

**Teacher Preparation Program Evaluation**  
**Based on**  
**K-12 Student Learning and**  
**Performance Assessments by School Principals**

**Center for Teacher Quality**  
**California State University**  
**February 2007**

**Introduction**

Recently the CSU Center for Teacher Quality (CTQ) began to investigate the impact of CSU teacher preparation on learning gains by the K-12 students of CSU-prepared teachers. This report updates the Trustees on this recent initiative. The report also summarizes other elements of CSU's ongoing evaluation of teacher preparation, and provides recent findings that supplement CTQ's work on K-12 student achievement.

**CTQ Questions Related to Student Achievement**

CTQ works closely with California school districts to assemble evidence addressing three evaluation questions, as follows.

- (1) *What is the relative importance of university-based teacher preparation in accounting for the academic progress of K-12 students in California, compared with the relative strength of other factors that are known to influence student learning such as student factors, school factors and community factors?*
- (2) *In relation to teachers prepared outside the CSU, how well do CSU-prepared teachers foster learning gains by their K-12 students, particularly in core subjects, and with a special focus on student groups that have historically been underserved by our system of elementary, secondary and post-secondary education?*
- (3) *Does evidence of K-12 student achievement help to identify specific programs of professional teacher preparation that are particularly effective and, if it does, can the effective features and characteristics of these programs be identified? For university students who want to teach, would it be feasible for CSU to extend and enlarge the most effective programs?*

While CTQ views these questions as closely related to each other, and to other issues confronting public education in California, the Center's professional evaluator and statistician are assembling distinct bodies of evidence for the purpose of resolving the three questions thoroughly and comprehensively for Trustees and Chancellor Reed.

### **How CSU Links Teacher Preparation to Student Achievement**

Measures of Student Achievement. Conceivably, multiple measures of K-12 student learning could be tapped in an evaluation of teacher preparation. To rely on a comprehensive array of measures would yield important benefits. The following benefits are especially critical and can be realized by using, among other instruments, the standardized achievement examinations that California administers statewide in grades 3-11 each year.

- (a) Relying on a common set of statewide learning measures will enable CTQ to combine evidence from diverse communities and regions of the state.
- (b) Most of the state's measures of learning are closely aligned with the standards-based curriculum that the State Board of Education has adopted for grades K-12.
- (c) Use of the state's standardized exams will also enable CTQ to take account of each student's prior level of learning.
- (d) Pupil scores on the state's standardized tests have relatively strong levels of reliability, compensating for the inaccuracies that characterize all educational measures.

CTQ will pursue opportunities to use *alternative measures of student learning*, but the alternative measures should *complement* and *supplement* evidence provided by standardized exams, which should be viewed as *core measures of student learning* in the CSU evaluation of teacher preparation.

Measuring Instructional Effects on Students. CTQ can utilize alternative approaches to assessing the impact of instruction on K-12 students. One approach is to assess the *gain* that each student realizes by comparing evidence assembled before and after her or his instruction in a subject that is tested on multiple occasions. Another approach focuses on student knowledge levels at the conclusion of an instructional year while taking into account the same students' levels of prior learning. In a third approach, CTQ can examine student knowledge levels at the conclusion of instruction without considering the students' pre-instructional knowledge levels. When CTQ brings learning evidence to the Board, the Center will specify exactly how student learning was measured.

Learning by Individual Students and by Groups of Students. CTQ is using a *student-by-student method* to measure instructional impact, rather than relying on evidence of *average learning levels by large groups of K-12 students*. By analyzing the available evidence on a student-by-

student basis, CTQ can differentiate the effects of CSU teacher preparation from those of other colleges and universities, whose graduates teach in the same districts, schools, grades and subjects as CSU-prepared teachers. If CTQ relied on summaries of learning by all students in a district, school, grade or subject, the effects of different institutions would be co-mingled with each other. To assess *CSU impact on student learning*, it is necessary to proceed on a student-by-student basis.

