analytical procedures followed in other Center for Teaching Quality Teacher Working Conditions reports, data from schools with a response rate of at least 40 percent were used in all formal statistical analyses, as detailed in Appendix B.

10. All statewide comparison statistics are estimates derived from: National Center for Education Statistics. (2006). *Schools and Staffing Survey (SASS)*, 2003-04, Public Teacher File. Washington, D.C.: U. S. Department of Education; with the exception of the statewide post-graduate degree data, which are derived from: Arizona Department of Education. (2006). *2005-2006 State Report Card*. Author.

Survey Results

11. Ingersoll, R. M. (2003). *Who controls teachers' work? Power and accountability in America's schools*. Cambridge, Mass.: Harvard University Press.

12. Barnes, G., Crowe, E., and Schaefer, B. (2007). *The cost of teacher turnover in 5 school districts: A pilot study.* Washington, D.C.: National Commission on Teaching and America's Future.

13. Fletcher, S., Strong, M., and Villar, A. (2003). *An investigation of the effects of variations in mentor-based induction on the performance of students in California*. A paper presented at the Seventh National New Teacher Center Symposium.

14. In other 2006-2007 Teacher Working Conditions surveys conducted by the Center for Teaching Quality, the proportion of respondents who indicated that they would stay in their current schools ranged from a high of 90 percent in Ohio to a low of 71 percent in Clark County, Nev.; however, the reader is urged to bear in mind that, because of sometimes extreme differences in sample sizes, hiring practices, working conditions, and supply and demand across states, cross-state comparisons of teacher attrition are suspect at best.

15. For instance, recent analyses of data from the Schools and Staffing Survey indicate that, of the teachers who leave, only 15 percent do so because of dissatisfaction with teaching as a career, while another 25 percent leave in pursuit of a non-teaching career. Still others leave because they have reached retirement age, a possibility that is also reflected in the 2007 Arizona Teacher Working Conditions Survey data (where over 30 percent of all leavers were teachers with 20 or more years of teaching experience). See Marvel, J., Lyter, D.M., Peltola, P., Strizek, G.A., and Morton, B.A. (2006). *Teacher attrition and mobility: Results from the 2004–05 teacher follow-up survey (NCES 2007–307)*. U.S. Department of Education, National Center for Education Statistics. Washington, D.C.: U.S. Government Printing Office.

16. Many of the findings in this section reflect findings in another recent report on teacher working conditions in Arizona: Amrein-Beardsley, A. (2007, Sept). "Recruiting expert teachers into hard-to-staff schools: what are the obstacles to pairing the best teachers with the lowest-achieving students? And what would it take to overcome them?" *Phi Delta Kappan*, 89(1): 64(4).

17. Most recently, Audrey Amrein-Beardsley (op. cit.) reported on the importance of salary and benefits to Arizona teachers. See also: Stinebrickner, T. R. (1998). "An empirical investigation of teacher attrition." *Economics of Education Review*, 17(2), 127-136; Johnson, S. M., Berg, J. H., and Donaldson, M. L. (2005). *Who stays in teaching and why: A review of the literature on teacher retention.* Report prepared for The Project on the Next Generation of Teachers. Cambridge, Mass.: Harvard Graduate School of Education. It should be noted, however, that not all studies of salary impact on teacher attrition find a direct link between salary and retention; see, for instance, Hanushek, E. A., Kain, J. F., and Rivkin, S. G. (1999). *Do higher*

salaries buy better teachers? NBER Working Paper No. 7082; Clotfelter, C. T., Ladd, H. F., Vigdor, J. L., and Wheeler, J. (2006). *High poverty schools and the distribution of teachers and principals.* Sanford Working Paper Series, No. SAN06-08.

18. The most important exceptions were three aspects of teacher empowerment: teacher involvement in deciding the content of professional development (with only 45 percent of principals indicating that they believe that teachers are involved in this process), deciding school budget issues (18 percent), and hiring new teachers (39 percent). In addition, fewer than half of all principals (46 percent) believe that efforts are made to minimize the amount of paperwork they are required to do, but this finding is not related to their perceptions of teacher working conditions. See Appendix A.

Analyses of Teacher Working Conditions Impacts on Teacher Attrition and Student Achievement

19. See, for example, Fuller, E. J. (1994). *Trust as the basis of urban school reform*. Presented at the annual meeting of the American Educational Research Association. New Orleans, La.; Fuller, E. J., & Young, M. D. (1995, April). *Building trust between school and community: The principal's role in increasing Hispanic academic achievement*. Presented at the annual meeting of the American Educational Research Association. San Francisco, Calif.; Fuller, E. J. (1996, April). *Conflict or congruence? The intersection of faculty, parent, and student trust in the principal*. Presented at the annual meeting of the American Educational Research Association. New York, N.Y.; Tschannen-Moran, M. & Hoy, W. K. (2000). "A multidisciplinary analysis of the nature, meaning, and measurement of trust." *Review of Educational Research*, 70, 547-593.

20. Johnson, S.M. & Donaldson, M.L. (2007). "Overcoming the obstacles to leadership." *Educational Leadership*, 65(1), 8-13; Berry, B. (2007). *Recruiting and retaining quality teachers for high-needs schools: Insights from NBCT summits and other policy initiatives*. Hillsborough, N.C.: Center for Teaching Quality.

21. A significant and negative result for high school teachers in small schools (schools with fewer than 500 students) is puzzling, but may be partially explained by the types of high schools that are typically small—typically harder-to-staff schools like alternative schools. In addition, a significant and negative association between an AZ LEARNS designation of "excellent" and middle school teacher attrition (see Appendix B) is also difficult to understand without access to additional data and may be worth further investigation on the part of the Arizona Department of Education.

22. See, for example, Cognard-Black, A. J. (2004). "Will they stay, or will they go? Sex-atypical work among token men who teach." *The Sociological Quarterly*, 45(1), 113-139.

23. It should be noted that this approach was taken for the analyses conducted in 2006 of the relationships between working conditions and student achievement.

24. A more complete rationale for the choice of this variable as a proxy for school-wide teacher working conditions is included in Appendix B.

25. Even though the direct impact of teacher working conditions on student achievement gains is difficult to detect in a single-year study such as this one, the impact of other teacher and school characteristics—some of which may be indirectly related to teacher working conditions—is clearer. At all three school levels, the proportion of economically disadvantaged students in a school—a proxy for the level of academic engagement available to students outside of school hours, among other things—is significantly and negatively related to changes in scores; the larger the proportion, the smaller the gains for a school. Also related is school size, with score gains declining as school size increases at the elementary and middle school levels.

Appendix B. Methodology

26. This fourth analysis also included teachers in mixed-level schools—4,987 more teachers in addition to the elementary, middle, and high school teachers included in the three disaggregated analyses.

27. Teachers who were employed in schools that were designated as mixed grade level schools and could not be categorized as elementary, middle, or high schools were excluded from the analysis.

28. Rachor, R. E., and Cizek, G. J. (1996). *Reliability of raw gain, residual gain, and estimated true gain scores: A simulation study.* Paper presented at the Annual Meeting of the American Educational Research Association (New York, April 8-12, 1996).

29. Ballou, D. (2002). "Sizing up test scores." *Education Next*, 2(2), 10-15.

30. www.ade.state.az.us

31 . The 40 percent threshold is a research decision in keeping with other Center for Teaching Quality teacher working conditions studies and is not related to nor is it intended to contradict Arizona's decision to release survey results only for schools with response rates of 50 percent or higher. Schools designated as mixed grade level schools and cannot be categorized as elementary, middle, or high schools are excluded from the analysis.