Urban Charter Schools Collective (UCSC)
Board Meeting Agenda

January 28, 2015

Special Board Meeting

This meeting is being video recorded.

Members
Kou Xiong, President (Term Expires June 2016)
Sue Lee, SCUSD Representative (No Expiration.)
____ Vacant(Term Expires June 2016)
Therese Jasperson; Board Member (Term Expires June 2017)
Lance Fang, Board Member (Term Expires June 2017)
Gennel Miles, Board Member (Term Expires June 2015)
Dennis Mah, Board Member (Term Expires June 2015)

6:00 p.m. Convene
6:05 Closed Session
6:35 Reconvene Open Session
9:00 Adjourn

Lisbon Elementary Staff Room
7555 S. Land Park Drive, Sacramento, CA 95831

1. **CALL TO ORDER** 6:00 PM
2. **BOARD ROLL CALL** 6:01 PM
3. **PUBLIC COMMENT** – Limit Two Minutes Per Person and Ten Minutes Per Issue Listed in the Agenda 6:05 PM
4. **BOARD WORKSHOP –** Staff Recruitment and Retention 6:10 PM
5. **BOARD MEMBERS IDENTIFY ITEMS FOR NEXT BOARD AGENDA** 8:50 PM
6. **ADJOURN** 9:00 PM

NOTE: If you need a disability-related modification or accommodation, including auxiliary aids or services, to participate in the public meeting, please contact Dennis Mah (916 835-9088) at least 48 hours before the scheduled Board meeting so we may make every reasonable effort to accommodate you. [Government Code § 54954.2; Americans with Disabilities Act of 1990, § 202 (42 U.S.C. §12132)]

Regularly Scheduled UCSC Board meetings are held on the second Monday of each month, except as noted.

- All meetings start at 6:00 PM and are conducted in the Lisbon Elementary staff lounge.
- Regular board meetings for 2014-15 have been scheduled for Aug. 11, Sept. 8, Oct. 13, Nov. 10, Dec. 8, Jan. 12, 2015, Feb. 10 (Tuesday), Mar. 9, Apr 13, May 11, June 8 , June 22 (4th Monday)

Calendar of Regular Board Meetings

Approved and Adopted on July 7, 2014

Regularly Scheduled UCSC Board meetings are held on the second Monday of each month, except as noted below for November and June. All meetings start at 6:00 PM and are conducted in the Lisbon Staff Lounge located at 7555 South Land Park Drive in Sacramento, CA 95831.

Each regular meeting will have the following two agenda items:
1) Principal's Report on Instruction & Learning which includes: ELAC update, Academy Council update, enrollment & attendance update, and suspension & referral update.
2) Business Office Manager's summary of Finance & Operation which includes: profit & loss statement for through the end of the prior month and cash flow update,

August 11, 2014	September 8, 2014	October 13, 2014	November 10, 2014
• Review actual enrollment and attendance and compare to projected • Review work of board nominating committee • Sick Leave/Vacation Policy • Staff evaluation process • Preparing for annual board self-evaluation • Approve new hires • Appoint nominating committee for vacant board position(s) • Update Board priorities	• Annual Board organizational meeting • Annual Board self-evaluation • Review annual program audit before submission to SCUSD by the principal • Approve prior year unaudited actuals – due to SCOE 9/15 • Set goals for next 12 months • Approve Public Charter Schools Grant's Application • Discuss Academy Council and Board relationship; See governance section of charter • Micromanagement • Update progress of YPSA's renewal process • Update Board priorities	• Update Board priorities • Update progress of YPSA's renewal process	• Update Board priorities • Update progress of YPSA's renewal process
December 8, 2014	**January 12, 2015**	**February 10, 2015** (Tuesday)	**March 9, 2015**
• Receive & review prior year fiscal audit conducted by Gilbert Associates –due to district, county, CDE, and state controller by 12/15 • Approve 1st Interim Financial Report for July 1-Oct. 31' due to SCUSD and SCOE by Dec. 15 • Introduce mid-year budget revisions to 2014-15 budget for approval at January meeting • Update Board priorities • Update progress of YPSA's renewal process	• Reviewing the Hmong Language Development Program • Review P-1 Attendance report submitted to CDE to compare project & actual attendance. P-1 ended on Dec. 31 • Approve mid-year budget revisions to 2014-15 budget • Review random drawing (lottery procedure) when applicants outnumber available seats • Plan for board member and academy council training • Update Board priorities • Update progress of YPSA's renewal process	• Approve Budget Development Calendar for creating next year's budget • Review enrollment and staffing projections in preparation for next year's staffing. • Review preliminary budget for next fiscal year based on governor's proposal • Approve ConApp Part 2. Due to CDE on Feb 24 • Discuss staff release procedures • Update Board priorities • Update progress of YPSA's renewal process	• Approve 2nd Interim Financial Report for July 1 - Jan. 31st and due to SCUSD and SCOE by Mar. 15 • Review parent involvement policy • Approve instructional calendar for the next school year • Review admin, teacher, and other staff compensation • Update Board priorities • Update progress of YPSA's renewal process
April 13, 2015	**May 11, 2015**	**June 8, 2015**	**June 22, 2015** (4th Monday)
• Board reviews and gives feedback to Academy Council on their budget recommendations for next year • Approve 2nd budget revisions to 2014-15 budget • Update one-year study and application process to join new SELPA • Salary schedule for 2015-16 • Update Board priorities • Update progress of YPSA's renewal process	• If released, review governor's May revisions to next year's proposed budget. Might not be released until the 15th • Review P-2 Attendance report submitted to CDE to compare project and actual attendance. P-1 ended on April 15th • Approve new hires • Approve list of employees with reasonable assurance of returning next year • Update Board priorities • Update progress of YPSA's renewal process	• Public hearing on the updated-LCAP and 2015-2016 budget. • Update Board priorities • Update progress of YPSA's renewal process	• Approve next year's budget and submit to SCUSD and SCOE by July 1st • Annual review and affirmation of Title I Parent Involvement Policy • ConApp Part 1 due June 30 for Title I, II, & III funding • Review all staff evaluations • Approve new hires • Approve updated-LCAP and 2015-16 Budget • Update Board priorities • Update progress of YPSA's renewal process

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NATIONAL COMPREHENSIVE CENTER FOR TEACHER QUALITY

Recruiting and Retaining Highly Effective Teachers: What Works and How Do You Know?

Laura Goe, Ph.D.

Principal Investigator

Western Regional SIG Conference

Los Angeles, CA ♦ April 5, 2010

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Laura Goe, Ph.D.

- Former teacher in rural & urban schools
  - Special education (7th & 8th grade, Tunica, MS)
  - Language arts (7th grade, Memphis, TN)
- Graduate of UC Berkeley's Policy, Organizations, Measurement & Evaluation doctoral program
- Principal Investigator for the National Comprehensive Center for Teacher Quality
- Research Scientist in the Performance Research Group at ETS

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National Comprehensive Center for Teacher Quality (TQ Center)

A federally-funded partnership whose mission is to help states carry out the teacher quality mandates of ESEA

- Vanderbilt University
  - Students with special needs, at-risk students
- American Institutes for Research (& LPA)
  - Technical assistance, research, dissemination
- Educational Testing Service
  - Technical assistance, research, dissemination

Topics

- What we can learn from the research
- Collecting data on teacher recruitment & retention: A primer
- Incentives and programs to influence recruitment and retention
- What to do with less effective teachers
- Alternatively certified teachers
- The new generation of teachers
- Where do we go from here?

The “real” goal

- The goal is NOT to recruit and retain effective teachers!
- **The “real” goal is to improve student learning and educational opportunities**
- Recruiting and retaining effective teachers is seen as a potential means to that end

The Research

The problem

- Each year, close to 200,000 teachers leave the profession, with another 200,000 transferring schools.
- This teacher turnover costs our public school system about $5 billion annually (Alliance for Excellent Education, 2005).

Highly qualified and experienced vs. "effective" teachers

- Little evidence of a link between teacher qualifications and student achievement
- Many studied report a link between teacher experience and student achievement; effectiveness improves in first 5 years (Goe, 2007)
- "Effectiveness" is defined in various ways but usually focuses on teachers' contributions to student learning growth

What we know…(many studies)

- There is more teacher turnover in high-poverty, high-minority schools
- Research suggests that these teachers are likely to move to schools that are closer to their homes
- Teachers are also more likely to move to schools that have
  - Fewer minority and poor kids
  - Higher achievement

Current assignment patterns

- High-poverty schools and high-minority schools have a larger percentage of beginning teachers than low-poverty schools and low-minority schools, and
- High-poverty schools and high-minority schools have a smaller percentage of teachers with master's degrees than low-poverty schools and low-minority schools (Tennessee Department of Education, 2007)

Are those who leave more effective?

- Recent research suggests that those who leave (whether the school, the district, or the profession) tend to be *less effective* than those who stay in schools
- The exception is first year teachers who leave—they tend to be *more effective* than those who stay (Hanushek and Rivkin, 2010)

Impact of incentives on teacher turnover

- Evaluators found that the probability of teacher turnover fell as the magnitude of the TEEG bonus award increased, while the probability of teacher turnover increased sharply among teachers receiving no bonus award, or a relatively small award.
  - "…a $3,000 award reduced turnover for beginning teachers by roughly 23 percentage points"
  - "…awards of $3,000 reduced turnover rates to less than a quarter of what the turnover rate was prior to implementation of a TEEG performance pay plan." (National Center on Performance Incentives, 2009)

Teacher distribution/transfer

- New teachers are placed with students who are academically behind those of more experienced teachers
- High value-added math teachers are more likely to stay in teaching in the district
  - They are not more or less likely to transfer schools
  - This pattern does not hold for reading teachers (Fullerton, 2010)

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“Fit” between person and organization

- “…characteristics that predict individual effectiveness may not predict organization effectiveness, even if the assumptions about individual predictors are valid” (Harris & Rutledge, 2010, pg 923)
- Person-Organization fit matters more when the organization has a “distinctive culture, the career ladder is lengthy, the interaction among organization members is great, and work flexibility is high.” (ibid, pg 924)

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Match between teachers & schools

- Investigated the contribution of “match between teachers and schools” to student achievement
- Showed that teacher effectiveness is higher *after* a move to a different school
- 25% of what is typically considered to be a teacher effect may actually be a teacher-school (match) effect (Jackson, 2010)

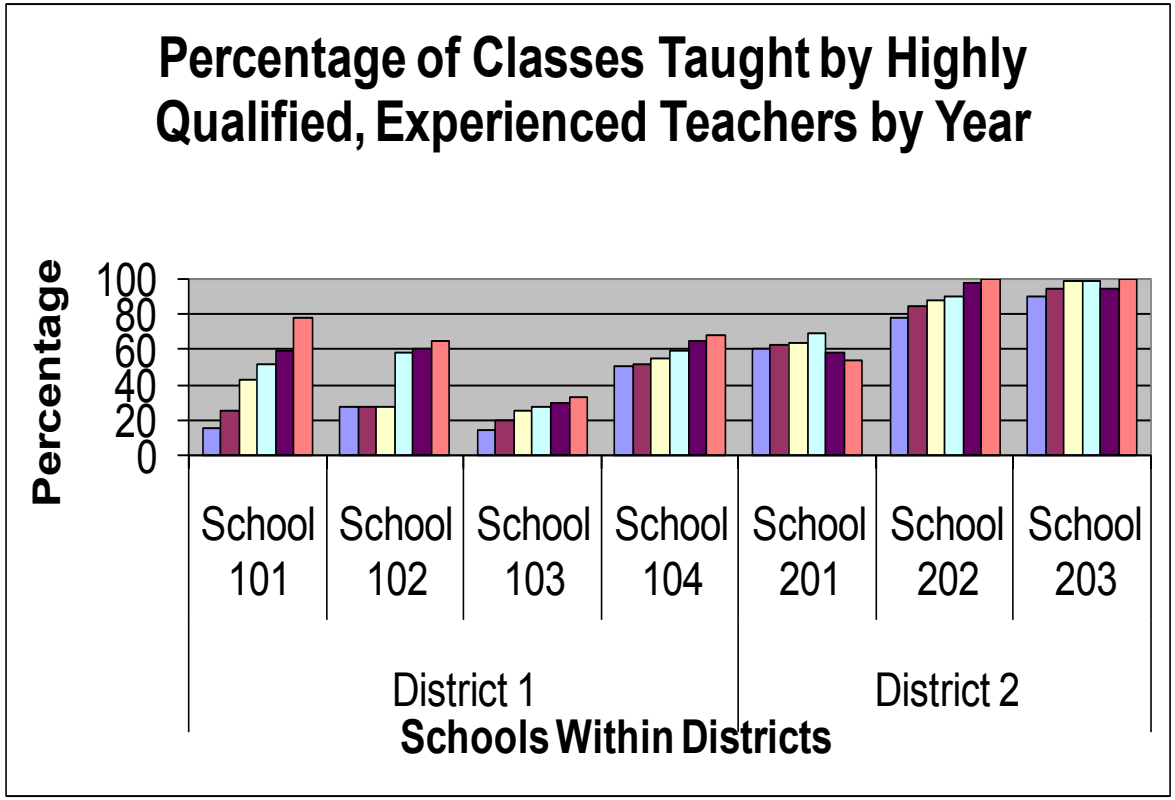
Teacher/student race matching

- "…Black teachers have more consistent success than White teachers in teaching minority students, and this matching effect is greatest in magnitude for Black teachers at the lower end of the [Praxis] licensure performance distribution" (Goldhaber & Hansen, 2010, pg 244)

Qualifications matched to context

- Successful teachers are more likely to stay in their placements
- Ensuring success starts with the “match” between teachers’ knowledge, skills, and attitudes and the population they will teach
  - Teacher self-efficacy
  - Speak students’ “home language”
  - Understand culture, strengths, and traditions of students and their families

Collecting (and learning from) data



Understanding teacher mobility

- Standard “exit interviews” to better understand why teachers move/leave
  - Key question: Is there anything that would have persuaded you to stay at this school?
- Results can be aggregated to give a clearer picture of patterns
  - Within district: school-to-school
  - Within regions: urban, suburban, rural
  - By teacher experience, other characteristics

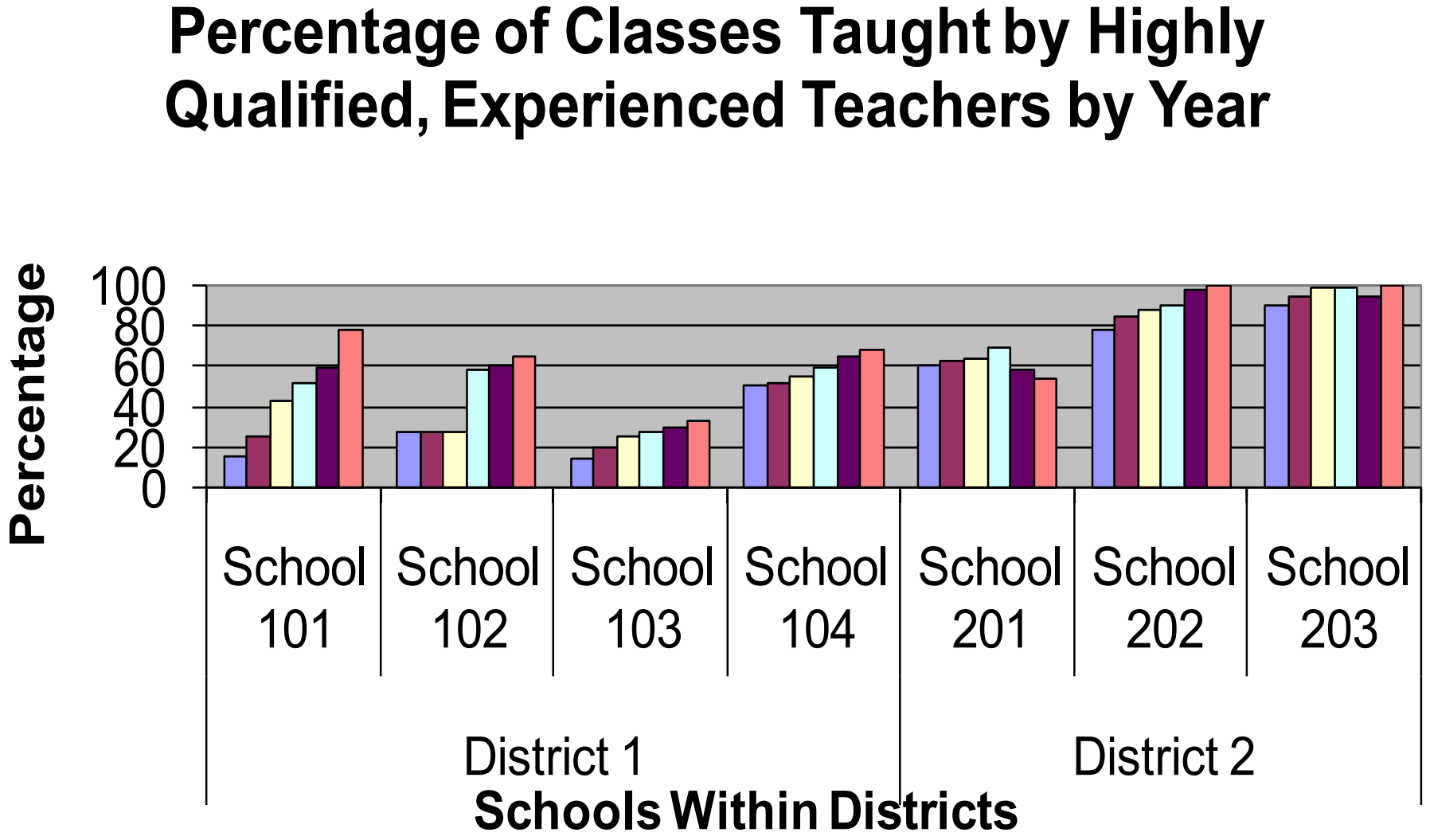
Documenting teacher mobility

- Many states have the *capability* to follow teachers' movements but don't track them
- Develop a database that allows you to track teachers' movements from school to school as well as exiting and reentering the profession
- Such a database will make it possible to quickly identify schools with highest/lowest turnover

Documenting changes in teacher mobility

- Many states are able to document the *current* distribution of highly qualified, experienced teachers by the percentage of poor and minority students in the school.
- The challenge is to document change over time and *relate changes to specific policies or incentives*
- To do this, you need complete and accurate data about teachers' participation in incentives, programs, etc.

Tracking change: An Illustration



Dummy Variables

- How will you know if a policy or incentive (local or state level) is having an impact on teacher distribution?
  - For each teacher, include a dummy variable with "1" for "yes" and "0" for "no" to document which incentives or policies applied to the teacher
- Then it will be possible to correlate changes in teacher distribution with the use of various policies and incentives

Other Useful Information to Collect

- In teacher database, include the following
  - Name of credential-granting institution of higher education (IHE)
  - Type of credential (alternative/traditional)
  - Subject-matter & specialized certification
  - Name of degree-granting IHE
  - Professional development or additional content-specific coursework
  - Additional certifications (e.g., bilingual or special education beyond regular teaching credential)
  - Languages spoken

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Recruitment & retention strategies

Goals for improving recruitment practices

- Make urban and rural districts and schools more competitive when it comes to recruiting the best teachers
- Create incentives to attract and retain highly effective teachers in the neediest schools
- Create a more stable teacher force and collegial environment, benefiting students and teachers

Tips and cautions

- Consider both intrinsic and extrinsic rewards for teachers when designing recruitment programs and policies
  - Signing bonuses aren't enough to keep teachers in the profession
- Ensure that recruits are the right fit for the school
  - Ensure hires know the student population and demonstrate a passion and commitment to their success

Recruitment strategies

- Provide incentives and policies to redistribute the teacher workforce
  - Make challenging schools more attractive
- Improve working conditions for teachers in urban and rural schools
  - Ask new teachers what they want/need
- Partner with institutions of higher education to better prepare teachers for urban and rural school settings
  - Create a feedback loop with IHEs

Recruitment strategies (cont.)

- Develop/support high-quality alternative certification programs
- Grow your own
  - Early school success is key
- Improve hiring practices
- Create partnerships to address out-of-school issues that affect recruitment and retention

Provide incentives and policies to redistribute the teacher workforce

- Restructure teacher pay to encourage the voluntary redistribution of the teacher workforce
- Provide scholarships and forgivable loans for teachers who teach in geographical shortage areas
- Combine pay incentives with cohort assignments
- Combine pay incentives with improved working conditions

Improve working conditions for teachers in urban and rural schools

- Provide support to new teachers by ensuring a comprehensive, intensive induction program is in place
- Support school leaders so that they can support teachers
- Create professional learning communities and career ladders for teachers

Partner with teacher preparation programs

- Work with universities to ensure their teachers are prepared to meet the challenges they will encounter in hard-to-staff schools
- Field experiences in high-needs schools should be extensive and high quality
- Alternative routes to certification allow paraprofessionals, military personnel and others transition to teaching

Improve Hiring Practices

- Hiring delays can cause districts to lose highly qualified teacher candidates
- Teachers are less likely to wait until July or August for job offers
- Hiring process should be changed to ensure teachers are hired earlier in the season to compete with suburban districts
- Hiring process should be information rich

Create partnerships to address out-of-school issues that affect recruitment and retention

- Provide housing assistance
- Provide reimbursement for moving expenses
- Promote business partnerships
- Consider “cohort models” like Teach for America (placing a critical mass of teachers together)

The less effective teachers

Effectiveness can be improved!

- Most teachers are doing the best they can
  - Help them do better with feedback, support, coaching, and a focus on classroom environment and relationships with students
- Teachers who are discouraged may need to see successful teachers with their kids
- Teachers who are consistently effective should be encouraged to model and teach specific practices to less effective teachers

Why you should keep them

- With the right instructional strategies, most teachers can improve student outcomes
- By creating and maintaining a better learning environment, students and teachers can collaborate successfully
- The teachers you hire to replace them are not necessarily going to be more effective
- You may not be able to find replacements!

Where do we go from here?

Next steps

- Ensure that evaluation systems allow you to differentiate between effective and less effective teachers
- Focus on improving effectiveness of teachers you already have
- Develop strategies for retaining effective and potentially effective teachers
- Recruit effective teachers through multiple, coordinated strategies (not one time bonuses)
- (YOUR GREAT IDEAS HERE)

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EIGHT QUESTIONS ON TEACHER RECRUITMENT AND RETENTION:

WHAT DOES THE RESEARCH SAY?

EDUCATION COMMISSION OF THE STATES

SEPTEMBER 2005

THIS REPORT WAS WRITTEN BY
MICHAEL B. ALLEN

BASED UPON RESEARCH REVIEWS BY
CASSANDRA GUARINO, LUCRECIA SANTIBAÑEZ,
GLENN DALEY AND DOMINIC BREWER,
RAND
AND BY
RICHARD INGERSOLL AND JEFFREY KRALIK,
UNIVERSITY OF PENNSYLVANIA

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The Education Commission of the States is a nonprofit, nationwide organization that helps state leaders shape education policy.

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SUMMARY OF THE FINDINGS

At least since the publication of *A Nation At Risk* in 1983, there has been widespread recognition by policymakers, educators and the American public that all children do not have the top-notch teachers they need to realize their full potential as learners. While even children who attend the highest-performing schools have, from time to time, teachers who simply don't measure up, the situation for children from low-income families is often reprehensible. High-poverty, low-performing schools suffer from severe teacher turnover, which increases the atmosphere of failure; they have far fewer accomplished, veteran teachers; and the qualifications of their faculty, especially in science and mathematics, are often marginal at best.

Addressing these problems requires (1) a thorough and accurate understanding of the characteristics of the teacher workforce and the impact those characteristics have on teachers' decisions to enter and remain in teaching and their success in the classroom; and (2) a repertoire of effective strategies for recruiting, supporting and retaining an adequate supply of good teachers and deploying them to every classroom in the nation.

What follows is a summary of the findings of a report by the Education Commission of the States (ECS) designed to do just that: Help policymakers gain a better understanding of both the nature of the teacher workforce and of promising recruitment and retention strategies.

To that end, ECS reviewed 91 studies on teacher recruitment and retention in search of answers to eight questions that are of particular importance to policy and education leaders. While empirical research is not the only important source of information and is not by itself a sufficient basis for policy, policies that are not grounded in the best research are likely to miss the mark and fall short of solving the problems they were intended to address.

The full report, available at http://www.ecs.org/trrreport, provides a detailed look at what the research says in response to each of the key questions and what that response implies for policy, and includes summaries of all 91 studies reviewed.

Eight Questions on Teacher Recruitment and Retention: What Does the Research Say? is the second in a series of three reports on teaching quality supported by a grant from the U.S. Department of Education. The first, an in-depth review of research on teacher preparation, was published in summer 2003. The final report, to be released in October 2005, will focus on what the research says about teacher licensure and certification.

Question 1:
What are the characteristics of those individuals who enter teaching?

RELATED QUESTIONS:

How do the characteristics of individuals who are currently teaching differ from the characteristics of those who are not? What accounts for the demographics of

the current population of teachers? What are the characteristics of the reserve pool of licensed teachers who currently are not teaching?

The nation's teacher workforce continues to be predominantly white (86%) and female (79%). Although that trend has changed little over the last 30 years, there are several nuances worth noting. The research provides **moderate evidence** that a larger percentage of the most intellectually able women decide to enter careers other than teaching now that more career opportunities are open to them. But there is also **moderate evidence** that one of the reasons for women's strong interest in teaching as a profession is – and likely will continue to be – the opportunity it affords to take time out to raise a family. With regard to the low percentage of minorities in the teaching profession, there is **limited evidence** that one of the reasons is the barrier that teacher certification examinations pose to minority teacher candidates.

Much has been made in recent years of the issue of the intellectual ability of teachers in comparison with other college graduates. The research provides **strong evidence** that those college graduates with the very highest demonstrated intellectual proficiency are less likely to go into teaching than other college graduates. There is also **limited evidence** that poor hiring practices may be, in part, to blame for this.

The reserve pool of teachers also is the subject of much discussion. The research reviewed for this report indicates that between 25% and 37% of those who leave teaching wind up returning at some point. This seems to suggest that the attrition rate of new teachers from teaching is mitigated by the fact that a large percentage of dropouts are only temporarily lost to the profession.

POLICY IMPLICATIONS

The research suggests that policymakers should, first of all, intensify their efforts to recruit capable minorities into teaching and to discover what accounts for their underrepresentation in the profession, although the likelihood of increasing minority representation significantly in the profession is small. Similarly, although it seems unlikely that teaching ever will attract a large percentage of the most academically talented individuals, policymakers should continue to seek to attract as able a teacher corps as possible. Finally, policymakers and educators should exploit the reserve pool of licensed teachers as fully as possible.

Question 2:

How do those individuals who remain in teaching compare with those who leave?

RELATED QUESTIONS:

What relationship do the following characteristics have to retention in teaching: age and teaching experience; gender, family and socioeconomic status; race and ethnicity; academic qualifications; intellectual proficiency; demonstrated

teaching ability; subject taught; and beliefs, values and attitudes? How does the turnover rate in teaching compare to that in other professions?

Research reveals some consistent patterns that confirm statistics commonly cited in contemporary discussions. There is **strong evidence** that teacher attrition is most severe among beginning teachers but the likelihood of a teacher leaving declines significantly after he or she has been in the classroom for four to five years, and then increases again markedly after 25-30 years in the profession. Roughly 50% of teachers leave their initial assignment – but not necessarily the profession itself – in the first five years of their career. There is **limited evidence** that younger beginning teachers are more likely to leave than those who were slightly older.

The literature also indicates younger women are the most likely to leave teaching, and there is **moderate evidence** that pregnancy and childrearing are key reasons why. This means it is possible a significant number of women who quit to raise a family return to teaching once their children are older, a possibility consistent with the limited evidence. Consistent with this possibility, several studies provide **limited evidence** that women who enter teaching at a more mature age are much less likely to leave than those who begin teaching when they are much younger.

The literature reviewed also provides **moderate evidence** that white teachers have greater rates of attrition than either African American or Hispanic teachers, and it offers **limited evidence** that minority teachers are more likely than white teachers to remain in schools with higher proportions of minority students.

With regard to the relationship between academic qualifications and teacher attrition, the literature reviewed provides **limited evidence** that teachers teaching in a field in which they have subject expertise or certification are less likely to leave than teachers with less appropriate qualifications. It provides **strong evidence** that attrition is greater among middle school and high school teachers than among elementary school teachers, and it provides **moderate evidence** that science and mathematics teachers are more likely to leave their jobs than secondary school teachers of other subjects.

With regard to the impact of intellectual proficiency, the literature provides **limited evidence** that teachers with high intellectual proficiency are more likely to leave teaching than teachers with significantly lower intellectual proficiency.

On the relationship of several other teacher characteristics – academic degree; socioeconomic status; and beliefs, values and attitudes – to attrition, the literature is **inconclusive**.

Finally, the literature is **inconclusive** on the issue of how attrition in teaching compares with that in other occupations, and there is no consensus on what a reasonable rate of attrition in teaching might be.

POLICY IMPLICATIONS

In view of the difficulty of significantly increasing minority representation in the teaching profession, it is important to examine more closely the reasons why white teachers leave schools with high percentages of minority students, and to develop strategies that may curb that tendency. Of particular importance is stemming the attrition of teachers – whether white or minority – who teach mathematics and science. Also worthy of study are the reasons for the higher rate of attrition among the more intellectually capable teachers and appropriate policy responses. Some of these many involve fiscal considerations, which will be discussed in Question 5.

Question 3:

What are the characteristics of schools and districts most likely to be successful in recruiting and retaining teachers?

RELATED QUESTIONS:

Do schools differ in their success at recruiting and retaining teachers based on the following characteristics: geography – urban, suburban or rural; grade level; school type – elementary schools, middle schools and high schools, public versus private? Do student-body composition and performance have an impact on the ability of schools to recruit and retain teachers?

The research reviewed for this question provides a stronger basis for some conclusions than for others. It provides **strong evidence** that attrition is greater among secondary school teachers than among elementary school teachers. With regard to the more specific issue of middle school attrition in comparison to high school or elementary school attrition, the literature is **inconclusive.**

Consistent with common perceptions, the research literature provides **moderate evidence** that teacher turnover is greater in schools with relatively higher proportions of low-income, minority and academically low-performing students. The literature also provides **limited evidence** that the qualifications of teachers in such schools tend to be inferior to the qualifications of teachers in other schools.

Finally, the literature provides **limited support** for the conclusion that teacher turnover is greater at private schools than at public schools, and – somewhat surprisingly in light of the current wave of interest in creating smaller schools – that turnover is also greater in small schools, both public and private, than in larger schools.

POLICY IMPLICATIONS

One of the implications of the research literature is clearly that educators and policymakers must focus particular attention on stemming teacher attrition in secondary

schools, and especially in mathematics and science. The literature also confirms the importance of addressing the issue of teacher recruitment and retention in schools with high percentages of low-income and minority students.

Finally, although the reasons are not clear, the fact that attrition in smaller schools is greater than in larger schools and greater in private schools than in public schools should raise a caution among those who advocate for reduction in school size and those who advocate for greater school privatization. While either of these might, all things considered, be reasonable policy alternatives, it is important to try to determine with greater confidence what impact moving in either direction would likely have on the supply and persistence of our nation's teachers.

Question 4:

What impact do the working conditions in schools have on their ability to recruit and retain teachers?

RELATED QUESTIONS:

How important are teacher autonomy and administrative support? How important is class size? How important are student characteristics and attitudes?

On the whole, the research literature is not sufficiently robust or fine-grained to support more than the most general observations as to the impact of various factors associated with working conditions on teacher recruitment and retention. The research does provide **limited support** for the expected conclusion that schools with greater administrative support and teacher autonomy have lower teacher attrition. The research also provides **limited evidence** that the higher the minority enrollment of a school, the higher the rate of teacher attrition – at least among white teachers. Similarly, there is **limited evidence** that attrition is greater in schools with higher levels of student poverty and also in schools with low student achievement.

While there remains a good deal of interest in class-size reduction as a means of improving teacher working conditions and thus, presumably, increasing teacher retention, the literature in support of such a strategy must be judged to be **inconclusive**. Several studies do indeed suggest that class-size reduction stems teacher attrition, but the actual impact reported is extremely small. A reduction in teachers' workload also is often touted as a measure that will increase teacher satisfaction and thereby reduce attrition, but here, too, the literature in support of this contention is **inconclusive**.

POLICY IMPLICATIONS

The research evidence in support of the impact on teacher recruitment and retention of any single factor or set of factors related to working conditions is modest, at best. Still, there is sufficient research to indicate the working conditions of teachers should be an important policy concern, especially in at-risk schools. One measure that seems important in view of the overwhelming percentage of white teachers in the workforce is to provide effective training for white teachers – either preservice or inservice – in handling student

diversity. Another measure likely to be helpful, though not discussed robustly in the research literature, is to provide teachers with strong administrative support and adequate autonomy. The fact that "adequate autonomy" is a somewhat subjective determination suggests the importance of considering teachers' perceptions of their working conditions, as well as more objective measures, in setting policy.

Finally, although the research literature provides no guidance on the issue of class size, it seems reasonable to suppose that larger classes are less negative a factor if working conditions are otherwise conducive to teacher satisfaction. This may imply that policymakers should attempt to determine which measures to increase teachers' job satisfaction are most cost effective and most feasible given demographic realities, labor market considerations and the availability of various resources in their particular state or district.

Question 5:

What impact does compensation have on the recruitment and retention of teachers?

RELATED QUESTIONS:

Does offering higher salaries increase the quality of teachers who are recruited and retained? How important is teacher compensation in teacher recruitment and retention as compared to other factors?

The research provides **strong support** for the conclusion that compensation plays a key role in the recruitment and retention of teachers. Not surprisingly, the research indicates that increasing compensation tends to increase the rate of teacher retention, but this relationship is not a simple one. Compensation has a varying impact on retention depending on other factors such as teachers' gender, level of experience and current job satisfaction. There is **moderate evidence** that working conditions may, in some cases, trump salary as a factor in teacher retention, and it is the *relative* salary between districts that is the important consideration. The research evidence is **inconclusive** as to whether limited career-advancement opportunities in teaching contribute to attrition.

With regard to teacher recruitment, there is **limited evidence** of a positive correlation between recruitment and various financial incentives, including compensation. With regard to teacher quality, the research is **inconclusive** as to whether financial incentives have an impact.

POLICY IMPLICATIONS

Given the complexity of the issue of compensation and the interaction of compensation with other factors such as working conditions and general job satisfaction, drawing the implications of the research for policy is not an easy matter. The clearest recommendation that can be made is for policymakers to ensure teacher salaries in their state or district are comparable to those in neighboring states and districts. The research does not provide any guidance on the issue of differentiated teacher pay or on across-the-

board salary increases. It does indicate clearly, however, it is the local labor market that is the determining factor and not national trends.

Question 6:

What impact do various strategies related to teacher preparation have on teacher recruitment and retention?

RELATED QUESTIONS:

Is there any significant difference between alternative route and traditional route programs in retention rates of the teachers they prepare? What impact does raising preparation program entrance or completion requirements have on the recruitment and retention of teachers?

The research provides **limited support** for the modest conclusion that the retention rates of alternative route graduates can be comparable to, and even exceed, that of traditional route graduates. Given the great variation within both types of preparation programs, however, larger generalizations about their relative success cannot be made. The research also provides **limited evidence** that some alternative programs are successful in recruiting a constituency into teaching that is more diverse ethnically and in age than the profession as a whole.

As far as the impact of imposing more stringent requirements for entrance into teacher preparation, the research literature is **inconclusive**.

POLICY IMPLICATIONS

These modest findings support the equally modest policy recommendation that efforts to develop high-quality alternative route teacher preparation programs are worthy of support.

Question 7:

What impact do induction and mentoring have on teacher retention?

RELATED QUESTION:

What are the characteristics of effective induction and mentoring programs?

The research reviewed for this report provides **limited evidence** that induction and mentoring can increase teacher retention. The diversity among the induction and mentoring programs discussed in the literature, however, and the difficulty of distinguishing between the specific effects of induction and mentoring and those that might be attributed to other factors means the literature is **inconclusive** as to what precisely makes such programs successful. Thus, those who

are considering implementing such programs will have to rely on the consensus of expert opinion.

POLICY IMPLICATIONS

Although the literature reviewed for this report does not provide enthusiastic research-based support for this strategy, it does suggest that induction and mentoring may indeed be worthwhile. It is important to recognize, however, that the impact of induction and mentoring programs on beginning teachers is contextual, and likely to be a function of the nature of their preparation program and of the school and district in which they are working. In other words, induction and mentoring may be of much greater benefit, and thus be much more cost effective, for some populations of beginning teachers than for others. Clearly, a good deal of additional research is needed to provide more definitive guidance for educators and policymakers. In the meantime, they must rely on the consensus of experts.

Question 8:

What is the efficacy of particular recruitment strategies and policies in bringing new teachers into the profession, including specifically targeted populations?

RELATED QUESTIONS:

Are programs that seek to recruit middle school, high school or community college students into teaching effective in increasing the number of students who enter teaching or the subsequent success of these teachers and their rate of retention in the profession? How effective are programs that offer scholarships or forgivable loans to college students who commit to going into teaching? What kinds of recruitment policies and programs are particularly successful in recruiting minority teachers?

Except for teacher preparation-related policies discussed in Question 6, there were simply no adequate studies available on the great majority of specific recruitment strategies that have been employed by states and districts. Thus, the research provides no answers to any of the questions asked above. This is unfortunate given the importance of finding effective strategies for recruiting well-qualified individuals into the teaching profession and the significant resources that states and districts currently spend on recruitment efforts.

POLICY IMPLICATIONS

Clearly, there is a need to undertake and support more research on, and more rigorous evaluation of, early recruitment efforts, loan-forgiveness programs and the many other specific kinds of strategies that have been employed. Such research should enable policymakers and educators to determine, with confidence, (1) whether less of the target population would have gone into teaching had the programs and strategies in question not been in place and (2) whether any other specific program goals, such as recruitment into

underserved schools or a minimum length of stay in the teaching profession, have been met.

On the other hand, given the significant expense and complexity involved in conducting an adequate impact study, it may be advisable to pursue certain low-cost strategies even in the absence of a full-blown study – as long as there is some evidence of a positive impact and no evidence of a negative impact.

ACKNOWLEDGMENTS

This report owes its existence to the support and efforts of many people.

A significant portion of the content of the report is based on a review of the research literature the Education Commission of the States (ECS) commissioned from RAND. That review was carried out by a team that included Cassandra Guarino, Lucrecia Santibañez, Glenn Daley and Dominic Brewer. Several other individuals, in turn, provided review for the RAND work as well as for a late draft of the present report: Robert Floden, Daniel Goldhaber, Rebecca Herman, Richard Ingersoll and Ana Maria Villegas. Richard Ingersoll and his co-author, Jeffrey Kralik, also contributed an important ECS-commissioned literature review of their own on induction and mentoring that is used as a supplement to the RAND review in this report.

Several ECS staff also provided invaluable assistance. Charles Coble offered both welcome moral support and critical insights. Suzanne Weiss worked her usual editorial magic, and Josie Canales painstakingly proofread the final manuscript. Kym Bloom is responsible for the layout.

In addition, Patricia A. Lauer, of Mid-continent Research for Education and Learning, made a significant contribution to the report as the author of the great majority of the entries in the Glossary.

Finally, and most significantly, this report would not have been possible without the generosity of the U.S. Department of Education and its Fund for the Improvement of Education, which supported the present report, the two other reports in the series and several other related activities. Particular gratitude goes to Thelma Leenhouts, the project's program officer, for her constant encouragement and interest throughout the preparation of this report.

The contributions of many others notwithstanding, the interpretations and opinions expressed herein are the responsibility of the report's author and do not necessarily reflect the views of any of the other individuals or organizations mentioned, including the U.S. Department of Education and the Education Commission of the States.

Michael B. Allen, ECS program director for teaching quality, wrote this report.

ABOUT THIS REPORT

This is the second in a series of three reports about the research on teaching quality that the Education Commission of the States (ECS) is producing through a grant from the U.S. Department of Education's Fund for the Improvement of Education (FIE). The focus of this report is on teacher recruitment and retention. The first report in the series, *Eight Questions on Teacher Preparation: What Does the Research Say*, was completed in July 2003. It can be viewed online at www.ecs.org/tpreport and a print version purchased from ECS at that same Web address. The final report will focus on teacher certification and licensure, and should be available by fall 2005.