Expert Advice, National Consultation and External Support. For expert advice on how to address the three CSU evaluation questions on page 1, CTQ consults on an ongoing basis with five advanced scholars and statisticians from throughout the nation, whose own work addresses the same questions. Recently CTQ also discussed its measurement plans with a committee of the National Research Council, which generally encouraged CTQ to move forward as planned. CTQ also submitted its plans to the Carnegie Corporation of New York, which endorsed our approach and awarded a three-year grant to support CTQ's work examining the impact of teacher preparation on K-12 student learning. In the course of assembling evidence of this impact, CTQ will remain in close touch with these external advisors and with faculty, administrators and leaders on CSU campuses.

Potential Sources of Learning Evidence. To identify and assess potential sources of learning evidence in California, CTQ has met with organizations linked to K-12 education in the state. In these consultations, CTQ gave particular attention to the organization called *Just for the Kids California*, which offers online public access to learning data from districts and schools throughout the state. School districts are the only organizations that currently maintain comprehensive evidence that would enable CTQ to resolve the three evaluation questions under investigation. In the future, CTQ looks forward to using a state database (which is currently being designed) for the evidence that CSU needs beginning in 2007.

### **Status Update on Teacher Preparation and Student Achievement**

Requests to Collaborate with Seven Large, Urban School Districts in California. In seven of California's largest urban school districts, CTQ has met with superintendents and directors of research, and has submitted requests for evidence that CTQ could use in a statistical analysis of teacher preparation's impact on student learning. Located in distinct regions of the state, in the vicinity of twelve CSU campuses, these seven school districts educate more than one million students, employ more than 40,000 teachers, and annually hire approximately 3,350 CSU graduates as new teachers. Working closely with these and other districts in California's urban centers, CTQ expects to assemble large amounts of evidence pertaining to the three evaluation questions.

Assurances of Districts' Willingness to Collaborate with CSU. The seven school districts have assured CTQ of their willingness to cooperate with CSU in assessing the effects of teacher preparation on K-12 student learning. In response to a CSU request for evidence, the seven districts indicated their willingness to provide most or all of the requested evidence. The districts' research offices are currently assembling evidence, and are asking clarifying questions about the CSU request. Given that the districts have other research-related priorities, and that the CSU request is large in magnitude, CTQ expects to receive the requested evidence by the end of June 2007.

Preliminary Files of Evidence from Two School Districts. Early on, two of the seven cooperating districts provided small sets of evidence that CTQ has relied on for preliminary analyses of the CSU evaluation questions. The two sets of evidence include limited numbers of teachers and students, and they encompass few of the factors that commonly influence learning on the part of K-12 pupils. CTQ analyzed the two sets of district evidence in order to pilot-test its analysis plans and to be as expeditious as possible in investigating teacher preparation's impact on student learning. In doing so, CTQ took note of the incompleteness of the two sets of evidence, recognized that more comprehensive sets are likely to be provided soon, and regarded the analyses as *preliminary* in nature.

### **Preliminary Analysis of Preliminary Evidence**

How CTQ Analyzed the Preliminary Evidence. The CSU Center for Teacher Quality began by examining the relative impact of diverse factors on K-12 student learning. *Compared with factors associated with students, their families and their communities, how much of their learning is associated with their teachers and the preparation of those teachers in CSU and other institutions?* In educational research and evaluation studies, this question and others like it are addressed with a complex statistical procedure called *hierarchical linear modeling*, which CTQ implemented with state-of-the-art software called *HLM 6*. This procedure enabled CTQ to estimate:

- (a) how much learning was associated with *student factors* when teacher factors were statistically held constant;
- (b) how much learning was associated with *teacher factors* when student factors were statistically held constant; and
- (c) how much learning *could not be explained* by this procedure because of the limited numbers of student and teacher factors that were measured in the evidence sets.

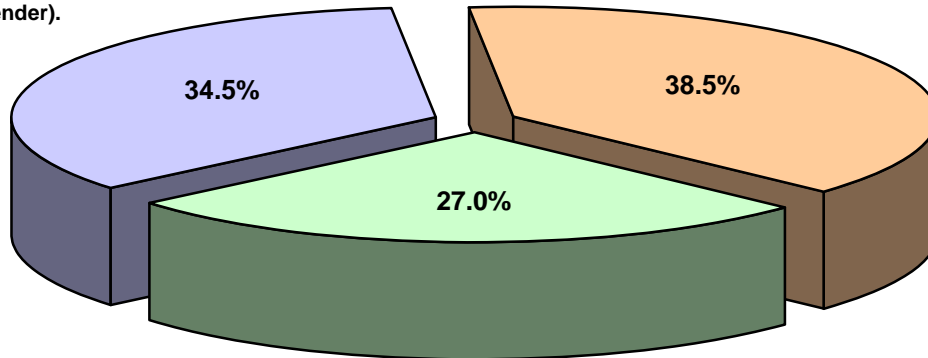
CTQ was able to assess the role of these factors in the learning of reading skills, language skills and math skills, but only in grades 4 and 5 due to technical reasons.

What CTQ Found in the Preliminary Evidence. Figure One illustrates the statistical findings of the preliminary analysis about the learning of *reading skills*. The blue segment of the graph illustrates how much student learning (34.5%) was statistically associated with *a few student demographic factors* while the teacher-related evidence was held constant statistically. The green segment indicates how much learning (27.0%) was associated with the *universities that prepared the teachers and the duration of teaching experience*, while the student demographic factors were held constant. The tan section of the graph estimates how much learning (38.5%) *could not be associated with student factors or teacher factors* due to limitations in the preliminary evidence.

**Figure One:  
Learning to READ in Grades Four and Five  
Preliminary Analysis of Important Factors**

**Blue:** 34.5 Percent of Student Learning in READING Was Statistically Linked to the Individual Students and Their Demographics (e.g., Family Income, Ethnicity, Gender).

**Tan:** 38.5 Percent of Student Learning in READING Was Statistically Linked to Factors that CTQ Could Not Measure in this Preliminary Analysis (e.g. Student Motivation, Interest, Attendance).



**Green:** 27 Percent of Student Learning in READING Was Statistically Linked to the Students' Teachers and the Preparation of Those Teachers in CSU and Other Accredited Universities Between 1995 and 1999.

Figure One describes the learning that students experienced in *reading*, as measured by California's standardized tests of reading skills in grades four and five. On the following page, Table One shows how the same learning factors influenced student achievements in all three of the assessed subjects: reading, language and mathematics.

<b>Table One</b>	<b>Reading</b>	<b>Language</b>	<b>Mathematics</b>
Percent of Student Learning Associated with <i>Student Factors</i> in the Preliminary Evidence	34.5%	29.1%	35.2%
Percent of Student Learning Associated with <i>Teacher Factors</i> in the Preliminary Evidence	27.0%	24.5%	22.6%
Percent of Student Learning that <i>Could Not be Estimated Based on Preliminary Evidence</i>	38.5%	46.4%	42.2%
	100.0%	100.0%	100.0%

Evidence about Comparative Institutional Effectiveness. Using the preliminary evidence, CTQ also attempted to assess the comparative effectiveness of institutions and programs for teachers, as suggested by evaluation questions (2) and (3) on page 1. In some comparisons, CSU teacher preparation appeared to be more effective than non-CSU preparation, but these differences were small. Insufficiencies in the evidence were too great for CTQ to reach any conclusions, even tentatively, in relation to questions (2) or (3). To support such inferences, the evidence would need to include more information about the institutions where the teachers were prepared, and it would need to include more teachers from distinct CSU campuses. CTQ will need to obtain much better sets of evidence in order to present reliable findings to Trustees about the relative effectiveness of different institutions, distinct campuses and different pathways for teachers, as measured by K-12 student learning gains.