The reports are intended to guide policymakers, educators and foundation officials in their efforts to improve the quality and supply of America's teacher workforce. ECS also hopes the reports will help researchers and others strengthen the knowledge base that underlies policy and practice, and ensure research in the field better addresses the needs and interests of practitioners and, especially, policymakers.

Among ECS' constituents – governors, legislators, state school chiefs and other political and education leaders – the issue of teaching quality consistently ranks as one of their top concerns. This is no doubt due in part to the shortage of well-qualified teachers faced by virtually every state to one degree or another. It also is due to the persuasive and growing body of evidence that teacher effectiveness is the single most-important educational factor in children's achievement in school. Without reliable guidance and the ultimate success of efforts to strengthen teacher quality and supply, however, policymakers and education leaders may turn their attention away from this issue, in spite of its fundamental importance, and pursue other strategies for improving education.

It is hoped this report and the other two in this series can indeed begin to offer the information so greatly needed. This report, as a starting point, presents an assessment of the current baseline of the research knowledge relating to specific questions about teacher recruitment and retention. As research continues, the report will need to be revised and updated periodically to reflect new studies that may shed light on the questions under consideration here or on other questions about teacher recruitment and retention that may emerge over time.

The report also indicates where there is insufficient research to answer the questions asked. This not only has implications for efforts to ground policy decisions in solid evidence but also for the assessment of what additional research needs to be undertaken to provide stronger evidence and more satisfactory answers.

How To Read the Report

The report is structured around the discussion of eight questions, each of which can be read independently of the others. The discussion of each question allows for both a quick summary reading (in the section called Quick Answer) and a more in-depth exploration. A Summary of

Studies provides an overview of the key findings and conclusions related to each question. Before delving into the discussions of the specific questions, however, it is recommended the reader turn to the chapter titled About the Eight Questions.

In addition to the specific discussions of each of the eight questions, the report includes other material that enhances the understanding of the reader and discusses the larger implications of the report's findings. The Introduction provides an overview of the issues involved in teacher recruitment and retention, and discusses the role of research in policy decisions. The concluding chapter, Improving the Research on Teacher Recruitment and Retention, contains some suggestions for making research on the issue more rigorous, more complete and more useful to policymakers. A more general discussion about improving the research on education, including suggestions for roles various stakeholders can play in such an effort, is found in the earlier report, *Eight Questions on Teacher Preparation*.

Because the report deals with highly technical issues and material, the use of technical terms was unavoidable. Terms relating to research are italicized in purple text (i.e., term). Except in the summaries of individual research studies, however, they are noted only the first time they appear in a given section of the report. Holding the cursor over any one of the identified terms causes a pop-up box to appear with a basic definition of the term. Double click on the identified term causes a window to appear with the more complete Glossary definition. The Glossary also can be viewed independently.

This report may be used in conjunction with *A Policymaker's Primer on Education Research: How To Understand, Evaluate and Use It*, which ECS and Mid-continent Research for Education and Learning (McREL) developed jointly, to help policymakers and others understand the subtleties of scientific research and be more confident in assessing and using it. The Primer, which was written by Patricia A. Lauer, is accessible online at www.ecs.org/researchprimer and available in an abridged version at that Web address.

This report notes those instances, via the use of a colored asterisk (*) followed by colored text, where the Primer can provide the reader with a more in-depth understanding of the related methodological issues.

The Basis for the Report

This report relies heavily on a review of the research literature on teacher recruitment and retention that ECS commissioned from a research team at RAND that included Cassandra Guarino, Lucrecia Santibañez, Glenn Dailey and Dominic Brewer. The researchers, who have outstanding reputations as social scientists, sought to be as objective as possible in carrying out their review. They employed rigorous criteria in the selection and analysis of the studies they reviewed; the criteria are summarized in the next section below and explained in more detail in Appendix A. Moreover, their work was itself reviewed anonymously by three prestigious outside scholars prior to completion of the final manuscript. The original RAND review, titled *A Review of the Research Literature on Teacher Recruitment and Retention*, is available from RAND at http://www.rand.org/publications/TR/TR164.

In addition to the RAND review, ECS commissioned Richard Ingersoll and Jeffrey Kralik, of the University of Pennsylvania, to conduct a review of research on induction and mentoring that also employed rigorous, though somewhat different, criteria of analysis and is used here as a supplement to the RAND report. That review, *The Impact of Mentoring on Teacher Retention: What the Research Says*, is found online on ECS' Web site at http://www.ecs.org/clearinghouse/50/36/5036.doc.

The summaries of the research in this report generally mirror those of the RAND researchers, although they may differ in some details. The present report frequently differs from the RAND study in the conclusions that can be drawn from the research. Moreover, the present report goes well beyond the scope of its predecessor in attempting to assess the implications of the research for developing relevant public policy. Those implications are based upon the author's own knowledge and understanding of the constellation of policy issues surrounding teacher recruitment and retention. And while the author has tried to be as fair and objective as possible in drawing the implications of research for policy, those implications ultimately reflect the author's own perceptions. Prior to its final release, however, the present report was reviewed in its entirety both within ECS and by external experts to minimize errors and identify unsound or unwarranted conclusions.

This report concludes with a discussion of some of the major shortcomings of research on teacher recruitment and retention and with a set of recommendations for strengthening it. While many of the recommendations for improving the research are based on the conclusions of both the RAND researchers and Ingersoll and Kralik, other recommendations grow out of several meetings with researchers and policymakers that ECS convened in 2002 as part of the larger project of which the present report is a part.

How Was the Research Selected?

The overwhelming bulk of the research included for review in this report was selected by the researchers at RAND, and the report relies heavily on the judgment of the RAND researchers as to the appropriate inclusion criteria. For some questions, however, additional literature from the previous ECS report on the research on teacher preparation was included. In addition, on rare occasions, the author used his discretion to add literature that was published since the time of the RAND review or recommended by outside reviewers. All the literature reviewed for the present report are examples of *empirical research* – studies that offer evidence for their conclusions that comes from systematic observation rather than from articles that are based on opinion and use other studies for support. Non-empirical pieces can be quite helpful in clarifying issues conceptually, but since this report addresses empirical questions, it seeks to provide empirical evidence.

The RAND researchers ultimately selected 91 studies for inclusion in their review, out of 1,780 potential candidates. A number of potential candidates were eliminated either because they were non-empirical or lacked the characteristics of sound scholarship. That then left just over 300

studies, with the final 91 empirical studies included on the basis of certain criteria and the judgment by the RAND researchers as to whether the studies met the following criteria:

- Published in high-quality, *peer-reviewed* publications or by organizations with a well-established peer-review process
- Original studies and not reviews of other work
- Current [published since 1980] and not superceded by later studies
- Addressed precisely the research questions asked
- *Research design* and analysis employed were appropriate to the topic under study.

For *quantitative research*, several additional considerations determined whether or not a study was included for review:

- The *sample* used in the analyses was of adequate size and was appropriately selected and surveyed
- The *variables* used were reliably measured with a high degree of *validity*
- The *statistical model* used in the analysis was judged to be largely free from *bias* or to address the likely sources of any bias, and it neither omitted relevant variables nor included irrelevant ones
- The conclusions offered in the study neither overstated nor misinterpreted the findings. (In some cases, such a failing did not eliminate a study from consideration but merited an appropriate critique in the original RAND review.)

For *qualitative research*, there were additional criteria used to decide whether or not to include a study in the review:

- Qualitative methods were employed either because the study used a small sample, considered data that were difficult to quantify or addressed phenomena for which no previous hypotheses had been developed
- Adequate empirical evidence and strong analysis were presented in support of the conclusions drawn
- The *hypotheses* formulated were relevant, or the interpretations drawn were informative for other researchers in the field.

A more detailed summary of the inclusion criteria employed by the RAND team appears in Appendix A. The criteria used for the review of the literature that was added from the *Eight Questions on Teacher Preparation* report were similar to those used by the RAND researchers and found in Appendix A of that report.

The Ingersoll and Kralik review used somewhat different inclusion criteria, which are detailed in the ECS report, *The Impact of Mentoring on Teacher Retention: What the Research Says*. The two key differences between the criteria used by Ingersoll and Kralik and those used by the other researchers are (a) Ingersoll and Kralik did not restrict their review to published, peer-reviewed literature, and (b) Ingersoll and Kralik reviewed only quantitative studies that involved a comparison between one or more groups who received induction and mentoring and a group who did not.

While the present review cannot claim to be absolutely exhaustive, it is hoped it includes virtually all the highest-quality relevant literature published up through 2004. A complete list of

the sources reviewed for this report appears in the References section. There were 91 empirical studies reviewed for this report.

To be sure, relying only on published literature invites a bias in favor of research that is of interest to an academic audience and that supports traditionally held positions. And it excludes a good deal of the local research and evaluation studies that teacher educators or other researchers conduct in relative obscurity. This is one of the advantages of the Ingersoll and Kralik review, which did look at studies that were not peer reviewed, though this was largely because there were so few studies, published or not, that met its specific criteria for inclusion.

In general, however, the value of peer review is it screens out work of inferior quality and work that has a strong advocacy, rather than scientific, orientation. Moreover, a good deal of local research relies on a set of experiences and assumptions that are often not widely shared outside a local context, so the wider significance or *external validity* of such local studies is often very limited. Finally, it would require an enormous amount of time (and a significantly greater expense) even to locate unpublished (or "fugitive") literature. Thus, the restriction of the review to published peer-reviewed literature gives it at least an initial assurance of quality and seemed a reasonable and cost-efficient limitation.

How Was the Research Evidence Assessed?

Assessing how well the research responds to the eight key questions is tricky. The reader will note frequent observations throughout this report about the implications or limitations of the research. These observations often draw on the assessments provided by the RAND researchers in their original research review.

This report attempts to provide an overall evaluation of how strongly the body of studies relevant to a specific question points to a particular answer. How to undertake such an overall evaluation, or *synthesis*, of the research is a subject of intense scientific discussion in and of itself. Even among research methodologists who consider only quantitative research, there are disagreements about proper procedure. When, as in the present case, there are both quantitative and qualitative research involved, and when there is little *experimental research* that stands above the rest in identifying cause-and-effect relationships, an assessment of the strength of the research base is that much more difficult.

Some researchers employ an approach called *meta-analysis* to provide a quantitative, statistical summary of the combined results of multiple studies related to the same question. The RAND researchers did not use this approach, however, because the questions being addressed were somewhat broader than those typically addressed in meta-analysis and because the outcome measures in the studies were so varied. Following their example, this report also does not use meta-analysis, but rather relies on a non-statistical and less formal approach to summarize the aggregate evidence provided by the research.

Because the primary purpose of this report is to provide an assessment of the relevant research for policymakers, the designations of the strength of the research are intended to be utilitarian.

The criteria employed in making these judgments are certainly not the only ones possible, and accomplished researchers certainly may quibble with the overall assessments given. Hopefully, however, the criteria used here provide a reasonable comparative evaluation and a practical and comprehensible shorthand indication for policymakers who want to use the research evidence in making policy decisions.

The designations of the strength of the research support used in answering the eight questions are as follows:

- The research was considered to offer **strong support or evidence** for a conclusion if (1) there were several solid *experimental studies* or *quasi-experimental studies* that supported it; and/or (2) there were a significant number of *correlational studies* that supported it involving advanced statistical approaches such as *regression analysis*; and (3) there were very few, if any, studies that cast doubt upon the conclusion. In other words, there needed to be an unequivocal pattern of support for the conclusion on the basis of solid quantitative research.
- The research was considered to offer **moderate support or evidence** for a conclusion if it did not meet the criteria for strong support, but (1) there were one or more solid experimental studies or quasi-experimental studies that supported it; and/or (2) there were more than several correlational studies that supported it involving advanced statistical approaches; (3) there were few studies that cast doubt upon the response; and (4) in borderline cases, especially if there was disagreement among studies, there were *descriptive studies* present that made it more plausible that certain correlations were based upon a true causal relationship. In other words, there needed to be a clear pattern of support for the conclusion on the basis of solid quantitative research.
- The research was considered to offer **limited support or evidence** for a conclusion if it did not meet the criteria for moderate support, but (1) there was at least one solid experimental study or quasi-experimental study that supported it; and/or (2) there were several correlational studies that supported it involving advanced statistical approaches; (3) there were a preponderance of descriptive studies that supported it, and (4) there was considerably weaker evidence in support of any conflicting conclusion.
- If the research for any conclusion did not at least meet the standard of providing limited support, then it was regarded as being **inconclusive**. This could be the case both when only one or two studies supported a conclusion and when there were not significantly more studies that support one conclusion than support one or more opposing conclusions.

It should be noted that although answers to several questions were judged to have strong research support, there was no experimental research, at all, in the relevant literature reviewed for this report. That absence is particularly lamentable in the case of induction and mentoring given the strong interest in it on the part of educators and policymakers. Thanks to funding from the U.S. Department of Education's Institute of Education Sciences, however, experimental research on induction and mentoring is recently underway. It would be extraordinarily difficult, however, to carry out experimental studies of the impact of compensation policies, school factors, etc. because the kind of controlled situation required to carry out such studies is not easily established. On such issues, good correlational research may be the best that can be accomplished.

Though the body of literature reviewed for this report lacks experimental studies, the rigor and sophistication of many of the statistical studies included is impressive. There are three caveats that should be noted, however:

1. The fact that a study passed muster with the reviewers and was included in the body of literature reviewed for this report does not mean it was without any weaknesses. All research studies have their flaws. While the RAND reviewers frequently noted problems with some of the studies, those were not included in this report. Anyone interested in the shortcomings of the studies identified by the RAND team is encouraged to read their original literature review.

2. Related to the first caveat, the complex statistical studies reviewed generally employed sophisticated statistical models. In this particular report, these are often models that attempt to account for all factors involved in an individual's choice to take or leave a particular teaching job, even in the absence of actual data about all those factors. Although the RAND reviewers attempted to screen out studies in which such models were biased or poorly constructed, even the best models have the status of good approximations.

3. Unlike the questions in our previous report on teacher preparation, several of the questions here do not concern causal relationships or the impact of certain policies or practices but, rather, seek to describe demographic realities and trends. Thus, it seems a little peculiar to discuss the strength of the research evidence that the teacher workforce, for example, is composed of a certain percentage of males, females, whites and minorities. Research on statistical realities is not cumulative in the way research on causal connections would be. Indeed, research studies published in the past may not quite reflect the actual demographic realities of 2005. Assuming a recent demographic research study is thorough and its sample is representative of the larger population in review, then its findings would be accepted as valid. Where an evidentiary assessment regarding demographic research does sometimes come into play in this report, however, is in trying to find the explanation for the statistical realities and trends that are noted.

*** For additional insight into the methodological issues involved in the preceding discussion, see the section titled "How Do I Know if the Research Is Trustworthy?" in *A Policymaker's Primer on Education Research*.**

INTRODUCTION:
TEACHER RECRUITMENT AND RETENTION, RESEARCH AND POLICY DECISIONS

The Critical Importance of Teacher Recruitment and Retention

While many factors contribute to the successful education of children, there is a strong consensus among experts that the effectiveness of their teachers is the single most important educational determinant. Studies by William Sanders and June Rivers (1996); Ronald Ferguson (1991); Steven Rivkin, Eric Hanushek and John Kain (1998); and others all support the primary importance of good teaching. Sanders and Rivers (1996), for example, found that students who had strong teachers for three years in a row made reading gains over the period that were 54% higher than their fellow students who began at the same level but who had weak teachers for three consecutive years. Rivkin, Hanushek and Kain found the quality of the teacher accounted for at least 7.5% of the variation they measured in student achievement – by far the largest single factor. This finding was corroborated by Dan Goldhaber, Dominic Brewer and Deborah Anderson (1999) who reported that just over 8% of the variation in student achievement was a result of teacher differences. And another study by Hanushek (1992) found that teachers' differences had an impact of as much as a grade level in student performance.

Teaching effectiveness, however, is a function of a number of factors. As the previous report on teacher preparation [*Eight Questions on Teacher Preparation: What Does the Research Say?* by the Education Commission of the States (ECS)] makes quite clear, a good grasp of the subject(s) being taught is essential, and skill in teaching the subject and a general ability to manage a classroom also are high on the list. Also helpful seems to be a teacher's ability to recognize and respond appropriately to the needs of the particular kinds of students he or she is teaching. Beyond these basic attributes, exceptional degrees of intelligence, personal charisma and dedication probably all help to make a teacher more effective, but the reality is exceptional teachers are, by definition, in short supply.

Beyond the teacher's own skills and abilities, effective teaching also likely depends on the environment in which an individual is teaching. A teacher may be very effective teaching in one kind of environment but not in another. She may lack the skills to teach in an extremely diverse classroom, the patience to teach boisterous students, the toughness to teach rebellious students, the empathy to be good with low-achieving students or the self-confidence to teach exceptional ones. She may be a wonderful 1st- or 2nd-grade teacher but a so-so 4th- or 5th-grade teacher. A particularly confident and self-reliant teacher may be effective in spite of poor support from colleagues and administrators, while a beginning or less confident teacher may require a much more supportive environment.

It would be ideal if every teacher taught in an environment that matched his or her skills and temperament. The reality, however, is not every teacher has adequate knowledge of the subject(s) they are assigned to teach. This is a particularly serious problem for low-income and minority students. A 1999 study by Richard Ingersoll found that in mathematics, for example,

43% of teachers in high-poverty secondary schools lacked a major or minor in their field compared with 27% in more affluent schools. In science, the figures were 28% and 18%, respectively. A 2002 study by Hamilton Lankford, Susanna Loeb and James Wyckoff of schools in New York State also found that the schools with the largest percentages of poor and minority students tended to have the least-qualified teachers.

While the No Child Left Behind Act of 2001 aims to change this disparity by requiring all teachers have adequate subject knowledge in their teaching fields, research by ECS and other organizations indicates many states are still far from reaching that goal. Indeed, a recent *Washington Post* article reported that 25% of the teachers in our nation's capitol still lack appropriate teaching credentials. In addition to disparities in subject knowledge, a study by the National Center for Education Statistics (2000) found that 20% of teachers in high-poverty schools have three or fewer years of teaching experience, compared with 11% in low-poverty schools. In other words, it appears there are not enough experienced, well-qualified teachers to go around, particularly for low-income and minority students.

At least part of the solution to this problem would be to recruit more well-qualified and experienced teachers into high-poverty schools. Policymakers across the United States are searching for ways to accomplish precisely that objective, with financial incentives, changes in collective-bargaining agreements, quick-entry (so-called "alternative") teacher preparation programs and more efficient district hiring practices growing in popularity as strategies. Such efforts aim not only to bring more people into the teaching profession, particularly in high-need subjects such as science and mathematics, but also to encourage more well-qualified teachers to teach in the most challenging schools.

The solution lies not only in teacher recruitment, however, but also in teacher retention. Policymakers and educators have been warned for an entire decade about the attrition of teachers from the profession. In its 2003 report *No Dream Denied: A Pledge to America's Children*, the National Commission on Teaching and America's Future (NCTAF) claimed there was no real problem of teacher supply in the United States but that teacher attrition was the true cause of the so-called "teacher shortage." Whether or not that claim is correct, particularly for the most acute shortage subjects such as mathematics and science, it is the case that evidence from across the country indicates the problem of teacher turnover is most acute in high-poverty schools. A recent report on schools in Colorado, for example, found that while the average turnover rate statewide between 2001 and 2004 was 20%, the 2002-03 turnover rate in 10 high-poverty schools in the Denver district was 50% or higher.

There are costs associated with high rates of teacher turnover both financially and in terms of creating a productive learning environment. Ideally, the teaching profession could benefit from recruiting promising beginning teachers who would remain in the profession for more than just five or six years, particularly since some studies (e.g., Murnane and Phillips, 1981) indicate that teacher effectiveness increases significantly over the course of that time. It may be unrealistic, however, given the fluidity of people's careers these days to expect most teachers to remain in a given teaching position for a decade or even to remain in the profession itself for much longer than that time.

What is needed to address teacher recruitment and retention effectively are (1) an accurate assessment of the demographic characteristics of the teaching profession, (2) an understanding of the teacher labor market and (3) any available evidence of the success – or likely success – of various strategies that might be employed to address recruitment and retention problems. That is precisely what this report seeks to provide. While many policy debates about teacher recruitment and retention are generally much less divisive than the debates about teacher preparation or about teacher licensure and certification, the issue of teacher compensation in particular has become extremely controversial in recent years. There is a large split between those who call for across-the-board increases in teacher salaries and those who believe salary increases can be justified only if teachers' pay is a function of their classroom performance or difficulty of their responsibilities. Thus, as in many spheres of education, strong advocacy groups have arisen on this issue whose view of the available evidence on the issue tends to favor their particular position. And there are other groups, as well, whose special interests in the area of teacher recruitment and retention predispose them to construe the evidence in support of their particular point of view.

ECS has no vested interest in any particular position on the issues related to teacher recruitment and retention. As much as possible, this report – *Eight Questions on Teacher Recruitment and Retention* – attempts to provide a neutral and objective assessment of the research findings. If there are any acknowledged biases in this effort, they are (1) a desire to find importance for policymakers and others in the body of research reviewed and (2) a concern, on the other hand, not to pretend that the research supports more than it legitimately does.

In the end, of course, teacher recruitment and retention are local problems that require locally appropriate solutions. The nature of teacher shortages, of the makeup and distribution of the teacher workforce, and of the strategies that will work in the labor market differ from district to district and state to state. Nevertheless, the broad picture the present study seeks to paint is likely to reflect the local situation in many states and districts. Hopefully, the important information and insights contained here will help educators and policymakers craft their own particular approaches to the challenges they face.

Finally, it is important not to lose sight of the fact that the issue of teacher recruitment and retention is related to the issue of teacher quality. It is not just about ensuring an adequate number of teachers for the U.S. classrooms are available, but about having the teachers in the profession who are as accomplished as possible. Teacher preparation programs need to recruit the most promising teachers they can and build the capacity of their recruits through solid teacher education. Likewise, once teachers are in the classroom, states and districts must continue to enhance their skills and knowledge through high-quality professional development.

The Role of Research in Policy Decisions

Policy decisions in education are never made solely on the basis of objective information. There are always values that come into play and, in the world of politics, compromises to win support or bow to fiscal constraints. In addition, education research is never adequate to justify the adoption or development of a particular policy, strategy or program.

There are several reasons for this inadequacy. First, policy decisions often require a commitment of money and resources. The fact that the research provides evidence for the effectiveness of a particular kind of program or strategy does not mean that program or strategy is affordable or cost effective or that it can be supported politically.

It is likely, for example, that doubling teacher salaries across the board would have a profoundly positive impact on a district's ability to recruit and retain teachers. In a large district, however, such a measure would be extremely expensive and would likely require the adoption of new tax policies the voters of the district would not accept. Moreover, there is growing reluctance among policymakers to support across-the-board salary increases; instead, policymakers increasingly favor differentiated compensation that rewards teachers who are successful or who assume greater levels of responsibility. In addition to that, the benefits of doubling teacher salaries might be minimal in terms of increasing either the quality or length of stay of teachers hired – i.e., it might not be cost effective.

In a similar vein, although research may show that the result of implementing a particular kind of strategy is *statistically significant*, it may not be *practically significant*. A hefty increase in district teacher salaries, for example, may be associated with a measurable impact on teacher retention. The decrease in attrition – the *effect size* – may be so modest, however (say, from 24% to 23%), that it is not ultimately worth the expense the salary increase entails. On top of that, the salary increase may have occurred simultaneously with a downturn in the local economy, meaning the decrease in teacher attrition may not have resulted from higher salaries, at all, but from the lack of other job options.

Second, policies, programs and interventions in education are highly contextual, and their success generally depends on the convergence of a number of factors that may not be easily *replicated* or that may not be identified in the research as important to the outcomes observed. In addition to research evidence, then, policymakers or educators need to have good information or else take a leap of faith that the adoption of a policy or program proven successful in one setting also will be successful in another.

Despite these limitations, research contributes valuable information for policy decisions. The weight of research evidence, and especially a lone research study, is never a sufficient guide for policy decisions, but decisions that fly in the face of a sizable body of good research are likely to be ineffective and possibly even disastrous. And while not even a whole body of research on a particular question will provide definitive answers, the verdict of multiple research studies should be regarded as the most reliable guide available.

The research evidence addressing various questions on teacher recruitment and retention is frequently inconclusive or at best limited. This does not necessarily mean the various strategies under consideration – for example, recruitment programs targeted at high school students or an increase in career-advancement opportunities within the teaching profession – are poor policy choices. It does mean, however, policy regarding such strategies lacks the support of solid research and must rely instead on less objective and reliable sources of evidence.

*** For additional insight into the methodological issues involved in the preceding discussion, see the section titled "How Do I Know if the Research Warrants Policy Changes?" in *A Policymaker's Primer on Education Research*.**

Considering the Whole Body of Evidence

Decisions about practice or policy should be informed by the entire body of good research available. Proponents of one point or view or another may be able to point to a single study or a number of studies that support their position, while ignoring those that do not. Such a selective use of research cannot provide real assurance the course of action the proponents recommend is wise. Even if the preponderance of research supports a particular decision or policy, evidence to the contrary should not be ignored.

The importance of evaluating the entire body of relevant evidence, as opposed to relying on a single study, holds for fields like health care or agriculture as much as for education. In health care, for example, new findings about the benefits or dangers of certain pharmaceuticals or foods or about the effectiveness of various diets appear with confusing frequency. If a person were to base decisions about what drugs to take or what foods to eat on the findings of each new study, that individual would be changing medications and diet constantly – so frequently, in fact, there would be insufficient time for the true impact of any particular change to be measured. Thus decisions about one's diet or pharmaceutical prescriptions must be based on an assessment of all available evidence, and apparent conflicts between the findings of different research studies must be explained to the satisfaction of the physician and patient.

The same holds true for education. While new studies about a particular strategy may not appear with the frequency of new research in health care, the investment in any strategy – especially if it is meant to be enacted in policy – is sufficiently great that any change of course will be costly and repeated changes unaffordable. Thus, it is in the best interest of policymakers, educators and other stakeholders to look at the entire body of available evidence when making policy decisions. The more good research that exists, the more it becomes possible to understand the limitations of any individual study and the inconsistencies that may seem to exist between the findings of one piece of research and another.

To be sure, it is entirely conceivable – in education as in other fields – a new research study will provide dramatic and powerful new evidence for or against the efficacy of a particular strategy. Until the findings of that study can be confirmed independently by other studies, however, and until the entire body of relevant studies can be reassessed in light of these new findings, the costs, risks, dislocations and other inconveniences that accompany change may make it prudent to stay the course. On the other hand, in cases where a current practice is demonstrably inadequate or downright harmful, the risks of implementing a new strategy, even though unproven, may be outweighed by the urgent need to make a change.

Supporting Resources

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ABOUT THE EIGHT QUESTIONS

This report focuses on eight key questions (and a number of related questions) concerning teacher recruitment and retention:

Question 1:

What are the characteristics of those individuals who enter teaching?

RELATED QUESTIONS:

How do the characteristics of those individuals who are currently teaching differ from the characteristics of those individuals who are not? What accounts for the demographics of the current population of teachers? What are the characteristics of the reserve pool of licensed teachers who currently are not teaching?

Question 2:

How do those individuals who remain in teaching compare with those who leave?

RELATED QUESTIONS:

What relationship do the following characteristics have to retention in teaching: age and teaching experience; gender, family and socioeconomic status; race and ethnicity; academic qualifications; intellectual proficiency; demonstrated teaching ability; subject taught; and beliefs, values and attitudes? How does the turnover rate in teaching compare to that in other professions?

Question 3:

What are the characteristics of schools and districts most likely to be successful in recruiting and retaining teachers?

RELATED QUESTIONS:

Do schools differ in their success at recruiting and retaining teachers based on the following characteristics: geography – urban, suburban or rural; grade level; school type – elementary schools, middle schools and high schools, public versus private? Do student-body composition and performance have an impact on the ability of schools to recruit and retain teachers?

Question 4:

What impact do the working conditions in schools have on their ability to recruit and retain teachers?

RELATED QUESTIONS:

How important are teacher autonomy and administrative support? How important is class size? How important are student characteristics and attitudes?

Question 5:

What impact does compensation have on the recruitment and retention of teachers?

RELATED QUESTIONS:

Does offering higher salaries increase the quality of teachers who are recruited and retained? How important is teacher compensation in teacher recruitment and retention as compared to other factors?

Question 6:

What impact do various strategies related to teacher preparation have on teacher recruitment and retention?

RELATED QUESTIONS:

Is there any significant difference between alternative route and traditional route programs in the characteristics and retention rates of the teachers they prepare? What impact does raising preparation program entrance or completion requirements have on the recruitment and retention of teachers?

Question 7:

What impact do induction and mentoring have on teacher retention?

RELATED QUESTION:

What are the characteristics of effective induction and mentoring programs?

Question 8:

What is the efficacy of particular recruitment strategies and policies in bringing new teachers into the profession, including specifically targeted populations?

RELATED QUESTIONS:

Are programs that seek to recruit middle school, high school or community college students into teaching effective in increasing the number of students who enter teaching or the subsequent success of these teachers and their rate of retention in the profession? How effective are programs that offer scholarships or forgivable loans to college students who commit to going into teaching? What kinds of recruitment policies and programs are particularly successful in recruiting minority teachers?

Where Did the Questions Come From?

ECS synthesized the questions from: (1) five focus groups conducted with policymakers in 2000-01, (2) an ECS review of legislation introduced in all 50 states during the 2000 and 2001 sessions, and (3) the experience and insight of ECS staff. While there are other questions policymakers and education leaders have concerning teacher preparation, ECS believes the eight questions addressed here are currently the most important.

How Are the Questions Answered?

The response to each question consists of four sections: Quick Answer, Significance of the Question, What the Research Says and What It Means for Policy.

The **Quick Answer** provides the briefest, most direct answer possible to the question posed. It goes without saying that such a brief answer cannot do justice to the complexity of the question and the nuances of the evidence. Moreover, the policy implications summarized in this section can be understood only in the context of the more detailed discussion.

The **Significance of the Question** outlines the debates or controversies that surround the question, provides a sense of what is at stake and gives examples of the kinds of policies that hinge on the answer.

What the Research Says is a detailed examination of the research on the question (and, in some cases, related questions) posed. This section is divided into two parts. The first part gives a general summary of the relevant research. Depending on the strength of the evidence provided as judged by the author of this report, research is said either to be **inconclusive**, provide **limited support or evidence**, **moderate support or evidence**, or **strong support or evidence**.

The second part provides brief summaries of every work reviewed that relates to the question under consideration. Frequently, the same work is summarized more than once under a question, and not always in identical detail, because specific findings may be relevant to different sub-questions. When a work is included more than once, the general summary information about the work appears only the first time.

The discussion in this section draws significantly on a review of the research by RAND that was specifically commissioned by ECS for this report, *A Review of the Research Literature on Teacher Recruitment and Retention*. The RAND review was written by Cassandra Guarino, Lucrecia Santibañez, Glenn Dailey and Dominic Brewer.

What It Means for Policy discusses the extent to which the research findings provide guidance for developing policies or programs. The discussion here is generally more substantive than the policy recommendations summarized in the Quick Answer. Conclusions in this section do not take into consideration the potential costs of implementing a given policy, and it is not ECS' intent to recommend that certain policies be implemented. Rather, the conclusions only indicate that specific policies, or kinds of policies, are consistent with the research evidence.

Question 1:

What are the characteristics of those individuals who enter teaching?

RELATED QUESTIONS:

How do the characteristics of individuals who are currently teaching differ from the characteristics of those who are not? What accounts for the demographics of the current population of teachers? What are the characteristics of the reserve pool of licensed teachers who currently are not teaching?

Quick Answer

The teacher workforce in the United States continues to be predominately white (86%) and female (79%). Although this trend has changed little over the last 30 years, there are more subtle nuances worth noting. The research provides **moderate evidence** that a larger percentage of the most intellectually able women decide to enter careers other than teaching now that more career opportunities are open to them. Nevertheless, there is also **moderate evidence** that one of the reasons for the interest in teaching among women is the opportunity it affords to take time out to raise a family, which means there is likely to continue to be relatively strong interest in teaching as a profession among women in spite of increased job opportunities elsewhere. With regard to the low percentage of minorities in the teaching profession, there is **limited evidence** that one of the reasons is the barrier teacher certification examinations pose to minority teacher candidates.

Much has been made in recent years of the issue of the relative intellectual ability of teachers in comparison with other college graduates. The research provides **strong evidence** that those college graduates with the very highest demonstrated intellectual proficiency are less likely to go into teaching than other college graduates. There is also **limited evidence** that poor hiring practices may be, in part, to blame for this.

The reserve pool of teachers also is the subject of much discussion. The research reviewed for this report indicates that between 25% and 37% of those who leave teaching eventually return at some point. This would seem to indicate that the attrition rate of new teachers from teaching is mitigated by the fact that a large percentage of dropouts are only temporarily lost to the profession.

Several important policy implications follow from the research. Policymakers should intensify their efforts to recruit capable minorities into teaching and to discover what accounts for their underrepresentation in the profession, although the likelihood of increasing minority representation significantly in the profession is small. Likewise, although it seems unlikely that teaching ever will attract a large percentage of the most academically talented individuals, policymakers should continue to seek to attract as able a teacher corps as possible. Finally, policymakers and educators should exploit the reserve pool of licensed teachers as fully as possible.

Significance of the Question

To focus efforts on the recruitment and retention of teachers, it is important to know several things. What is known about the characteristics of current teachers who have been successfully recruited into the profession and how do they compare with the characteristics of those individuals who might be prospective teachers but who may have left the classroom or have never taught? Also important is to learn, if possible, about the individuals who most likely enter teaching and remain in the profession for a reasonable period of time so efforts can be increased to recruit and retain the teacher population and to develop appropriate policies concerning the necessary size and content of teacher preparation programs. And if it can be further elucidated, what are those characteristics that make up successful teachers because it is those teachers, above all, that need to be attracted and retained in the teaching profession.

Ideally, the teaching profession would like to have a system that ensures the very best teachers it possibly could hire are employed. The system would reassure there are not systematic barriers preventing or discouraging the entry into teaching of certain groups of individuals who would likely make fine teachers. Not only are factors such as gender, race or ethnicity, and intellectual proficiency a concern, but also beliefs, values and attitudes. Of course, different strategies of teacher recruitment and retention result in attracting and retaining the kinds of individuals who would be highly desirable as teachers but are not currently well represented in the profession. Similarly, has every reasonable effort been made to recruit from all different populations of potentially effective teachers? And if various individuals have misperceptions or attitudes about teaching that are unwarranted and deter them from pursuing teaching careers, can corrections be made to those misperceptions to make teaching a more viable option for them?

States and school districts currently employ a myriad of strategies to recruit teachers into the profession. These are not always highly successful, however, and many experts insist more could be done. A number of people believe, for example, the system fails to bring into teaching as many of “the best and the brightest” as could be, and consequently, recruitment strategies need to be rethought to entice more of these talented people into the teaching profession. Others point to the large reserve pool of licensed teachers currently not in the classroom as the potential answer to the shortage of teachers, which plagues many schools and districts. Has much been done as possibly can be, not only to tap into this reserve pool but also to ensure these teachers remain in teaching? And are there important differences between those teachers in the reserve pool and those in the classroom, differences that would have implications for the ability and strategies to recruit them back into active teaching?

Of course, the very fact these people either left teaching or never entered the classroom may mean, in comparison with other options available to them that they have insufficient interest in the teaching profession and that stepped up efforts to recruit them would largely be a waste of time and money. On the other hand, if it could be determined what might motivate talented non-teachers to enter the profession, effective recruitment strategies may be developed. Moreover, some of the people not currently teaching may have desired to teach and been prepared as teachers but were not hired in the candidate selection process. Is it possible to know that school hiring processes selected the most appropriate people and did not routinely eliminate or discourage capable candidates?

Finally, what about the apparently small percentage of men and minorities in K-12 teaching? While African Americans and Hispanics each made up approximately 17% of K-12 students in American public schools in 2001-02, only 9% of K-12 teachers in the United States were African American and just over 5% were Hispanic. Only 21% of K-12 public school teachers in 2001 were men.

The research on the impact of hiring minority teachers shows a complex pattern of effects and is too sparse, on the whole to support confident conclusions. (See, for example, Wilson and Floden, 2002, *Creating Effective Teachers*.) Nevertheless, a recent report, published by several organizations under the umbrella of the National Collaborative on Diversity in the Teaching Force (2004), documents the potentially positive impact of minority teachers on the performance of minority students.

What the Research Says

DISCUSSION

One of the caveats of summarizing trends in the research about the characteristics of those individuals who enter, leave and remain in teaching is the population of teachers is continually changing. While the nature of those changes may seem relatively consistent from year to year, over a long period of time important differences in the nature of the teacher population may become apparent as important social and economic conditions leave their impact. Certainly, one very important consideration is the increased career opportunities for women and minorities that have arisen over the past 30-40 years since the passage of civil rights legislation and the rise of the equal rights/women's liberation movement. Thus, studies based upon data that are more than even a decade old may identify demographic trends among the population of teachers that are not really descriptive of the teacher workforce in 2005. Unfortunately, most of the published research does use older data, and so the picture the research paints for this report may be less current in some respects than would be ideally desired.

As noted in discussing the Significance of the Question, the makeup of the teacher workforce in the United States continues to be predominately white and female. As the research shows, this is an historical trend that, on the surface, has not changed significantly in over 30 years. Underneath the surface, however, does the research indicate important changes that are not readily apparent? Does the research offer any suggestions as to what might change this trend and increase the representation of males and minorities in the teaching profession? Beyond gender, race and ethnicity, does the research reveal anything about other important characteristics of the current population of teachers in the United States that may influence their effectiveness in the classroom and be important in developing effective recruitment and retention policies? Does the research indicate the existence of a pool of potential teacher candidates not currently well represented in the profession who could be very successful if they were recruited?

The research here largely provides demographic information and trends. Assuming the statistics given are accurate it seems inappropriate to discuss the strength of the evidence that the teacher

workforce is composed of a certain percentage of males, females, whites and minorities. These statistics can be accepted as fact. Where an evidentiary assessment does come into play, however, is in trying to find an explanation for these statistical realities and trends.

The research reviewed for this question is divided into five categories:

1. Teachers' gender
2. Teachers' race or ethnicity
3. Teachers' intellectual ability
4. Teachers' beliefs, values and attitudes (including socioeconomic status)
5. Reserve pool of credentialed teachers.

➢ *With regard to gender*

The studies reviewed for this report confirm the continuing overwhelming predominance of women in the K-12 teacher workforce. Beneath this surface fact, however, one study (Flyer and Rosen, 1997) noted that the proportion of female college graduates who enter teaching has declined dramatically since the 1960s. The study attributed that decline largely to the greater variety of job opportunities now open to women. That does not seem to have had an impact on the proportion of women in the teaching workforce, however, but only on which women enter teaching. The research regarding the present issue of gender, together with the research concerning the comparative intellectual ability of teachers that is discussed below, provides **moderate evidence** that a larger percentage of the most intellectually able women decide to enter careers other than teaching now that more career opportunities are open to them.

None of the research reviewed here indicated whether the proportion of male college graduates who enter teaching has risen. Nor, did it indicate whether the increase in job opportunities for women has reduced or is likely to reduce significantly the percentage of women in the teaching profession in the future. One suggestion made by several studies, however, for which there seems to be **moderate support** in view of the fact that other studies reviewed for different questions in this report also confirm it, is women find the teaching profession more compatible than many others with their desire to take time out from their careers to raise a family. Thus, it can likely be expected that teaching will continue to be an occupation that women in particular find attractive.

➢ *With regard to race or ethnicity*

The studies reviewed for this report addressed a variety of considerations related to minority participation in teaching. Researchers such as Kirby, Berends and Naftel (1999) pointed out that while the enrollment of minority students in public schools is expected to increase dramatically in the next 10 to 20 years, the recruitment of minority individuals into the teaching profession did not keep pace with the increase in the percentage of K-12 minority students in the 1980s and early 1990s. Moreover, several of the studies reviewed here found that new teachers continue to be predominantly white.