Tentative Status of the Preliminary Evidence. When CTQ receives more comprehensive data about the impact of teachers and their preparation on student learning, the findings may differ from the preliminary findings in several potential ways. Any or all of the percentages in Figure One and Table One may increase or decrease when the evidence portrays larger numbers of students and teachers in a more diverse array of schools, when it includes more student factors such as English language proficiency, and when it includes more information about teachers and their preparation in the CSU and in other institutions.

Implications of the Preliminary Evidence. Although the preliminary evidence is tentative, it suggests that CTQ is pursuing a promising line of inquiry about the effects of teacher education on student learning in California. In reading, language and mathematics, the preliminary evidence indicates that teachers and their preparation are probably significant factors in accounting for student academic progress. Of the factors that are included in this analysis, teachers and their preparation are most susceptible to improvements through changes in CSU policies and practices. As these factors account for substantial amounts of learning, even a tentative finding suggests that CSU campuses may be in a position to contribute substantially to

improvements in K-12 learning by improving and expanding their effectiveness in preparing new teachers. CTQ expedited its work on K-12 student learning at Trustees' request. Preliminary findings based on incomplete evidence suggest that CTQ's growing focus on K-12 student learning may prove to be a cost-effective investment of the Center's limited resources.

### **Scope of the CSU Evaluation of Teacher Preparation Outcomes**

Scope of the Original Evaluation. When Chancellor Reed and the 23 CSU campuses initiated the Systemwide Evaluation of Teacher Preparation in 2000-01, they recognized that teacher education has many outcomes. Participants in the evaluation consider K-12 student learning to be an outcome of particular significance, but not the only important outcome that should be included in a broad evaluation. To plan the evaluation over time, CSU Deans of Education developed the *CSU Mosaic* (on the next page) to illustrate graphically the kinds of evidence that contribute to CSU's understanding of its overall effectiveness in preparing university students to be excellent teachers.

Scope of the Continuing Evaluation. While CTQ works closely with school districts in assembling evidence about K-12 student learning, CSU campuses continue to benefit from new batches of other evidence being produced according to the *CSU Mosaic*. Related to Outcomes One, Two and Three in the *Mosaic*, campuses receive increasing amounts of valuable feedback as more and more teachers participate in the *CSU Exit Evaluation* and in the *First-Year Teacher Evaluation* each year. Deans and faculties in CSU colleges of education continue to improve teacher education programs based on these findings as well as the *First-Year Supervisor Evaluations* in response to Outcome Three.