A number of studies reviewed attempted to illuminate the reasons why there is not greater minority representation in the teacher workforce. Several studies (Dometrius and Sigelman, 1988; Gitomer, Latham and Ziomek, 1999; and Murnane et al., 1991) provide **limited evidence** that teacher certification examinations may be a barrier for the entry of minority candidates into the teaching profession, specifically African Americans. Several other studies, however, suggested there may be other reasons for the low proportion of African Americans and other minorities in teaching. Murnane et al. (1991) noted a sharp decline in minority representation in teaching between the 1960s and the 1980s, a phenomenon they attributed both to more stringent licensure requirements and increased career alternatives for minorities. On the other hand, Broughman and Rollefson (2000) found the proportion of new minority teachers in the public schools doubled between 1987 and 1994. Interestingly, one study (Rong and Preissle, 1997) found that while African Americans in 1990 comprised 9.8% of the U.S. labor force, they constituted 8.8% of male elementary school teachers and 10.7% female elementary teachers. This suggests that teaching, at least as of 1990, remained a relatively popular career choice among African Americans.

The literature clearly indicated that national trends do not necessarily reflect local trends, however. Kirby, Berends and Naftel (1999) focused on the state of Texas, where they found the percentage of Hispanic teachers rose from 11% in 1981 to 15% of all K-12 teachers in Texas in 1996, while the percentage of African American teachers declined from 11% to 8% during that same period.

Most of the studies discussed below suggested that hiring minority teachers is a desirable goal, given the increase in minority enrollments, and they commonly cite the need for teachers to serve as role models, understand minority students and use a culturally meaningful pedagogy. (See, for example, King, 1993.) The wider research literature offered mixed findings, however, regarding the empirical relationship between teacher diversity and minority student outcomes.

➢ *With regard to demonstrated intellectual proficiency*

Intellectual proficiency is certainly not the only important factor that contributes to the effectiveness of teachers. ECS' previous report, *Eight Questions on Teacher Preparation: What Does the Research Say?* (2003), indicated that strong subject-matter preparation is important and that pedagogical skills and knowledge also seem to be helpful. A number of research studies (e.g., Ehrenberg and Brewer, 1994) suggested, however, that teachers' demonstrated intellectual and verbal proficiency does contribute to their effectiveness. And, indeed, common sense would suggest that, other things being equal, it would be preferable to have teachers with stronger intellectual skills.

With regard to teacher recruitment, then, what is known about the general intellectual proficiency of those who enter teaching? Since it is difficult to define and measure verbal and intellectual proficiency precisely, the studies reviewed here used a variety of measures: college entrance examination scores, gradepoint average, class rank, selectivity of the college attended, IQ tests and teacher licensure examination scores. Although none of these measures could be said to be a completely reliable indication of actual intellectual proficiency, taken

together they provide **strong support** for the conclusion that, on the whole, those college graduates with the highest demonstrated intellectual proficiency are less likely to go into teaching than other college graduates. Two studies (Pigge, 1985; and Schlechty and Vance, 1981) found the intellectual proficiency of teachers – particularly females – declined between the early 1970s and 1980s, a phenomenon Schlechty and Vance attribute to greater job opportunities for women outside of teaching.

What is true in the aggregate, however, may not be true for individual populations. One study (Murnane and Schwinden, 1989) found the opposite was the case for African Americans, a finding they attributed to limited other occupational choices at that time. Gitomer, Latham and Ziomack (1999) found that while the mean SAT score of graduates in elementary education was lower than the mean for all college graduates, the mean SAT score of secondary education graduates was higher than average.

Several studies reviewed also provided **limited evidence** that this inverse relationship between measured intellectual or verbal proficiency and entry into teaching may be partially attributable to school hiring practices. The studies found that school principals do not regard high intellectual proficiency to be as important as other characteristics they look for in a prospective teacher. One study (Wise et al., 1987) even found an anti-intellectual bias among school administrators in one district, who shared their belief that academically more accomplished teacher candidates were likely to be less patient with average students.

➢ ***With regard to beliefs, values and attitudes***

The relatively few studies reviewed here often were marginal in quality and were insufficient, in any case, to provide much insight into the beliefs, motivations and socioeconomic characteristics of the individuals who enter teaching. They did provide **limited support**, however, for the common supposition that people who enter teaching tend to be motivated less by factors such as prestige and salary and more by factors such as the desire to contribute meaningfully to society or specifically to work with children and youth. A particularly interesting finding from one of the strongest studies (Hanushek and Pace, 1995) was most of the people who ended up in teacher education programs did not have aspirations to teach while they were in high school and only a fifth of those who did aspire to teach in high school ever completed a teacher education program. This finding should give some pause to those who place their faith in early recruitment programs and suggests, on the other hand, that efforts to recruit teachers at the college or post-college level may be important.

➢ ***With regard to the reserve pool***

The seven studies reviewed in relationship to this question provided a variety of different observations concerning the pool of those who were certified to teach, but for one reason or another were not currently active in the classroom. While there was insufficient research to provide adequate confirmation for most of these observations, there was **limited support** for a few of them. It is important to note, however, that while the research provides a basis for understanding patterns that held true for the times and places studied, it is difficult to draw

confident conclusions about the work patterns of future teacher graduates based upon those of past cohorts. Changing patterns of work and childrearing and differences in economic conditions and labor markets (national, regional and local) all contribute to the uncertainty of any such predictions.

The studies reviewed here confirmed a significant percentage of certified teachers who left teaching or did not enter teaching immediately upon obtaining their teaching certificate did eventually go back into the classroom. The several studies reviewed here calculated the percentage of returnees to be between 25% and 37%. The studies also indicated elementary school teachers were more likely to return to the classroom than secondary school teachers, and science and mathematics teachers were the least likely to return. The research found the longer a teacher's original stay in teaching, the more likely he or she was to return. On the other hand, the longer a break a teacher took from active teaching, the less likely he or she was to return. And teachers who were more experienced or older (up to the age of 40) were found to be more likely to return than younger teachers.

The evidence as to why teachers left or never went into teaching in the first place is too limited to provide any confident conclusions and thus must be said to be **inconclusive**. One study, which did seek to explain the reasons teachers left (Kirby, Grissmer and Hudson, 1991), noted that pregnancy or childrearing were by far the main reasons cited.

The findings of one other study bear noting, even though it is the only study to cite them. Grissmer and Kirby (1997) projected that the reserve pool would decline significantly by the year 2010 because the workforce is growing older and because former teachers over the age of 40 are less likely to return to teaching. Also important to consider here, however, is how the reserve pool is to be defined. While it is typically defined as those already certified teachers who are open to resuming teaching careers, the fact that a significant number of individuals have come to switch careers in recent years to enter teaching implies the reserve pool in fact may be much larger.

SUMMARY OF STUDIES

➢ *With regard to gender*

Six studies, which met the criteria of acceptability for this report, discussed this issue:

1. Berry (1986) was a *simple descriptive study* that interviewed 80 non-education seniors at six different universities to discover why they were not planning to go into elementary school or secondary school teaching. Among the study's many findings was women were more likely than men to consider teaching as an option because they perceived a career in teaching to be more conducive to raising a family than a career in business or industry. The study does not follow up on the actual career decisions eventually made by the individuals it interviewed.

2. **Broughman and Rollefson (2000)** was a *simple descriptive study* that analyzed three years of the Schools and Staffing Survey (SASS). It looked at data on approximately 184,000 newly hired teachers in 1987-88, 223,000 new teacher hires in 1990-91 and 259,000 new teacher hires in 1993-94. The study found, for 1993-94, that 72.5% of new teachers hired in public schools were female while 76.7% of newly hired private school teachers were female. The gender breakdown of newly hired teachers was not given for the other two survey years.

3. **Flyer and Rosen (1997)** involved a *simple descriptive study* and *regression analysis* of data from the National Center for Education Statistics (1960-90), the Schools and Staffing Survey (1950-1990), the Current Population Survey (1976-1991), the National Longitudinal Survey of Youth (1979-91) and various National Education Association status reports. No exact *sample size* is given, but it is in the thousands and involves analysis of data from all 50 states. The study found that nearly 50% of the women graduating from college in 1960 went into teaching, whereas fewer than 10% went into teaching in 1990. In general, the study found this trend was due to the increase in female labor force participation rates and the opening of a wider variety of job opportunities to women. Nonetheless, the study found that women have continued to dominate the teaching profession. Almost 85% of elementary school teachers in 1990 were female, for example, a proportion that changed little over several decades. The study found that this was true in spite of wider job opportunities for women and a substantial decline in the wages of elementary school teachers relative to other occupations. One possible factor in the continued popularity of teaching among women, according to the study, was teachers who spent time out of the labor force (perhaps to raise children) were not penalized in future earnings growth, which was not found to be the case for other occupations.

4. **Hanushek and Pace (1995)** employed a *simple descriptive study* and a *regression analysis* of data on 1,325 high school seniors of the class of 1980 who were followed through 1986 in the High School and Beyond survey. The study found that of those who completed a bachelor's degree, white males were 10% less likely than white females to complete a degree in education.

5. **Henke et al. (2000)** was a *simple descriptive study* of 9,274 individuals who graduated college between 1992 and 1993 and were participants in the 1993 Baccalaureate and Beyond Longitudinal Study and in follow-up interviews in 1994 and 1997. The study found that women were more likely than men to enter the teacher pipeline, defined as either actually having taught in a school, having become certified to teach, having applied for a teaching position or considering becoming a teacher. Within four years of graduation from college, 43% of female graduates had entered the teacher pipeline in comparison with 29% of male graduates. Of those, 17.1% of women and 7.5% of men actually had taught.

6. **Murnane et al. (1991)** involved a *regression analysis* of data from several sources to analyze teacher licensure trends in the 1960s, 1970s and 1980s. The samples included 30,614 Michigan teachers followed from 1974-86, 50,502 North Carolina teachers followed from 1972-85 and 2,639 college graduates from across the United States who participated in the National Longitudinal Survey (NLS) between 1967 and 1985. The study found that female college graduates were more likely to become teachers than male college graduates in the late 1960s, the 1970s and the early 1980s. Based on the NLS data, the study found that women were 3.5 times more likely than men to have taught within five years of graduation. The researchers attributed this difference to the fact that alternative career opportunities were less financially attractive for women than for men during this period of time and to the family-friendly work schedule of teaching that may be particularly attractive to women who both want to pursue a career and care for their children. [Note: Much of this study is essentially a reprise of Murnane and Olsen, 1989a; and Murnane and Olsen, 1990.]

➢ ***With regard to race or ethnicity***

Ten studies reviewed for this report addressed various factors related to minority participation in teaching:

1. **Broughman and Rollefson (2000)** found that 84% of newly hired teachers in 1993-94 were nonminority (i.e., white non-Hispanics). The study also found, however, that between 1987-88 and 1993-94 the proportion of new minority teachers doubled in public schools and quadrupled in private schools.
2. **Dometrius and Sigelman (1988)** was a *simple descriptive study* that employed a mathematic model to analyze data on 169,608 public school teachers in Texas in 1982 that was obtained from Equal Employment Opportunity Commission surveys of public school teachers in 1978, 1979, 1980 and 1982. The study found that, of these teachers, 11.7% (19,876) were African American and 12.2% (20,610) were Hispanic. The study also found the percentage of African Americans and Hispanics who failed either the Texas Examination of Current Administrators and Teachers (for certification) or the Pre-Professional Skills Test (for admission to a teacher education program) was significantly higher than for prospective white teachers. Using the model to predict the proportion of African American and Hispanic teachers by 1996, the study found that, other things being equal, the higher failure rate on the tests would lead to a decline of roughly 13-42% in the proportion of African American teachers in the Texas workforce and 15-31% in the proportion of Hispanic teachers.
3. **Gitomer, Latham and Ziomek (1999)** was a *comparative descriptive study* using over 360,000 records on individuals who took the SAT or ACT college entrance examinations from 1977-95 and also took the Praxis

I or Praxis II tests. The study found that, of the 88,567 people who took the Praxis I, white candidates passed at the highest rate (87%), while 77% of Hispanic and 55% of African American candidates passed. Of the 272,064 teacher candidates taking the Praxis II test for licensure during the same period, white candidates again passed at the highest rate (92%), while 68% of Hispanic and 65% of African American candidates passed. The researchers noted that the teacher candidate pool was overwhelmingly white even before testing (85%), so the likely effect of testing was to increase the proportion of white teachers even further. Significance tests for differences in proportions were not performed in this study, however.

4. **Gordon (1994)** was a *simple descriptive study* of 140 minority teachers interviewed in California in the early 1990s. At least one-fourth of the respondents in the study identified the following factors as contributing to the low percentage of minorities in the teaching profession: (1) poor minority high school graduation rates; (2) negative experiences in school; (3) lack of student discipline and respect in the classroom; (4) absence of preparation to deal with inner-city classrooms; (5) low status and pay associated with teaching; (6) image of a teacher as a "nice," white, middle-class female that is inconsistent with the self-image of minorities; (7) ready availability of more lucrative and more prestigious jobs.

5. **Hanushek and Pace (1995)** found that, of those individuals who completed a bachelor's degree, Asians were 18% less likely and African Americans were 9.2% less likely than white females to obtain a degree in education.

6. **Henke et al. (2000)** found the following ethnic and racial pattern among 1992-93 bachelor's degree recipients: 36% of white recipients entered the teaching pipeline within four years of graduation, 45% of African American degree recipients, 42% of Hispanic degree recipients, and 18% of Asian/Pacific Islander degree recipients. Only 13% of white, 11% of African American, 16% of Hispanic, and 4% of Asian/Pacific Islander degree recipients actually had taught during this period, however.

7. **King (1993)** was a *simple descriptive study* that surveyed a small group of 41 prospective and beginning African American, Caribbean American and African teachers from one institution of higher education during the 1989-90 school year. When asked why their minority peers did not choose to teach, the study participants cited lack of prestige and respect, low salaries, difficult working conditions and the availability now of other career options for minorities as the main deterrents. Due to the small *sample size* and the fact that all subjects were drawn from one institution, however, it is difficult to generalize these findings to the population of either all education students or all African American education students.

8. **Kirby, Berends and Naftel (1999)** involved both a *simple descriptive study* and a *regression analysis* of data on 98,951 teachers in Texas who were followed from 1980-96. The study found a significant rise in the

percentage of Hispanic teachers (from 11% in 1981 to 15% in 1996) and a corresponding decrease in the percentage of African American teachers (from 11% in 1981 to 8% in 1996). The proportion of minorities among new teachers was slightly higher (26% in 1996, compared to 23% among all teachers). The study indicates, however, that the trend toward an increasing percentage of minority teachers in Texas is likely to be limited by the relatively low college enrollment rate of minorities and the difficulty minorities – especially African Americans – have in passing the state teacher candidacy and licensure examinations. The study also notes that the percentage of minorities among K-12 students in Texas was just over 50% in 1996 and is projected to be over 66% by 2025 – far higher than the proportion of minority teachers.

9. **Murnane et al. (1991)** examined minority representation in teaching based on its sample from the National Longitudinal Survey and its sample of teachers from North Carolina. The study found that minority representation in the national teaching force declined dramatically from the 1960s to the 1980s. Approximately 60% of 1967 African Americans who graduated college in 1967 entered teaching within five years of graduation, compared to approximately 38% of white 1967 graduates. By 1984, those figures had declined dramatically for both groups: only 11% of African Americans who graduated college in 1984 entered teaching and only 12% of white graduates. Mirroring the national trend, the study found the representation of black college graduates among teaching licensees in North Carolina declined from approximately 20% in 1977 to 10% in 1982. The study attributes the decline in the proportion of African American teachers to three factors: (1) the introduction of more stringent testing requirements for teachers, especially standardized testing; (2) expanded alternative labor market opportunities for minorities during the decades in question; and (3) inferior high school preparation for African American students that results in lower college attendance and completion rates.

10. **Rong and Preissle (1997)** was a *simple descriptive study* of U.S. census data from 1970, 1980 and 1990. The exact *sample size* is not given, but the article reports that the microdata samples used represent 5% of the U.S. population. The study found that Asian Americans were underrepresented in teaching despite high college graduation rates. The study found, moreover, that, unlike African Americans and Hispanic Americans who are underrepresented in professional occupations altogether, Asian Americans are generally over-represented (based on their share of the workforce) in professions other than teaching. In 1990, 37% of Asian Americans 25 years of age and older were college graduates, compared to 29% of European Americans, 15% of African Americans and 14% of Hispanic Americans. Asian Americans comprised 2.8% of the U.S. labor force overall, compared to 79.5% for European Americans, 9.8% for African Americans and 7.5% for Hispanic Americans. In the K-12 teaching force in 1990, however, the study found that only 1.2% of K-12 teachers were Asian American, compared with 84.4% who were European

American, 9.6% who were African American and 4.7% who were Hispanic American. The study also noted that the percentage of female Asian Americans in teaching declined from 7% of Asian American college graduates in 1980 to 5% in 1990. This parallels an even steeper decline for African American female college graduates. In 1960, 60% of female African American college graduates went into teaching, compared with 24% in 1990.

➢ ***With regard to demonstrated intellectual proficiency***

Eighteen studies reviewed for this report addressed this issue. Thirteen studies looked at how factors such as the selectivity of undergraduate institutions or scores on college entrance or teacher certification examinations correlated with individuals' decisions to enter teaching. Eleven of those studies found that college graduates with the strongest intellectual proficiency tended not to go into teaching or to remain in teaching, and one study (Gitomer, Latham and Ziomeck, 1999) had mixed findings:

1. **Ballou (1996)** was a *simple correlational study* that also employed *regression analysis* of data on more than 50,000 new bachelor's degree recipients from the Survey of Recent College Graduates administered six times from 1976 through 1991, as well as data on an unspecified number of teachers from the 1987-88 Schools and Staffing Survey. The study found, first of all, that students from colleges defined as "selective" were less than half as likely to pursue teacher certification as students from colleges defined as "average" in selectivity. Second, the study found that while 85% of graduates from less selective schools who were certified to teach applied for teaching positions, only 75% of certified graduates of more selective schools applied. Third, the study found the percentage of certified graduates who were actually employed after applying to teach also was smaller for graduates of selective colleges; in other words, even if interested in teaching, they fared more poorly in the job market than graduates from less selective colleges. Fourth, the study found that graduates of more selective colleges are slightly more likely than graduates of less selective colleges to work in schools with smaller percentages of poor students and higher percentages of college-bound students. Based on other data, however, Ballou concluded this does not mean graduates of selective colleges were less willing to accept difficult teaching assignments than graduates of less selective colleges. The study found, finally, that the only measure of academic ability that was positively correlated (and then only slightly) with an applicant's success in obtaining a teaching job was gradepoint average. In other fields, however, the study found the selectivity of a graduate's college was strongly correlated with employment success.

2. **Berry (1986)** distinguished between high and low achievers (based on SAT scores and GPA) and found the brightest students did not view K-12 teaching as an attractive or appropriate career for a variety of reasons. The reasons they gave ranged from undesirable working conditions, to barriers in state certification requirements, to not having the right personality, to having negative perceptions of their peers who were interested in teaching, to being discouraged from teaching by their own teachers, to simply having other career aspirations.

3. **Gitomer, Latham and Ziomek (1999)** found the group of individuals who passed the Praxis I test for admission to schools of education had math scores comparable to the average scores of all college-bound seniors (514 versus 511) and verbal scores higher than the average scores of all college-bound seniors (525 versus 505). Teacher candidates who passed the Praxis II teacher licensure test had SAT scores that were lower than the average for college graduates (507 versus 542 in math and 522 versus 543 for the verbal section). After disaggregating their data, the researchers found that elementary education candidates passing the Praxis II had lower SAT scores than college graduates (507 versus 542 in math and 522 versus 543 for the verbal section). In contrast, those who passed Praxis II for an academic content area had higher SAT verbal scores than college graduates in general, and those pursuing licensure in mathematics or science had higher SAT math.

4. **Hanushek and Pace (1995)** found that, holding race and gender constant, higher-ability students, as measured by performance on cognitive tests, were less likely than lower-ability students to pursue a bachelor's degree in education. The mean probability of obtaining a bachelor's degree in education for all students was 12%, and that probability dropped to 6.5% for students scoring one *standard deviation* above the mean test score. The study also found that, among individuals obtaining a bachelor's degree in any field, those with higher ability were less likely to be employed in teaching. The study only followed high school seniors for six years, however, thus the results could not take into account those students who took a longer time to complete an undergraduate degree or choose an occupation.

5. **Henke et al. (2000)** found that graduates whose college entrance examination scores fell in the top quartile were less likely than those in the bottom quartile (32% versus 41%) to enter the teacher pipeline. Six percent of graduates in the top quartile had prepared to teach and taught versus 12% in the bottom quartile.

6. **Manski (1987)** employed a *simple descriptive study* and a *regression analysis* of data on 2,952 high school seniors from the National Longitudinal Study of the High School Class of 1972 who were followed through 1979. The study found that, in general, the probability of becoming a teacher was inversely related to academic ability as measured by SAT scores and class rank. For example, in the case of males in the

400-800 SAT range, 16% became teachers and 22% entered other professions. In the 1201-1600 SAT range, 55% of males were non-teaching professionals and only 5% were teachers. In the case of females, in the 400-800 SAT range, 34% became teachers and 14% entered other professions. In the 1201-1600 range, 9% of females became teachers while 46% were non-teaching professionals.

7. **Murnane and Olsen (1990)** was a *regression analysis* of data on 13,890 white North Carolina teachers who began teaching between 1975 and 1984 and whose careers were followed through the 1985-86 school year. The study found the higher a teacher's score on the National Teacher Examination (NTE), which was used as a *proxy* for academic ability, the shorter time the teacher was likely to stay in teaching. The study cautions, however, there is no established correlation between a high score on the NTE and teaching effectiveness.

8. **Murnane and Schwinden (1989)** was a *regression analysis* of data on 47,403 individuals (both white and African American) who became new teachers in North Carolina between 1975 and 1985. The study found that, for whites, the probability of actual entry into teaching was lower for those with higher National Teacher Examination (NTE) scores only in the fields of English, mathematics or physics/chemistry. In other fields, NTE scores had no predictive effect. For African Americans, however, the probability of actual entry into teaching was *higher* in every field for those with higher NTE scores – a phenomenon the researchers explain as the result of (1) African Americans with lower NTE scores not being offered teaching positions and (2) African Americans with higher NTE scores not having as many other job options as whites.

9. **Murnane et al. (1991)** found that, nationally, high IQ college graduates were less likely than those with average IQs to enter teaching during the late 1960s and the 1970s.

10. **Pigge (1985)** was a *simple correlational study* of 9,704 teacher education graduates of a medium-sized Ohio university from 1972-75 and 1980-83. The study found that those graduates who had higher ACT scores, higher college GPAs and higher high school class ranks were less likely to go into teaching. The study also found the teacher education graduates in the 1980s group – especially those who expressed a desire to enter teaching – were less academically talented (as measured by ACT scores) than the graduates of the 1970s group.

11. **Pigge and Marso (1992)** was a *simple correlational study* of 550 teacher candidates who entered the teacher preparation program at Bowling Green State University in 1985 and whose records were checked in 1991 to see if they had completed the program. The study found that those who completed the teacher preparation program tended to have slightly higher scores on the Comprehensive Test of Basic Skills and slightly higher GPAs in college than those who did not complete their teacher preparation

program. The study did not find any correlation between completion of the teacher preparation program and teacher candidates' self-ratings of future effectiveness as teachers or the presence of teachers in their immediate family.

12. **Schlechty and Vance (1981)** was a *simple correlational study* using administrative data on 32,131 entering teachers in North Carolina from 1973 to 1980. The study found the percentage of white female teachers hired with National Teacher Examination (NTE) scores above the median declined by 37% during that period. In comparison, the percentage of white female teachers hired with NTE scores below the median declined by only 4.6%. There was no similar decline among high-scoring males or black females. Schlechty and Vance attribute the decline in high-scoring white females to greater job opportunities outside teaching. They also found that teachers with higher NTE scores left teaching at a faster rate than those with lower NTE scores.

13. **Stinebrickner (2002)** involved a *simple descriptive study* of 422 female teachers and 1,028 non-teachers and a *regression analysis* using a subset of 313 female teachers and 772 female non-teachers, all of whom took part in the National Longitudinal Study of the High School Class of 1972. The teachers were followed until 1986. The study found the average combined verbal and math SAT scores for the non-teachers was 95 points higher than that of the teachers in the sample.

Five studies addressed the issue of the perceived value by school administrators of a prospective teacher's intellectual proficiency in comparison with other attributes:

14. **Abernathy et al. (2001)** was a *comparative descriptive study* based on surveys of 57 undergraduate teacher education students, 10 education faculty and 75 school principals in the Rocky Mountain region during the late 1990s. Respondents were asked to assess the importance of various qualifications and attributes in a teacher's ability to obtain a job. All three groups emphasized demonstrated prior teaching success, ability to work with diverse learners, demonstrated class-management skills, personal character and reputation among other teachers in the district. Factors that could indicate intellectual ability, such as honors and awards or gradepoint average, were generally regarded as of lesser importance, though students rated gradepoint average higher than did the other two groups and also considered writing ability to be important.

15. **Ballou (1996)** found that graduates of more selective institutions were less likely to be hired as public school teachers after applying. After ruling out, through statistical analysis, a number of factors that might explain this, such as the possibility that graduates of more selective institutions were less likely than other graduates to accept positions at certain kinds of

schools, Ballou suggested one possible explanation might be that public schools did not consider ability, as signaled by college selectivity, to be of high value or that they feared [with some vindication from the research] that candidates from more selective colleges were less likely to stay in their teaching jobs for the long term.

16. **Berry, Noblit and Hare (1985)** was a *simple descriptive study* based on interviews with 180 individuals in the Southeast, including district central office administrators and school principals. The study found that school officials valued the ability to relate to children and parents or involvement in extracurricular activities more than superior intelligence or academic ability.

17. **Farkas et al. (2000)** was a *simple descriptive study* based on a nationwide survey of 664 public school and 250 private school teachers with five or fewer years of experience, 802 college graduates under 30 who were not currently in teaching careers and 511 school superintendents and principals. When principals were asked about the absolutely essential characteristics of effective teachers, 60% identified in-depth knowledge of their subjects. By comparison, 88% identified ability to maintain classroom discipline, 86% a love of children, 84% effective teaching techniques, 87% high expectations for all students, 81% a talent for motivating children, 75% an ability to work well with students whose backgrounds were different from the teacher's, and 71% establishing strong relationships with parents. When asked which of these various characteristics new teachers had in hand, principals were much more confident about subject-matter knowledge than about any other characteristic, except for a love of children. This study does not specifically address the issue of intellectual ability, unless subject knowledge is taken as a *proxy* for intellectual ability. Also, principals may not so much be indicating that in-depth subject knowledge is less important to them as they are indicating that it is more common for the teachers they hire to know their subject than to have the other skills they mention. One additional limitation of the study is many of the questions were designed to elicit positive responses.

18. **Wise et al. (1987)** was a *comparative descriptive study* of teacher hiring practices in six school districts across the United States. The study found that school principals and district personnel tended to value candidates' personal qualities and interpersonal skills more highly than their academic ability. In one district, administrators shared their belief that the smarter a candidate, the less patient he or she was likely to be with average students. Some principals in the district were reluctant to hire bright candidates who were recent college graduates out of a fear they would leave teaching quickly.

➢ ***With regard to beliefs, values and attitudes (including socioeconomic background)***

Eight studies, which met the criteria for inclusion in this review, discussed the beliefs, values and attitudes of teachers and prospective teachers:

1. **Andrew (1983)** was a *simple descriptive study* based on a random selection of 248 self-analysis papers written by sophomore teacher education students at the University of New Hampshire between 1975 and 1981. The study offered retrospective information on motives for pursuing teacher education. The desire to perform a social service was the most commonly cited motive, with enjoyment of children (cited much more commonly by women) and love of subject identified respectively as the second and third most significant reasons.

2. **Berry (1986)** found that students from rural and lower socioeconomic backgrounds seemed more likely to consider teaching as a career than upper-middle class urban students. Parental expectations, perceived career options and a desire among rural students to remain near their families were apparent influences in these instances. The study concluded, however, that socioeconomic background is not as significant a factor as a number of others.

3. **DeLong (1987)** was a *simple descriptive study* based upon interviews of 139 elementary and secondary teachers in a single intermountain state. The study found the desire to work with children and to help others learn and develop were the reasons most frequently cited by teachers for having entered the teaching profession.

4. Farkas et al. (2000) found that 86% of the teachers and 82% of the college graduates who were not in teaching believed that only those with a “true sense of calling” should teach. A large majority of the college graduates surveyed who were not in teaching shared the belief that teaching provided a more important benefit to society than their current job (80%) and that being a teacher required more commitment and dedication than their current job (64%). The study found significant differences in the attitudes between teachers and others (and sometimes between public school and private school teachers) regarding the importance of certain job characteristics. Eighty-three percent of teachers (public and private) said it was absolutely essential a job involve work one loves to do, versus 60% of the college graduates. Eighty-one percent of the teachers said it was essential a job allow time for family, versus 73% of the college graduates. Seventy-two percent of the teachers said it was essential a job contribute to society and help others, versus 39% of the college graduates. Sixty-four percent of public school and 57% of private school teachers said it was essential a job provide good support and supervision, versus 41% of college graduates. Sixty percent of public school and 45% of private school teachers said job security was essential, versus 54% of college

graduates. Thirty-three percent of public school and 26% of private school teachers said it was essential a job provide opportunities for advancement, versus 55% of college graduates. Finally, 30% of public school and 17% of private school teachers said it was essential a job pay well, versus 38% of college graduates. The study also surveyed teachers' attitudes toward various measures that might improve teaching and reduce the teacher shortage. Both public and private school teachers cited smaller class sizes as the most effective measure for improving teaching. With regard to measures for addressing the teacher shortage, both public and private school teachers identified higher salaries for teachers who worked in difficult schools as the most effective measure and paying higher salaries to teachers who improved student performance as the second most effective measure. When teachers were asked whether they would prefer higher salaries to (a) better student behavior, (b) stronger administrative support, (c) highly motivated colleagues and (d) comfort with a school's academic mission and teaching philosophy, higher salary was less important by far in every case.

5. **Hanushek and Pace (1995)**, using data from High School and Beyond, which followed one cohort of 1980 high school seniors through 1986, found that most of those individuals who ended up in teacher education programs had not expressed an aspiration to teach while in high school. In fact, only a small proportion (22%) of those aspiring to teach in high school ever completed a teacher education program. Moreover, of those individuals who completed a bachelor's degree in education, only 41% had expressed some interest in teaching before starting college.

6. Hounshell and Griffin (1989) was a *simple descriptive study* that involved interviews of 37 individuals who graduated from the supervised science student teaching program at the University of North Carolina – Chapel Hill between 1977-83 but who either had never taught or were no longer teaching. The study found that initially, graduates had been attracted to teaching because of its humanitarian qualities and involvement with young people. Due to small *sample size*, this study has limited generalizability, however.

7. **King (1993)** found the opportunity to work with young people, the perception that their abilities were well suited for teaching, the belief that teaching contributed to the betterment of society and the opportunity to be creative were the most important factors in the decision of these individuals to become teachers. More specifically, the participants in the study cited the lack of role models for minority youth, the need for minority teachers and the poor conditions of the minority community as influential in their decision to enter teaching. Professional prestige and salary were rated among the least important factors, though these were much more important to the men in the group than the women. For women, one other factor they cited as important was the ability to balance teaching with parental responsibilities.

8. **Shipp (1999)** was a *simple descriptive study* based on a 1992 survey of 263 African American college students at two universities in the Midwest and Southeast. The survey asked about career choice factors, and it included both education and non-education students. The study found the education students placed the most emphasis on making a contribution to society, followed by intellectual stimulation, advancement opportunities and the opportunity to encourage others. The non-education students gave the most importance to career advancement opportunities, job security, salary and intellectual stimulation (in that order).

➢ ***With regard to the reserve pool***

Seven studies, which met the criteria for inclusion in this report, discussed either the likelihood that teachers who quit teaching would return or the factors affecting that decision:

1. **Beaudin (1993)** was a *regression analysis* of data on 3,060 elementary and secondary school teachers who began their careers in Michigan public schools between 1972 and 1975. All of these teachers left teaching within four years of entry, but 898 returned. The study sought to explore the characteristics of those who resumed teaching versus the characteristics of those who did not. The study found that re-entrants were a significant source of new hires and that elementary, more experienced or older teachers were more likely to return than other types of teachers. Teachers who began their careers with a bachelor's degree were more likely to leave initially and return later than those with advanced degrees. Physics, chemistry and math teachers were less likely to return than teachers in other fields.
2. **Beaudin (1995)** was a *regression analysis* of data collected in 1985 from 898 teachers in Michigan public schools who started their careers in the early-to-mid 1970s, left teaching within the first four years and had returned by 1985. The study found that a number of factors seemed to influence whether a teacher returned to their original district when they resumed teaching or moved to another district. One of these factors was beginning salary; the higher the beginning salary a teacher had earned, the more likely he or she was to return to that district. Each $100 increase in beginning salary was correlated with a 1.9% increase in the probability of return. Per-pupil expenditure also was correlated with the likelihood a teacher would return, with every $10 increment in per-pupil expenditure increasing the likelihood of return by 1.4%. Student-teacher ratio was also a factor. Every increase of one student in the ratio in a teacher's original district was correlated with a 1.7% increase in the likelihood of their return – a somewhat counterintuitive finding that Beaudin attributes to the possibility that districts with higher student-teacher ratios simply had more teaching positions available (not that higher student-teacher ratios were inherently preferable to teachers). The study also found the longer a

teacher's original stay in teaching (up to the four-year limit of the study), the more likely he or she was to return to their original district. On the other hand, the longer a teacher remained out of teaching, the less likely he or she was to return to their original district. The study found that females and teachers who interrupted their careers at an older age were somewhat more likely to return to their original districts. And, black teachers generally were more likely than whites to return to their original district, particularly if that district had a higher percentage of black residents. Each 1% increase in the proportion of black residents in a district was correlated with an increase of 6.9% in the probability a black teacher would return and a very slight decrease of .02% in the probability a white teacher would return.

3. **Grissmer and Kirby (1997)** was a *simple descriptive study* of 1995 and 1996 data from the National Center for Education Statistics. No information about *sample size* was given. The study found that returning teachers comprised approximately 40% of all entering teachers in the late 1980s. The study predicted that the reserve pool would decline significantly between 1998 and 2010. It attributed this primarily to the fact that the teacher workforce is growing older, and teachers over 40 who have dropped out are less likely to return.

4. **Kirby, Grissmer and Hudson (1991)** was a *simple descriptive study* that examined survey data on 1,660 Indiana public school teachers who were newly hired in 1988-89. The study found that 46% of the new hires had never taught before. Of the 54% with previous teaching experience, 28% were former Indiana public school teachers returning to the profession, 16% had been public school teachers in another state and 10% had taught in private schools. The study also found that returning teachers were older than brand new teachers, with 40% of returning teachers over the age of 40 and 70% over the age of 35. Almost 75% of brand new teachers were under 30 years of age. Most of the returning teachers had 1-5 years of previous teaching experience, and 15-25% (depending upon previous school type and location) had 6-10 years of experience. The study also looked at the occupations of returning Indiana public school teachers just prior to their return and found that 40% were working in education, mostly as substitutes or aides, 11% were in managerial or administrative positions, 11% were in sales and 7% were postsecondary teachers. When asked why they took a break in their teaching careers, the most frequent response was pregnancy or childrearing (47%), followed by the desire to try another career (13%) and a move by the teacher's spouse (9%). Among inexperienced teachers, the study found that only 52% received their degree in the year prior to their entry into teaching. Roughly 25% delayed their entry into teaching by one year and another 25% by two or more years. Seventy-six percent of inexperienced teachers, however, began teaching in the year after they received their teaching certificate, indicating postponed certification was a factor in the delayed entrance of many new teachers into teaching. Finally, the study found the reserve pool

of former teachers formed an increasing proportion of new hires in Indiana in the late 1980s. In 1971, over 60% of new hires were inexperienced teachers, 15% were returning teachers and the rest had migrated from another state. By 1988, the percentage of inexperienced teachers had fallen to around 45%, and the percentage of returning teachers had risen to around 30%.

5. **Murnane and Olsen (1989b)** was a *regression analysis* of data on 8,462 teachers in North Carolina, 7,785 teachers in Michigan and 1,377 teachers in Colorado who began teaching between 1975 and 1982. The study found that over one-fourth of the new teachers who quit their first teaching assignment within five years eventually returned to the classroom. Elementary teachers were the most likely to return. Among high school teachers, mathematics, chemistry and physics teachers were the least likely to return.

6. **Murnane et al. (1991)** used data on a subset of the larger sample used for this study to examine the reserve pool. The sample involved 4,283 North Carolina teachers, 4,676 Michigan teachers and 456 teachers who participated in the National Longitudinal Survey. The study found that 28% of teachers who left teaching returned within five years and that 12% of the remaining teachers returned within 12 years. The longer the interruption the less likely teachers were to return; one in six teachers returned after a one-year hiatus, one in 20 after a two-year interruption. The study also found that one-third of the women returned within five years compared to one-fifth of the men and that women over the age of 30 were more likely to return than younger ones. And the study found that, among North Carolina teachers, those with higher scores on their licensure examination were less likely to return. Finally, the study uncovered changes in the pattern of return from the 1970s to the 1980s. Women who left teaching for professional jobs in the 1970s were less likely to return to teaching than women who did the same in the 1980s. Among men, however, the reverse was true. Moreover, more women who left teaching in the 1970s were out of the labor force the year after they left teaching than in the 1980s (56% vs. 30%), and higher percentage of these women in the 1970s than in the 1980s returned to teaching (47% vs. 36%). The study concludes that these trends mean it may become increasingly difficult in the future to lure people from the reserve pool – especially women – back into teaching.

7. **Stinebrickner (2002)** found that 33% of teachers who left the workforce and were observed five or more years later had returned to teaching, as had 35% of teachers who changed occupations after they first left teaching. In all, 37% of the teachers who had left their first spell in teaching returned to teach at some point during the observation period. In comparing teachers and non-teachers, the study found that 47% of teachers and 77% of non-teachers who had left the full-time workforce after their first job returned to some sort of work within five years after

their initial exit (though not necessarily a return to teaching on the part of the teachers). The researcher notes, however, that economic conditions and women's views about work may have changed since the data for this study was collected, thus limiting is applicability to today's social and economic realities.

What It Means for Policy

Although future economic conditions might have an impact on who enters and remains in teaching, the long historical pattern of the predominance of white females in the teacher workforce shows no sign of changing significantly in the near future. This does not mean policymakers should abandon efforts to recruit more men and minorities into teaching or ignore barriers to the entry of capable minorities into the teacher profession.

The implications of the research reviewed for efforts to recruit and retain minority teachers are unclear. Although reports such as the one completed by the National Collaborative on Diversity in the Teaching Force note that minority teachers may serve as important role models for minority students and may increase their motivation, confidence and sense of safety, it would be premature to conclude minority teachers are always better for minority students. As Ferguson (1998) points out, other factors such as general teacher competence need to be considered, as well. Moreover, some studies have found mixed results for students with minority teachers that are very difficult to explain and use as guidance for policy (e.g., Ehrenberg, Goldhaber and Brewer, 1995).

This should certainly not be interpreted to suggest that, other things being equal, students perhaps ought to be assigned to teachers who share their ethnic and racial background; the racial segregation of teachers and students could well have other negative social ramifications. Nevertheless, given the possible advantages of having minority teachers teach minority students – and indeed all other students, as well, who stand to benefit from greater exposure to minority perspectives and successful minority professionals – it would seem to make sense to intensify efforts to recruit capable minorities into teaching and to discover what accounts for their underrepresentation in the teaching profession.

In this regard, the issue of the apparent barrier that certification examinations, in particular, pose for prospective minority teachers should be addressed. Also, given the increased professional opportunities for minorities who once automatically may have entered teaching, it is possible significant increases in teacher compensation could provide some inducement for talented minorities to choose teaching over other possibilities. This will be discussed further in addressing Question 5 on compensation. It is likely, however, such efforts at best will have only a small impact on the overall makeup of the profession.

Also important to consider is the reality, in spite of the emphasis many experts put on the need to recruit a greater percentage of academically talented individuals into teaching, that teaching competes with law, medicine, engineering and other skilled professions for high-achieving individuals. Indeed, the percentage of the most intellectually capable individuals who enter

teaching is relatively low and has apparently even declined over the past several decades. This is particularly true for women, who now, like minorities, have many more career options than they once did. Moreover, it seems unlikely, particularly given the kinds of economic considerations discussed in Question 5, the teaching profession will ever attract a large percentage of the most academically talented college graduates – unless fundamental change occurs in the nature of the occupation and the level of economic support Americans are willing to provide.

While policymakers should not abandon efforts to attract the "best and brightest" into the teaching profession, it seems more important to ensure the profession is dominated by those who are at the very least academically and intellectually able. In addition to focusing on academic ability, policymakers should recognize the importance of the idealism and the strong interest in children and youth that are common among those who do enter teaching. And policymakers should take appropriate steps to ensure (a) those attitudes continue to be prevalent among the individuals recruited into the profession and (b) the practice of teaching continues to be satisfying enough to attract individuals who share them.

Thus, policies and practices relating to teacher preparation, recruitment and retention, as well as expectations for what teachers are able to accomplish in the classroom, need to respond accordingly. While there are many teachers who possess exceptional intelligence and seem virtually heroic in their dedication to helping their students learn in the face of the most daunting challenges, a successful education system cannot be developed based on the assumption that the exception is the rule. The great majority of teachers are mere mortals. On the other hand, policymakers and district leaders should take steps to interrupt any anti-intellectual bias among school administrators that prevents the hiring of talented individuals who are likely to make exceptional teachers.

Finally, the reserve pool of licensed teachers, as well as the pool of potential career changers, should be fully tapped as a source to fill vacant teaching positions. Policymakers should ensure those who either never taught or quit teaching at some point do not encounter barriers unrelated to the level of their knowledge and skill that frustrate their entry or re-entry into the classroom. Those in the pool who are older and more experienced may be particularly good candidates for recruitment into (or back into) the profession.

On the other hand, the reserve pool is not likely to be a good source of science and mathematics teachers, which is particularly disappointing given the nationwide shortage of teachers in those fields. This fact, together with the possibility that the reserve pool may decline significantly over the next several years, means policymakers must continue to provide strong support for efforts to recruit and prepare new teachers. Similarly, given the correlation between a teacher's initial stay in teaching and the likelihood of their re-entry, policymakers must continue to focus on retaining young teachers in the profession if there is to be a reserve pool that can be dependably activated.

Supporting Resources

Ehrenberg, R.G., Goldhaber, D.D. and Brewer, D.J. (1995). "Do teachers' race, gender and ethnicity matter? Evidence from the National Educational Longitudinal Study of 1988." *Industrial and Labor Relations Review, 48*(3), 547-561.

Ferguson, R.F. (1998). "Can schools narrow the black-white test score gap?" In C. Jencks and M. Phillips (Eds.), *The Black-White Test Score Gap*. Washington, DC: Brookings Institution, 318-374.

National Center for Education Statistics. (2003). *Public School Student, Staff and Graduate Counts, By State: 2001-2002 School Year.* Washington, DC: U.S. Department of Education.

National Center for Education Statistics. (2004). *Digest of Education Statistics, 2003.* Washington, DC: U.S. Department of Education.

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National Collaborative on Diversity in the Teaching Force (2004). *Assessment of Diversity in America's Teaching Force: A Call to Action*. Washington, DC: Author.

Wilson, S.M. and Floden, R.E. (2002.) *Creating Effective Teachers – Concise Answers for Hard Questions (An Addendum to the Report Teacher Preparation Research: Current Knowledge, Gaps and Recommendations).* Washington, DC: ERIC Clearinghouse on Teaching and Teacher Education.

Question 2:

How do those individuals who remain in teaching compare with those who leave?

RELATED QUESTIONS:

What relationship do the following characteristics have to retention in teaching: age and teaching experience; gender, family and socioeconomic status; race and ethnicity; academic qualifications; intellectual proficiency; demonstrated teaching ability; subject taught; and beliefs, values and attitudes? How does the turnover rate in teaching compare to that in other professions?

Quick Answer

The literature reviewed to address this question reveals some consistent patterns that confirm statistics commonly cited in contemporary discussions. There is **strong evidence** that teacher attrition is most severe among beginning teachers but that the likelihood of a teacher leaving declines significantly after he or she has been in the classroom for four to five years and then increases again markedly after 25-30 years in the profession. Some 50% of teachers leave their initial assignment – but not necessarily the profession itself – in the first five years of their career. There is **limited evidence** that younger beginning teachers are more likely to leave than those slightly older.

The literature also indicates younger women are the most likely to leave teaching, and there is **moderate evidence** that pregnancy and childrearing are key reasons why. This means it is possible a significant number of women who quit to raise a family return to teaching once their children are older, a possibility consistent with the limited evidence. Consistent with this possibility, several studies provide **limited evidence** that women who enter teaching at a more mature age are much less likely to leave than those who begin teaching when they are much younger.

The literature reviewed also provides **moderate evidence** that white teachers have greater rates of attrition than either African American or Hispanic teachers, and it offers **limited evidence** that minority teachers are more likely than white teachers to remain in schools with higher proportions of minority students.

With regard to the relationship between academic qualifications and teacher attrition, the literature reviewed provides **limited evidence** that teachers teaching in a field in which they have subject expertise or certification are less likely to leave than teachers with less appropriate qualifications. It provides **strong evidence** that attrition is greater among middle school and high school teachers than among elementary school teachers, and it provides **moderate evidence** that science and mathematics teachers are more likely to leave their jobs than secondary teachers of other subjects.

With regard to the impact of intellectual proficiency, the literature provides **limited evidence** that teachers with high intellectual proficiency are more likely to leave teaching than teachers with significantly lower intellectual proficiency.

On the relationship of several other teacher characteristics to attrition, the literature is **inconclusive**. These include a teacher's academic degree; their socioeconomic status; and their beliefs, values and attitudes.

Finally, the literature is **inconclusive** on the issue of how attrition in teaching compares with that in other occupations, and there is no consensus on what a reasonable rate of attrition in teaching might be.

One of the policy implications that would seem to follow from the research is, particularly in view of the difficulty of significantly increasing minority representation in the teaching profession, it is important to examine more closely the reasons why white teachers leave schools with high percentages of minority students and to develop appropriate strategies that may lessen that tendency. Of particular importance is stemming the attrition of teachers – whether white or minority – who teach mathematics and science. Also worthy of study are the reasons for the higher rate of attrition among the more intellectually capable teachers and appropriate policy responses. Some of these many involve fiscal considerations, which will be discussed in Question 5.

Significance of the Question

The attrition of teachers from the teaching profession is a serious concern for many policymakers and was the focus of the 2003 report by the National Commission on Teaching and America's Future, *No Dream Denied*. There can be no doubt that teacher turnover is an important cost factor for cash-strapped states and local districts. Moreover, excessive turnover also can compromise the quality of instruction in our nation's schools if it involves an exodus by many of the most capable and experienced teachers. While the findings about the impact of teacher experience on their students' performance are mixed, it does seem to be the case that teachers with at least three to five years of experience are more effective than less-experienced teachers. In this case, it is important to ensure both (1) teachers stay in the profession long enough to acquire more teaching proficiency and (2) once they have acquired greater proficiency, they remain for at least some amount of time.

Thus, it becomes important for several reasons to know the characteristics of those teachers who remain in the field over time and how they may be different from those who leave. If it is known what it is about those who remain in teaching that enables them to stick it out, more people with those characteristics can be encouraged to enter the profession. Similarly, people who lack those characteristics can be steered away from becoming teachers.

On the other hand, the fact that someone remains in teaching does not necessarily ensure that individual is a good teacher. It is entirely possible many individuals who leave the profession

were among our most talented or promising teachers. In this case, efforts should focus on finding out why they leave, perhaps luring them back and ensuring their rate of attrition is stemmed.

It also is important to know how the attrition rate of teachers compares to that in other professions. Although attrition may make it difficult to ensure there are enough skilled teachers to staff every classroom, it is possible there may be little that can be done to reduce it significantly if the attrition rate in teaching is better than or comparable to that in other professions. There simply might be a "natural" rate of attrition in virtually all professions entered by young adults right out of college because of their inevitable uncertainty about career choice and the relative instability of their personal lives. Moreover, most experts claim most Americans these days will change occupations frequently throughout their working lives, so there may be a career transience in contemporary American society that is as unavoidable in teaching as in many other professions. On the other hand, there are education experts who believe the current attrition rate among teachers can be significantly reduced, and attrition hardly seems inevitable in cases where increased support for beginning teachers, more attractive working conditions or other efforts might make a difference.

To be sure, some of the reasons for teachers leaving the profession or moving from one position to another may be largely a function of considerations like compensation and working conditions, which are discussed in Questions 3 and 4. In addition, as some of the research studies reviewed here point out, many individuals who quit teaching – particularly younger women – leave only temporarily and subsequently return, for example, when their own young children enter school.

Nevertheless, while it may be impossible to completely separate out these various factors in attempting to explain why some teachers stay in teaching and others leave, it is important to identify as accurately as possible the different considerations that account for retention and attrition so policies and strategies can be developed to retain teachers – and particularly successful teachers –who are as well-targeted and effective as possible.

Finally, teacher attrition is also an important cost consideration. Although it is difficult to assess those costs accurately, and private-sector models for calculating the cost of employee turnover are not readily applicable to teaching, there can be little doubt that excessive teacher turnover within a district significantly increases the expense of teacher recruitment and professional development and drains funds that could be employed more strategically for other purposes.

What the Research Says

DISCUSSION

Given that the literature reviewed for this question was drawn from different years and different samples of teachers – some national and some restricted to specific states – it is difficult to draw conclusions that hold true universally. Indeed, the most important and accurate statistics on teacher retention are inevitably local. Moreover, as with all the literature in this study, some studies relied on information several decades old and may not reflect the true current picture.

This is particularly true for statistics concerning minorities and women, who have seen an increase in job opportunities outside of teaching over the past 30 years. Nevertheless, there are some consistent patterns that can be identified over time and that confirm statistics commonly cited in contemporary discussions.

➢ ***With regard to the impact of age and experience on attrition from teaching***

There is an overwhelming consensus in the literature reviewed for this report that provides **strong support** for the widely held view that teacher attrition from the profession is most severe among beginning teachers. The likelihood of leaving generally appears to decline significantly after a teacher has been in the classroom for four or five years. Although the studies reviewed had slight differences in the actual ages cited, it appears the most stable population of teachers is somewhere around 40-50 years of age. After around the age of 50 and 25-30 years of teaching experience, the attrition rate of teachers begins to increase markedly once more, thus presenting a U-shaped attrition curve. One study, however (Boe et al., 1997) found that while this U-shaped curve held for teachers leaving the profession altogether, the rate at which teachers moved from school to school continued to decline with increasing age and length of experience.

The studies gave somewhat differing figures for the attrition rates among beginning teachers. This is understandable given the different samples they employed; local labor market conditions differ somewhat from place to place and year to year. In general, however, the studies provide **moderate support** for the frequently cited statistic that somewhere in the neighborhood of 50% of teachers leave their initial teaching assignment – though not necessarily the profession itself – in the first five years of their career.

The literature also provides **limited evidence** that, among beginning teachers, younger teachers are more likely to leave than those who are slightly older. Given the fact that some studies used state- or district-level data that did not trace teachers once they left the state or district, it is not clear how much of the relatively high attrition among young teachers involves their leaving the profession and how much involves their taking another position elsewhere. For both kinds of attrition, however, the pattern appears to be the same.

The literature also provides **limited evidence** for the expected trend that the most senior teachers have a higher attrition rate than mid-career teachers due largely to the feasibility of retirement from the profession.

➢ ***With regard to the relationship between gender, family characteristics and socioeconomic status on teacher attrition***

The relationship between gender and teacher attrition is complex and defies any global statements about tendencies. The literature indicates that younger women were the most likely to leave teaching, and it provides **moderate evidence** that pregnancy and childrearing were key reasons why women leave. This means it is possible a significant number of women who quit to raise a family return to teaching once their children are older.

Secondly, and consistent with this possibility, several studies provide **limited evidence** that women who entered teaching at a more mature age were much less likely to leave than those who began teaching when they were much younger. One study (Murnane et al., 1991) found that women who entered teaching after the age of 30 were less likely to leave teaching than were males of any age. Another study (Theobald, 1990) found that women over 40 were less likely to leave their teaching jobs than were men of the same age.

As to the impact of socioeconomic status, since only one rather dated study (Dworkin, 1980) addressed this issue, the evidence from the research must be regarded as **inconclusive**. Predictably, the study indicated that teachers in families where the head of the household had a high-status occupation were more likely to consider leaving teaching than teachers in families where the head of the household had a low-status or medium-status occupation.

➢ ***With regard to the relationship of race or ethnicity and teacher attrition***

The research reviewed for this report provides **moderate evidence** that white teachers have greater rates of attrition than either African American or Hispanic teachers. There are two caveats that must be considered in generalizing from the research, however. First, much of the research focused on specific states, and it is not clear to what extent the findings for one state can be generalized to other states. This is particularly true for studies of Texas in view of the large minority population there. Second, the data for most of the studies reviewed for this report are from the 1970s and 1980s, and the picture may have changed since then, especially since there are increased career options for minorities outside of teaching.

One other interesting finding for which the research provides **limited evidence** is minority teachers are more likely than white teachers to remain in schools with higher proportions of minority students. One study (Hanushek, Kain and Rivkin, 2001) found that when African American teachers did leave the schools in which they were teaching, they tended to move to schools with even higher percentages of African American students.

➢ ***With regard to the relationship between academic qualifications and teacher attrition***

Overall, the research on the relationship between teachers' academic degree and their likely attrition is **inconclusive**. Of the five studies that addressed the issue, two found teachers with an advanced degree more likely and two found them less likely to quit teaching than teachers with only a bachelor's degree. The fifth study (Beaudin, 1993) indicated that the relationship between level of degree and rate of attrition is complex and is a function of whether a teacher entered teaching with an advanced degree in hand or obtained the degree later in his or her career. Compared to teachers with only a bachelor's degree, teachers who entered the profession with a master's degree were more likely to leave but less likely to leave if they had an advanced degree plus several years of teaching experience. In other words, length of teaching experience is an additional variable that has an impact on the effect of having a higher degree.

Another interesting finding for which there was **limited evidence** in the studies reviewed is teachers who are teaching in a field in which they are fully certified or have good subject-matter expertise are less likely to leave than teachers with less appropriate qualifications.

➢ ***With regard to the relationship between intellectual proficiency and teacher attrition***

The literature reviewed for this report provides **limited evidence** that teachers with high intellectual proficiency are more likely to leave teaching than teachers with significantly lower demonstrated intellectual proficiency. The relationship is complex, however. Moreover, the measure of intellectual proficiency differs greatly between studies and includes a variety of different *proxy* measures such as the selectivity of a teacher's undergraduate institution, college entrance examination scores, teacher certification test scores and college gradepoint averages. And two studies (Murnane and Olsen, 1990; and Shin, 1995) found that teachers in the middle range of intellectual proficiency were more likely to leave than teachers in either the low or very high range. Another study (Schlechty and Vance, 1981) found the correlation between intellectual proficiency and attrition was strongest for white females, but it also held for males and for African Americans.

➢ ***With regard to the impact of the subject taught on teacher attrition***

The research literature provides **strong evidence** that attrition was greater among middle school and high school teachers than among elementary school teachers. And although two studies (Murnane and Olsen, 1991; and Mont and Rees, 1996) had contrary findings, the rest of the literature also provides **moderate evidence** that those who taught science and mathematics were more likely to leave their jobs than secondary teachers of other subjects.

➢ ***With regard to the relationship of beliefs, values and attitudes to teacher attrition***

This issue is something of a "grab bag," but it attempts to establish whether or not there are factors relating to a teacher's personality or view of life that have an impact on the likelihood they will leave or remain in teaching. Only three studies that addressed this issue were reviewed for this report, and all noted some sort of correlation between teacher attrition and particular values, attitudes or beliefs. Given the small number of studies, however, and the fact that none of the three focused on the same considerations, the research literature related to this issue would have to be judged **inconclusive**.

➢ ***With regard to attrition in teaching versus other occupations***

The four studies in the literature reviewed in relationship to this question are ultimately **inconclusive**. In part, this is because of the limited number of studies. In part, it is because the findings of the studies were not consistent. Also, the definitions and measures of attrition and turnover differed between the studies, and the comparison groups used were different, as well. This makes comparability of the findings questionable.

Even if the literature were more conclusive, however, there would remain the conceptual issues of what a reasonable rate of attrition for teaching should be and whether it is

acceptable or problematic that attrition for teachers may be higher than attrition in some occupations and lower than in others. Two of the studies compared turnover in teaching to turnover in nursing, a similarly female-dominated profession requiring a college degree, and found that turnover is slightly greater in teaching. Taken together, the four studies reviewed suggest the teaching profession may have lower retention rates than the nursing profession but significantly higher retention rates than a number of other occupations that employ college graduates.

SUMMARY OF STUDIES

➢ ***With regard to the impact of age and experience on attrition from teaching***

Eleven studies, which met the criteria of acceptability for this report, discussed this issue:

1. **Adams (1996)** was a *regression analysis* of data on 2,327 African American, Hispanic and white elementary school teachers (K-8) hired by a large school district in Texas, with predominantly minority enrollment, between 1985 and 1991. The teachers represented a variety of ages and routes into teaching. The study found the overall median length of a teacher's stay in the district was 71 months and approximately 25% of teachers left the district within two years. Teachers who began teaching before the age of 40 were found to be 43% more likely to leave the district during the six-year period of the study than teachers who began teaching after the age of 40.
2. **Boe et al. (1997)** was a *simple correlational study* of attrition among 639 special education teachers and 4,159 general education teachers who participated in the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Follow-up Survey. The study found the percentage of teachers who moved from one school to another declined systematically with increasing age but the percentage of teachers who left teaching altogether exhibited the commonly found U-shaped turnover pattern. The 30-49-year-old age group was the most stable, with maximum stability among 45-50-year-olds. In addition, the study found a correlation among general education teachers between years of teaching experience and attrition. For teachers with four or more years of experience, 6.8% moved to a different school and 5.6% left teaching altogether. In comparison, among teachers with less than four years of experience 14.5% moved to a different school and 9.2% left teaching.
3. **Dworkin (1980)** was a *simple correlational study* of 3,064 teachers who taught in the public schools of one school district in the Southwest during the late 1970s. The study found that teachers under the age of 36 and over the age of 56 were much more likely to say they were seriously considering leaving teaching than teachers in the 36-56-year-old age range.

4. **Grissmer and Kirby (1992)** involved both a *simple descriptive study* and a *regression analysis* of data on all Indiana public school teachers between 1965 and 1988. There were approximately 43,500 teachers in 1965 and 52,000 in 1988. Over the 23 years surveyed, the study found the overall rate of teacher attrition had declined from 15% in the late 1960s to less than 5% by 1987. The study found attrition to be correlated with age in a U-shaped pattern common to many occupations. For teachers 22-24 years old, attrition was 23% in 1965 and 13% in 1985, compared to the average attrition rate of 12.4% and 5.6%, respectively, for all teachers during those two years. The lowest rate of attrition was among teachers 45-54 years old, at 2-4% in both years. For teachers 55 years of age and older, attrition was 10-17%.

5. **Hanushek, Kain and Rivkin (2001)** combined a *simple descriptive study* and *regression analysis* in their study of 378,790 Texas teachers between 1993 and 1996. The study found that 29% of teachers in their first two years and 25% of teachers in the third to fifth year of their careers left their school, versus 16% in years 11-30 of their careers and 27% with over 30 years of teaching experience. Eighteen percent of those in their first two years of teaching left the public school system completely, compared with 24% with over 30 years of experience.

6. **Ingersoll (2001a)** employed both a *simple descriptive study* and *regression analysis* in analyzing the relative impact of a number of factors on the retention or attrition of 5,643 teachers who participated in the 1990-91 Schools and Staffing Survey and the 1991-92 Teacher Follow-up Survey. The study found the age of teachers to be the strongest predictor of turnover, with teachers under the age of 30 and over the age of 50 being more likely to leave their current teaching positions (either to move to another school or leave the profession) than teachers in between. Young teachers were found to be 171% more likely to depart than middle-aged teachers.

7. **Kirby, Berends and Naftel (1999)** combined a *simple descriptive study* and a *regression analysis* of data on 98,951 public school teachers in Texas from 1980-96. The study found the familiar U-shaped attrition pattern. The attrition rate of teachers under the age of 40 was found to be 11-13% from 1986-96; a little over 5% for teachers between the ages of 40 and 54; and much higher after that. The study found that teaching experience was also an important factor in predicting attrition. Overall, the study found that attrition was 16% for first-year teachers, 26% for teachers in their first two years and close to 50% by the sixth year. It found that attrition leveled off after the 12th year of teaching to 1/2-1% per year. It also found an overall decline in attrition among young teachers between 1980 and the mid-1980s on. And it found that attrition among less-experienced teachers was much greater, after the first year, for teachers under the age of 30 than for those who were 30 years of age and older.

8. **Murnane (1984)** employed *structural equation modeling* in examining data on 104 elementary school teachers who worked in the early 1970s in one urban school system. The study found that teacher attrition from that district was highest during the first five years of the teaching career. Among teachers who had been in the district for at least five years in the early 1970s, 88% were still teaching in the district in 1980. Among teachers who were only in their first of year of teaching in the early 1970s, however, only 27% were still in the district in 1980.

9. **Murnane et al. (1991)** was a *regression analysis* of data on 6,935 full-time teachers who began teaching in the Michigan public schools between 1972 and 1975, and 9,644 teachers who began teaching in North Carolina between 1974 and 1978. The study found the first year of teaching had the highest attrition rate, although early attrition rates were higher in Michigan than in North Carolina. First-year attrition for Michigan teachers was 21% and second year attrition was 13% versus 11% and 8%, respectively, for North Carolina teachers. The study suggests this was due, in part, to anticipated student declines and economic weakness in Michigan. At the end of the 10th year of teaching, attrition was roughly 4% for teachers in both states.

10. **Singer and Willet (1988)** employed a *regression analysis* of data on 14,829 teachers who were new hires in 50+ school districts in the St. Louis, Missouri, area between 1969 and 1981. The study found that 78% of teachers were still employed at the end of their first year of teaching (though not necessarily in the same district in which they began), 66% at the end of their second year and 52% at the end of their fourth year. After 13 years, 30% of the teachers were still employed in one of the 50+ districts, though not necessarily in the same district throughout that time. The risk of leaving teaching was greatest during the first year of teaching (with a 25% probability of leaving), remained high for the next five years (between 10% and 16%) but declined considerably by year nine (to 5% or less). The study also found a correlation between surviving the early years of teaching and length of stay in the profession. Teachers who survived their first year had an estimated median total stay in teaching of 7.0 years; teachers who survived their second year had an estimated total stay of 9.8 years. Singer and Willet highlighted the importance of detecting involuntary layoffs to avoid erroneous conclusions. They found, for example, that the probability of leaving among teachers hired after 1975 in the St. Louis area increased significantly during 1982 due to layoffs caused by federal budget cuts.

11. **Stinebrickner (1999)** employed a *regression analysis* on data from the National Longitudinal Study of the High School Class of 1972 on 341 individuals who were certified to teach and were followed until 1986. The study found the probability of exiting teaching increased in the first four years of the teaching career but then declined dramatically.

➢ ***With regard to the relationship between gender, family characteristics and socioeconomic status on teacher attrition***

Sixteen studies, which met the criteria of acceptability for this report, discussed this issue:

1. **Adams (1996)** found that women were 37% more likely to leave their jobs in the district than men during the six years of the study.
2. **Allred and Smith (1984)** was a *comparative descriptive study* that examined district files on 2,346 rural teachers and 11,785 urban teachers in Utah from 1980-81. Of those teachers, 834 who left their districts following the completion of the school year – 233 from rural schools and 601 from urban schools – also were surveyed. The study, which focused primarily on rural schools, found the most often cited reason for leaving rural districts *during* the school year was maternity (39% of teachers cited this reason).
3. **Dworkin (1980)** found that teachers from families where the head of the family had a high-status occupation were more likely to say they were seriously considering leaving the teaching profession than teachers from families in which the head of the family had a medium- or low-status occupation or was a farmer.
4. **Grissmer and Kirby (1992)** found that attrition among female teachers declined dramatically between the late 1960s and the late 1980s, going from a high of 17% to around 5%. For men the rate of attrition declined during the same period from 10% to less than 5%. The study found that, by the end of this period, women teachers were dropping out of the teaching force less than in earlier years, were returning more often if they did leave and were staying out of teaching for shorter periods of time. The study also noted the overall participation rate of women in the labor force grew substantially during this period, from 43% to 72%, a phenomenon it attributed to multiple factors.
5. **Gritz and Theobald (1996)** employed a *regression analysis* of data on the careers of 9,756 white teachers in Washington State from their entry into teaching between 1981 and 1990 through the 1991-92 school year. The study found that males remained in their teaching positions longer than females.
6. **Ingersoll (2001a)** found that male teachers were less likely to quit teaching than female teachers.
7. **Kirby, Berends and Naftel (1999)** found that, on average, male teachers in Texas had a 5% lower rate of attrition (i.e., leaving teaching) than females.
8. **Kirby, Grissmer and Hudson (1991)** was a *simple descriptive study* that examined survey data on 1,660 Indiana public school teachers newly hired

in 1988-89. The study found that that when citing the reasons why they had left teaching, pregnancy and childrearing were the most frequent answers given.

9. **Marso and Pigge (1997)** was a *simple correlational study* of 551 teacher candidates who began their teacher preparation program in 1985 at a large Midwestern university and who were followed up in 1992 to determine their certification and teaching status. The study found that male and female teacher candidates were equally likely to have embarked upon a full-time teaching career upon completion of their teacher preparation program. It also found, however, that the men were less likely to be teaching in 1992 than women and less likely to be part-time teachers.

10. **Murnane et al. (1991)** found in both Michigan and North Carolina that entering teachers who were women over 30 years of age were less likely to leave teaching than men of any age, whereas men, in turn, were less likely to leave teaching than women 30 years of age or younger.

11. **Rees (1991)** employed *regression analysis* in his examination of data on 49,396 full-time, tenured teachers (all under the age of 55) who taught in New York State between 1975 and 1978. The study found that male and female teachers before marriage have similar quit rates, but after marriage, women were more likely to quit than men.

12. **Stinebrickner (1998, 1999)** employed a *regression analysis* on data from the National Longitudinal Study of the High School Class of 1972 on 341 individuals who were certified to teach and were followed until 1986. The study found that males tended to stay in teaching longer than females, even after controlling for marriage and fertility. The 1998 study found that marriage shortened a teaching career, while having children lengthened it. [Note: This is essentially the same study published in two different publications.]

13,14. **Stinebrickner (2001a, 2001b)** involved *regression analysis* of data on 450 (in 2001a) and 551 (in 2001b) individuals who participated in the National Longitudinal Survey of the High School Class of 1972, were certified to teach between 1975 and 1985, and were followed until 1986. The studies found that female teachers had a higher probability than male teachers of leaving the teaching profession at each year of duration of their first-spell length of teaching. The gap was narrow at first, but widened with each year. In the case of female teachers (but not male teachers), the probability of remaining a teacher declined markedly with marriage or as the number of children increased.

15. **Stinebrickner (2002)** involved a *simple descriptive study* of 422 female teachers and 1,028 female non-teachers and a *regression analysis* of data on a subset of 313 female teachers and 772 female non-teachers, all of whom took part in the National Longitudinal Study of the High School Class of 1972. The teachers were followed until 1986. The study found a large amount of attrition among female teachers was directly related to

marriage and fertility events, and the impact of such events on teachers was much greater than on women who were engaged in other occupations. Female teachers who were married, for example, were 1.94 times more likely to leave the workforce than female teachers who were not married. Female teachers with newborn children were nearly eight times more likely to leave the workforce than female teachers without newborn children – twice the probability of women in non-teaching professions leaving the workforce when they have newborns.

16. **Theobald (1990)** employed *regression analysis* in his study of 37,321 K-12 teachers in the state of Washington in 1984-85, 37,696 in 1985-86 and 38,378 in 1986-87. The study found that men over 40 were more likely to leave the district than were women over 40. Furthermore, male teachers with graduate degrees were nearly 50% more likely to leave their positions than similar males without these degrees. This effect of graduate degrees was not statistically significant for females.

➢ ***With regard to the relationship of race or ethnicity and teacher attrition***

Seven studies reviewed in this report addressed this issue:

1. **Adams (1996)** found that African American teachers had lower attrition rates than teachers of other races. Whites were more likely than African Americans or Hispanics to leave the district. The district in question had a student enrollment that was 46% Hispanic, 37% African American, 12% white and 4% Asian.
2. **Hanushek, Kain and Rivkin (2001)** found that white teachers were more likely to move to a different school or district the higher the proportion of African American or Hispanic enrollment in their current school. This was especially true for younger teachers in schools with high percentages of African American students. In contrast, African American and Hispanic teachers were less likely to transition as a function of high-minority enrollment. In fact, African American teachers tended to move to schools with a higher proportion of African American students than the schools they left.
3. **Ingersoll (2001a)** found that minority teachers were less likely to quit teaching than whites.
4. **Kirby, Berends and Naftel (1999)** found that Hispanic teachers had the lowest early attrition rates. Median teaching spells were six years for white female teachers, seven years for white male teachers, 10 years for Hispanic females and males, nine years for black females and six years for black males.
5. **Murnane and Olsen (1989a)** was a *regression analysis* of data on 7,852 Michigan teachers who began teaching between 1972-75 and whose

careers were followed though the 1984-85 school year. The study found that black teachers had longer teaching spells than white teachers employed by the same district.

6. **Murnane et al. (1991)** found that black teachers were more likely to work in large, poor, urban districts than white teachers. After controlling for district-level fixed effects, black teachers had higher retention rates than white teachers.

7. **Shin (1995)** was a *simple correlational study*, using a technique called "survival analysis," of data on 455 current teachers and 331 former teachers who participated in the 1986 follow-up questionnaire in National Longitudinal Study of the High School Class of 1972. The study found that minority teachers had higher retention rates than white teachers. Median survival for minority teachers was 9.8 years versus 6.1 for white teachers. One caution concerning this study, however, is it did not control adequately for the influence of other potentially important factors

➢ ***With regard to the relationship between academic qualifications and teacher attrition***

Seven studies, which met the criteria of acceptability for this report, addressed this issue.

The evidence on whether teachers with post-graduate degrees stay longer is mixed. Two studies found that teachers with more education were more likely to leave teaching, and two had the opposite finding:

1. **Adams (1996)** found that teachers with only a bachelor's degree were 68% more likely to leave than those with graduate degrees.

2. **Beaudin (1993)** was a *regression analysis* of data on 3,060 elementary and secondary school teachers who began their careers in Michigan public schools between 1972 and 1975. All these teachers left teaching within four years of entry, but 898 returned. The study sought to explore the characteristics of those who resumed teaching versus the characteristics of those who did not. The study found that teachers who began their careers with a bachelor's degree were more likely to return. Attrition and having a master's degree were positively correlated in the case of inexperienced teachers, but negatively correlated when teachers had more than three years of experience, suggesting that teachers with only a bachelor's degree may interrupt their careers at an early stage to obtain more education.

3. **Kirby, Berends and Naftel (1999)** found that teachers with advanced degrees at entry tended to have higher attrition rates than those entering with a bachelor's degree.

4. **Rees (1991)** found that more highly educated teachers were more likely to quit, all else equal.

5. **Shin (1995)** found that median stays in teaching were higher for teachers with master's degrees (10.60 years) than for teachers with bachelor's (5.24 years), doctoral (2.98) and associate degrees (2.96 years). As noted above, however, the methodological shortcomings of this study are problematic.

Two other studies addressed the impact of certification or subject knowledge on attrition:

6. **Boe et al. (1997)** found that teachers with a full certification in their main assignment were 8% more likely to remain in their school the following year than teachers who were only partly certified.

7. **Mont and Rees (1996)** employed a *regression analysis* of data gathered from 1979-89 on the careers of 525 New York state high school teachers hired in one district outside New York City in 1979. The study found that class size and the proportion of classes taught in a teacher's subject area were related to turnover – smaller class sizes and better subject-area matching reduced the probability of leaving.

➢ ***With regard to the relationship between demonstrated intellectual proficiency and teacher attrition***

Nine studies, which met the criteria of acceptability for this report, addressed this issue. The studies used measures on various kinds of tests as the *independent variable*, all of which can be considered *proxies* for intellectual aptitude:

1. **Henke et al. (2000)** was a *simple correlational study* of 9,274 individuals who graduated college between 1992 and 1993 and were participants in the 1993 Baccalaureate and Beyond Longitudinal Study and in follow-up interviews in 1994 and 1997. The study found that graduates who had become teachers and who had college entrance examination scores in the top quartile were twice as likely to have left teaching as those with scores in the bottom quartile. In addition, among those who were teaching four years after graduation, only two-fifths of those in the top quartile reported they expected to be teaching three years later, in contrast to three-quarters of teachers with scores in the bottom three quartiles.

2. **Lankford, Loeb and Wyckoff (2002)** was a *simple correlational study* that analyzed data from several different sources on every teacher in New York State (approximately 180,000 annually) between 1984-85 and 1999-2000. The study looked specifically at the cohort of teachers hired in 1993 and found evidence to support the hypothesis that more qualified teachers have higher rates of turnover, both in terms of attrition (leaving the system altogether) and migration (switching schools and districts). With regard to

attrition, teachers leaving the system were somewhat less likely to have failed their certification exam on their first attempt and 60% more likely to have received their bachelor's degree from a highly competitive college. With regard to school/district migration, teachers transferring to districts that were different from the district in which they began their careers were half as likely to have failed their certification exam and 35% more likely to have received their degree from a highly competitive institution than teachers who stayed in the same district. Receiving schools had on average, 4% fewer poor students and 2% fewer non-white students. Teachers generally left schools in which the proportion of non-white and poor students was about 75-100% greater than in the schools to which they transferred.

3. **Marso and Pigge (1997)** found no correlation between teacher candidates' actual entry into teaching and their academic ability as measured either by the Comprehensive Test of Basic Skills or the ACT.

4. **Murnane and Olsen (1990)** was a *regression analysis* of data on 13,890 white North Carolina teachers who began teaching between 1975 and 1984 and whose careers were followed through the 1985-86 school year. The study found that teachers with higher than average National Teacher Examination (NTE) scores had shorter teaching spells, but teachers with the highest NTE scores of the sample had longer spells.

5. **Murnane, Singer and Willett (1989)** was a *regression analysis* of data on 5,100 white teachers who began teaching in North Carolina between 1976 and 1978 and whose careers were followed through 1986. The study found evidence that more "able" teachers left first. The evidence showed that secondary teachers with high NTE scores were nearly twice as likely to leave after one year than teachers with low scores. In addition, high NTE score teachers were less likely to return after a career interruption.

6. **Schlechty and Vance (1981)** was a *simple correlational study* using administrative data on 32,131 entering teachers in North Carolina from 1973 to 1980. The study found that teachers with higher NTE scores left teaching at a faster rate than those with lower NTE scores. For white females hired in 1973 with the highest 10% of NTE scores, only 37.3% remained in teaching after seven years, compared to 62.5% of the corresponding group with the lowest 10% of NTE scores; individuals between these extremes consistently exhibited the same negative relationship between test scores and retention. Findings for white males were similar though less consistent; findings for black males and females were similar though less pronounced in magnitude.

7. **Shin (1995)** found that teachers with a gradepoint average (GPA) in the middle range were more likely to remain teaching than teachers in either the top range or the bottom range of the GPA distribution. Again, however, the methodological shortcomings of this study noted above call into question some of the findings.

8,9. **Stinebrickner (2001a, 2001b)** found the probability of remaining in teaching declined more rapidly over time for teachers in the high SAT group versus those in the low SAT group. Stinebrickner also found that high SAT individuals received wage premiums in non-teaching jobs but not in teaching.

➢ ***With regard to the impact of the subject taught on teacher attrition***

Eleven studies reviewed for this report addressed this issue:

1. **Arnold, Choy and Bobbit (1993)** involved a *simple descriptive study* and *regression analysis* of data on 67,800 teachers from the 1987-88 Schools and Staffing Survey and approximately 7,500 teachers from the 1988-89 Teacher Follow-up Survey. The study found that mathematics and computer science teachers were three times more likely to leave teaching during the year than elementary school teachers, and secondary teachers in other subjects were twice as likely to leave as elementary school teachers.
2. **Beaudin (1993)** found that physics, chemistry and mathematics teachers had the lowest probability of returning to the classroom by 1985 among teachers in all fields who had left teaching within four years of entry during the period 1972-75. Approximately one-third of the elementary teachers and one-fourth of English teachers who left returned subsequently to teaching in a public school. In contrast, only 20% of mathematics teachers and 12% of physics or chemistry teachers who left returned to public school teaching.
3. **Grissmer and Kirby (1992)** found the five-year rate of teacher turnover was slightly higher for secondary school teachers, in general, than for elementary school teachers over the 23 years the study examined. In the high school sciences, however, the attrition rate was much higher. The average five-year attrition rate of elementary school teachers was 36%, for secondary math teachers 41%, for secondary English teachers 47%, for secondary biology teachers 51%, and for secondary physics and chemistry teachers 57%.
4. **Henke, Zahn and Carroll (2001)** employed both a *simple descriptive study* and a *regression analysis* of data on approximately 9,300 college graduates who participated in the 1993, 1994 and 1997 waves of the Baccalaureate and Beyond Longitudinal Study. The study found that first-time teachers in 1994 (both full time and part time) who had majored in engineering, mathematics or natural science were less likely to be found teaching in 1997 (either full time or part time) than teachers who had majored in education. The attrition for the former was 30% compared to 14% for the education majors. Caution is necessary in comparing these numbers to those in other studies because of the particular definition of turnover used in this study, which focuses on attrition from the profession

(thus not including movers who changed jobs within teaching) and includes both full-time and part-time teachers.

5. **Ingersoll (2001a)** found that mathematics and science teachers were more likely to leave their current teaching positions (either to move to another school or leave the profession) than teachers in other subject specialties.

6. **Kirby, Berends and Naftel (1999)** found that secondary teachers who taught specific subjects, and especially science teachers, had higher attrition rates than elementary teachers.

7. **Murnane and Olsen (1989b)** was a *regression analysis* of data on 8,462 teachers in North Carolina, 7,785 teachers in Michigan and 1,377 teachers in Colorado who began teaching between 1975 and 1982. The study found that high school teachers were more likely to leave teaching than elementary teachers. The median first-spell length of elementary teachers was 13.5, 16.4 and 6.6 years in North Carolina, Michigan and Colorado, respectively. [Note: *Sample sizes* for Colorado are less than one-fifth of sample sizes for the other two states.] Chemistry and physics teachers had the lowest median first-spell lengths of all teachers, with 4.1 and 4.9 years in North Carolina and Michigan, respectively. The study found, further, that once elementary teachers left they were more likely to return than high school teachers. Twenty-eight percent of elementary teachers in North Carolina and 33% in Michigan returned for a second spell less than six years after finishing their first spell. (The average for all teachers was 25% in North Carolina and 30% in Michigan.) Mathematics and physics/chemistry teachers had the lowest re-entry rates, 19% and 16% in North Carolina, and 22% and 15% in Michigan.

8. **Murnane and Olsen (1990)** found the average length of the first teaching spell for high school physics and chemistry teachers was the longest among high school teachers (4.8 years median) and the average length of the first teaching spell for mathematics teachers was the longest among high school teachers (12+ years median). They also found that high school teachers had shorter spells than elementary school teachers.

9. **Murnane et al. (1991)** found greater attrition and a lower likelihood of return among chemistry and physics teachers. The study found that retention was higher among elementary teachers than among secondary teachers.

10. **Shin (1995)** found that elementary teachers stayed longer than secondary teachers, with average survival times of 8.34 and 5.66 years, respectively. The methodological shortcomings of the study noted above, however, call into question some of the findings.

One study found evidence to contradict the pattern of higher attrition by field:

11. **Mont and Rees (1996)** found the turnover patterns of mathematics and science teachers did not differ significantly from those of teachers in other fields.