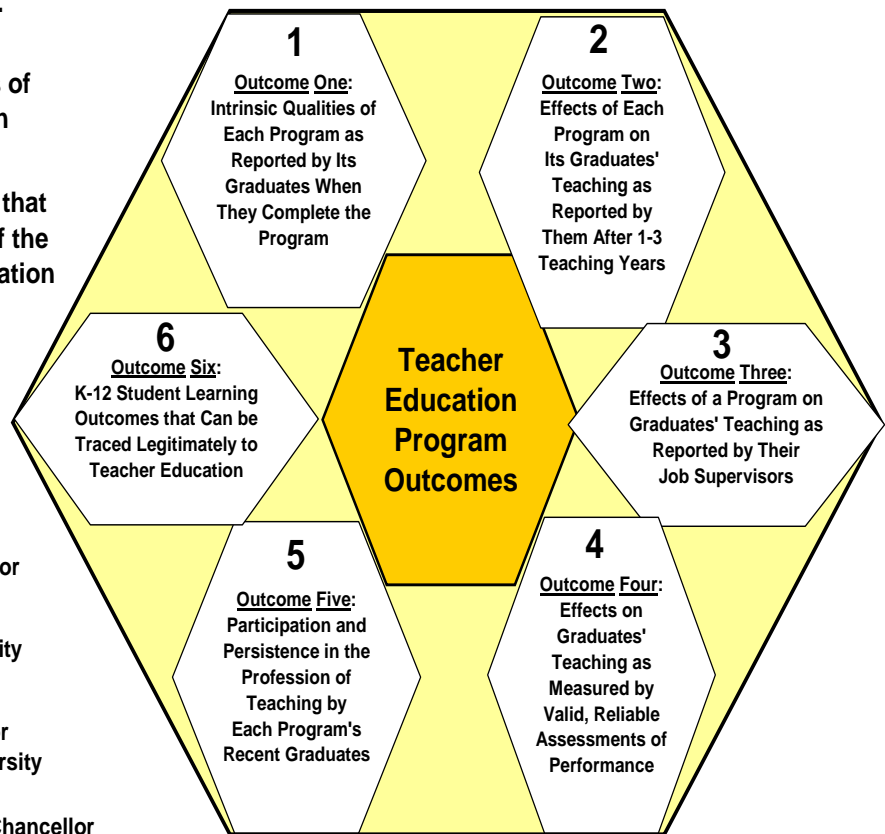
Meanwhile, CSU campuses also continue to prepare for implementation of Teaching Performance Assessments (Outcome Four) in 2008, when the assessment results will be included in CSU's evaluation of program outcomes. Pertaining to Outcome Five, soon the Chancellor's Office will release a major report about the primary reasons why teachers remain in teaching or drop out of teaching, which is expected to provide valuable information to CSU campuses as well as schools and districts throughout California. Finally, the evaluation participants look forward to the day when annual reports of CSU evaluation results will include updated information about student learning as a result of teacher preparation, in keeping with Outcome Six in the *Mosaic*.

Overall, then, the Chancellor's Office plans to continue pursuing Outcomes One through Six toward the eventual goal of reporting a comprehensive set of evaluation findings to Trustees in the future.

## The CSU Mosaic:

Significant Outcomes of  
Teacher Preparation

The Conceptual Model that  
Guides Development of the  
CSU Systemwide Evaluation



Bill Wilson  
Assistant Vice-Chancellor

David Wright  
Center for Teacher Quality

Academic Affairs  
Office of the Chancellor  
The California State University

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## **Recent Findings that Supplement CTQ's Work on K-12 Student Achievement**