➢ ***With regard to the relationship of beliefs, values and attitudes to teacher attrition***

Three studies reviewed for this report addressed this issue:

1. **Chapman and Hutcheson (1982)** was a *discriminant analysis* of survey data on 590 teacher education alumni in three public universities in Indiana who graduated between 1967 and 1978. The study found that individuals were more likely to remain in elementary school if they assigned a higher value to recognition by administrators but a lower value to salary increases, job responsibility and autonomy, the opportunity to learn new things, and the chance to contribute important decisions. Those most likely to remain in high school teaching assigned more importance to approval from family and friends and recognition by administrators but less importance to job responsibility and autonomy and salary increases. Survey responses could reflect retrospective justifications for decisions rather than causes of those decisions, however.
2. **Marso and Pigge (1997)** found that, among approximately 550 teacher candidates in 1985 who were surveyed seven years later, those who were initially very certain about their decision to teach were more likely to persist.
3. **Miech and Elder (1996)** was a *regression analysis* of data on 3,783 respondents in a nationally representative sample gathered for a 1965 study by James Davis and on 724 respondents in the National Longitudinal Study (NLS) of the High School Class of 1972. All respondents in the Davis study graduated college in 1961, became teachers in 1962 and were followed through 1964. All respondents in the NLS sample became teachers between 1972 and 1986 and were followed throughout that period. Miech and Elder found that people who could be categorized as “idealists” were more likely to leave the teaching profession. In looking at males who entered teaching from 1962-63, they found that male idealists were more likely to leave teaching by 1964 than males who were non-idealists. Among females who entered teaching during this same period, attrition among female idealists was indistinguishable from that of female non-idealists. They speculate that since women had fewer labor market choices in the earlier period, psychological factors did not play as much of a role in their choice of occupation as they did later on.

➢ ***With regard to attrition in teaching versus other occupations***

Four studies, which met the criteria of acceptability for this report, discussed this issue:

1. **Harris and Adams (2004)** was a *regression analysis* using data on nearly 17,000 individuals drawn from the Current Population Survey over the period from 1992-2001. The study compared the turnover of teachers, nurses, social workers and accountants on the assumption all these occupations require similar levels of education and involve a helping relationship. For college graduates, the study found that teachers were approximately 1% more likely to leave their profession than nurses, 6% less likely to leave than social workers and equally as likely as accountants to leave their respective professions. The study also found that salary plays a greater role in teacher attrition than in the other occupations. In addition, the study found that teaching and social work share a U-shaped pattern of attrition (greater among both younger and older teachers). Finally, the study found that teachers were the most likely to switch to an unrelated occupation upon leaving their current profession.

2. **Henke, Zahn and Carroll (2001)** found that among those college graduates who were working as full-time, first-time teachers in 1994 and were still employed in 1997, 18% were no longer teaching. This was similar to rates for graduates who entered jobs in health, law enforcement, the military, engineering, science and legal support, but lower than rates for graduates entering all other occupations. This attrition rate pertains only to those individuals who were employed in 1997, however, and thus underestimates the rate of all attrition from teaching or other occupations.

3. **Ingersoll (2001a)** found a 14% turnover rate for teachers in the mid-1990s, compared with an 11 percent nationwide turnover rate for employees in all occupations as reported by the Bureau of National Affairs and a 12% turnover rate for nurses in hospitals as published by a human resource consulting firm. Ingersoll's definition of turnover includes migration from one position to another within the same profession, however, and his use of different data sources to arrive at turnover rates in different professions carries with it some disadvantages.

4. **Stinebrickner (2002)** found that 60% of the teachers studied left teaching at some point during the sample period, while 88% of non-teachers left their job during the period. The study also found that 53% of teachers had an initial spell in teaching of four or more years, while approximately 35% of non-teachers remained employed in their initial occupation for four or more years. Sixty-seven percent of the teachers who left teaching exited the full-time workforce altogether for some period of time, compared with only 41% of non-teachers who left their first occupation. Five percent of the teachers who left the full-time workforce began school full time,

compared with 26% of the non-teachers. The study found, in addition, that the probability of a female teacher exiting the full-time workforce when she gives birth to a child is 60%, compared to 31% for female non-teachers. Thus, the study hypothesized that a significant reason for teacher attrition was related to the birth of children. The study found, finally, that non-teachers tended to return to work more quickly after exiting the workforce than did teachers; 47% of teachers and 77% of non-teachers had returned to work (not necessarily to the same occupation) within five years of initially leaving.

What It Means for Policy

Drawing clear implications for policy from the research findings related to the specific questions addressed in this chapter is a difficult undertaking because those implications depend strongly on one's point of view about a number of different issues. Given that the rate of attrition in teaching, for example, is lower than in most other professions but higher than in nursing, should that be met by the comfort of knowing it could be worse, resignation that perhaps the present attrition rate is acceptable, or resolve to make it at least as low as the attrition rate in nursing? Moreover, the attrition figures given in the research reviewed here were all averages based upon national samples, and much higher or lower figures in specific local markets might clearly imply the need to take aggressive steps to stem teacher attrition or, on the other hand, the ability to relax in the face of a high degree of stability.

There are, however, a few findings that may have less ambiguous implications for policy. Schools with high percentages of minority students are often characterized as having dysfunctional rates of teacher turnover. Given that minority teachers appear to have a greater tendency than white teachers to remain in these schools, maintaining a solid core of minority teachers at these schools may increase overall stability. In view of the small percentage of minority teachers in the profession now and in the foreseeable future (see the previous chapter), however, this is a difficult prescription to follow. The alternative is to examine much more closely the reasons why white teachers leave these schools and to develop appropriate policies and strategies that may curb that tendency.

Another actionable finding is the significant rate of attrition among high school science and mathematics teachers. Given the well-documented shortage of mathematics and science teachers across the United States, stemming the attrition of those individuals who do teach mathematics and science in secondary schools would seem to be a very high policy priority. Thus, here again, the reasons why mathematics and science teachers leave the classroom must be studied carefully and policies and strategies that respond effectively must be developed.

The shortage of mathematics and science teachers is not only an issue of attrition, however, but also involves a much greater crisis in our education system, including the way mathematics and science teachers are prepared. The 2000 report of the National Commission on Mathematics and Science Teaching for the 21st Century (the so-called Glenn Commission) provides a powerful analysis of this problem.

Finally, the evidence that the more intellectually proficient teachers leave the profession at a greater rate than teachers who are less intellectually proficient also calls for appropriate studies of the reasons for higher attrition among these teachers and for appropriate policy responses.

Supporting Resources

Darling-Hammond, L. (2000, January). "Teacher Quality and Student Achievement: A Review of State Policy Evidence." *Education Policy Analysis Archives,* 8(1).

National Commission on Mathematics and Science Teaching for the 21st Century (2000). *Before It's Too Late*. Washington, DC: Author.

National Commission on Teaching and America's Future (2003). *No Dream Denied: A Pledge to America's Children.* Washington, DC: Author.

Question 3:

What are the characteristics of schools and districts most likely to be successful in recruiting and retaining teachers?

RELATED QUESTIONS:

Do schools differ in their success at recruiting and retaining teachers based on the following characteristics: geography – urban, suburban or rural; grade level; school type – elementary schools, middle schools and high schools, public versus private? Do student composition and performance have an impact on the ability of schools to recruit and retain teachers?

Quick Answer

As with the other questions addressed in this report, the research reviewed for this question provides a stronger basis for some conclusions than for others. The research provides **strong evidence** that attrition is greater among secondary school teachers than among elementary school teachers. With regard to the more specific issue of middle school attrition in comparison to high school or elementary school attrition, the literature is **inconclusive.**

Consistent with common perceptions, the research literature provides **moderate evidence** that teacher turnover is greater in schools with relatively higher proportions of low-income, minority and academically low-performing students. The literature also provides **limited evidence** that the qualifications of teachers in these schools tends to be inferior to the qualifications of teachers in other schools.

Finally, the literature provides **limited support** for the conclusion that teacher turnover is greater at private schools than at public schools, and, somewhat surprisingly in light of the current wave of interest in creating more small schools –turnover also is greater in small schools – both public and private – than in larger schools.

One of the implications of the research literature is clearly that educators and policymakers must focus particular attention on stemming teacher attrition in secondary schools, especially in mathematics and science as noted in discussing Question 2. The literature also confirms the importance of addressing the issue of teacher recruitment and retention in schools with high percentages of low-income and minority students.

Finally, although the reasons are not clear, the fact that attrition in smaller schools is greater than in larger schools and greater in private schools than in public schools should raise a caution among those who advocate for a reduction in school size and among those who advocate for greater school privatization. While either of these might, all things considered, be reasonable policy alternatives, it would be important to attempt to determine with greater confidence what impact moving in either direction would likely have on the supply and persistence of our nation's teachers.

Significance of the Question

Although many states have undertaken statewide efforts to recruit teachers, individual districts generally are even more active in recruitment efforts. Moreover, teachers are attracted to specific districts, or to individual schools within those districts, based on their characteristics. Teachers seeking their first teaching position may be less selective or have fewer options than veteran teachers when it comes to choosing a place to teach, especially if job openings are scarce in the schools and districts where they ideally want to work; most beginning teachers understand the importance of gaining valuable teaching experience, wherever they can get it. Even for new teachers, however, the reality is some states and districts are more successful in recruiting than others and some individual schools are more desirable.

Policy discussions frequently question whether there is a connection between the socioeconomic profile of schools and districts and their ability to recruit and retain teachers. The assumption is poorer, urban districts have particular difficulty attracting and retaining well-qualified teachers. Thus, this chapter focuses on demographic, socioeconomic, geographic and academic characteristics of local districts and schools that make them desirable or undesirable places for teachers to work. These include factors such as the relative affluence of the school or district; whether the school is urban, suburban or rural; the size and ethnic composition of the student population; the overall academic performance of the student population; the grade levels the school serves; and whether the school is public or private.

To say that the student-related factors cited in this chapter influence teacher recruitment and retention is not at all to indicate certain kinds of students are inherently less desirable to teach or that the student and school characteristics identified can be said to be true causes of teachers' decisions to select, reject, leave or remain in a given school. There is an interaction between the various characteristics of a particular school and its students and the skills and characteristics of an individual teacher (as identified in Questions 1 and 2) that leads the teacher to decide whether or not to teach there. And there are additional considerations important to a teacher's ability to perform his or her job successfully that are discussed in the next chapter under the rubric of working conditions.

Another consideration that may influence the ability of specific districts to recruit teachers – though not a demographic or socioeconomic consideration of the district or its schools per se – is the nature of district recruitment practices and policies. A recent report, for example, by the New Teacher Project, *Missed Opportunities: How We Keep High-Quality Teachers Out of Urban Schools* (2003), focuses on the role played by district hiring practices and concludes that a number of common practices inhibit efforts to hire well-qualified teachers.

What the Research Says

DISCUSSION

The numerous school characteristics that seem to have an impact on teacher recruitment and retention are sometimes difficult to disentangle. As much as possible, attempt was made to list predictive factors and the studies that address them separately. Especially in the case of student factors – ethnicity, socioeconomic status and academic performance – the limitations of the literature, however, require the different factors be combined, which unfortunately results in a less precise analysis. In general, the research literature indicates that school size, sector (private versus public), location, wealth, student composition and school grade level all appear to play a significant role in teacher recruitment and retention, although the relationships tend to vary somewhat from study to study.

➢ ***With regard to the influence of geography on teacher recruitment and retention***

There is very little literature on this issue reviewed for this report – only two studies – to provide any confident conclusions, so the evidence on this question must be said to be **inconclusive**. Both studies reviewed, however, found that teacher turnover rates tended to be lower for non-urban schools.

➢ ***With regard to the influence of school grade level on teacher recruitment and retention***

As noted in the discussion of a similar issue in Question 2, the research literature provides **strong evidence** that attrition is greater among secondary school teachers than among elementary school teachers. Looking more deeply at attrition patterns, one study (Murnane and Olsen, 1989b) found that elementary school teachers who left teaching were more likely to re-enter the profession than high school teachers who left after their initial teaching period. Although one study (Carter and Carter, 2000) found that middle school assignments are less desirable than high school assignments, the research literature overall must be said to be **inconclusive** on this aspect of the issue.

➢ ***With regard to the influence of the public versus private status of schools on teacher recruitment and retention***

The literature reviewed for this report provides **limited evidence** that teacher turnover is greater at private schools than at public schools. One study (Ingersoll, 2001b) indicated that while both public and private schools had similar rates of migration from one school to another, attrition from the profession was far greater among private school teachers.

There are several other interesting findings in the literature in regard to the public versus private schools issue, but the literature is so limited the evidence for any substantive conclusions based on these findings must be said to be **inconclusive**. Ballou and Podgursky (1997 and 1998), for example, found that private schools seem to value both teacher experience and intellectual proficiency (as measured by college selectivity) more than do public schools.

➢ ***With regard to the influence of the ethnic and socioeconomic composition, school size and the academic performance of the students on teacher recruitment and retention***

Although one study (Shin, 1995) had a contrary finding, overall the studies reviewed for this report offer **moderate support** for the conclusion that schools and districts with relatively higher proportions of low-income, minority and academically low-performing students have greater difficulty retaining teachers than other schools and districts.

Several studies reviewed for the report also provide **limited evidence** that teacher attrition in small schools – both public and private – is greater than in larger schools. One study (Ingersoll, 2001b) indicated this might be a function of lower salaries paid in small private schools.

Finally, several studies provide **limited evidence** that the qualifications of teachers in schools with high percentages of low-income and minority students are inferior to the qualifications of teachers in other schools.

SUMMARY OF STUDIES

Because of the interrelationship of the various factors identified as having an influence on teacher recruitment and retention, many of the studies reviewed in response to this question discuss several factors together. Thus, a number of the studies are cited as relevant to the discussion of more than one set of factors. Insofar as possible, only the appropriate portion of the study that relates to the factor under consideration is addressed in repeated summaries of a study.

➢ ***With regard to the influence of geography on teacher recruitment and retention***

Two studies, which met the criteria of acceptability for this report, addressed this issue:

1. **Ingersoll (2001a)** employed both a *simple descriptive study* and *regression analysis* in analyzing the relative impact of a number of factors on the retention or attrition of 5,643 teachers who participated in the 1990-91 Schools and Staffing Survey and the 1991-92 Teacher Follow-up Survey. The study found that large schools had lower teacher attrition rates than small schools. It also found that wealthier schools and rural schools tended to experience less teacher turnover than poorer or urban schools.
2. **Lankford, Loeb and Wyckoff (2002)** was a *simple correlational study* that analyzed data from several different sources on every teacher in New York State (approximately 180,000 annually) between 1984-85 and 1999-2000. The study looked specifically at the cohort of teachers hired in 1993 and found that fewer than 40% of new teachers hired in that year were still teaching in the same school in which they began their careers by 1998. There were significant differences in turnover rates depending on the type

of school. Teacher turnover rates tend to be higher in urban schools, particularly those in large urban areas. In the New York City region, for example, 28% of teachers in urban schools were still in the same school five years later compared to 46% in suburban schools.

➢ ***With regard to the influence of school grade level on teacher recruitment and retention***

Nine studies reviewed for this report addressed this issue:

1. **Arnold, Choy and Bobbit (1993)** involved a *simple descriptive study* and *regression analysis* of data on 67,800 teachers from the 1987-88 Schools and Staffing Survey and approximately 7,500 teachers from the 1988-89 Teacher Follow-up Survey. The study found that, depending upon the subject taught, secondary teachers were two to three times more likely to leave teaching during the year than elementary school teachers.

2. **Beaudin (1993)** was a *regression analysis* of data on 3,060 elementary and secondary school teachers who began their careers in Michigan public schools between 1972 and 1975. All these teachers left teaching within four years of entry, but 898 returned. The study sought to explore the characteristics of those who resumed teaching versus the characteristics of those who did not. The study found that approximately one-third of the elementary teachers who left returned subsequently to teach in a public school, compared to only 12-25% of secondary school teachers (depending upon the subject taught).

3. **Carter and Carter (2000)** was a *simple descriptive study* that surveyed 170 education majors in North Carolina and Virginia. The study found that middle grades (6-9) were considered less desirable by these prospective teachers due primarily to concerns about disciplinary and attitudinal problems among adolescents. Respondents reported, however, that salary incentives and small class sizes would compensate for the undesirable characteristics of middle schools. Whereas only 9% of respondents initially expressed an interest in teaching in middle school, 49% indicated they would consider middle school teaching if they received a salary bonus of $3,000-5,000. Fifty-seven percent said they would consider middle school teaching if they could be assured the school would enforce student discipline. And 51% said they would seriously consider middle school teaching if class sizes could be reduced to 15 students. With a *sample size* of 170 and no response rate provided, however, it is difficult to assess the *validity* of these findings.

4. **Grissmer and Kirby (1992)** involved both a *simple descriptive study* and a *regression analysis* of data on all Indiana public school teachers between 1965 and 1988. There were approximately 43,500 teachers in 1965 and 52,000 in 1988. Over the 23 years surveyed, the study found the five-year rate of teacher turnover was slightly higher for secondary school teachers,

in general, than for elementary school teachers, though it was much higher among high school science teachers.

5. **Kirby, Berends and Naftel (1999)** combined a *simple descriptive study* and a *regression analysis* of data on 98,951 public school teachers in Texas from 1980-96. The study found that secondary teachers who taught specific subjects, and especially science teachers, had higher attrition rates than elementary teachers.

6. **Murnane and Olsen (1989b)** was a *regression analysis* of data on 8,462 teachers in North Carolina, 7,785 teachers in Michigan and 1,377 teachers in Colorado who began teaching between 1975 and 1982. The study found that high school teachers were more likely to leave teaching than elementary teachers. The median first-spell length of elementary teachers was 13.5, 16.4 and 6.6 years in North Carolina, Michigan and Colorado, respectively. [Note: *Sample sizes* for Colorado are less than one-fifth of sample sizes for the other two states.]

7. **Murnane and Olsen (1990)** was a *regression analysis* of data on 13,890 white North Carolina teachers who began teaching between 1975 and 1984 and whose careers were followed through the 1985-86 school year. The study found that high school teachers had shorter initial teaching spells than elementary school teachers.

8. **Murnane et al. (1991)** employed a *regression analysis* of data on 6,935 full-time teachers who began teaching in the Michigan public schools between 1972 and 1975 and 9,644 teachers who began teaching in North Carolina between 1974 and 1978. The study found that retention was higher among elementary teachers than among secondary teachers.

9. **Shin (1995)** employed a *regression analysis* of data on 455 current teachers and 331 former teachers who participated in the 1986 follow-up questionnaire in the National Longitudinal Study of the High School Class of 1972. The study found that elementary teachers stayed longer than secondary teachers, with average survival times of 8.34 and 5.66 years, respectively.

➢ ***With regard to the influence of the public versus private status of schools on teacher recruitment and retention***

Five studies, which met the criteria of acceptability for this report, addressed this issue:

1. **Arnold, Choy and Bobbit (1993)** provided some evidence that retention rates differed between public and private schools. The study found that public schools had slightly lower first-year attrition rates than private schools (6% versus 11%).

2. **Ballou and Podgursky (1997)** involved a *simple descriptive study* and a *regression analysis* of data on 41,645 public and private school teachers

who participated in the 1990-91 Schools and Staffing Survey. The study found that private schools placed more emphasis on the academic skills of the teachers they recruit than did public schools and thus private schools employed a disproportionately large share of graduates of the nation's more selective colleges and universities.

3. **Ballou and Podgursky (1998)** was a *regression analysis* of data from two samples of public and private school principals' ratings of their teachers. Both samples were drawn from the 1990-91 Schools and Staffing Survey, with 9,237-10,878 principals in one sample and 3,121-3,688 in the second. The study found that while new teachers were rated similarly by public and private school principals, experienced teachers were rated significantly higher by private school principals than by public school principals. These results were not followed up by an analysis of actual attrition in public versus private schools, however, or by an analysis of whether private schools were able to retain a higher-quality staff.

4. **Ingersoll (2001b)** employed both a *simple descriptive study* and *regression analysis* in analyzing the relative impact of a number of factors on the retention or attrition of 5,643 teachers who participated in the 1990-91 Schools and Staffing Survey and the 1991-92 Teacher Follow-up Survey. The study found that private schools had higher annual turnover of their teachers (18.9%) than did public schools (12.4%). This included both teachers who left the profession and teachers who moved to another school. The bulk of the difference was made up of those who left teaching; both private and public schools had about 7% annual rates of teachers moving to other schools. Among private schools, non-Catholic religious schools had the highest turnover at 21.5%, with Catholic schools at 17.7% and non-sectarian schools at 16.1%. There was a dramatic difference between large and small private schools. Large private schools (600 or more students) had a 9.8% annual average turnover, and small private schools had a 22.8% annual average turnover. Of all school categories studied, large private schools had the lowest rate of teachers moving to other schools (about 3%), while small private schools were comparable to public schools in the rate of teachers moving to other schools (about 8%). The study also found that mathematics and science teachers in public schools were more likely than other teachers to leave their jobs, but not so in private schools. In addition, male and minority teachers were more likely than other teachers to leave the jobs in private schools but less likely to leave their jobs in public schools. And private school teachers were more likely than public school teachers to leave the teaching profession altogether. In fact, teachers in small private schools left teaching at well over twice the rate of teachers in high-poverty urban schools (15% versus 5.7%). Finally, the study found that far more teacher turnover in small private schools was linked to job dissatisfaction than in high-poverty, urban public schools, with low salaries being the most prominent source of dissatisfaction in small private schools.

5. **Shin (1995)** was a *simple correlational study*, using a technique called "survival analysis," of data on 455 current K-12 teachers and 331 former K-12 teachers who participated in the 1986 follow-up questionnaire in the National Longitudinal Study of the High School Class of 1972. The study found higher teacher retention rates at public schools than at private schools. The median stay for first-time teachers was 8.26 years at public schools compared to 3.83 years at private schools. One of the problems with this study, however, is it did not control adequately for the influence of other potentially important factors.

➢ ***With regard to the influence of the ethnic and socioeconomic composition, school size and the academic performance of the students on teacher recruitment and retention***

Ten studies, which met the criteria of acceptability for this report, addressed these factors:

1. **Berry, Noblit and Hare (1985)** was a *simple descriptive study* based on interviews with 180 individuals in the Southeast, including district central office administrators and school principals. The study found the primary reasons cited for dissatisfaction were difficulty in handling disadvantaged children or disciplinary problems in the classroom.

2. **Hanushek, Kain and Rivkin (2001)** combined a *simple descriptive study* and *regression analysis* in their study of 378,790 Texas teachers between 1993 and 1996. The study found that school characteristics played a large role in influencing teacher movements across schools and exits from the system. Schools serving academically disadvantaged students and high minority enrollments had greater difficulty retaining teachers than high-achieving, low minority schools. This apparently was due mainly to the movements of white teachers (the majority), who appeared to gravitate toward schools with non-minority, higher-income students. African American teachers, on the other hand, tended to move into schools with a greater proportion of black enrollment than the schools they left.

3. **Ingersoll (2001a)** found that large schools had lower attrition rates than small schools. In addition, the study found that wealthier schools and rural schools tended to experience less teacher turnover than poorer schools or urban schools.

4. **Ingersoll (2001b)** discovered there was a dramatic difference in teacher turnover between large and small private schools. Large private schools (600 or more students) had a 9.8% percent annual average turnover, and small private schools had a 22.8% annual average turnover. The study found that teachers in small private schools left teaching at well over twice the rate of teachers in high-poverty urban schools (15% versus 5.7%). Finally, the study found that far more teacher turnover in small private schools was linked to job dissatisfaction than in high-poverty, urban

public schools, with low salaries being the most prominent source of dissatisfaction in small private schools.

5. **Murnane et al. (1991)** found that large, poor, urban districts had high attrition rates and were less successful at retaining their white teachers than their non-white teachers.

6. **Rees (1991)** employed *regression analysis* in his examination of data on 49,396 full-time, tenured teachers (all under the age of 55) who taught in New York State between 1975 and 1978. The study found that teachers of below-average students and teachers in urban districts had higher probabilities of leaving than teachers of above-average students or those in suburban districts. In addition, increases in county unemployment rates were linked to a reduced probability of quitting.

7. **Shen (1997)** was a *discriminant analysis* of data on 3,612 teachers who participated in the 1990-91 Schools and Staffing Survey and the 1991-92 Teacher Follow-up Survey. The study found that teachers who stayed in the same school from 1991 to 1992 were more likely than teachers who left during that period to be teaching in schools with fewer inexperienced teachers and lower percentages of minorities and free-lunch eligible students.

Most of the previous studies support the notion that schools with more minority students and lower academic achievement have higher teacher attrition rates. The following study provides contradictory findings, though the methodology used in the study casts some doubt on the interpretation placed on the findings.

8. **Shin (1995)** found that teachers in schools with higher proportions of low-ability students stayed about a year longer than teachers in schools with high-ability schools. In addition, the study found that teachers in schools with mixed economic-status populations stayed nearly twice as long as teachers in schools with student populations that were strictly higher or strictly lower in socioeconomic status. The study also found that smaller schools had more teacher attrition than larger schools. [Note: The precise definitions of “smaller” and “larger” could not be found.] Median survival times were 5.3 years at smaller schools and 7.3 years at larger schools. The study has important methodological shortcomings, however, as noted above.

One study looked at the distribution of teacher qualifications across different types of schools and districts as related to attrition:

9. **Carroll, Reichardt and Guarino (2000)** was a *regression analysis* of data on over 107,000 K-12 teachers from a sample of 738 school districts in California who were employed in 1994 or 1995 and data on some 36,500 teachers who were newly hired by those districts in 1995 or 1996.

The study found higher attrition and vacancy rates in high-minority districts. The higher the percentage of African American students in a teacher's school, the greater the likelihood the teacher would leave the district. Within a district, the higher the percentage of African American or Hispanic students in a teacher's school, the greater the likelihood that the teacher would transfer to another school in the district with a lower percentage of minority students. Also, districts serving a very large number of Hispanic students were found to have the greatest difficulty filling teaching vacancies. And the likelihood that a newly hired teacher had a teaching credential was found to decrease as the percentage of African American and Hispanic students in a school increased. It should be noted that the study did not find a consistent relationship across grades and years studied between teacher attrition and the percentage of students in a school eligible for free lunch.

One study noted a marked difference in the qualifications of teachers between low-performing and higher-performing schools and between schools with high and low percentages of poor and minority students:

10. **Lankford, Loeb and Wyckoff (2002)** was a *simple correlational study* that analyzed data from several different sources on every teacher in New York State (approximately 180,000 annually) between 1984-85 and 1999-2000. The study found that both between districts and within districts, the schools with the largest percentages of poor and minority students tended to have the least-qualified teachers according to such measures as teachers' failure on examinations of general knowledge, lack of certification in any courses taught and competitiveness of the college from which teachers graduated. In New York City, for example, 26% of non-white students and 30% of poor students had teachers who failed a general knowledge examination compared to 16% of white students and 21% of non-poor students. The study also found that schools in which more than 20% of students scored at the lowest level on the state's 4th- and 8th-grade English Language Arts examination had consistently less-qualified teachers than other schools. The study found, for example, that 35% of the teachers in the lowest-performing schools had failed general knowledge examinations compared to 9% in the highest-performing schools.

What It Means for Policy

Several findings in the research literature bring forth important implications for policy. While educators and policymakers should not take for granted the evidence that elementary education teachers remain in their field, the markedly greater attrition among secondary school teachers clearly implies the need to focus greater effort on the retention of the latter. As noted in the previous discussion of Question 2, this is particularly true in mathematics and science.

Second, the literature reviewed for this chapter confirms the importance of efforts to pay particular attention to the recruitment and retention of teachers in schools with high percentages of low-income and minority students.

Third, although the reasons are not clear, the fact that attrition in smaller schools is greater than in larger schools and greater in private schools than in public schools should raise a caution among those who advocate for a reduction in school size and among those who advocate for greater school privatization. While either of these might be reasonable policy alternatives, it would be important to determine with greater confidence the impact moving in either direction would likely have on the supply and retention of our nation's teachers.

Supporting Resource

Levin, J. and Quinn, M. (2003). *Missed Opportunities: How We Keep High-Quality Teachers Out of Urban Schools.* The New Teacher Project.

Question 4:

What impact do the working conditions in schools have on their ability to recruit and retain teachers?

RELATED QUESTIONS:

How important are teacher autonomy and administrative support? How important is class size? How important are student characteristics and attitudes?

Quick Answer

On the whole, the research literature relating to this question is not sufficiently robust or fine-grained to support more than the most general observations relating to the impact of various factors associated with working conditions on teacher recruitment and retention. The research does provide **limited support** for the expected conclusion that schools with greater administrative support and teacher autonomy have lower teacher attrition. The research also provides **limited evidence** that the higher the minority enrollment of a school, the higher the rate of teacher attrition – at least among white teachers. Similarly, there is **limited evidence** that attrition is greater in schools with higher levels of student poverty and also in schools with low student achievement.

While there remains a good deal of interest in class size reduction as a means of improving teacher working conditions and thus, presumably, increasing teacher retention, the literature in support of such a strategy must be judged to be **inconclusive**. Several studies indicate class-size reduction curbs teacher attrition, but the actual impact reported is extremely small. A reduction in teachers' workload also is often touted as a measure that will increase teacher satisfaction and thereby reduce attrition, but here, too, the literature in support of this contention is **inconclusive.**

Although the research evidence in support of the impact on teacher recruitment and retention of any single factor or set of factors related to working conditions is modest, at best, there is sufficient research to indicate the working conditions of teachers should be an important policy concern, especially in at-risk schools. One measure that seems important in view of the overwhelming percentage of white teachers in the workforce is to provide effective training for white teachers – either preservice or inservice – in handling student diversity. Another measure likely to be helpful, though not discussed robustly in the research literature, is to provide teachers with strong administrative support and adequate autonomy. The fact that "adequate autonomy" is a somewhat subjective determination indicates the importance of considering teachers' perceptions of their working conditions, as well as more objective measures, in setting policy objectives.

Finally, although the research literature provides no guidance on the issue of class size, it seems reasonable to suppose that larger classes are less negative a factor if working conditions are otherwise conducive to teacher satisfaction. This may imply that policymakers should attempt to determine which measures to increase teachers' job satisfaction are most cost effective and most

feasible given demographic realities, the labor market considerations and the availability of various resources in their particular state or district.

Significance of the Question

The difficulty of the working conditions in some schools, especially low-income urban schools, has been legend for many years. Increasingly, however, there are stories about difficulties in suburban and small city schools. In fact, almost all the highly publicized incidents of school violence in the last several years have been in such schools. The stories that make the news and capture public attention, of course, tend to be the most sensational. The great majority of our nation's public schools, however, do not have classes meeting in the halls or children sitting on the floor without desks for lack of space. They do not have students threatening their peers and teachers with knives or plotting horrific acts of retaliation against students and faculty who have "dissed" them.

Nevertheless, many schools, particularly core inner-city schools, are increasingly challenging places to teach. The impact of budgetary problems is well-documented and evidenced by decaying school facilities, outdated equipment, a shortage of up-to-date text books, decreases in student support services and increases in class size. The increased number of second-language learners, the integration of significant numbers of special-need students into the regular classroom, the increased proportion of urban school children living in or near poverty, and the large number of students who come to school unready to learn or lagging far behind many of their peers in basic academic skills and knowledge all mean that today's teachers have to respond to an unparalleled and daunting diversity of student abilities and needs. Many schools are poorly administered and provide teachers with inadequate instructional support.

The expectation, in the No Child Left Behind era, that schools be held accountable for ensuring all students are learning has made it painfully clear that a large number of schools are failing their responsibility, and the often-demoralized teachers and administrators in failing schools face mounting pressure to correct the problem. A 2004 ECS study, *Teacher Perceptions of the Working Environment in Hard-to-Staff Schools*, found a strong correlation between the schools in North Carolina that were identified as "hard-to-staff" and teachers' negative rating of school working conditions. And it likewise found a strong correlation between teacher's negative perceptions of their work environment and student performance in that the students in those schools identified as having poor working conditions by the teachers inevitably performed more poorly than students in non-identified schools.

As noted in the Introduction to this report, there is a skewed distribution of well-qualified teachers with far more marginally qualified teachers in schools with high percentages of low-income, minority children. A subsequent assumption may be that the difficulties of teaching in these schools makes it difficult for them to recruit and retain highly qualified teachers. If that is the case, which factors related to working conditions are the most powerful influences on teachers' decisions to go or stay? In particular, what are the impacts of teacher autonomy, administrative support, class size, and student factors such as attitudes, skills and discipline?

The purpose of this chapter is precisely to address such questions. Subsequent chapters will look at what the research tells us about the effectiveness of various kinds of policies and programs states and districts have implemented to try to retain teachers in schools with difficult working conditions. These include strategies such as mandatory induction and mentoring programs and various financial incentives and career-advancement opportunities (such as advanced certification status that may carry salary raises or bonuses) to keep teachers in traditionally hard-to-staff schools.

What the Research Says

The research that relates to this question is grouped according to its response to four categories of school climate factors:

1. Teacher autonomy and administrative support
2. Class size
3. Student factors such as attitudes, skills, discipline, student poverty and diversity
4. Other factors.

The distinction between these factors is somewhat artificial. Class size and discipline, for example, are often interrelated; the smaller the class, the easier it may be for a teacher to prevent disruptions by providing more individualized student attention. Similarly, if student poverty and diversity are factors in whether teachers remain at or leave a certain school, it may not be the poverty and diversity, in and of themselves, that are the key reasons but rather student discipline problems and other conditions that are more prevalent where student poverty and diversity are high. Thus, the research relevant to one set of factors often will be relevant to another. Nevertheless, the distinctions are useful because they capture sets of conditions that differ from one school to the next and may well relate to teachers' job satisfaction and commitment.

Another factor to keep in mind in assessing the significance of the research literature related to the impact of working conditions on teacher recruitment and retention is that much of the literature reviewed in relationship to this topic focused on beginning teachers. Some of the research that involved veteran as well as novice teachers, however, indicates the impact of the various factors related to working conditions may differ as a function of a teacher's experience. Conditions that a beginning teacher finds stressful, for example, may be of little consequence to a veteran teacher. On the other hand, the idealism of newer teachers may overcome the negativity of conditions that more sanguine, experienced teachers find less tolerable. Also, the relative importance of various factors may change depending upon the teacher's length of service.

Similarly, the research indicates that the impact of some of the working condition factors cited may vary depending upon a teacher's ethnic background or gender.

On the whole, however, the research is not robust or fine-grained enough to support more than the most general observations about the impact of the various factors associated with working conditions on teacher recruitment and retention.

DISCUSSION

➢ ***With regard to the presence of teacher autonomy and administrative support***

Nine studies reviewed for this report addressed the issue. The studies provide **limited support** for the expected conclusion that schools with relatively greater administrative support and teacher autonomy have lower levels of teacher attrition. Several studies also noted the importance of teachers' perceived influence over school decisions as a factor affecting their retention. Interestingly, Shen (1997) discussed the circularity at play here; teachers who had more influence remained longer in the same school, and teachers who remained longer in the same school were more likely to have perceived they had influence. One study (Gritz and Theobald, 1996) found greater attrition among beginning teachers in schools where there were more instructional aides, but the researchers explained this by saying beginning teachers may have perceived the need to supervise aides as an added burden that diminished their autonomy, even if the aides were intended to provide increased instructional support.

One of the limitations of the studies reviewed in relationship to this question is all but one (Seyfarth and Bost, 1986) involved teachers' perceptions of their autonomy and administrative support rather than any independent measures of the actual autonomy and support provided. And while school administrators and policymakers may have some ability to manipulate school inputs to increase the autonomy of teachers and the efforts administrators make to support them, they have much less control over how teachers respond to these efforts. This indicates clearly, however, that the perceptions of teachers are extremely important and also must be addressed.

➢ ***With regard to the impact of class size***

The 10 studies that addressed this issue provide evidence that, on the whole, must be judged to be **inconclusive**. While six of the studies found a statistical correlation between an increase in class size (or an increase in the student-to-teacher ratio) and teacher attrition, two studies (Hanushek, Kain and Rivkin, 2001; Stinebrickner, 1998 and 1999) found no *statistically significant* correlation. Moreover, one of the six studies (Theobold, 1990) found that while extremely large student-to-teacher ratios were associated with teacher attrition, actual efforts to reduce class size also were associated with teacher attrition. There also was clear disagreement among the six studies about the impact of class size in comparison to the impact of other factors related to working conditions. Kirby, Berends and Naftel (1999) indicated the impact of larger class sizes was comparable to the impact of other key factors. Mont and Rees (1996) found the impact of class size to be an important factor but less pronounced than that of several others. Ingersoll (2001a), which was the only study in which teachers were actually asked what impact class size had on their decision to leave their position, found the impact of larger class sizes to be relatively minimal. Two other studies looked at the impact of class size on teacher's decisions to take a position in a particular district – in other words, on teacher recruitment. While one of these studies (Lankford, Loeb and Wyckoff, 2002) found evidence that teachers were more likely, in some but not all instances, to transfer to districts with smaller class sizes, the other study (Beaudin, 1995)

actually found that an increase in the district's class size was correlated with a greater likelihood of teachers accepting a position there.

➢ ***With regard to the impact of student-related factors (diversity, affluence, attitude, skill, behavior)***

Seventeen studies reviewed for this report addressed the relationship of student factors and teacher attrition. Several circumstances made it difficult to draw clear conclusions from this research, however.

First, not all the studies addressed the same student-related factors, so the actual number of studies supporting the impact of any single factor was small. Moreover, it was not always clear whether studies that seemed to address similar factors were in fact looking at the same *independent variable*. Rees (1991), for example, looked at the impact of teaching in urban districts on attrition, but it is not clear whether that implies the impact of teaching in a school with a significant percentage of minority students or low-income students. Similarly, Shen's (1997) focus on the impact of teaching in a school with a large percentage of students eligible for free and reduced-price lunch is related to, but not exactly the same as, Theobold's (1990) focus on the impact of teaching in districts with different assessed property valuations. And it is not clear when Johnson and Birkeland (2003) talk about the impact of lack of "student seriousness about school" whether this is the same factor as the lack of "student motivation" described by Ingersoll (2001a) and whether it might be related to the impact of low student academic performance cited in several other studies.

Second, the studies that addressed the same variables or factors did not completely agree on their relative significance. While several studies, for example, pointed to the clear negative impact of student discipline problems on teacher retention, Evans (1987) and Shen (1997) found student behavior not to be a particularly strong factor.

Finally, it is quite likely the different school and student factors are related to one another and may be interdependent, thus complicating the discussion of their impact on teacher recruitment and retention. There is likely to be a correlation, for example, between high levels of poverty and diversity at a school and student discipline problems. Similarly, many of the other factors that have an adverse impact on school climate are characteristic of schools with high percentages of low-achieving students. Though the *statistical analysis* used in many of these studies attempts to uncover this sort of interdependence, it still may be unclear precisely which factors play the most important role in teacher attrition.

The factor that appears to have the most evidentiary support for its impact on teacher attrition is the ethnic composition of the student body. A number of studies provide **limited evidence** that the higher the minority enrollment of a school, the higher the rate of teacher attrition – at least among white teachers. While most of those studies found this to be a relatively strong correlation, not all of them did. Moreover, two studies (Boe et al., 1997; Ingersoll and Alsalam, 1997) found no such correlation, though Ingersoll and Alsalam asked about satisfaction with teachers' decisions to enter the teaching profession and not about satisfaction with their actual job. Nor was it clear from the studies that did find such a

correlation whether it was greater for beginning teachers or more experienced teachers or for male or female teachers. One study (Lankford, Loeb and Wyckoff, 2002) found that schools with larger proportions of poor, minority or low-performing students tended to have teachers whose qualifications were substantially inferior to the qualifications of teachers in other schools.

The studies reviewed for this report also provided **limited evidence** that the attrition rate of teachers is greater in schools with higher levels of student poverty, although once again not every study found this correlation to be strong. Ingersoll (2001a), however, found the rate of teacher turnover in high-poverty public schools was 45% greater than the turnover rate in more affluent schools. One study (Johnson and Birkeland, 2003) that found a correlation between student poverty and teacher attrition also found that teachers frequently said it was not the poverty of the students that was the problem but the greater faculty instability and the lack of resources at higher-poverty schools. And one study (Theobold, 1990) had a seemingly contrary finding, namely, that teachers were more likely to leave their job in a district with a high assessed property valuation than in a district with a low assessed valuation.