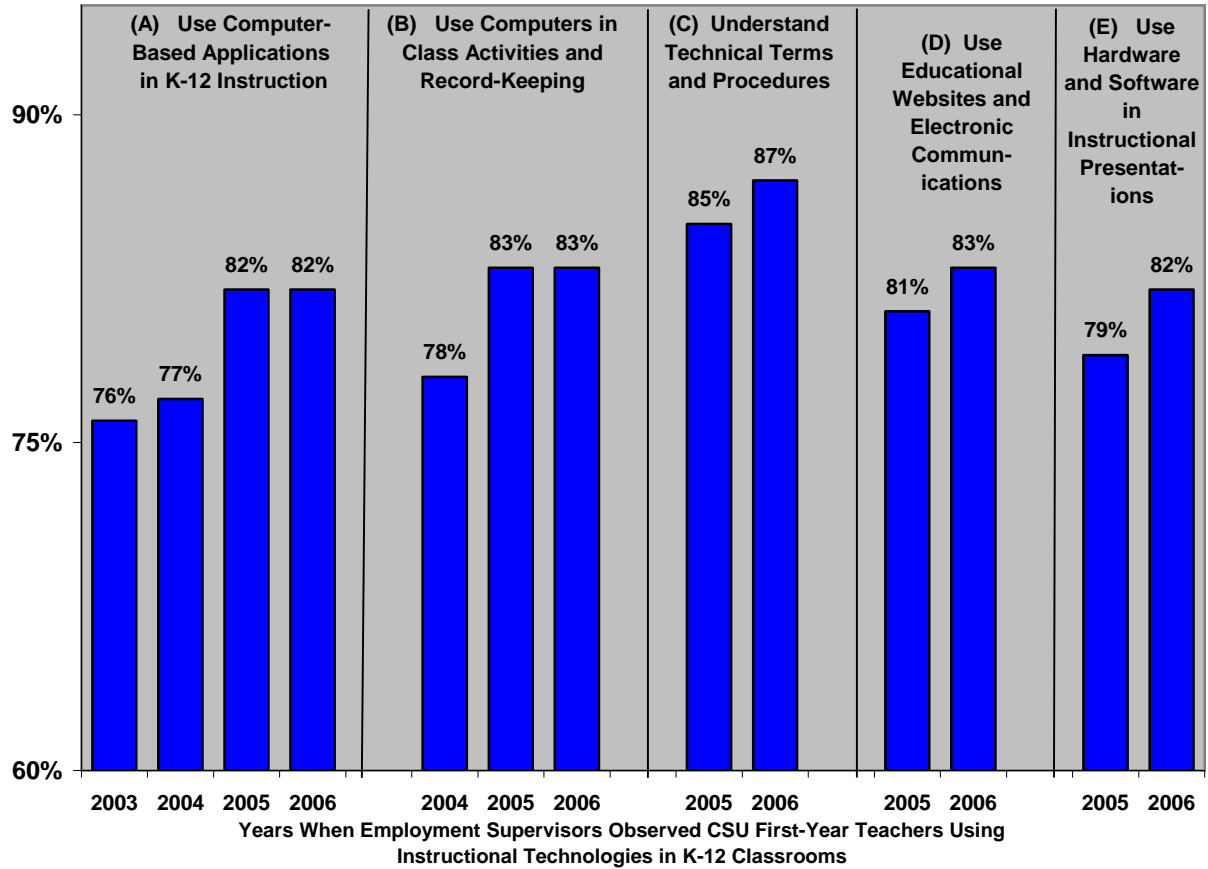
In 2006, the job supervisors of 2,165 new teachers assessed CSU's effectiveness in preparing them for the rigors of classroom teaching. These elementary school principals and high school department chairs had observed the CSU teachers' classrooms and met with them to discuss issues of classroom practice. Pertaining to each responsibility of a classroom teacher, CSU asked the supervisors how well CSU did in preparing the teachers for that responsibility. In doing so, CSU also gave each supervisor the name of a new teacher who was guided and assisted by that supervisor, and whose preparation was to be assessed by the supervisor. Supervisors assessed CSU effectiveness in relation to 42 duties of teachers. In evaluating each teacher's preparation for each responsibility, supervisors reported that individual teachers were "*well prepared*" or "*adequately prepared*" or "*somewhat prepared*" or "*not-at-all prepared*" for the responsibility.

Beginning on page 10, Figures Two through Five summarize the supervisors' judgments about several areas of CSU preparation. In all cases the graphs present the percentages of CSU teachers who were reported by their supervisors to be either well-prepared or adequately-prepared in the CSU. The numbers of participating supervisors vary from graph to graph because some questions were answered only by elementary principals, others only by high school department chairs, and still others by both groups of participants.

**Figure Two: Preparing CSU Teachers to Use Instructional Technologies in K-12 Classrooms**

Percentages of CSU Teachers Who Were Well-Prepared Or Adequately-Prepared to:

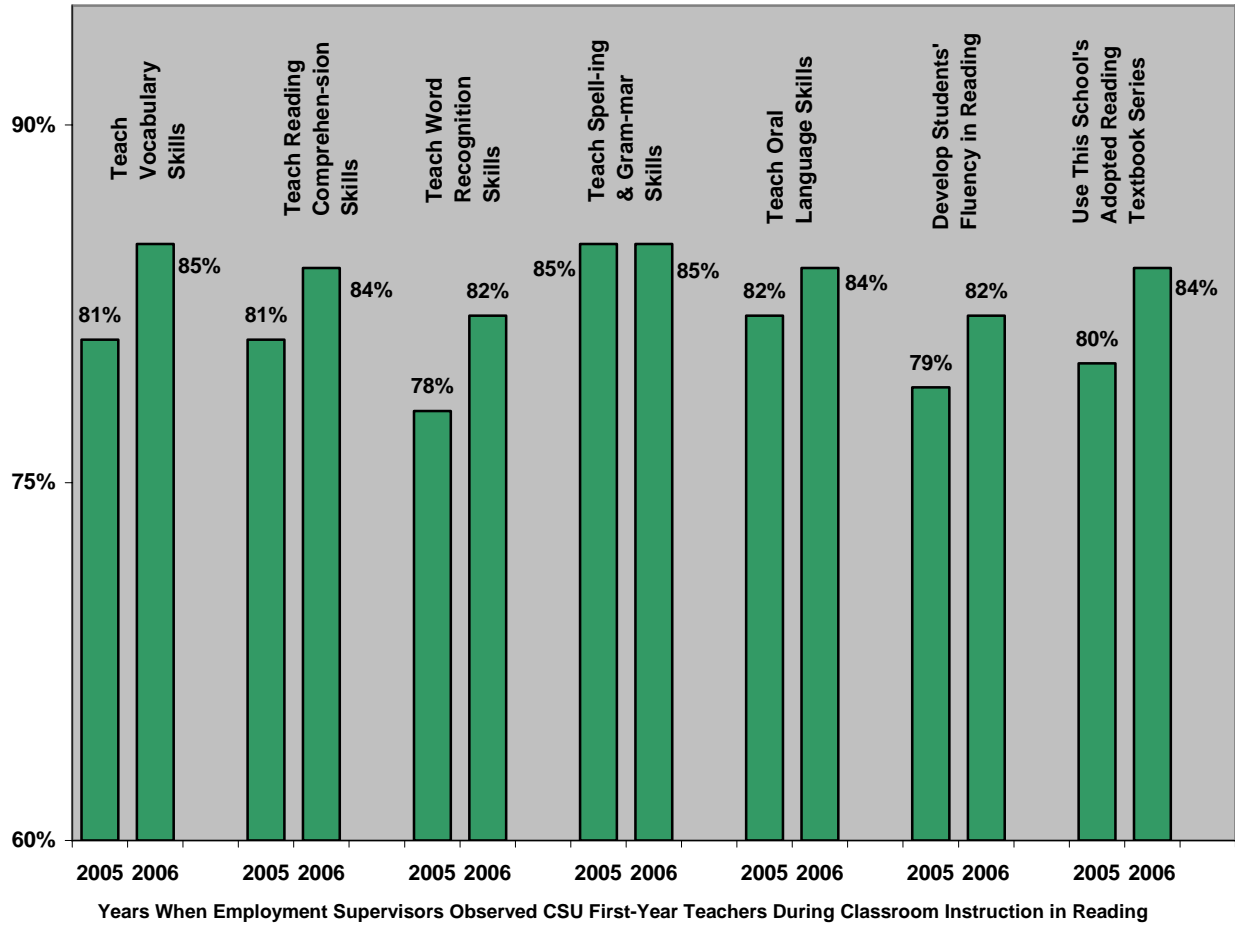
**Sources of Evidence:** Employment Supervisors of First-Year CSU Teachers in Grades K-12 (More than 1,380 Supervisors Each Year).