The one other student factor for which there seemed to be **limited evidence** of an impact on teacher attrition was student achievement. A number of studies noted a correlation between low student achievement and teacher attrition, and one study (Hanushek, Kain and Rivkin, 2001) found student achievement to be one of the strongest factors related to teacher attrition or retention. Several other studies discussed the impact of student motivation on teacher attrition, a factor that may well be related to student achievement.

Only four studies noted that poor student discipline played a role in teacher dissatisfaction or attrition, and not all of those studies found it to be a strong factor. Thus, the research must be judged to be **inconclusive** about the importance of this factor, especially in relationship to the other factors mentioned.

➢ ***With regard to the impact of other factors***

Five studies reviewed looked at the impact of a number of other factors on teacher recruitment and retention. These included such things as workload, faculty culture, the adequacy of instructional materials, the physical condition of the school and the percentage of classes taught in a teacher's area of certification. Although four studies noted the role an inappropriate or excessive workload had in contributing to teacher dissatisfaction, it is not clear how great a factor this might be in leading to attrition. And there were only one or two studies that even mentioned any other factors. Thus, in the final analysis the evidence for the impact of any of these considerations on teacher retention must be judged **inconclusive**.

SUMMARY OF STUDIES

➢ ***With regard to the presence of teacher autonomy and administrative support***

Nine studies, which met the criteria of acceptability for this report, addressed this issue:

1. **Gritz and Theobald (1996)** employed a *regression analysis* of data on the careers of 9,756 white teachers in Washington State from their entry into teaching between 1981 and 1990 through the 1991-92 school year. The study found the beginning teachers were more likely both to leave their first position and leave the public school system in those districts that increased spending on paraprofessionals without increasing teacher salaries. Gritz and Theobald suggest this result is best explained by the hypothesis that young teachers feel burdened by the extra responsibility of supervising aides in the classroom (and thus feel they have less autonomy). The study also found that beginning teachers are more likely to leave those districts that increase spending on central administration and districtwide supervision.

2. **Hall, Pearson and Carroll (1992)** was a *discriminant analysis* of survey data on 369 public school teachers who were teaching in a large urban Florida school district during the early 1990s. The survey asked teachers whether or not their long-range career plans were to continue in the teaching profession. Among the several factors that distinguished between those teachers who said they planned to quit and those who said they planned to remain in the profession were their satisfaction with the level of their perceived autonomy and with the school administration.

3. **Ingersoll (2001a)** employed both a *simple descriptive study* and *regression analysis* in analyzing the relative impact of a number of factors on the retention or attrition of 5,643 teachers who participated in the 1990-91 Schools and Staffing Survey and the 1991-92 Teacher Follow-up Survey. The study found there were lower rates of teacher attrition in schools where there was greater administrative support, more faculty influence and greater faculty autonomy.

4. **Ingersoll and Alsalam (1997)** was a *regression analysis* of data on 53,347 teachers in 11,589 schools who participated in the 1990-91 Schools and Staffing Survey. The study found a positive correlation between teachers' satisfaction with their decision to become a teacher and the degree of teacher autonomy and faculty influence perceived by the teachers in their schools.

5. **Johnson and Birkeland (2003)** was a *simple descriptive study* of 50 new public school teachers in Massachusetts who were first interviewed in 1999 and again in 2000 and 2001. The teachers represented a diversity of school settings, grade levels, ages and educational backgrounds. The study found that 11 (22%) of the teachers had left teaching altogether by the end of their second year, the majority after their first year. Another 11 teachers had either left their school at the end of three years, eight voluntarily and six of those to different districts. All the movers moved to schools with a more affluent student population. Of the 28 (56%) remained in teaching,

15 were dissatisfied with their schools or with teaching as a career. The main reason given by teachers who quit teaching or moved was a feeling of ineffectiveness, which they attributed primarily to inadequate administrative support, inappropriate teaching assignments or excessive teaching loads, and lack of curricular and other resources. The teachers who remained generally did feel effective. Those who remained but were dissatisfied with their schools cited the same problems as the teachers who left, while those who remained but were dissatisfied with teaching as a career noted additional factors such as low pay, lack of respect for the profession and students' lack of seriousness about school.

6. **Kirby, Berends and Naftel (1999**) involved both a *simple descriptive study* and a *regression analysis* of data on 98,951 teachers in Texas who were followed from 1980-96. In looking only at cohorts of new teachers for each year between 1987 and 1995, the study found a 1% increase in support staff was correlated with a 2-9% decrease in teacher attrition and a 1% increase in district administrative staff was correlated with a 5-6% *decrease* in teacher attrition. The rates of attrition varied with the racial and ethnic background of the teachers. Minority teachers tended to be impacted more by changes in working conditions than white teachers, a finding the researchers attributed to the fact that minority teachers tend to work in districts with fewer resources and more difficult conditions. As a point of comparison, the study found that a $1,000 increase in salary was correlated with a 1-6% decrease in attrition.

7. **Seyfarth and Bost (1986)** was a *simple correlational study* based on a survey of 126 district superintendents in the same Middle Atlantic state. The study found that teacher turnover was lower in districts that offered teachers leaves of absence, optional inservice workshops or dedicated planning time. The correlation between these factors and lower turnover was much weaker than the correlation between higher beginning salaries and reduced turnover, however.

8. **Shen (1997)** was a *discriminant analysis* of data on 3,612 teachers who participated in the 1990-91 Schools and Staffing Survey and the 1991-92 Teacher Follow-up Survey. The study found that teachers who stayed in the same school from the 1990-91 through the 1991-92 school year were more likely than teachers who left to perceive that they had influence over school- and teaching-related policies and that administrators understood their problems.

9. **Weiss (1999)** was a *regression analysis* of data on 5,088 first-year teachers who participated in either the 1987-88 or the 1993-94 Schools and Staffing Survey. The study found that teachers' perceptions of (1) the supportiveness of school leadership and culture, and (2) the degree of their autonomy and discretion in making decisions about various school and instructional practices and policies were among the principal factors associated with high teacher morale (indicated by teachers' perceptions that it was worthwhile to give their best effort). Teachers' perceptions of

school leadership and culture also were strong predictors of their sense of commitment to teaching and their stated intention to remain in teaching.

➢ ***With regard to the impact of class size***

Ten studies, which met the criteria of acceptability for this report, addressed this issue:

1. **Beaudin (1995)** was a *regression analysis* of data collected in 1985 from 898 teachers in Michigan public schools who started their careers in the early-to-mid 1970s, left teaching within the first four years and had returned by 1985. The study found that a number of factors seemed to influence whether a teacher returned to their original district when they resumed teaching or moved to another district. One of these factors was student-teacher ratio. Every increase of one student in the ratio in a teacher's original district was correlated with a 1.7% increase in the likelihood of their return – a somewhat counterintuitive finding Beaudin attributes to the possibility that districts with higher student-teacher ratios simply had more teaching positions available (not that higher student-teacher ratios were inherently preferable to teachers).
2. **Grissmer and Kirby (1992)** involved both a *simple descriptive study* and a *regression analysis* of data on all Indiana public school teachers between 1965 and 1988. There were approximately 43,500 teachers in 1965 and 52,000 in 1988. Over the 23 years surveyed, the study found a correlation between teacher attrition and class size. The average class size in Indiana public schools declined 24%, from 25.8% in 1965 to 19.5% in 1986. The average rate of teacher attrition during that period fell from 12.4% to 5.6%.
3. **Hanushek, Kain and Rivkin (2001)** combined a *comparative descriptive study and regression analysis* in their study of 378,790 Texas teachers between 1993 and 1996. Though none of the factors they looked at seemed to have a large impact upon teacher attrition, they found little evidence that class size was a significant factor, at all.
4. **Ingersoll (2001a)**, as part of his *comparative descriptive study*, examined the reasons for departure given by the 5,643 teachers who either left the profession or changed schools. Among the many factors, class sizes that were too large were given as a reason by 6% of those who changed schools and 13% of those who left. A number of other factors were cited much more frequently: poor salary (47% and 45%); inadequate administrative support (38% and 30%); student discipline problems (18% and 30%); lack of student motivation (10% and 38%); lack of faculty influence (13% and 18%); inadequate time to prepare (10% and 23%).

5. **Kirby, Berends and Naftel (1999)** found that an increase of one point in the student-teacher ratio (e.g., from 16:1 to 17:1) was correlated with a 3-7% increase in teacher attrition.

6. **Lankford, Loeb and Wyckoff (2002)** was a *simple correlational study* that analyzed data from several different sources on every teacher in New York State (approximately 180,000 annually) between 1984-85 and 1999-2000. The study looked specifically at the cohort of teachers hired in 1993 and found that those teachers transferring between districts in New York State between 1993 and 1998 tended to move to districts in which class size averaged approximately two students smaller. Teachers in the New York City area who transferred to another district moved to districts in which classes averaged nearly six fewer students. The difference in the size of classes when teachers statewide transferred schools within their districts was negligible.

7. **Mont and Rees (1996)** was a *regression analysis* on data gathered from 1979-89 on the careers of 525 New York State high school teachers hired in one district outside New York City in 1979. The study found that an increase in the average class size (20.76) by 40% was correlated with a 67% increase in the rate of teacher attrition from the district. Increasing the average class size by 20% was correlated with a 16% increase in the attrition rate.

8. **Rees (1991)** employed *regression analysis* in his examination of data on 49,396 full-time, tenured teachers (all under the age of 55) who taught in New York State between 1975 and 1978. The study found there was a very small correlation between a reduction in class size and a reduction in teacher attrition. A reduction in the state average class size by 63% (from 27 to 10) would be predicted to decrease the probability of a teacher leaving the district by 3%. An increase in the average class size by 63% would be predicted to increase the likelihood a teacher would leave the district by 4%.

9. **Stinebrickner (1998, 1999)** employed *regression analysis* on data from the National Longitudinal Study of the High School Class of 1972 on 341 individuals who were certified to teach and were followed until 1986. The study found the correlation between an increase in the student-to-teacher ratio and a reduced stay in teaching was very small and not *statistically significant*. [Note: This is essentially the same study published in two different journals.]

10. **Theobold (1990)** employed *regression analysis* in his study of 37,321 K-12 teachers in the state of Washington in 1984-85, 37,696 in 1985-86 and 38,378 in 1986-87. The study found that extremely large pupil-to-teacher ratios were associated with teacher attrition. On the other hand, it also found that efforts to reduce class size also led to teacher attrition.

➢ ***With regard to the impact of student-related factors***

Seventeen studies reviewed touched upon this issue:

1. **Beaudin (1995)** found that black teachers who had left teaching were more likely than white teachers who had left teaching to return to their original district, particularly if that district had a higher percentage of black residents. Each 1% increase in the proportion of black residents in a district was correlated with an increase of 6.9% in the probability a black teacher would return and a very slight decrease of .02% in the probability a white teacher would return.

2. **Berry, Noblit and Hare (1985)** was a *simple descriptive study* based on interviews with 180 individuals, including 82 teachers who had left a large public school district in the Southeast in the early 1980s. The study found the primary reasons the teachers cited for dissatisfaction were difficulty in handling disadvantaged children or disciplinary problems in the classroom.

3. **Boe et al. (1997)** was a *simple correlational study* of attrition among 639 special education teachers and 4,159 general education teachers who participated in the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Follow-up Survey. The study found no association between the percentage of minority enrollment and teacher turnover, with the data *aggregated* to the national level.

4. **Evans (1987)** was a *comparative descriptive study* that investigate the attitudes of 98 engineering freshmen at a medium-sized Midwestern university in 1983 toward science or mathematics teaching as a career choice. On the basis of a survey questionnaire, Evans distinguished those students who expressed interest in teaching at some point and took some action to explore that interest from those who were not interested in teaching. Perceived disciplinary problems were cited by both groups of students as a factor discouraging them from going into or considering teaching, but this was ranked much lower as a deterrent than low salary, monotony of the classroom routine, poor job security and lack of job prestige.

5. **Galchus (1994)** was a *regression analysis* of school-related data in 75 Arkansas counties from the 1984-85 school year. The study attempted to look at both the factors that had an impact on the demand for well-qualified teachers in a county and the factors that had an impact on teachers' desire to teach in the schools in that county (the supply side). A well-qualified teacher (actually, a minimally competent teacher) was defined as a teacher who had passed the state's basic skills test. On the supply side, the study found the pass rate of a county's students on the reading portion of the Arkansas Minimum Performance Test had the greatest impact of any of the factors correlated with the percentage of

teachers in the county who had passed the state's basic skills test. In other words, the more capable the students, the more teachers wanted to work with them and, thus, the more capable overall the teacher workforce. Though this study passed the criteria for inclusion, questions about its methodology, however, raise doubts about the validity of its findings.

6. **Hanushek, Kain and Rivkin (2001)** found student achievement to be one of the most influential factors, significantly more so than salary or class size. Higher average student achievement is correlated strongly with reduced teacher attrition for both novice and more experienced teachers. The study also found that white teachers – especially beginning teachers – are more likely to move from schools with a high-minority student population, while black and Hispanic teachers are less likely to move from schools with a high percentage of minority students.

7. **Hounshell and Griffin (1989)** was a *simple descriptive study* that involved interviews of 37 individuals who graduated from the supervised science student-teaching program at the University of North Carolina – Chapel Hill between 1977-83 but who either had never taught or were no longer teaching. The study found that almost half of the teachers interviewed found teaching to be less satisfying than they had expected. Problems with student discipline and student apathy contributed to the dissatisfaction of the teachers who left the profession, though they were not mentioned as frequently as poor compensation. (Note: The very small *sample size* of this study limits the generalizability of its conclusions.)

8. **Ingersoll (2001a)**, as part of his *comparative descriptive analysis*, found that 18% of the teachers who changed schools and 30% who left the profession cited student discipline problems as an important factor in their decision. Similarly 10% of the teachers who changed schools and 38% who left the profession cited lack of student motivation as an important factor. In addition, and perhaps related to these factors, Ingersoll found the rate of teacher turnover in high-poverty public schools was 45% greater than in more affluent schools.

9. **Ingersoll and Alsalam (1997)** found no association between either the percentage of minority enrollment or poverty enrollment in a school and teachers' satisfaction with their decision to go into teaching.

10. **Johnson and Birkeland (2003)** found that all the teachers in their study who moved to other schools ended up in schools with significantly more affluent student populations. On average, the schools they transferred to had 46% fewer students eligible for free and reduced lunch. The teachers said they were not seeking wealthier students but, rather, schools with more stable faculties and greater resources. The study also found that teachers who remained in their schools but expressed dissatisfaction with teaching as a profession cited lack of student seriousness about school as one of the factors contributing to their dissatisfaction.

11. **Lankford, Loeb and Wyckoff (2002)** found that those teachers newly hired in 1993 who transferred between districts in New York State between 1993 and 1998 tended to move to districts in which the proportion of poor and non-white students was about 50-60% smaller than in their old districts. For teachers in the New York City area who changed districts, their new districts had an average of one-third the proportion of poor students and one-half the proportion of minority students. For within district transfers statewide, schools to which teachers transferred had on an average of 4% fewer poor students and 2% fewer non-white students. The study also found that schools with larger proportions of poor, minority or low-performing students tended to have teachers whose qualifications were substantially inferior to those of teachers in other schools – lack of certification, failure on general knowledge examinations, graduation from less competitive colleges.

12. **Mont and Rees (1996)** found higher levels of student quality – as defined in relationship to their perceptions of the "average" student by each teacher in the database – reduced significantly the probability that teachers would leave. The study also found a strong correlation between the percentage of white students and teacher attrition; for less-experienced teachers, in particular, there was a much greater tendency for attrition rates to increase as the percentage of white students decreased.

13. **Rees (1991)** found that teachers who are primarily responsible for teaching below-average students and teachers who work in urban districts have a higher probability of leaving their job.

14. **Rumberger (1987)** was a *regression analysis* of combined data on 453 school districts in large metropolitan areas that was taken from the U.S. Department of Education's 1978-79 Merged Federal File, the 1980 U.S. Census, the 1982 Census of Governments and the 1983-84 Survey of Teacher Demand and Shortage. Using engineering and teaching as occupational alternatives for college graduates with mathematics and science backgrounds, the study found the proportion of newly hired teachers (a measure of teacher turnover) is higher in districts with larger percentages of minority students. While *statistically significant*, however, the impact of minority student enrollments was much weaker than that of other factors. Moreover, this factor is not significant in all states.

15. **Shen (1997)** found that teachers were significantly more likely to move to other schools or leave the profession if they taught at schools with a higher percentage of minority students or a higher percentage of students receiving free lunches. She did not find a strong correlation, however, between teacher attrition and teachers' perceptions that student behavior or lack of family support were problems at their school.

16. **Theobold (1990)** found a strong relationship between the assessed property valuation in a district and the decisions of its teachers to stay or leave. It found that teachers in a wealthy district were significantly more

likely to leave their job the following year than teachers in a poorer district. The study suggests a number of possible explanations for this finding, which seems to contradict much of the other research literature. The average percentage of minority students in the districts was quite small (less than 5% for all minorities), but the study did find some correlations between the percentage of minority students and teacher attrition. The attrition of male teachers tended to increase as the percentage of African American or Hispanic students in a district increased. The attrition of male teachers tended to decrease as the percentage of Asian students increased. And the attrition of female teachers tended to decrease as the percentage of Native American students increased.

17. **Weiss (1999)** found that teachers' perception of the school climate, including student behavior, had a strong association with teacher morale and often with teachers' expressions of satisfaction with their career choice and intentions to stay or leave.

➢ ***With regard to the impact of other factors***

Five studies reviewed for this report cited several other working condition-related factors as having potential impact on teacher recruitment or retention:

1. **Berry, Noblit and Hare (1985)** listed a variety of reasons teachers gave for being frustrated about their working conditions, including the amount of paperwork, too many responsibilities, too heavy a workload, the lack of a planning period, inadequate supplies and not feeling valued or appreciated. These were not the primary reasons teachers gave for leaving the district, however; the student-associated factors cited above were more significant.
2. **Hounshell and Griffin (1989)** found that excessive time commitments and a larger workload than expected contributed to teacher dissatisfaction.
3. **Johnson and Birkeland (2003)** found the teachers in their study who were most dissatisfied with their jobs cited inappropriate teaching assignments, excessive teaching loads and lack of curricular and other resources as important factors contributing to their dissatisfaction. Some teachers also cited low pay and lack of respect for the profession as negative factors. Those teachers who were most satisfied with their schools cited the importance of an "integrated professional culture," as opposed to a school culture that tended to be dominated by either novice or veteran teachers.
4. **Mont and Rees (1996)** found a small correlation between the percentage of classes teachers taught in their subject area of certification and teacher turnover. A decrease of 10% in the percentage of classes taught in a teacher's area of certification was correlated with a 3% increase in teacher

attrition. A decrease of 20% was correlated with an 11% increase in attrition.

5. **Seyfarth and Bost (1986)** found that teacher turnover was lower in districts in which school buildings were in good condition.

What It Means for Policy

Although the research evidence in support of the impact on teacher recruitment and retention of any single factor or set of factors related to working conditions is modest, at best, there is sufficient research to indicate the working conditions of teachers should be an important policy concern. Moreover, some of the considerations most often associated with high-poverty schools – low student achievement, a high percentage of minority students, inferior resources and faculty instability – are the most strongly correlated with teacher attrition. This implies that educators and policymakers should pay particular attention to the working conditions in these at-risk schools, which have the highest incidence of teacher turnover. To the extent, however, that working conditions involve student demographic factors, these will be very difficult to change and policymakers may have to focus on more clear policy-amenable levers such as compensation or professional development to compensate for them.

Another important finding from the research – also noted in the discussion of Question 2 – is minority teachers seem to be more comfortable than white teachers in schools with high percentages of minority students. Given that, as also noted in discussion of Question 2, it seems unlikely the percentage of minorities who enter teaching is going to increase substantially in the near future, one clear important policy and practice recommendation is to focus on providing effective training for white teachers – either preservice or inservice – in handling student diversity.

In the past several years, there has been increasing attention among educators and policymakers to the importance of providing schools and their faculties with good leadership, which is generally understood to include strong administrative support and adequate autonomy. While the research literature on this subject is not robust, it clearly supports the need to address it as a factor in teacher recruitment and retention and to take into consideration teachers' perceptions of their working situation in addition to more objective measures.

Finally, although the issue of class size continues to be an important policy discussion in states such as California and Florida, the research literature provides no guidance on the subject. This may well be an indication of the fact the impact of class size on a teacher's decision to take or leave a particular teaching position is affected by other factors that have a positive or negative influence on that decision such as student diversity, student motivation or achievement, and the quality of school leadership. It seems reasonable to suppose that every teacher ideally would like smaller rather than larger classes but that larger classes are less negative a factor if working conditions are otherwise conducive to teacher satisfaction. This may imply that, in addressing problematic working conditions, policymakers should attempt to determine which measures that increase teachers' job satisfaction are most cost effective and most feasible given demographic

realities, the labor market considerations and the availability of various resources in their particular state or district.

Supporting Resource

Glennie, E., Coble, C.R. and Allen, M. (2004, November). *Teacher Perceptions of the Work Environment in Hard-to-Staff Schools*. Denver, CO: Education Commission of the States. http://www.ecs.org/clearinghouse/55/87/5587.doc.

Question 5:

What impact does compensation have on the recruitment and retention of teachers?

RELATED QUESTIONS:

Does offering higher salaries increase the quality of teachers who are recruited and retained? How important is teacher compensation in teacher recruitment and retention as compared to other factors?

Quick Answer

The research provides **strong support** for the conclusion that compensation plays a key role in the recruitment and retention of teachers. Not surprisingly, the research indicates that increasing compensation tends to increase the rate of teacher retention, but this relationship is not a simple one. Compensation seems to have varying impact on retention depending upon such other factors as teachers' gender, level of experience and current job satisfaction. There is **moderate evidence** that working conditions may trump salary in some cases as a factor in teacher retention and also that it is the relative salary between districts that is the important consideration. The research evidence is **inconclusive** about whether limited career-advancement opportunities in teaching contribute to attrition.

With regard to teacher recruitment, there is **limited evidence** of a positive correlation between recruitment and various financial incentives, including compensation. With regard to teacher quality, the research is **inconclusive** whether financial incentives have any impact.

Given the complexity of the issue of compensation and the interaction of compensation with other factors such as working conditions and general job satisfaction, drawing the implications of the research for policy is not an easy matter. The clearest recommendation that can be made is for policymakers to ensure teacher salaries in their state or district are comparable to those in neighboring states and districts. The research does not provide any guidance on the issue of differentiated teacher pay or on across-the-board salary increases. It does indicate clearly, however, that the local labor market is the determining factor and not national trends.

Significance of the Question

Perhaps no subject related to teacher recruitment and retention generates more discussion and more controversy than the issue of teacher compensation. Indeed, even in this report there are more studies on compensation than on any other individual subject. In the belief that compensation has a significant impact on teacher recruitment and retention, many state and local policymakers have implemented a variety of financial incentives to attract and keep teachers in their schools. A number of states and districts have raised salaries in general, either at the bottom, the top or across the board. Many offer loan-forgiveness programs to attract students into

teaching – particularly in hard-to-staff schools – or offer targeted bonuses and salary incentives for teachers such as housing allowances, tuition for advanced courses and increased compensation for receiving certification from the National Board for Professional Teaching Standards. Also, districts appear to be slowly moving away from the traditional single-salary schedule and implementing some form of differentiated compensation that provides salary increases for teaching in hard-to-staff schools and sometimes in high-need subjects or that bases ongoing salary raises upon increases in skill or some other factor besides longevity. The most controversial among differentiated compensation strategies is pay-for-performance, the practice of rewarding teachers as a function of their demonstrated success in the classroom.

The debate over pay-for-performance, while beyond the scope of our discussion in this report, does touch on a number of interesting considerations that are addressed in the literature reviewed here and that are of considerable importance to policymakers as they think about developing a variety of compensation-related policies. One key question is whether increasing compensation is a significant incentive, at all, for recruiting and retaining teachers, especially in relationship to other possible incentives. While some experts insist compensation is a critical motivating factor for teachers, others believe salary is less important than in other occupations because so many teachers are motivated by a strong sense of idealism. It may be the case that idealistic individuals are more easily satisfied with lower salaries, but it is open to question whether there is more idealism among teachers than among nurses, social workers, physicians, clergy or individuals in many other occupations. Moreover, the fact that teachers may be idealistic does not necessarily prevent them from moving from a lower-paying position to a higher-paying one where they can still engage their idealism.

Adding to the difficulty of addressing the role of compensation in teacher recruitment and retention is the complexity of the entire issue of teacher compensation. There is a great deal of debate, for example, over whether teachers are adequately compensated in comparison with workers in other professions. The salaries of teachers have been variously compared to those of nurses, social workers, architects, engineers, lawyers and others based on the assumption that individuals with comparable education should be compensated similarly. Such comparisons are questionable, however, because there are features of teaching that make it unlike many of these other occupations such as the work schedule and the fact that most teachers are public employees. Moreover, teacher compensation is not uniform throughout the United States. According to the most recent survey of salaries by the American Federation of Teachers, starting teacher salaries across the United States range from under $25,000 per year to over $37,000 per year, with a range of average annual salaries from just over $32,000 to just under $56,000.

In any event, the central question in this report is not whether or not teachers should be compensated more or less than workers in other fields. They key issue considered here is whether, given the labor market conditions and other circumstances, increasing compensation can have an impact on teacher recruitment and retention. If so, then how large should compensation incentives be to have the kind of impact desired? It is entirely possible that many of the incentives currently being offered are far too small to have major impact, especially if the goal is to entice teachers to teach in schools where the working conditions are stressful. And, how do compensation incentives impact the quality of teachers in the profession? As noted above in the discussion of pay-for-performance, it is possible that compensation policies that reward the

greatest number of teachers have the result of pushing away many excellent, or potentially excellent, teachers; or, conversely, that rewarding the most outstanding teachers has a negative impact on the great majority of teachers, resulting in serious attrition.

What the Research Says

DISCUSSION

Interpreting the significant volume of research on the impact of compensation on the recruitment and retention of teachers is tricky business. In part, this is because there is almost certainly an interaction between compensation and other factors likely to influence recruitment and retention such as school climate, class size and the like. A certain level of increased compensation may be enough to recruit or keep a teacher in a school plagued by difficult working conditions. Conversely, satisfying working conditions may make a school sufficiently attractive to a teacher that he or she will decline an offer to teach in another school at a higher level of compensation.

Economists discuss these factors in terms of the "rewards" and "opportunity costs" that enter into the choices people make about their courses of action. Declining a higher salary is an opportunity cost that may be offset by the reward of a fulfilling work environment. Alternatively, passing up the chance to work in a very stimulating school is an opportunity cost that a teacher may bear because he or she is rewarded by a higher salary in his or her present position.

Also complicating the interpretation of the research about teacher compensation is the fact that teacher salaries, and the perception of their relative acceptability, are influenced by both local and national economic considerations. Even though teacher salaries might be perceived as low in comparison with salaries in other professions nationally, low teacher salaries in a particular district are likely to be more acceptable if they are nevertheless no lower than salaries in neighboring or comparable districts. In times of high unemployment, low salaries are generally more acceptable because teachers have fewer job alternatives that might offer higher compensation. And, of course, the "law of supply and demand" predicts that salaries will be higher if there is a scarcity of teachers than if there is a surplus.

Thus, the research reviewed for this report needs to be seen in the light of larger school and economic contexts. This means that findings about compensation in research conducted during the economic peak of the late 1990s may not be completely applicable to 2005, when the economy is less robust. Or, findings based on schools in the booming Southwest may not be fully applicable to schools in the struggling Rust Belt. Similarly, findings of research on compensation practices in urban schools may not be completely transferable to suburban or rural schools. Indeed, one of the studies reviewed for this report (Jacobson, 1988) found that while increasing salaries for more experienced teachers was correlated with higher overall retention rates in suburban districts, in rural districts overall retention was greater when salaries for senior and mid-career teachers were comparable.

Much of the research on compensation recognizes these factors and limitations, and the studies reviewed for this report often attempted to take them into account in their methodology and in

the interpretation of their findings. The great majority of the studies reviewed were correlational and employed sophisticated statistical methods to derive their findings that involved the development of complex models to attempt to account for the many factors involved in teachers' decisions to leave or remain in a position. To be sure, models that seek to capture the complexity of human choice are only approximations, and statistical correlations between teachers' behavior and various factors are not absolute proof the factors had the same degree of importance in any given teacher's actual decisions. Nevertheless, to the extent the research over time and across geographic boundaries shows definite trends, those trends should be taken seriously.

Thus, as a prelude to a more nuanced and policy-relevant discussion, it is fair to say simplistically that the research provides **strong support** for the conclusion that compensation plays a key role in the recruitment and retention of teachers. Even studies that cited the importance of emotional or attitudinal factors in teacher recruitment and retention – factors such as the desire to help young people or to improve society – recognized that salary was a very important motivating factor in teachers' decisions to remain in or leave their current positions, or to remain in or leave the profession altogether.

➢ ***With regard to the impact of higher salaries on teacher retention, in general***

Taken as a whole, the 28 research studies reviewed for this report that looked at the relationship between teacher compensation and retention provide **strong evidence** that increasing compensation tends to increase the rate of teacher retention. Two studies (Brewer, 1996 and Theobald, 1990) suggested that even the prospect of higher future salaries (not just as teachers but also as school administrators) might contribute to teacher retention. A number of the studies determined that increasing compensation by a specific amount or percentage increased the probability that a teacher would remain by a corresponding percentage. The fact that the amount of salary increase and the resultant change in the retention rate varied so much between studies, however, indicates the importance of the local economic context and the impossibility of concluding that a specific increase in compensation will have the same impact in two different situations. It also indicates the deep complexity of the teacher retention issue, in which compensation has varying impact depending upon a whole host of other factors such as teachers' gender, level of experience and current job satisfaction.

Several studies provide **moderate support** for the conclusion that the *relative* salary level between districts is a much more important factor in teacher retention than the absolute salary level or than salary differences within a single district. There is a good deal of literature not reviewed for this report indicating that teachers generally perceive their job market to be local and confined to surrounding districts, so the compensation picture in all neighboring districts is what becomes all-important. Similarly, two studies (Murnane et al., 1991; Rickman and Parker, 1990) suggest that how teacher salaries compare to salaries in other professions is an important factor in teacher retention, but the lack of additional studies means the research evidence on the impact of salaries in other professions must be judged to be **inconclusive**.

The research included several other interesting findings, which bear mentioning because they indicate the complexity of salary effects; there was no sufficiently broad base of research to

corroborate these findings, however, and so overall the evidence in support of them must be considered **inconclusive**. One study (Boe et al., 1997) found the beginning salary level in a district was correlated with the likelihood that teachers who initially left their jobs during the first four years of their career in that district would return. In other words, the higher the beginning salary level, the more likely teachers would return. Several other studies addressed the issues of how salary increases differently impacted teachers at various stages in their career or how compensation differently impacted the decisions of men and women and white and minority teachers, but the findings of these few studies were either inconsistent or insubstantial and support no confident conclusions.

The research also indicates that while compensation was the single most frequently cited factor, it is not necessarily the most important component in teachers' decisions whether to leave or remain in their current positions. A number of studies offer **moderate evidence** that – as noted above in the discussion of Questions 3 and 4 – factors that can be lumped under the category of working conditions are extremely important and may trump compensation in some cases.

Several studies that involved self-reports by teachers of the impact of compensation on their decision to leave or remain in their current jobs or the teaching profession were particularly illuminating. All reported that the teachers they interviewed considered salary to be an important factor – though not necessarily the only or most important factor – in their decision to continue teaching. One study (Chapman and Hutcheson, 1982) found that wage increases and job autonomy were more important for teachers who quit teaching, while recognition and approval from others were more important for those who stayed. Another study (Hounshell and Griffin, 1989) found that compensation became an important factor in teachers' decisions to stay or leave when their initial idealism and enthusiasm about teaching gave way to disappointment about the reality of their jobs. Still another study (Ingersoll, 2001a) indicated that the single most important reason for teacher turnover was job dissatisfaction, to which low salaries could be a contributing factor together with difficult working conditions.

Finally, although two studies reviewed (Hall, Pearson and Carroll, 1992; Johnson and Birkeland, 2003) confirmed the common perception that limited career-advancement opportunities within the teaching profession contribute to attrition, overall the evidence in this report to support that contention would have to be judged **inconclusive**.

➢ ***With regard to the impact of higher salaries on teacher recruitment, in general***

There were far fewer studies (only five) that addressed the specific relationship between compensation and success in teacher recruitment. These studies do provide **limited evidence**, however, for the conclusion there is a positive correlation between financial incentives, including compensation and recruitment.

Two of the studies (Hanushek and Pace, 1995; Hounshell and Griffin, 1989) addressed the impact of compensation on recruitment generally. One study (Reed and Busby, 1985) focused on recruitment in rural schools. And the other two studies (Evans, 1987; Rumberger, 1987) looked at the impact of salaries on recruitment into mathematics and science teaching.

One noteworthy finding in Rumberger (1987) was that the elimination of the shortage of mathematics and science teachers in the large metropolitan districts studied would require the elimination of the $10,000 average salary differential (in 1979 dollars) between teachers and engineers who might consider teaching. Again, however, this is one finding of a single study, and it does not justify more general conclusions.

➢ ***With regard to the impact of teacher compensation on the quality of teachers recruited or retained***

Seven studies reviewed for this report dealt with the more specific teacher quality question. Complicating the significance of any conclusions that can be drawn from this research is the fact that the nine studies used various *proxy* measures of teacher quality. These were primarily the same sorts of measures of intellectual and academic ability used in Questions 1 and 2, but one study (Loeb and Page, 2000) made the assumption that better quality teaching would be reflected in increased college attendance rates and decreased high school dropout rates in a state. Although some of the studies found a correlation between increased salaries and various measures of teacher quality not all of the studies shared this finding, and the research overall must be judged **inconclusive** on the question as to whether increasing compensation tends to increase teacher quality.

Interestingly, one study (Galchus, 1994) found that while raising salaries increased the pool of better-qualified teachers, the salary raises had a negative effect on demand for such teachers. This may indicate that as teacher salaries increased, school and district administrators were willing to compromise quality and hire less-expensive and less-qualified teachers.

SUMMARY OF STUDIES

➢ ***With regard to the impact of higher salaries on teacher retention, in general***

Twenty-eight studies, which met the criteria of acceptability for this report, discussed this issue:

1. **Allred and Smith (1984)** was a *comparative descriptive study* that examined district files on 2,346 rural teachers and 11,785 urban teachers in Utah from 1980-81. Of those teachers, 834 who left their districts following the completion of the school year – 233 from rural schools and 601 from urban schools – also were surveyed. The study, which focused primarily on rural schools, found that 43% of teachers who left rural districts after the completion of the school year cited salary as the primary reason for leaving. Allred and Smith suggest this figure might be substantially higher if other reasons, which might be salary-related, are counted such as new employment or moving from the area.
2. **Beaudin (1995)** was a *regression analysis* of data collected in 1985 from 898 teachers in Michigan public schools who started their careers in the

early-to-mid 1970s, who left teaching within the first four years and who had returned by 1985. The study found that a number of factors seemed to influence whether a teacher returned to their original district when they resumed teaching or moved to another district. One of these factors was beginning salary; the higher the beginning salary a teacher had earned, the more likely he or she was to return to that district. Each $100 increase in beginning salary was correlated with a 1.9% increase in the probability of return.

3. **Boe et al. (1997)** was a *simple correlational study* of attrition among 639 special education teachers and 4,159 general education teachers who participated in the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Follow-up Survey. The study found that base salary was a positive and significant predictor of retention. For teachers earning $20,000 or less, 17.8% had left their teaching assignment the following year, compared with a 9.0% rate of attrition among teachers who were earning more than $30,000.

4. **Brewer (1996)** was a *regression analysis* of data on 5,458 teachers newly hired in their district in New York State in 1975 and followed through 1989. The study found a very small positive correlation between newly hired teachers' current salaries and their rate of retention only for female teachers and male teachers new to teaching. For both male and female newly hired teachers, however, the greater the average teacher salary in the entire county (which may include several districts) relative to their own salary, the greater the likelihood they would leave their district. The study also found that, for men, higher district salaries for administrators led to higher retention rates, suggesting that the prospect of future earnings induced men to stay in teaching, as well.

5. **Chapman and Hutcheson (1982)** was a *discriminant analysis* of survey data on 590 teacher education alumni in three public universities in Indiana who graduated between 1967 and 1978. The study found that those who left teaching assigned a greater importance to job autonomy and salary increases, while those who continued to teach placed a higher value on approval from family and friends and recognition by supervisors and administrators.

6. **Grissmer and Kirby (1992)** employed a *regression analysis* in their analysis of data on over 43,000 teachers in Indiana from 1965-88. The study found that a 10% increase in salary was associated with a roughly 10% reduction in teacher attrition. Since the reduction was only 4% for women, however, the study concluded that women appeared to be more sensitive to the erosion in real teacher wages.

7. **Gritz and Theobald (1996)** employed a *regression analysis* of data on the careers of 9,756 white teachers in Washington State from their entry into teaching between 1981 and 1990 through the 1991-92 school year. The study found that white female teachers were less likely to leave if their

districts' salaries were high relative to those in other districts and that white male teachers were less likely to leave if their districts' salaries were high relative to salaries in other occupations.

8. **Hall, Pearson and Carroll (1992)** was a *discriminant analysis* of survey data on 369 public school teachers who were teaching in a large urban Florida school district during the early 1990s. The survey asked teachers whether or not their long-range career plans were to continue in the teaching profession and asked them a number of other questions about their satisfaction with their current jobs and their perceptions of why teachers leave the profession. The teachers who said they planned to quit teaching were more likely than those who indicated they planned to stay to cite dissatisfaction with salary, limited opportunities for career advancement and stressful working conditions as reasons why teachers leave. Likewise, those who planned to stay were more frequently satisfied with their current job and salary and experienced less stress.

9. **Hanushek, Kain and Rivkin (2001)** combined a *simple descriptive study* and *regression analysis* in their study of 378,790 Texas teachers between 1993 and 1996. The study found that salary was related to teachers' decisions to switch schools, particularly for male teachers. There was a much weaker correlation between salary and teacher's decisions to switch schools or districts, however, than between teacher's decisions to switch and the percentage of minority, low-income or poor achieving students (though this correlation did not hold true for black and Hispanic teachers). Moreover, salary was found not to be as strong a factor in teachers' decisions to leave the public schools entirely as poor student performance. The study concluded that schools with high percentages of minority students who perform poorly academically might have to pay from 20-50% more in salary than schools serving predominately white or Asian, academically successful students. It also concluded that the relative salary level between districts, rather than absolute salary level, was a more important factor in teachers' decisions to leave their schools.

10. **Hounshell and Griffin (1989)** was a *simple descriptive study* that involved interviews of 37 individuals who graduated from the supervised science student-teaching program at the University of North Carolina – Chapel Hill between 1977-83 but who either had never taught or were no longer teaching. The study found that almost half of the teachers interviewed found teaching to be less satisfying than they had expected. The most commonly cited reason for leaving teaching for another job was salary. (Note: The very small *sample size* of this study limits the generalizability of its conclusions.)

11. **Ingersoll (2001a)** employed both a *simple descriptive study* and *regression analysis* in analyzing the relative impact of a number of factors on the retention or attrition of 5,643 teachers who participated in the 1990-91 Schools and Staffing Survey and the 1991-92 Teacher Follow-up Survey. The study found the level of compensation for advanced teachers

(with a master's degree and 20 years of experience) had a small positive effect on voluntary teacher turnover after controlling for teacher and school characteristics. A difference of $1,000 in salary was associated with a difference of 3% in the odds of *voluntary* teacher departure. The most important reason for turnover seemed to be job dissatisfaction, and the most frequently reported causes of job dissatisfaction both for migrant teachers and teachers who left the profession were low salaries, lack of support from the school administration and student discipline problems.

12. **Ingersoll and Alsalam (1997)** was a *regression analysis* of data on 53,347 teachers in 11,589 schools who participated in the 1990-91 Schools and Staffing Survey. The study found a positive association between higher end-of-career salaries and teachers' satisfaction with their decision to go into teaching. Salaries did not appear to be as strong a factor as teacher autonomy and influence or support for new teachers, however.