**Figure Three: Preparing CSU Elementary Teachers in Specific Skills for Reading-Language Arts Instruction**

Percentages of CSU Teachers Who Were Well-Prepared Or Adequately-Prepared to:

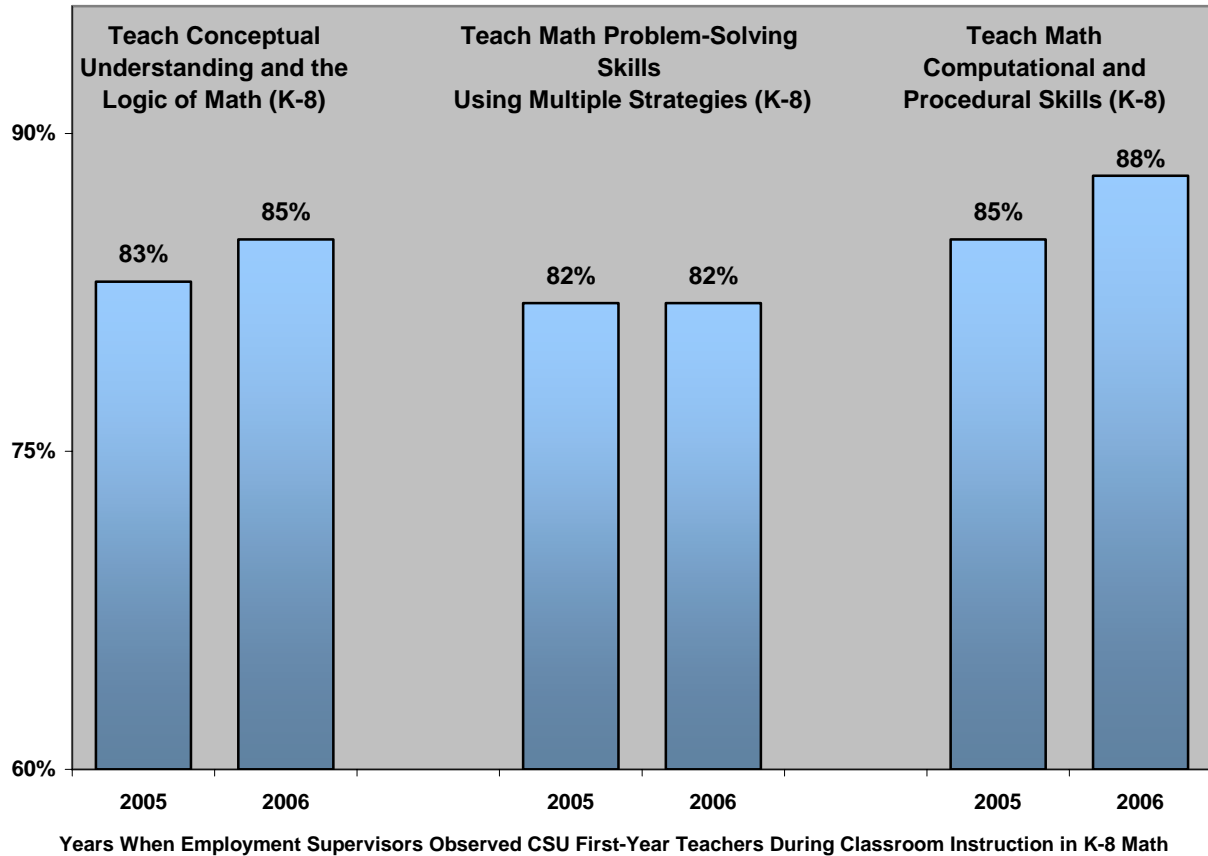
Sources of Evidence: Employment Supervisors of First-Year CSU Teachers in K-8 (More than 945 Supervisors Each Year).



**Figure Four: Preparing Elementary Teachers in Specific Domains of the K-8 Math Curriculum**

Percentages of CSU Teachers Who Were Well-Prepared Or Adequately-Prepared to:

Sources of Evidence: Employment Supervisors of First-Year CSU Teachers in K-8 (More than 965 Supervisors Each Year).



**Figure Five:** Percentages of CSU Teachers in K-8 Who Were Well-Prepared Or Adequately-Prepared to Teach Six Major Subjects of the K-8 Curriculum

Sources of Evidence: Elementary School Principals Who Supervised CSU Teachers