13. **Jacobson (1988)** was a *simple correlational study* of district salary rankings and retention rates in 15 rural and 42 suburban districts in two counties in New York State for the 1974-75 and 1984-85 school years. The study identified retention rates and changes in salary for entry-level, mid-career and senior teachers. It found that suburban districts that improved salaries for mid-career teachers in the 10-year period had higher overall rates of retention of teachers who were teaching there in 1974-75 than districts that did not. The effect was strongest for female teachers. This same pattern was observed among female teachers in rural areas, though it appeared not to be as pronounced. For rural male teachers, retention appeared to be a function of factors other than salary. While the study took into account teachers likely to retire between the two school years, it did not distinguish between teachers who left voluntary and those forced to leave because of reductions in staffing.

14. **Johnson and Birkeland (2003)** was a *simple descriptive study* of 50 new public school teachers in Massachusetts who were first interviewed in 1999 and again in 2000 and 2001. The teachers represented a diversity of school settings, grade levels, ages and educational backgrounds. The study found that 11 (22%) of the teachers had left teaching altogether by the end of their second year, the majority after their first year. Another 11 teachers had either left their school at the end of three years, eight voluntarily and six of those to different districts. The movers all moved to schools with a more affluent student population. Of the 28 (56%) remaining in teaching, 15 were dissatisfied with their schools or with teaching as a career. Among the teachers who had left the profession, the study found that while teacher pay figured into the decisions of some of the teachers to leave public school teaching, it was a "secondary irritant" for others in comparison to poor working conditions. Although all of the teachers who moved voluntarily to other teaching assignments ended up in schools with wealthier student populations, the study did not cite pay as one of the factors in their decision to transfer. Those teachers who remained in their

schools but were dissatisfied with teaching as career did mention low pay as one factor in their dissatisfaction, along with lack of respect for the teaching profession, students' lack of seriousness about school, an excessive workload and lack of a clear career path in the profession.

15. **Kirby, Berends and Naftel (1999)** combined a *simple descriptive study* and a *regression analysis* of data on 98,951 public school teachers in Texas from 1980-96. In considering only cohorts of new teachers for each year between 1987 and 1995, the study found that a $1,000 increase in salary reduced attrition from the state education system by about 2.9% overall and 5-6% among Hispanic and black teachers. As a point of comparison, a 1% increase in support staff was correlated with a 2-9% decrease in teacher attrition, and a 1% increase in district administrative staff was correlated with a 5-6% *decrease* in teacher attrition. The rates of attrition varied with the racial and ethnic background of the teachers.

16. **Lankford, Loeb and Wyckoff (2002)** was a *simple correlational study* that analyzed data from several different sources on every teacher in New York State (approximately 180,000 annually) between 1984-85 and 1999-2000. The study looked specifically at the cohort of teachers hired in 1993 and found that those teachers transferring between districts in New York State between 1993 and 1998 tended to receive a salary increase in their new district of from 4-15%. For teachers in the New York City area who transferred to other districts, the salary increase averaged from 12-22%. The study found there was a general salary increase, as well, involved in within-district transfers, but much smaller in size. The implication drawn by the researchers is that within-district salary differences are not generally great enough to act as incentives to teach in one school rather than another but that salary differences between districts in a single metropolitan area or geographic region might be.

17. **Mont and Rees (1996)** employed a *regression analysis* of data gathered from 1979-89 on the careers of 525 New York State high school teachers hired in one district outside New York City in 1979. The study found that higher salaries resulted in lower attrition. It indicated that, all else being equal, a 10% increase in starting salaries would result in 6% less attrition.

18. **Murnane and Olsen (1989a)** was a *regression analysis* of data on 7,852 Michigan teachers who began teaching between 1972-75 and whose careers were followed though the 1984-85 school year. The study found a sizable positive effect of salaries on retention in teaching (though not necessarily in the same school or district). An increase of $1,000 in 1967 dollars ($3,400 in 1987 dollars) was associated with an increase of over four years in the median length of a teacher's stay.

19. **Murnane and Olsen (1990)** was a *regression analysis* of data on 13,890 white North Carolina teachers who began teaching between 1975 and 1984 and whose careers were followed through the 1985-86 school year. The study found that salaries had an important relationship to length of

stay in teaching: teachers who were paid more tended to remain longer in the profession (though not necessarily in the same school or district). A $1,000 increase in salary (in 1987 dollars) was associated with a two to three year increase in the length of stay of a teacher who started teaching in 1975 and a 15% increase in the probability the teacher would stay in teaching for at least 10 years. This association was half as pronounced for teachers who began their careers in 1979, however, a phenomenon the study attributes to a decline in student enrollments that had its own impact on teacher mobility and reduced the influence of salary.

20. **Murnane, Singer and Willett (1989)** was a *regression analysis* of data on 5,100 white teachers who began teaching in North Carolina between 1976 and 1978 and whose careers were followed through 1986. For secondary school teachers, the study found evidence that higher salaries were associated with reduced attrition from the profession (not necessarily from a particular school or district) but that the association disappeared by the eighth year of a teacher's career. Secondary school teachers whose annual salary was $2,000 more than the average annual salary (in 1987 dollars) remained in the classroom an average of two extra years. For elementary school teachers, the association between salary and reduced attrition was smaller, but it was still positive. Elementary school teachers whose salary was $2,000 less than the average salary left the classroom an average of one year earlier.

21. **Murnane et al. (1991)** employed a *regression analysis* of data on 6,935 full-time teachers who began teaching in the Michigan public schools between 1972 and 1975 and 9,644 teachers who began teaching in North Carolina between 1974 and 1978. The study found that teachers who earn more tend to stay in teaching longer than teachers who earn less but that this effect holds only in the first five years of a teacher's career. The researchers suggested that reasons for this are (1) opportunities outside of teaching decline over time while teachers' job satisfaction tends to increase over time; and (2) the teachers most sensitive to salary differences between teaching and other occupations are likely to leave earlier in their career. In comparing the patterns in Michigan and North Carolina, the study suggested that salary incentives have a greater impact on teachers' career decisions when the demand for teachers is stable or growing.

22. **Rees (1991)** employed *regression analysis* in his examination of data on 49,396 full-time, tenured teachers (all under the age of 55) who taught in New York State between 1975 and 1978. The study found that salary level was related to teacher attrition. Other things being equal, teachers whose salary was 21% below the mean state salary were 29% *more* likely to leave the district. Teachers whose salary was 22% above the mean state salary were 24% *less* likely to leave the district. The study also found a relationship between teacher salaries and changes in the collective-bargaining contracts between districts and their teacher unions. In those

districts with grievance procedures involving binding arbitration for contract disputes and either binding or advisory arbitration for noncontract disputes, teacher turnover was significantly lower than in districts without these particular grievance procedures. A salary increase of 11%, however, was found to offset the effect on teacher turnover of moving from binding arbitration to no procedure for noncontract disputes. Rees suggests arbitration may provide a cost-effective alternative to salary hikes and contractual policies, such as grievance procedures, might influence retention rates as much or more than wage policies. One caution with this study is the data are 25-30 years old; a similar study done today might yield different findings.

23. **Rickman and Parker (1990)** was a *regression analysis* of data from the 1985 Current Population Survey that included approximately 2,000 full-time K-12 teachers. The study found that approximately 5% of the respondents who said they were teaching in 1984 were no longer teaching in 1985. The study also found that a 1% increase in teachers' wages relative to wages in other occupations reduced the probability of leaving teaching by approximately 1.75% and by 2.11% when considering only those occupations into which teachers are most likely to switch.

24. **Rumberger (1987)** was a *regression analysis* of combined data on 453 school districts in large metropolitan areas that was taken from the U.S. Department of Education's 1978-79 Merged Federal File, the 1980 U.S. Census, the 1982 Census of Governments and the 1983-84 Survey of Teacher Demand and Shortage. Using engineering and teaching as occupational alternatives for college graduates with mathematics and science backgrounds, the study found that both the percentage of math and science teachers who were uncertified and the rate of teacher turnover in a district were positively related to the salary differential between engineers and teachers. The study estimated that to eliminate the shortage of math and science teachers would require the elimination of the $10,000 average salary differential between teachers and engineers (in 1979 dollars). Expressed in other terms, eliminating the salary differential would reduce the average proportion of newly hired teachers by half – in other words, would increase the rate of teacher retention. The study cautioned, however, these are average figures and would be different in different states.

25. **Seyfarth and Bost (1986)** was a *simple correlation study* based on a survey of 126 district superintendents in the same Middle Atlantic state. The study found the superintendents reported lower teacher turnover in districts that offered teachers higher beginning salaries. Offering leaves of absence, optional inservice workshops or dedicated planning time also were correlated with lower turnover, but not as strongly as salary.

26. **Stinebrickner (1998, 1999)** was a *regression analysis* of data from the National Longitudinal Study of the High School Class of 1972 on 341 individuals who were certified to teach and were followed until 1986. The

study found that wages were significantly related to length of stay in teaching. A person with a wage that was one *standard deviation* above the mean had about a 9% greater probability of staying in teaching for more than five years. [Note: This is essentially the same study published in two different publications.]

27. **Theobald (1990)** employed *regression analysis* in his study of 37,321 K-12 teachers in the state of Washington in 1984-85, 37,696 in 1985-86 and 38,378 in 1986-87. The study found that a teacher's prospective salary was positively correlated with a decision to remain, especially for male teachers. On average, a teacher expecting to earn 10% above the mean district salary was 6.9% more likely to stay the following year, holding all else constant.

28. **Weiss (1999)** was a *regression analysis* of data on 5,088 first-year teachers who participated in either the 1987-88 or the 1993-94 Schools and Staffing Survey. The study found that teachers who expressed satisfaction with their salary appeared to be positively associated with the length of their intended stay in teaching. In other words, those teachers who said they were satisfied with their salaries were more likely to say they intended to remain in teaching for a longer period of time. There was no significant correlation, however, between actual differences in teachers' salaries and the length of time they said they planned to remain in the teaching profession. In addition, the study found an association between teachers' level of satisfaction with their salary and their morale in the 1993-94 sample, but it found no such correlation in the 1987-88 sample. Overall, the study found salary to be a much weaker factor in predicting teachers' attitudes and behavior than teachers' perceptions of school leadership and culture or of their autonomy.

➢ ***With regard to the impact of higher salaries on teacher recruitment***

Five studies reviewed for this report addressed this issue. Two studies looked at the impact of compensation on recruitment in general, and two others offered evidence that salary differentials may have an impact on the recruitment of teachers in fields of shortage:

1. **Evans (1987)** was a *comparative descriptive study* that investigated the attitudes of 98 engineering freshmen at a medium-sized Midwestern university in 1983 toward science or mathematics teaching as a career choice. On the basis of a survey questionnaire, Evans distinguished those students who expressed interest in teaching at some point and took some action to explore that interest from those who were not interested in teaching. Both teaching-oriented students (N=20) and non-teaching-oriented students (N=77), ranked low salaries first among reasons that discouraged them from pursuing a teaching career (although they ranked low maximum salaries fourth). The second and third most discouraging

factors for teaching-oriented students were the perceived monotony and lack of job security the students associated with teaching. Disciplinary problems were another factor cited, though it was ranked significantly lower than salaries. Small *sample sizes* may limit the generalizability of these results to a larger population.

2. **Hanushek and Pace (1995)** employed a *simple descriptive study* and a *regression analysis* of data on 1,325 high school seniors of the class of 1980 who were followed through 1986 in the High School and Beyond survey. The study found that differences between the salaries offered beginning teachers and the average salaries of all female college graduates ages 25-34 were not a substantial factor in predicting the likelihood of the women entering teaching. This held true for high-ability college graduates as well as graduates, in general. The study notes, however, that its data only refer to the year 1980 and to salaries considered in the short term and not to long-term salary expectations of beginning teachers.

3. **Hounshell and Griffin (1989)** reported that roughly a third of the interviewees in their study said higher salaries would encourage them to re-enter teaching.

4. Reed and Busby (1985) was a *simple descriptive study* that focused specifically on teacher recruitment and retention in rural schools. It analyzed results from a survey of 67 superintendents in rural districts in Virginia. The study found that 78% of the new rural hires reported overall were made in districts offering high levels of incentives. Such incentives were not necessarily in the form of salary, however, though all were financial. Sixty three percent of districts reported offered starting salaries that were "competitive"; 96% reported offering health insurance, life insurance or good retirement or leave plans as recruitment incentives; 47% offered assistance finding housing; and 3% provided assistance with moving expenses.

5. **Rumberger (1987)** found that both the percentage of mathematics and science teachers who were uncertified and the rate of teacher turnover in a district were positively related to the salary differential between engineers and teachers. The study estimated that to eliminate the shortage of math and science teachers would require the elimination of the $10,000 average salary differential between teachers and engineers (in 1979 dollars).

➢ ***With regard to the impact of teacher compensation on the quality of teachers recruited or retained***

Seven studies, which met the criteria of acceptability for this report, discussed this issue:

1. **Figlio (2002)** was a *regression analysis* of data on 2,672 newly hired teachers in 188 school districts in 89 counties across the United States

taken from the 1987-88 and 1993-94 restricted-access versions of the Schools and Staffing Survey. This data was supplemented by administrative data from the U.S. Department of Education's Common Core of Data and from the Census of Governments. The study linked districts in the 1987-88 and 1993-94 surveys and found that districts that provided a raise in salaries relative to the salaries of other districts in their county markedly increased the probability of hiring new teachers (both first-time and experienced transfer teachers) from more selective undergraduate institutions and with college majors in their teaching field. As the study points out, however, these results held only for non-union districts that unilaterally raised salaries relative to those in the surrounding districts. The findings cannot be generalized, therefore, to unionized school districts or to a situation in which salaries are increased in all districts within a large geographical area.

2. **Loeb and Page (2000)** was a *regression analysis* of data from the Public Use Microdata Samples from the Census from 1960-90. The study constructed data sets on 49 states and the District of Columbia (Alaska was not included) to determine what effect increases in teacher salaries had on the achievement of students in the states. Student achievement was measured in terms of high school dropout and college attendance rates. The study found that high school dropout rates declined and college attendance rates increased in states that increased their teaching wages relative to the wages of college-educated women in other occupations, suggesting that raising relative salaries for teachers may promote teaching quality as measured through student outcomes.

3. **Manski (1987)** employed a *simple descriptive study* and a *regression analysis* of data on 2,952 high school seniors from the National Longitudinal Study (NLS) of the High School Class of 1972 who were followed through 1979. Of these, 510 (19%) reported in 1979 that they were employed as teachers. The study found that, in general, the probability of becoming a teacher was inversely related to academic ability as measured by SAT scores and class rank. It also found that raising salaries alone was associated with a very small increase in the average academic ability of teachers. A 40% increase in weekly teacher salaries, for example, would have increased the average SAT score from 950 to 972. If salary increases for teachers were coupled with a minimum ability requirement, however, the average academic ability of the teacher workforce increased substantially, even when salary increases were relatively small. A 10% salary increase coupled with a minimum SAT requirement of 800, for example, would raise the average teacher SAT score to 1,020 (very close to the average for all college graduates in the NLS cohort). The study found that imposing a minimum SAT score requirement of 800 without a salary increase would increase the average ability of teachers to that of all college graduates, but it would reduce the teacher supply by 20%. [Note: The data used in this study are rather old,

and the results thus may not be generalizable to contemporary economic conditions.]

4,5. **Stinebrickner (2001a, 2001b)** were *regression analyses* of data on 450 (in 2001a) and 551 (in 2001b) individuals who participated in the National Longitudinal Survey of the High School Class of 1972, were certified to teach between 1975 and 1985 and were followed until 1986. The studies found that individuals with high SATs received higher wages when they worked in non-teaching jobs than when they worked in teaching jobs. The studies examined two wage-increase scenarios, a simulated 25% across-the-board wage increase under a traditional rigid salary schedule and a simulated average wage increase of 25% in which an individual teacher's salary increase is a function of their ability (as defined by SAT scores). The studies found that both scenarios increased by approximately 50% in the aggregate the number of years the individuals in the sample would be predicted to teach. The across-the-board increase, however, resulted in a much smaller increase in the amount of time high-ability teachers taught than did the ability-based increase, however. Also, in both scenarios, males were more responsive to the wage increases than females – a circumstance Stinebrickner attributes to the greater likelihood that females will opt out of teaching to raise children.

Two studies found that raising salaries across the board can lead to a decrease or no meaningful increase in the quality of teachers, although their studies offer only weak evidence to support this point:

6. **Ballou and Podgursky (1997)** employed a *regression analysis* of combined data on over 60,000 public and private school teachers from the 1987-88 and 1990-91 Schools and Staffing Surveys, the 4,000-17,000 individuals in each of the four administrations of the Survey of Recent College Graduates from 1981-91, and scores and career preferences of high school students on the SAT test between 1980 and 1992. The study found the percentage of teachers with mathematics and science degrees rose slightly during the 1980s, which also happened to be a period when teacher salaries generally increased. The study was unable to find any true statistical correlation, however, between state-level increases in teacher salaries and any measures of teacher quality, including SAT scores, and the recruitment of graduates from selective colleges.

7. **Galchus (1994)** was a *regression analysis* of school-related data in 75 Arkansas counties from the 1984-85 school year. The study attempted to look at both the factors that had an impact on the demand for well-qualified teachers in a county and the factors that had an impact on teachers' desire to teach in the schools in that county (the supply side). A well-qualified teacher (actually, a minimally competent teacher) was defined as a teacher who had passed the state's basic skills test. The study found that an increase in teachers' salaries reduced the demand for well-

qualified teachers, with the net result that a 1% increase in average teacher salaries would lead to a .41% decrease in the percentage of teachers who passed the Arkansas basic skills test. [This means, presumably, that as teacher salaries increase, people are more willing to compromise quality and hire less-qualified teachers at lower salaries.] On the supply side, the study found a positive correlation between average salary for teachers in a county and the percentage of teachers who passed the basic skills test. A 1% increase in the average teacher salary was correlated with a .93% increase in the percentage of teachers who passed the basic skills test. Though this study passed the criteria for inclusion, questions about its methodology, however, raise doubts about the validity of its findings.

What It Means for Policy

On the most basic level, the research makes it clear that compensation must be taken into consideration in crafting policies regarding the recruitment and retention of teachers. In general, increasing teacher compensation, including the prospects for greater future compensation, increases retention. The research also is clear, however, that teachers do not respond to salary alone in their decisions to accept or remain in a particular teaching position but that working conditions and general job satisfaction also are very important.

Moreover, it is quite reasonable to assume the two factors interact with one another in the sense that if a teacher is inclined to leave a position because of low job satisfaction – or is reluctant to accept a position because of concerns about job satisfaction – a higher salary can compensate to an extent for the negative factors. Given the importance of job satisfaction to teachers, however, it seems unlikely that teacher attrition can be reduced significantly though monetary compensation alone and that, in many cases, addressing working conditions will have a greater impact. The research reviewed in connection with Question 1, which indicates that many teachers are especially motivated by a desire to make a meaningful contribution, further suggests the importance of creating a work environment in which that desire can be fulfilled.

To the extent that salary is a factor in teacher recruitment and retention, it is the relative level of salaries in a given district in comparison with salaries in neighboring districts that is most important. Teaching remains largely a local job market, and teachers rarely are interested in teaching positions outside a reasonably well-circumscribed distance from their current home. This means it is less important that average teacher salaries in North Dakota, for example, approach average teacher salaries in Connecticut for North Dakota to keep its teachers there. But it does imply that salaries in Grand Forks, North Dakota, need to be competitive with salaries in Fargo, North Dakota, or in Bemidji, Minnesota, if Fargo is to keep from losing teachers to these other districts nearby. On the other hand, it may be important to all these districts that their salaries be competitive with those in Minneapolis or St. Paul, in spite of their distance away. Although the present study did not address the issue of the difficulty of teacher recruitment in isolated rural areas in comparison with the difficulty in larger urban districts, there are many anecdotal accounts of young teachers from rural districts being attracted to the glamour of larger cities – at least in the short term.

There are a number of educators and policymakers interested in the possibility that differentiated compensation – paying teachers differently on the basis of a number of factors that may include demonstrated performance or the nature of their responsibilities – might be a policy that figures importantly in the teacher recruitment and retention discussion. One related policy suggestion, for example, is to pay more to teachers in hard-to-staff subjects, such as mathematics and science, to attract and retain them. Such a suggestion is often based on the assumption that teachers and prospective teachers in these fields have more lucrative opportunities outside teaching. Unfortunately, the literature reviewed for the present question sheds very little confident light on this issue. And while literature reviewed for Question 2 clearly indicates greater attrition among mathematics and sciences teachers, it remains unclear on the basis of this report to what extent increasing compensation for teachers in those fields would help alleviate the recruitment and retention problem.

Similarly, a number of people have called for a general increase in teacher salaries to attract more individuals with superior demonstrated intellectual proficiency. Here again, the literature reviewed for this report provides no guidance for such a policy. And it is certainly possible other factors besides salary are at play in the greater rates of attrition among these teachers that was noted in the discussion of Question 2. They might be much less tolerant than others, for example, of less than ideal working conditions.

Finally, the literature reviewed for this question makes it clear that although there are certain trends that are likely valid throughout the United States, any compensation policies ultimately need to take into consideration the peculiarities of the local labor market. A rural market, for example, in which teacher salaries may be quite high in comparison with those of other workers, presents a very different picture than an urban market in which individuals in many other professions are likely to earn much more than teachers do. And an urban market suffering high rates of unemployment is different still than an urban market where good jobs go begging for lack of prospective workers.

Supporting Resource

American Federation of Teachers (2003). *2003 Survey and Analysis of Teacher Salary Trends*. Washington, DC: Author. www.aft.org/salary.

Question 6:

What impact do various strategies related to teacher preparation have on teacher recruitment and retention?

RELATED QUESTIONS:

Is there any significant difference between alternative route and traditional route programs in the characteristics and retention rates of the teachers they prepare?

What impact does raising preparation program entrance or completion requirements have on the recruitment and retention of teachers in the profession?

Quick Answer

The research reviewed for this report provides **limited support** for the modest conclusion that the retention rates of alternative route graduates can be comparable to, and even exceed that, of traditional route graduates. Given the great variation within alternative route programs and also within traditional programs, however, larger generalizations about the relative success of both types of program cannot be made. The research also provides **limited evidence** that some alternative programs are successful in recruiting a constituency into teaching that is more diverse ethnically and in age than is true of the profession as a whole.

As far as the impact of imposing more stringent requirements for entrance into teacher preparation, the research literature is **inconclusive.**

These modest findings support the equally modest policy recommendation that efforts to develop high-quality alternative route teacher preparation are worthy of support.

Significance of the Question

Teacher recruitment and retention often are thought of as issues that only come into play once teachers have completed their preparation programs and the need arises to entice them to accept or remain in a particular teaching job. The fact of the matter, however, is recruitment and retention issues specifically apply to teacher preparation policies and practices, as well.

To begin with, it is important to address the recruitment of teacher candidates into preparation programs. While there may be no aggregate shortage of candidates who enroll in teacher preparation programs, there is a dearth of prospective secondary school mathematics and science teachers. Are there any strategies, then, that are particularly successful in luring prospective mathematics and science teachers into teacher preparation programs?

Beyond the question of successful strategies to recruit candidates into preparation programs, there is the issue of attracting candidates who will be most likely to finish the programs and enter teaching. Some experts place the attrition rate in teacher preparation programs as high as 40% and the percentage of program graduates who do not enter teaching upon graduation at 40%.

(See, for example, Darling-Hammond, 1996, *What Matters Most: Teaching and America's Future*.) This would mean that only 36% of all teacher candidates who initially enter teacher preparation programs end up teaching upon completion of those programs – an extremely low number. As previously noted in the discussion of Question 2, however, some research suggests a significant percentage of teacher preparation program graduates who do not go into teaching immediately eventually enter the field. Moreover, there are likely significant differences in the rate of attrition between elementary education majors and teacher candidates in secondary education programs, since the latter major in another field and often pursue teacher education as a backup.

The attrition rate in teacher preparation programs, however, also likely reflects the "cash cow" approach many colleges and universities take to those programs – i.e., enroll as many candidates as possible to generate more tuition money for the university. Indeed, many experts point out teacher preparation programs tend to cost the university very little in comparison with other pre-professional programs and thus make significant profits for their institutions.

Also, the more teacher candidates a preparation program has, the more full-time equivalents it generates to justify the size of its faculty. In other words, there are institutional pressures and incentives that work against employing any strategies that would limit entry into teacher preparation programs. It would seem, however, that screening prospective teacher preparation candidates more carefully or making academic requirements for entry into teacher preparation programs more stringent might increase program completion rates and the entry rate of graduates into the classroom.

Beyond the concerns of program completion and entry into the profession, there are the issues of teacher effectiveness and length of tenure. It is one thing to increase the number of people going into teaching, another to ensure they are good teachers and yet another to ensure the profession is a good career fit they will pursue for more than a couple of years.

It is quite possible the same strategies that could increase completion rates for teacher preparation programs – better screening of candidates and more stringent program entrance requirements – also might increase the effectiveness and ensure the longer-term commitment of graduates. Similarly, implementing more stringent program completion or certification requirements might have a similar outcome. Is there any research indicating whether or not these measures might indeed facilitate these goals?

On the other hand, it is already noted in the discussion of Question 1 that many minority candidates have difficulty in passing program entry or certification examinations. It would seem, then, that making such examinations more rigorous could have a further deleterious impact on the entry of minorities into the teaching profession. Does the research shed any light on this issue?

Another important set of questions concerns possible differences between alternative route and traditional route preparation programs that have implications for teacher recruitment and retention. Traditional undergraduate programs, by definition, primarily serve the 18-22-year-old students who comprise the traditional college-age population, while alternative route programs

generally target an older cohort. Does the difference in age have an impact either on the effectiveness or length of tenure of the teachers who graduate from these programs? Are there other significant differences, either in the characteristics of the students or in the programs themselves, that have an impact on the comparative success of alternative versus traditional preparation programs in graduating effective teachers who remain in the classroom long term?

Both the literature reviewed by RAND specifically for this report and some of the literature on alternative route programs reviewed by Floden, Wilson and Ferrini-Mundy for the previous ECS report *Eight Questions on Teacher Preparation: What Does the Research Say?* illuminate the questions raised, and both will be included in the discussion that follows. Similarly, research reviewed in *Eight Questions on Teacher Preparation* on the impact of more stringent teacher preparation program entrance requirements also will be included here.

Finally, although not addressed in this report, the issue of the quality of teacher preparation programs would seem to be an important factor in teacher retention. Although induction and mentoring programs might compensate to some extent for deficiencies in preparation, it would stand to reason that teachers who are inadequately prepared will find their introduction to full-time teaching to be more difficult and frustrating and will thus be more likely to quit the profession than teachers who are better prepared. Indeed, there is good evidence for this connection in the research reviewed for the *Eight Questions on Teacher Preparation*, and it has been made in a number of other reports, as well.

What the Research Says

DISCUSSION

The literature reviewed for this question addresses two considerations related to teacher preparation: (1) the differences in the characteristics and retention rates between teachers recruited into teaching through alternative route preparation programs and those recruited through traditional route programs; and (2) the impact of raising entry or completion requirements for teacher preparation programs on the characteristics and retention rate of program graduates.

It was the original intention of this report to discuss the empirical evidence for the success or failure of a wide range of programs and policies that states and districts have employed in their efforts to recruit teachers. Of particular interest, for example, were "early recruitment programs" aimed at pre-college youth and "grow-your-own" strategies that seek to recruit people into teaching who live in small rural communities or urban neighborhoods with the expectation they will teach in the communities or neighborhoods where they live. As it turned out, however, there were simply few to no adequate studies available of the great majority of these and other kinds of recruitment strategies. What studies there were tended to have serious methodological flaws that rendered them useless as objective assessments. Many studies, for example, failed to account for *selection bias*, thus making it impossible to assess the extent to which participants in the programs studied would have gone into teaching anyway, or the extent to which the programs themselves influenced their decisions or their experience in teaching. Moreover, for many of the

studies – even those ultimately included in this report – the length of stay in teaching is not well-measured; it is not always clear, for example, whether or not a first year of teaching spent in an internship is counted.

➢ ***With regard to alternative versus traditional route preparation programs***

One of the great difficulties in comparing alternative versus traditional route teacher preparation programs is there's virtually as much variation within the universes of alternative and traditional programs as there is between the two types. This is even apparent in the small body of literature reviewed for this report. Consequently, any generalizations about alternative versus traditional programs are suspect.

Nevertheless, the studies reviewed here provide **limited support** for the equally limited conclusion that the retention rate of alternative route graduates can be comparable to, and even exceed, that of traditional route graduates, depending upon the particulars of the programs being compared. The literature included for this report suggests that attention to the selection process of teacher candidates, the nature of the preservice experience and the support and growth opportunities for beginning teachers all might play an important role in increasing the retention of program graduates. There was rarely enough information about these factors in either the traditional or alternative route programs being discussed, however, to get a sense of the quality of the programs under discussion, let alone to draw broader conclusions about essential program components or teacher candidate characteristics.

Indeed, there is an inherent difficulty in much of the research literature in distinguishing the effect of the preparation programs themselves on teacher retention from the impact of the personal characteristics of the individuals who tend to choose one kind of program or another. The relative intellectual ability, idealism or maturity of the candidates in different programs may be important factors accounting for their propensity to stay in teaching that is quite apart from the nature of the programs themselves.

The research discussed for this report also provides **limited evidence** that, while not universally the case, alternative route programs can be successful in recruiting into teaching a constituency that is more diverse in terms of age and ethnicity than the profession as a whole. Once again, the literature was too thin and the basis of comparison between alternative and traditional programs too tenuous to draw more confident or significant conclusions.

For a more substantive discussion of the research into the features of effective traditional and alternative route teacher preparation programs, the reader is encouraged to read ECS' earlier report, *Eight Questions on Teacher Preparation: What Does the Research Say?*

➢ ***With regard to raising teacher preparation program entrance requirements***

The literature reviewed for this report must be judged to be **inconclusive** regarding the impact of more stringent entrance requirements for teacher preparation programs. In part, this is because the literature that focused specifically on entrance requirements was scarce. Indeed, the studies reviewed here include several that discussed state teacher certification

examinations instead, on the assumption that there are similar factors at play. The weakness of the evidence is also a result of the fact that the studies confronted a number of unknowns or had to rely on uncertain *hypotheses* and assumptions. Several, but not all, of the studies suggested that toughening program entrance requirements might adversely impact the percentage of minorities who enter the profession.

SUMMARY OF STUDIES

➢ ***With regard to alternative vs. traditional route preparation programs***

Nine studies, which met the criteria of acceptability for this report, addressed this issue:

1. **Andrew and Schwab (1995)** was a *comparative descriptive study* of 1390 teachers who graduated between 1985-90 from programs in an 11-university nationwide consortium. The study found that 90% of the graduates of extended five-year programs had entered teaching as of 1990 compared to 80% of the graduates of four-year programs. Similarly, 87% of extended program graduates were still teaching compared to 78% of four-year program graduates. Graduates of extended programs also were more likely than four-year program graduates to say they intended to be still teaching in five years. The study did not adequately describe the data, however. Among other things, it is not clear how long the various program graduates had been teaching. If, for example, there were more recent graduates of five-year programs than of four-year programs, one would expect the retention rates of the five-year graduates to be higher for that reason alone.

2. **Applegate and Shaklee (1988)** was a *simple descriptive study* based on data on 56 students in what was called an Alternative Teacher Education Program at Kent State University. The program was not an alternative program in the usual sense, however, of placing participants in the classroom as full-time teachers after a brief preservice component. The program specifically sought to enroll students of high academic ability and involved a fairly extensive recruitment and screening process. It radically altered the traditional teacher preparation curriculum by providing more flexibility in courses, inquiry-oriented seminars and field experiences over two or more years under the guidance of mentor teachers. The study found the program retention rate for the alternative program was 76%, compared with a 46% retention rate in the university's traditional program. The study concluded that several features of the program accounted for the higher retention rate, including the mentorship experience, the seminars and the closeness of the small program cohort (25-30 students per year). The study did not address the possible impact of candidate self-selection.

3,4. **Clewell and Villegas (2001)** was a *comparative descriptive study* that looked at data on 1,933 participants and graduates from 40 different Wallace-Reader's Digest-funded Pathways to Teaching Careers preparation programs who were surveyed between 1995 and 2000.

Villegas and Clewell (1998), also a *comparative descriptive study* of the same programs, surveyed 1,763 program participants between 1995 and 2000. One set of programs served emergency-certified teachers and the other served Peace Corps veterans. Most, though not all, of these programs were "alternative route" programs that placed participants as full-time teachers in classrooms very early in the program instead of upon completion. The study found that programs for emergency-certified teachers had an overwhelming majority of participants who were minorities, while the Peace Corps program had very few minority participants. For both sets of programs, participants were carefully screened and evaluated and given at least several weeks' intensive preservice training. Then during their full-time assignment to the classroom, participants were provided with ongoing supervision, mentoring, education coursework, counseling, peer support and family support (such as child care). Support for participants continued, in most cases, for a year after their graduation from the program. Eighty-five percent of the Peace Corps teachers completed the program, compared to 75% of the emergency-certified teachers. The study also looked at the retention rates for program graduates. It found that 78% of Peace Corps program participants taught for at least three years after graduation, which exceeded the national average of 71%. Approximately 12% of participants subsequently left teaching, however. About 81% of the emergency-certified participants taught for at least three years after graduation from the program, with roughly 5% subsequently leaving the profession. These findings, however, are based upon a 63% survey return rate, which means it is possible the overall retention rate for the programs is lower than reported.

5. **Davis, Resta and Higdon (2001)** was a *simple descriptive study* using data from a survey administered to three cohorts of program graduates (72 graduates in all) of the Teacher Fellows Program in Texas. The program offered a 15-month master's degree for newly certified teachers and includes intensive summer work, induction and mentoring during the first year of teaching and additional coursework throughout the 15 months of the program. Teacher Fellows were contracted to work in a school district, with their salary paid for as a $14,000 fellowship by the university, while the district contributed master teachers to serve as Faculty Exchange Teachers who mentored the Teacher Fellows and served as instructors for the university. The study found that all 39 members of the 1998-99 and 1999-2000 Teacher Fellow cohorts were teaching as of the 2000-01 school year and that 83% of the 1997-98 cohort members who responded to the survey were still teaching. These findings may suffer from *selection bias*.

6. **Kirby, Darling-Hammond and Hudson (1989)** was a *simple descriptive study* that involved a 1987 survey of 481 participants and graduates of nine nontraditional teacher education programs throughout the United States that were preparing people to become mathematics and science teachers. These included programs for mid-career people, for recent

bachelor's degree recipients who lacked certification and coursework in teaching, and for currently certified teachers who wanted to become certified in another field. The programs varied in length from 16 weeks to two to three years, and two were alternative route programs that placed teachers full-time in classrooms after minimal preservice work. The study found that recruits from nontraditional programs appeared to enter and remain in teaching at similar, or slightly higher rates than other college graduates prepared for teaching. Excluding former teachers, 86% of nontraditional program graduates entered teaching, and 75% percent were still teaching within two years of program completion. In comparison, the 1985 Recent College Graduates Survey found that 60% of bachelor's degree recipients nationwide who were newly qualified to teach in 1983-84 were teaching. When asked about their plans to remain in teaching, 70% of those surveyed said they planned to stay in teaching "for a while," while roughly half said they planned to make teaching a lifelong career. These percentages were roughly comparable to those for teachers in general. Demographically, the researchers found the nontraditional programs recruited higher proportions of older and female candidates and higher proportions of minority candidates than the national average. Those who were career changers were drawn largely from relatively low-paying positions, even if they came from a mathematics or science-related field.

7. **Natriello and Zumwalt (1993)** was a *comparative descriptive study* of 129 participants of New Jersey's Provisional Teacher Program who began teaching in 1987 and 187 individuals who graduated that same year from the state's traditional college-based teacher education programs. Follow-up surveys were administered to study participants in 1988 and 1989, at the end of their first and second years of teaching. The Provisional Teacher Program was an alternative preparation route that placed program participants in classrooms as full-time teachers before completing their coursework and obtaining teaching certification. The study found that alternate route teachers were more likely to be drawn from an urban background and have a facility for foreign language. Demographically, 88% of the traditionally prepared teachers were Anglo, compared to 69% of the alternatively prepared teachers. Alternatively prepared teachers also expressed a greater preference for teaching disadvantaged students and in urban districts. With respect to retention, the study found that alternatively prepared elementary school teachers were more likely to remain in teaching than traditionally prepared teachers, but that for other areas such as mathematics the reverse was true.

8. **Raymond, Fletcher and Luque (2001)** was a *regression analysis* that compared 8,500 beginning and veteran teachers in the Houston public schools with 117 Teach for America (TFA) graduates who participated in the Houston Alternative Certification Program and were hired to teach between 1996 and 2000. The study found that TFA graduates were more likely than other new teachers to remain teaching in the district for at least

three years and that TFA graduates also included a smaller percentage of minority members.

9. **Stoddart (1990)** was a *simple descriptive study* of the Los Angeles Unified School District Intern Program that recruited 1,100 teachers over a six-year period specifically to teach in hard-to-staff urban schools. The study found the alternatively prepared teachers had academic credentials comparable to the general population of teacher education graduates, and there was a much greater percentage of males and minorities in the alternative route group. While almost 50% of the alternatively prepared teachers left the district (but not necessarily the teaching profession) over the six-year period, the 18% attrition rate in the first three years was considerably lower than the national average.

➢ ***With regard to raising teacher preparation program entrance requirements***

Five studies, which met the criteria of acceptability for this report, addressed this issue.

Four studies provided evidence that preservice policies that raised requirements for entry into teaching might discourage or prevent minority students from teaching. One study (Hanushek and Pace, 1995) suggested that minorities might not be adversely affected by stricter entry requirements.

1. **Case et al. (1988)** involved both a *simple descriptive study* and a *regression analysis* of 1986 survey data on 73 member institutions of the Association of Colleges and Schools of Education in State Universities and Land Grant Colleges and Affiliated Private Universities. Although the study had difficulty obtaining accurate data on minority enrollment trends, its findings indicated university officials had mixed views about the obstacles that college admissions criteria posed to the entry of minority students into teacher education. Thirty-eight percent of the institutions surveyed viewed the admissions criteria at their own colleges as hindering minority acceptance into the college, while the same percentage said their admission criteria were not a significant problem. The study also found the institutions surveyed identified entry into student teaching as an important point of attrition for minority students. In general, the enrollment of African American students at the institutions surveyed was declining. The institutions employed a number of recruitment strategies aimed at minority students, as well as a variety of retention strategies. The regression analysis indicated support services (such as tutoring, advising, remedial programs and test-taking workshops) were important aids to the retention of minority students, as well as "ethnic opportunities" such as seminars and special courses. The strongest factor identified in the retention of minority students was the number of an institution's minority professional staff.

2. **Dometrius and Sigelman (1988)** was a *simple descriptive study* that employed a mathematic model to analyze data on 169,608 public school teachers in Texas in 1982 that was obtained from Equal Employment Opportunity Commission surveys of public school teachers in 1978, 1979, 1980 and 1982. The study investigated the hypothetical projected effects of a new testing regime implemented in Texas on the diversity of the teacher workforce in that state from 1987-96. Assuming an attrition rate of 46% for African Americans, an optimistic entry rate of 6.6% and an annual system growth of 2%, the share of African American teachers in the Texas workforce under a no-testing regime was predicted to be 11.4% in 1996. Under the testing-regime scenario, however, the share of African American teachers in 1996 would fall to 8.8%. This was due mainly to the fact that minorities had lower pass rates than whites on teacher credentialing tests. These results hinged on the assumption that entry and pass rates for different groups would remain constant into the future, however.

3. **Gitomer, Latham and Ziomek (1999)** was a *comparative descriptive study* using over 360,000 records on individuals who took the SAT or ACT college entrance examinations from 1977-95 and also took the Praxis I or Praxis II tests. The study found that, of the 88,567 people who took the Praxis I, white candidates passed at the highest rate (87%), while 77% of Hispanic and 55% of African American candidates passed. Of the 272,064 teacher candidates taking the Praxis II test for licensure during the same period, white candidates again passed at the highest rate (92%), while 68% of Hispanic and 65% of African American candidates passed. The researchers noted that the teacher candidate pool was overwhelmingly white even before testing (85%), so the likely effect of testing was to increase the proportion of white teachers even further. The study also found that candidates who passed the Praxis I tended to have higher SAT and ACT scores on their college admissions tests than those who failed the test. It also found that if a higher cut-off score on the Praxis I were required for passing the test, the ACT and SAT scores of those who passed would be higher, but the percentage of candidates who passed and would be admitted to teacher preparation programs would be greatly reduced, especially among minority candidates. Significance tests for differences in proportions were not performed in this study, however.

4. **Hanushek and Pace (1995)** employed a *simple descriptive study* and a *regression analysis* of data on 1,325 high school seniors of the class of 1980 who were followed through 1986 in the High School and Beyond survey. The study found that state certification requirements appeared to inhibit supply. Having a state certification exam, such as the National Teachers Examination (NTE), lowered the rate of teacher preparation by 4%, other things being equal. This was not a trivial effect considering the mean probability of entering a teacher preparation program was 12%. In addition, the study found that increasing teacher preparation course requirements by 10 credits decreased supply by 1.2%. The analysis did not

find that certification requirements had a disproportionate effect on minorities. Hanushek and Pace acknowledged that a decrease in supply as a result of raising standards was not, per se, a negative outcome if those filtered out would have been less-effective teachers.

5. **Murnane and Schwinden (1989)** was a *regression analysis* of data on 47,403 individuals (both white and African American) who became new teachers in North Carolina between 1975 and 1985. The study found the net effect of reinstating the NTE certification requirement in North Carolina (NTE was not required between 1975-77) appeared to have had a negative effect on the percentage of schoolteachers who were African American.

What It Means for Policy

Although the research evidence is limited, the studies reviewed for this report provide support for efforts to develop high-quality alternative route teacher preparation programs. Not only do such programs have the potential for turning out teachers who are as committed to the profession as traditionally prepared teachers, but they also can be effective vehicles for increasing the participation of minorities in teaching. How such programs should be configured to be successful, however, is not clear from the literature included here. And it may well be it is less important whether a teacher preparation program be "traditional" or "alternative" than it have specific program features that account for its success or its ability to attract and retain minority candidates.

As far as making entrance requirements for teacher preparation programs more stringent, the evidence is too thin to offer any real guidance for policy. The possibility that raising admission standards may have the adverse impact on teacher supply that many people fear – especially on the percentage of minorities in the profession – must be taken into account when considering such a move. In the absence of solid research, educators and policymakers might consider the anecdotal evidence from the experience of institutions and states that have attempted to strengthen admission requirements to teacher preparation programs.

Supporting Resources

Allen, M. (2003). *Eight Question on Teacher Preparation: What Does the Research Say?* Denver, CO: Education Commission of the States.

Darling-Hammond, L. (1996). *What Matters Most: Teaching for America's Future*. Washington, DC: National Commission on Teaching and America's Future.

Question 7:

What impact do induction and mentoring programs have on teacher retention?

RELATED QUESTION:

What are the characteristics of effective induction and mentoring programs?

Quick Answer

The research reviewed for this report provides **limited evidence** that induction and mentoring can increase teacher retention. The diversity among the induction and mentoring programs discussed in the literature, however, and the difficulty of distinguishing between the specific effects of induction and mentoring and those that might be attributed to other factors means the literature is **inconclusive** on the question of what precisely makes such programs successful. Thus, those who are considering implementing such programs will have to rely on the consensus of expert opinion.

Although the literature reviewed for this report does not provide enthusiastic research-based support for this strategy, it does indicate that induction and mentoring may indeed be worthwhile. It is important to recognize, however, that the impact of induction and mentoring programs on beginning teachers is contextual and is likely to be a function of the nature of their preparation program and of the school and district in which they are working. In other words, induction and mentoring may be of much greater benefit, and thus be much more cost-effective, for some populations of beginning teachers than for others. Clearly, a good deal of additional research is needed to provide more definitive guidance for educators and policymakers. In the meantime, they must rely on the consensus of experts.

Significance of the Question

For a number of years now, many policymakers and educators have advocated induction and mentoring programs as a critical ingredient in the development of beginning teachers and an important bulwark against teacher attrition. Induction can be defined as the process of orienting beginning teachers into the teaching profession. It is intended to be a process through which new teachers are acquainted more deeply with the values and responsibilities associated with teaching and with the policies and culture of the specific school and district in which they are working. Induction frequently includes peer-group support, meetings and informal classes that help new teachers more successfully process and learn from their teaching experiences. An induction program may include a mentoring component.

Mentoring can be defined as a relationship in which a veteran teacher provides support and coaching to one or more novice teachers. The relationship can be formal or informal and may involve meetings of varying frequency. Mentors may be specifically trained for their role or

remain untrained. A mentoring relationship may be part of an overall induction program, or it may exist in isolation from any other support component.

A number of states and school districts have developed mentoring or induction programs, sometimes with both components integrated into one program and sometimes with either component alone. Some states and districts claim their induction and mentoring programs have substantially reduced the attrition of new teachers from the profession and greatly increased the five-year retention rate. It is these claims that have led to the strong support for mentoring and induction programs. One important question, however, is whether or not these claims are reliable. In a number of cases, states or districts have implemented induction and mentoring programs as one element in a series of reforms designed to improve the quality or conditions of teaching. It becomes difficult, then, to know whether the resulting increase in retention attributed to induction and mentoring are truly attributable to them, to other reforms or to a combination of factors.

Moreover, the specific features of induction and mentoring programs differ widely from state to state and district to district, making it very difficult to identify what components are most effective or what features are essential to program success. As noted previously, some programs include only one of the two strategies (induction or mentoring). And the specifics of the components vary greatly. Apart from differences in the frequency of meetings or the training of mentors, in some programs both mentors and inductees are granted release time to participate while in other programs this is not the case. In some programs mentors are compensated for their efforts, while in other programs they are not, and the amount of compensation differs significantly from program to program.

Policymakers and educators seeking to adopt effective induction and mentoring programs or to evaluate the effectiveness of induction and mentoring as a strategy thus have a difficult time obtaining the reliable information they need to make an informed decision. The various efforts that have been made to date to define the essential components of induction and mentoring programs represent the consensus of educators, however, and are not generally grounded in solid empirical research. Moreover, they do not address the question whether all new teachers benefit equally from induction and mentoring or whether the benefits are a function of the particular competencies and attitudes beginning teachers bring to the table. This question is particularly important to policymakers, who would like to assess the cost effectiveness of mentoring and induction programs and ensure maximum benefits while minimizing costs.

While it is hoped that induction and mentoring programs would not only increase the rate of teacher retention but also contribute to more effective teaching, the connection between such strategies and improved teaching is both tenuous and virtually absent from the more rigorous research literature.

What constitutes “quality” induction and mentoring, just how much they contribute to teacher retention, and what impact they have on teachers with different abilities and different kinds of preparation are precisely the questions hoped to be answered in this research.

What the Research Says

DISCUSSION

Unlike the literature reviewed in connection with the other questions in this report, the literature reviewed on the subject of induction and mentoring includes not only empirical studies identified by the reviewers at RAND but also a *research review* added by this report's author. That review, *The Impact of Mentoring on Teacher Retention: What the Research Says* (Ingersoll and Kralik, 2004), specifically was commissioned by ECS in an attempt to obtain a very rigorous assessment of the contribution of induction and mentoring programs alone – separate from any other measures or factors that might contribute to teacher retention in a particular school or district.

The report made it clear that while there were some 150 published *empirical research* studies of induction and mentoring that met minimum standards of quality, almost none of them employed any sort of *methodology* that compared the group of teachers who participated in induction and mentoring with a similar *control group* of teachers who did not. Thus, it would have been impossible to draw any confident conclusions about the efficacy of induction and mentoring from the available literature. In the end, Ingersoll and Kralik identified only 12 studies that used a control group and were otherwise acceptable. Only three of those 12, however, were *peer-reviewed* studies that would have met the standards set by the RAND reviewers.

Nevertheless, the author of this report believes the Ingersoll and Kralik study is an extremely important contribution to the research literature and should be included in the research discussed for the report. Indeed, another recent review (2005, unpublished) of the literature on induction and mentoring by Michael Strong, of the New Teacher Center at the University of California at Santa Cruz, confirms that the Ingersoll and Kralik study is one of the most important contributions to the field.

Based upon Ingersoll and Kralik (2004) and the other two studies included in this review, the research literature provides **limited support** for the conclusion that induction and mentoring programs can contribute to greater teacher retention. One of the caveats here, however, is the diversity among the induction and mentoring programs discussed in the literature and the difficulty of distinguishing between the specific effects of induction and mentoring and those that might be attributed to other factors. The literature, therefore, is **inconclusive** on the question of what precisely makes such programs successful. Thus, those who are considering implementing such programs will have to rely on the consensus of expert opinion.

SUMMARY OF STUDIES

Two studies, which met the criteria of acceptability for this report, addressed this issue:

1. **Ingersoll and Alsalam (1997)** was a *regression analysis* of data on 53,347 teachers in 11,589 schools who participated in the 1990-91 Schools and Staffing Survey. Among the various factors of the profession associated with teachers' satisfaction with their decision to go into

teaching, the perceived effectiveness of support for new teachers was associated most strongly.

2. **Odell and Ferraro (1992)** was a *simple descriptive study* involving a follow-up survey of 141 K-5 teachers in New Mexico who had participated in a mentoring program four years earlier. The study found that participants in the program had a lower annual attrition rate (4%) than the statewide average for beginning teachers (over 9% per year). The study did not use a true matched *control group*, however, and the statewide average may not be an appropriate comparison group given that a great deal of within-state variation exists at the school and district level.

Additional information was obtained through the research review by Ingersoll and Kralick, included below:

1. **Ingsersoll and Kralik (2004)** was a *research review* of 12 empirical research studies on induction and mentoring. The synthesis found that studies reviewed provided some empirical support for the claim that mentoring programs can have a positive impact on teachers and their retention. It cautioned, however, this impact may be minimal unless the programs either include or are supplemented by other important elements, such as peer-support networks and common planning time.

What It Means for Policy

The development of induction and mentoring programs to increase the effectiveness and retention of new teachers is a strategy that has gained increasing popularity among educators and policymakers in the last several years. Although the literature reviewed for this report does not provide enthusiastic research-based support for this strategy, it does indicate that induction and mentoring may indeed be worthwhile.

While the tentativeness of the research support may be disappointing to advocates of induction and mentoring programs and to those who have invested significant resources in their development and implementation, that caution is understandable given the high evidentiary standards of good research. Moreover, the lack of a strong research base and the cautiousness of research findings reflect the fact that a number of important considerations arise in the discussion of induction and mentoring programs:

1. Not all induction and mentoring programs are alike, and the research is not sufficiently robust to indicate confidently what features are critical to program success. In fact, depending upon the specific district context, different features may be important.
2. It is quite likely that the impact of induction and mentoring programs on beginning teachers also is contextual. That is, not all new teachers may benefit equally. Teachers who were prepared in exemplary teacher education programs may benefit less from induction and mentoring than teachers whose preparation programs were weak. Similarly, teachers who came through an alternative route preparation program that

already relied on a strong induction and mentoring component may derive much less benefit from another round of induction and mentoring than teachers who entered teaching without having had induction and mentoring. And teachers who begin their careers in affluent, high-achieving schools may be less reliant on induction and mentoring for success than beginning teachers who are assigned to high-poverty, low-achieving schools.

3. Induction and mentoring programs are frequently implemented together with curricular modifications, compensation reforms, leadership transitions and other efforts or new conditions that also might have a significant impact on teacher retention. This makes it difficult to know whether any positive impacts are the result of induction and mentoring per se or the result of other reforms. Indeed, the research suggests the impact of induction and mentoring programs may be compromised unless they include or are supplemented by other strategies.

Another clear implication of the lack of strong research on induction and mentoring is the need for more and more rigorous research. Ingersoll and Kralik note 10 important policy questions about induction and mentoring that cannot be answered satisfactorily without a more robust research base. While these are discussed in detail in the Ingersoll and Kralik report, they bear summarizing here:

- What teachers are helped the most by induction and mentoring programs and under what circumstances?
- Which components or sets of components are most helpful in addressing the various weaknesses among new teachers with differing backgrounds?
- Which components are best for which kinds of outcomes (e.g., teacher retention versus teacher effectiveness)?
- Do the selection, preparation, training, assignment and compensation of mentors make a difference?
- How much contact time is necessary between mentor and mentee?
- How long do mentoring programs need to be?
- Does mentoring matter for student growth and achievement, in addition to teacher retention?

Supporting Resources

Ingersoll, R. and Kralik, J.M. (2004). *The Impact of Mentoring on Teacher Retention: What the Research Says*. Denver, CO: Education Commission of the States.

Strong, M. (2005). *Induction, Mentoring and Teacher Retention: A Summary of the Research.* Santa Cruz, CA: New Teacher Center (unpublished).

Question 8:

What is the efficacy of particular recruitment strategies and policies in bringing new teachers into the profession, including specifically targeted populations?

RELATED QUESTIONS:

Are programs that seek to recruit middle school, high school, or community college students into teaching effective in increasing the number of students who enter teaching or the subsequent success of these teachers and their rate of retention in the profession? How effective are programs that offer scholarships or forgivable loans to college students who commit to going into teaching? What kinds of recruitment policies and programs are particularly successful in recruiting minority teachers?

Quick Answer

Except for teacher preparation-related policies discussed in Question 6, there were simply no adequate studies available on the great majority of the specific recruitment strategies that have been employed by states and districts. Thus, the research provides no answers to any of the questions asked above. This is unfortunate given the importance of finding effective strategies for recruiting well-qualified individuals into the teaching profession and the significant resources that states and districts currently spend on their recruitment efforts.

This situation clearly calls for a recommendation to support and undertake more research on and rigorous evaluations of early recruitment efforts, loan forgiveness programs and the many other specific kinds of recruitment strategies that have been employed. Such research should include assessments of impact and enable policymakers and educators to determine, with confidence, (a) whether fewer of the target population would have gone into teaching had the programs and strategies in question not been in place and (b) whether any other specific program goals – such as recruitment into underserved schools or a minimum length of stay in the teaching profession – have been met.

On the other hand, given the relatively small cost of a few of these strategies and the significant expense and complexity involved in conducting an adequate impact study, it may be advisable to pursue these less-expensive programs, even in the absence of such a solid study, if there is any evidence, at all, to indicate their impact may be positive and no evidence to suggest it is likely to be negative.

Significance of the Question

In addition to salary and other financial incentives and to quick entry into the profession through alternative route teacher preparation programs, states and districts across the country have implemented various other kinds of policies and programs to recruit new teachers into the

profession. Among the most popular of these are "early recruitment programs" aimed at pre-college youth and "grow-your-own" strategies that seek to recruit people into teaching who live in small rural communities or urban neighborhoods with the expectation they will teach in the communities or neighborhoods where they live. Sometimes such strategies are aimed specifically at minority populations. An important question, therefore, is whether these various programs are effective and are a good public policy investment.

Obviously, efforts that target specific populations – African Americans, for example – are likely to be responsible for recruiting more individuals from those populations into teaching than otherwise would join the profession. From a policy standpoint, however, the issue is more complex than this, and recruitment strategies must provide responses to a number of additional questions:

1. What percentage of the individuals recruited in such targeted programs ends up going into teaching?
2. What percentage of those who do enter teaching would not have been likely to go into the field had it not been for the programs?
3. What percentage of individuals in targeted programs teaches in underserved schools, and how long do they remain there? (This is especially important if recruitment into such schools is a goal of the program.)
4. Do the individuals recruited through such programs remain in teaching for a significant period of time, or does a large percentage leave teaching to pursue other occupations?
5. How do the individuals targeted through such programs compare with other teachers in terms of their qualifications and teaching success?

Clearly, programs and policies generally should be specifically designed so they are likely to provide favorable answers to these and similar questions, although there are exceptional programs, such as Teach for America, which seek to recruit participants into teaching for only two to three years. Most programs, however, seek to recruit candidates into teaching for a longer term and would be considered failures if participants taught for so short a period of time. In any case, without answers to such questions, the real efficacy of the programs and policies employed cannot be determined.

The importance of being able to answer these questions is quite clear in the case of scholarship and loan-forgiveness programs. How is it known if they serve their intended goals? Do scholarships bring into teaching people who otherwise would not have taught? Given some evidence that the more able students tend to have shorter teaching careers (see Question 2), is offering scholarships based on intellectual ability ultimately an effective policy for teacher recruitment? Do policies that forgive student loans in exchange for teachers' service in high-needs fields or schools accomplish their intended objective? Do teachers fulfill their contract to teach in such schools, or do they often find more desirable, higher-paying jobs in teaching and other fields that may more than make up for the loan amount they have to repay?

Other questions exist for early recruitment efforts. Beyond anecdotal stories from young teachers who may claim their experience in the "teacher cadet corps" was the key factor in their decision to enter teaching, is it really known whether such programs recruit significant numbers of students into teaching who would not have gone into teaching, anyway? Are such programs more

likely to be effective with older students, such as community college students looking to make a career decision, rather than with younger students whose career choices tend be to much more uncertain and open?

What the Research Says

DISCUSSION

It was the original intention of this report to discuss the empirical evidence for the success or failure of a wide range of programs and policies that states and districts have employed in their efforts to recruit teachers. As it turned out, however, except for teacher preparation-related policies discussed in Question 6, there were simply no adequate studies available of the great majority of recruitment strategies that have been employed. The few studies available tended to have serious methodological flaws that rendered them useless as objective assessments of program success.

SUMMARY OF STUDIES

There were no studies found that met the criteria of acceptability for this report.

What It Means for Policy

Clearly, the absence of any adequate research means this report has no evidence to contribute to the policy discussion. The one confident research-related recommendation that can be made, then, is to encourage policymakers and program directors to undertake more solid research on and evaluations of the programs they support and administer. Such research must be thorough enough to provide answers to the kinds of questions suggested here as important to address.

While such research would be ideal, however, there is also a cost-benefit consideration involved. Good research and program evaluation, especially studies that provide reliable assessments of impact, can be expensive. And for some strategies, it would be extremely challenging to set up the kinds of studies necessary to provide the solid evidence ideally desired. Early recruitment programs, for example, face so many factors beyond the control of the programs that it would require an extremely large sample to determine whether the programs themselves had any significant impact. The number of participants in any individual recruitment program, however, tends to be relatively small.

Of course, many of the recruitment strategies states and districts employ are also costly and ought to have solid assessments of impact to justify their development or continuation. Other strategies, however – in particular, early recruitment programs or efforts to increase outreach to other target populations – often are not expensive and may be worth pursuing if there is any evidence, at all, to indicate their impact may be positive and no evidence to suggest it is likely to be negative.

IMPROVING THE RESEARCH ON TEACHER RECRUITMENT AND RETENTION

It is clear the research on teacher recruitment and retention is thin in many areas. Far too few questions permit being answered with the kind of confidence that would provide secure guidance for policy. To some extent, this may be a result of the difficulty of gaining access to studies on various recruitment and retention-related programs. Much more, however, it reflects the paucity of solid research on these questions.

Guarino et al. identified a number of implications from their review of the literature. What follows includes their suggestions for improving the research on teacher recruitment and retention, some of the suggestions and implications drawn from Ingersoll and Kralik, and some additional comments provided by the author of this ECS report:

1. **The data used by researchers must be more recent.**

   Most of the research available uses data from the 1970s and 1980s. Especially since so many of the considerations related to teacher recruitment and retention are economic and thus subject to the vicissitudes of the more general labor and employment market, research based upon economic conditions that existed even more than several years ago may have only limited relevance today. Guarino et al. note that the new Schools and Staffing Survey, which was conducted in the year 2000, is a welcome source of new data that undoubtedly will generate a number of new studies. The Schools and Staffing Survey, however, does not provide *longitudinal data* on individuals, which tracks them over a period of time and which, where available, provides important insights regarding longer-term trends and impacts.

2. **Better data on the movement of teachers through the entire career pipeline and from position to position, as well as data on teacher performance, need to be collected by the districts and states.**

   Recruitment and retention is all about the movement of teachers. Many researchers have found, however, it is very difficult to obtain accurate and detailed data about teacher movement. Much of the available data is based on teachers' survey responses, which are often unreliable and incomplete. Large national data-collection efforts, such as the Schools and Staffing Survey, are expensive and impractical to do on an annual basis. Moreover, as large as these databases are, they still are not large enough to permit generalizations about teachers in different subfields in different regions.

   Thus, Guarino et al. suggest individual states hold the greatest promise for providing the data necessary for the kinds of studies that are indicated. In particular, Guarino et al. call upon states to collect data from schools and districts annually and to ensure such data include detailed information about teacher education, experience, compensation, as well as information about teacher vacancies, turnover and recruitment efforts. Especially important, and often omitted, are (1) information about the movement of teachers in and out of districts,

and in and out of the education system; and (2) information about the quality and performance of individual teachers.

Unfortunately, data that tracks actual changes in teacher assignments from school to school, district to district or state to state is extremely difficult to find. Once teachers leave employment in a particular district or state, it is often impossible to determine whether they have left the profession or taken a new teaching position elsewhere. It is vital to track teachers' entire career paths to gain a full picture of teacher employment patterns and responses of teachers to various kinds of outreach, incentives and working conditions.

Echoing Guarino et al., the State Higher Education Executive Officers (SHEEO) have published a report that explores in detail the kinds of data states need to collect to track teacher movement and develop a more complete picture of the nature of their teacher workforce, in general. The 2003 report, *Data Systems To Enhance Teacher Quality*, offers five recommendations:

1. States should develop comprehensive data systems that provide information on teacher supply, teacher quality and teacher mobility. This includes information about teacher preparation, licensure and employment history, and the achievement of teachers' students.
2. Key state players must work together to develop the kind of integrated system necessary. This includes policymakers, higher education institutions, local districts, state employment agencies and retirement systems.
3. States must commit the financial and human resources necessary to develop and maintain such a system.
4. States must develop a system that involves unique identifying numbers for each teacher to provide accurate longitudinal data.
5. States should make the data collected available for analysis (with appropriate safeguards to ensure confidentiality) and should share the results of the analysis with policymakers, education leaders and the general public.

Although the movement of teachers from one state to another is still a relatively rare phenomenon, it is likely to become more common as our society grows increasingly more mobile. Thus, for administrative as well as research purposes, it will become increasingly important to be able to track the movement of teachers between states, tracking that requires much more cooperation among states than is currently the norm.

3. **Rigorous evaluation research of specific policies must become a greater priority.**

Although the education literature includes many articles that discuss particular education policies, it contains few *empirical studies* of those policies. To remedy this and obtain reliable data on the effect of specific policy interventions, policymakers at all levels – school, district, state and federal – must make it a priority to provide adequate resources to undertake rigorous evaluations of the policies they develop and implement. Without such rigorous evaluation, it is impossible to know the true impact and lessons of policies that have been enacted.

4. **More rigorous research in general must be conducted in the area of teacher recruitment and retention, especially research that employs control or comparison groups.**

   While it may be extremely difficult to employ *control groups* in large-scale studies of the patterns of teacher employment or the effects of various teacher compensation policies, it is certainly reasonable to conduct studies of induction and mentoring or of programs designed to recruit or retain specific populations of teachers that use a comparison group and a treatment group. In some cases, it should even be possible to set up *experimental studies* or *quasi-experimental studies* to determine with much greater accuracy and confidence whether a particular strategy designed to enhance teacher recruitment or retention truly has an impact or whether any differences in the behavior or outcomes of the two groups is due to other considerations.

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GLOSSARY

[Note: The bulk of this glossary was written in 2003 by Patricia A. Lauer, a principal researcher at Mid-continent Research for Education and Learning.]

bias – any effect that is introduced into an experiment or research study that may influence the outcome based on anything other than the variables involved (e.g. expectations, the use of inappropriate statistics)

aggregated data – data for which individual scores on a measure have been combined into a single group summary score

> *Example:*
> *In education research, it is common to aggregate individual student scores on an achievement test into a mean score for each school. Researchers then use the aggregate school achievement score for data analyses. Aggregating data reduces the sample size (e.g., from 5,000 students to 10 schools.) Aggregating data also obscures differences among individual scores.*

case study – a data-collection method in which a single person, entity or phenomenon is studied in depth over a sustained period of time and through a variety of data

> *Example:*
> *A researcher conducts a yearlong case study of a school district that was awarded a grant to improve teacher quality. The researcher documents the processes used to implement the grant, interviews teachers and administrators, observes staff development and measures student achievement before and after the grant was awarded.*

comparative descriptive study – a research study in which data are collected to describe and compare two or more groups of participants or entities

> *Example:*
> *A researcher identifies high-poverty schools in the state that have either high or low student achievement. The researcher describes the alignment or match between each school's curriculum and state standard, and compares the high- versus low-achieving schools to determine whether the degree of alignment is different.*

control – the strategy used in scientific research to regulate the effects of variables that are not intended to influence the results or conclusions

> *Example:*
> *A researcher conducts a study of two different teacher preparation courses on how to teach mathematics. The researcher controls for differences among preservice students by randomly assigning the students to one of the two courses. The researcher controls for differences among course instructors by having a single instructor teach both courses.*

control group – the group that does not receive the experimental treatment and is therefore used as a reference or comparison group for effects of the experimental treatment.

correlational research/study – nonexperimental research in which data are collected to determine the relationship between them

> *Example:*
> *In School District X, a researcher collects data on beginning teachers' scores on the state licensing test (variable 1) and data on the achievement gain s of each teacher's students (variable 2). The researcher then uses correlational statistics to measure the association between the two variables.*

dependent variable – the variable measured in a study – the "outcome." In experimental research, the dependent variable is affected by the independent variable. In correlational research, the dependent variable is associated with one or more other variables

> *Examples:*
> *In an experimental research study, a researcher randomly assigns teachers in a large elementary school to receive one of three types of professional development: a class on instructional strategies, a training program on how to increase student motivation or a teacher discussion group. The researcher measures the differences in achievement gains among the students of the three teachers. The dependent variable is student achievement gains.*
>
> *For a correlational research study, a researcher collects data on beginning teachers' scores on the state licensing test and data on the achievement gains of each teacher's students (variable 2). The researcher then uses the association between the two variables to estimate student achievement gains. The dependent variable is student achievement gains.*

descriptive study – a research study that has the goal of describing what, how or why something is happening

discriminant analysis – a type of statistical analysis in which there is only one dependent variable but multiple independent variables

effect size – the degree to which a practice, program or policy has an effect based on research results, measured in units of standard deviation

> *Example:*
> *A researcher finds an effect size of d = .5 for the effect of an after-school tutoring program on reading achievement. This means (provided that the research study is valid) that the average student who participates in the tutoring program will achieve one-half standard deviation above the average student who does not participate. If the standard deviation is eight points, then the effect size translates into four additional points, which will increase a student's ranking on the test.*

empirical research/empirical studies – research that seeks systematic information about something that can be observed in the real world or in a laboratory

ethnography – a data-collection method in which information is collected about an intact group of individuals in their natural setting, primarily through observations

Example:
A researcher studies the challenges that face three beginning teachers at one elementary school. The researcher observes and documents the teachers in their classrooms, on the playground, in the teachers' lounge, at staff meetings, at parent conferences and in staff development sessions.

experimental study (experimental research) – a research study that has the goal of determining whether something causes an effect

external validity – the degree to which results from a study can be generalized to other participants, settings, treatments and measures

hypothesis(es) – a statement about the researcher's expectations concerning the results of a study

Examples:
A new standards-based mathematics curriculum will benefit elementary students at all grade levels.

A new standards-based mathematics curriculum will have different effects on elementary students depending on grade level.

independent variable – in experimental research, the variable that the researcher varies or manipulates to determine whether it has an effect on the dependent variable

Example:
As part of an experiment, a researcher randomly assigns teachers in a large elementary school to receive one of three types of professional development: a class on instructional strategies, a training program on how to increase student motivation or a teacher discussion group. The researcher measures the differences in achievement gains among the students of the three teachers. The independent variable is professional development, and it has three different values.

longitudinal data – data collected from the same participants at different points in time. The purpose is to make conclusions about individual change over time

Example:
A researcher studies the mathematics achievement of students who were taught a new standards-based mathematics curriculum when they were in 6th grade. The researcher compares their performances in mathematics achievement in grades 7, 8 and 9 to the performance of another group of students at each of those grade levels who were not taught the new curriculum in 6th grade. The purpose of the research is to determine whether change in mathematics performance over time is related to the type of 6th-grade mathematics curriculum.

meta-analysis – a comprehensive, systematic and quantitative review of past empirical research studies on a specific topic; most meta-analyses examine only quantitative studies; effect-size statistics are calculated to produce an overall conclusion about the various studies on the topic

Example:

A researcher conducts a meta-analysis of computer-assisted instruction in reading. The researcher examines 40 studies and calculates an overall effect size of d = .25, indicating a small positive effect of computer-assisted instruction on reading achievement.

methodology – the methods, procedures, rules, and postulates employed in accordance with a particular discipline

peer-reviewed – a research study that has been critiqued by other researchers prior to publication or presentation at a research conference

practical significance – the degree to which a practice, program or policy has enough of an effect to justify its adoption

proxy – a measure used to approximate the data sought when it is difficult to get a more precise measure due to constraints involving data collection or time

Example:
Passing rates on state licensing tests by teacher candidates are a proxy measure for the quality of teacher preparation delivered by teacher education institutions.

qualitative research – research in which the data are narrative descriptions or observations

Example:
A researcher observes how teachers instruct different reading curricula in two different schools. The researcher also interviews the teachers to understand their approaches to the different curricula and how approaches might be influenced by school characteristics.

quantitative data – data that are numbers and measurements

quantitative research – research in which the data are numbers and measurements

Example:
A researcher randomly assigns students to different reading curricula. At the end of the school year, the researcher examines the students' scores on a reading achievement test to determine whether the different curricula had different effects on reading.

quasi-experimental study – a research study in which (1) an independent variable is directly manipulated to measure its effects on a dependent variable and (2) participants are *not randomly assigned* to comparison groups

Example:
A researcher assigns 15 teacher preparation candidates who have senior seminar on Wednesdays to participate in eight weeks of student teaching. The researcher assigns 15 teacher preparation candidates who have senior seminar on Tuesdays to participate in 16 weeks of student teaching. After the candidates graduate, the researcher compares their scores on a performance-based teacher-licensing test. The amount of student teaching is the independent variable, and candidate performance on the teacher-licensing test is the dependent variable. The researcher does not randomly assign candidates to the comparison groups. As a result, differences between the groups on the

test could be due to the amount of student teaching or due to other characteristics of the teacher candidates.

regression analysis – a statistical technique for determining the association between a dependent variable and one or more independent variables and thereby being able to predict variation in dependent variable by knowing the other variables

Example:
In School District X, a researcher collects data on beginning teachers' scores on the state licensing test (variable 1), number of college courses in mathematics (variable 2), amount of time spent in school-based field experiences prior to certification (variable 3) and the achievement gains in mathematics by each teacher's students (dependent variable). The researcher uses regression statistics to measure the association between the three teacher variables and student achievement gains and to estimate student achievement gains based on the contribution of each of the teacher variables to that association.

replicate – to repeat a research study using the same method and similar participants. A successful replication obtains the same results as the original study

research design – a plan of what data to gather, from whom, how and when to collect the data, and how to analyze the data obtained; for valid results, the design must be appropriate to answer the question or hypothesis being studied

sample size – the number of participants (e.g., students) or entities (e.g., schools) in a study sample; large samples are preferred because, if randomly selected, they are more representative of the population than small samples

selection bias – systematic effects on the dependent variable that occur due to characteristics of the study participants

Example:
A researcher conducts a study on the influence of student teaching on teaching performance. The researcher assigns 20 teacher preparation candidates who attend college during the day to participate in 16 weeks of student teaching. The researcher assigns 20 candidates who are night students to have eight weeks of student teaching. Selection bias in this study is likely because the characteristics of day and night students, such as age and motivation, may be different. The results could be due to these differences instead of the amount of student teaching.

simple descriptive study – a research study in which data are collected to describe persons, organizations, settings or phenomena

Example:
A researcher surveys administrators of 10 alternative teacher preparation programs to describe characteristics of the different programs.

standard deviation – a measure of the variability of the scores in a distribution (i.e., a set of scores) equivalent to the average distance of the scores from the mean

Example:
Scores: 9, 10, 10, 12, 14

For the example set of five scores, the mean is 11, and the standard deviation is 2. The scores vary on average about two points from the mean.

statistical model/analysis – the type of statistics used whereby data are analyzed to determine the relationship between variables in an experimental or quasi-experimental study; the appropriate statistics allow for generalizations about a population based on a sample drawn from that population

statistical significance – a result that has 5% or less probability of occurring by chance; because it is unlikely that a statistically significant result has occurred by chance, the result is said to reflect non-chance factors in the study, such as the effects of a treatment

structural equation modeling (SEM) – a statistical method generally used for confirmatory rather than exploratory purposes, to determine the extent to which data on a set of variables are consistent with hypotheses about the association among the variables

synthesis (research synthesis) – a comprehensive and systematic literature review of past empirical research studies on a specific topic; research syntheses can be quantitative or qualitative; meta-analysis is the term used for a quantitative synthesis, and narrative review is the term used for a qualitative synthesis

validity – the extent to which a study or measure accurately reflects or assesses the specific concept or variable the researcher is attempting to measure

variable – a characteristic or quantity that can change and have different values

Example:
Variables studied in education include characteristics of students (e.g., achievement), teachers (e.g., certification), schools (e.g., curriculum), districts (e.g., leadership), teacher preparation programs (e.g., accreditation) and states (e.g., education funding).

APPENDIX A

CRITERIA USED BY GUARINO ET AL. FOR ACCEPTANCE OF STUDIES FOR REVIEW

In the Methodology section of their review, the RAND researchers provided an elaborate discussion of the criteria they employed for accepting or rejecting articles. What follows in this chapter is distilled from the RAND discussion.

The RAND literature review included all studies that met the following four general criteria:

1. Relevance
2. Scholarship
3. Empirical nature
4. Quality

A study was determined to be **relevant** if it illuminated issues related to the recruitment and retention of teachers in the United States. The researchers limited studies to those of teacher labor markets in the United States and to those published between 1980 and 2003. Due to limited time and resources, the researchers did not review the large body of research focusing exclusively on the recruitment and retention of special education and vocational education teachers.

A study was determined to be **scholarly** if it was published in peer-reviewed journals or by organizations with well-established peer-review processes, such as the National Center for Education Statistics, the Educational Testing Service, the Urban Institute and the RAND Corporation, among others. The researchers also included books, book chapters and monographs that offered empirical evidence and analysis. They excluded publications by any organizations that are not research institutions with a well-established peer-review process. The researchers also excluded working papers because (a) they are not peer reviewed, (b) it was not possible to systematically search for them, and (c) their findings are subject to change. Newspaper and magazine articles also were excluded.

A study was considered **empirical** if it offered evidence – quantitative or qualitative, or both – for conclusions, rather than simply opinion, theory or principles. The researchers excluded simple program descriptions that were not analytical or evaluative, as well as publications that offered only opinions, theory or principles without offering new or original evidence to support conclusions. Thus, they also excluded literature reviews and publications that only cited research performed by others.

A study was deemed to be of sufficiently strong **quality** if it met the generally accepted standards of rigor for quality in empirical research discussed in more detail below.

Although the preponderance of empirical studies the researchers found on the subject of teacher recruitment and retention were statistical in nature, they included both *quantitative* and *qualitative research* in their literature search and applied a similar baseline standard of rigor to

each type of research. Quantitative methods are the research tools of choice when the phenomena being studied are well-described by large quantities of numerical or categorical data. This is the case for issues of teacher recruitment and retention because they so heavily involve the realities of the labor market. Quantitative methods can yield findings that can be generalized to larger populations, and they also can tease out more general facts or trends from those embedded in particular contexts.

A qualitative approach generally yields useful information when a quantitative approach is not possible because the phenomena being studied are too few to permit a large sample size, too impressionistic or meaning-dependent to quantify readily, or too new or too little studies to allow researchers to formulate an appropriate set of hypotheses or analytic approach. A qualitative approach also may be useful in providing a context for the interpretation of phenomena of interest. Thus, qualitative research is often useful in hypothesis generation and essential when concepts cannot be reliably captured via quantitative methods.

In the end, quantitative and qualitative research are complementary. Qualitative research often precedes and serves as a foundation for quantitative research, as it provides insight into meaningful distinctions that can then be used to categorize, quantify and collect data on a large scale. Quantitative research is grounded in qualitative pieces of information that can be described and gathered in quantifiable units in sufficient quantity to permit the use of statistical tools. This means that a qualitative understanding of the phenomena being studied is needed before *quantitative data* can be gathered.

Elaboration of Quality Criteria

The researchers included a study in their review if its *research design* and analytic strategy were appropriate to the topic under study, its *methodology* was applied in a careful manner, its focus was relevant to the research questions posed in the ECS report, and its interpretation was well-supported.

Specific Quality Criteria for Quantitative Research

The researchers' assessment of the quality of a quantitative study involved four considerations:

1. The *sample* had to be adequate in size to support credible inferences; it had to reflect accurately the characteristics of the larger population that was sampled; it had to be selected randomly; it had to be complete and be adjusted, if necessary, to account for nonresponse of various groups in the larger population; and it had to draw on appropriate units of analysis: it is problematic, for example, if *aggregated data* (e.g., average state teacher salaries) are used to draw conclusions about smaller units of analysis (e.g., average teacher salaries in a specific district). Also, the researchers of the individual studies had to address any issues of sample incompleteness or attrition.
2. The *variables* used in a study had to be measured reliably and with a high degree of *validity*.

3. The *statistical models* used had to be efficient and free from significant *bias*, and they had to appropriately represent the phenomena under study. The researchers of the individual studies needed to demonstrate an awareness of the potential for any bias in their models and employ measures to attempt to correct for it.
4. The interpretation placed on the findings had to be warranted and be consistent with the results. While an unjustified interpretation did not automatically disqualify a study, it was an important consideration and was noted in any critique of the RAND study.

Specific Quality Criteria for Qualitative Research

The researchers' assessment of a qualitative study involved three considerations:

1. The *methodology* employed had to be appropriate to the research question. If the subject of investigation was the impact of particular program on teacher's attitudes about the teaching profession, for example, a *case study* or *ethnography* might well be the best approach to provide useful data.
2. The study offered sufficient evidence to support its conclusions.
3. The study provided an interpretation and analysis of the data that was of interest to other researchers in the field or led to the formulation of relevant hypotheses.

Search Strategy and Results

The RAND researchers conducted electronic database searches of Education Abstracts, Social Science Abstracts, Econlit, ERIC and JSTOR. They undertook table-of-contents searches on widely recognized journals, including the *American Educational Research Journal, Educational Evaluation and Policy Analysis,* the *Journal of Policy Analysis and Management,* the *Economics of Education Review,* and the *Journal of Education Finance.* And they searched the National Center for Education Statistics publications index, the Educational Testing Service publications index, the RAND report index, the Urban Institute report index, the American Institutes for Research report index and the book index of the University of California libraries.

Although peer review was an important criteria for selection, the fact that (a) the searches sometimes yielded inconsistent indications about whether a journal was peer reviewed or not and (b) the researchers also chose to study non-peer-reviewed publications of high enough quality and relevance to justify inclusion eventually led the researchers to re-run all searches without the peer-reviewed screen and then to assess the quality of the publications on a case-by-case basis.

In addition, the RAND researchers asked a number of scholars for their suggestions of relevant works to include in this study.

These searches yielded an initial total of 4,773 candidates for review. Of these, 2,989 were on topics insufficiently relevant to this project; 1,475 were either non-empirical in nature or located in journals not widely regarded as quality scholarly publications even though they might be peer

reviewed; and 213 were of interest, but were either reviews of other work, early publications superseded by later work that was included, not quite on target regarding the specific research questions or rejected under the quality criteria as described in the previous section. This left 91 items in the final RAND review. [One article was subsequently discovered to be non-empirical by the author of the ECS report.]

* **For additional insight into the methodological issues involved in the preceding discussion, see the sections titled "How Do I Know if the Research Is Trustworthy?" and "A Research Typology" (Appendix A) in *A Policymaker's Primer on Education Research*.**