Educating Teachers for California's Future

By Linda Darling-Hammond with Jeannette LaFors & Jon Snyder

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As the 21st century approaches, it is increasingly clear that schools must become dramatically more successful with a wide range of learners if more citizens are to acquire the sophisticated skills they need to participate in a knowledge-based society. It is also increasingly clear that teachers' expertise and effectiveness are critical to the success of American education. The kind of pedagogy needed to help students to think critically, create, and solve complex problems as well as to master ambitious subject matter content is much more demanding than that needed to impart routine skills. And, in an era when the student population is more diverse than ever before, teachers are being asked to achieve these goals for *all* children, not just the 10 or 20 percent who have traditionally been selected into "gifted and talented" or "honors" programs.

In a typical public school classroom in California, more than 25 percent of students come from families with incomes below the poverty line, at least 20

percent speak a first language other than English, nearly half are members of racial/ethnic "minority" groups or recent immigrants, and about 10 percent have identified learning disabilities. Whereas in the past, schools varied the curriculum and learning standards for different learners, today's students are being asked to master the same curriculum standards and pass the same tests for promotion and graduation, regardless of their different learning needs, starting points, and prior experiences. This poses even greater challenges for teaching. Only teachers who are both knowledgeable in their content areas and extremely skillful in a wide range of teaching methods can respond appropriately to diverse students' needs and enable them to succeed at these challenging learning goals.

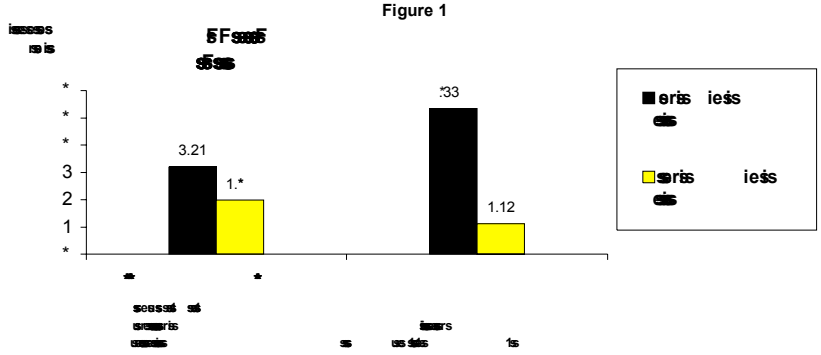
The Importance of Teaching and Teacher Education

A growing body of research finds that teacher expertise is one of the most important school factors influencing student achievement, followed by the smaller but generally positive effects of small schools and small class sizes (Darling-Hammond, 1999; National Commission on Teaching and America's Future [NCTAF], 1996). That is, teachers who know a great deal about teaching and learning and who work in environments that allow them to know students well are critical elements of successful learning. Studies of student achievement in Texas (Ferguson, 1991), Alabama (Ferguson and Ladd, 1996), and New York (Armour-Thomas, Clay, Domanico, Bruno, & Allen, 1989), for example, have concluded that teachers' qualifications—based on measures of knowledge and expertise, education, and experience—account for a larger share of the variance in students' achievement than any other single factor, including poverty, race, and parent education.

Studies in Georgia, North Carolina, Michigan, and Virginia, as well as national research, have found that students achieve at higher levels and are less likely to drop out when they are taught by teachers with certification in their teaching field, by those with master's degrees or enrolled in graduate studies, and by those with greater preparation in methods of teaching (Council for School Performance, 1997; Hawk, Coble, & Swanson, 1985; Knoblock, 1986; National Assessment of Educational Progress [NAEP], 1994; Sanders, Skonie-Hardin, & Phelps, 1994). Comparisons of teachers with similar experience but different amounts of subject matter knowledge and teacher education reveal significant differences in their students' achievement in both mathematics and language arts, after taking account of the students' initial achievement levels. Teachers who lack certification in their field and those who have entered through short-term alternative certification programs are less effective in developing student learning than those who have a full program of teacher education (See Figures 1 and 2) (For a review, see Darling-Hammond, 2000b).

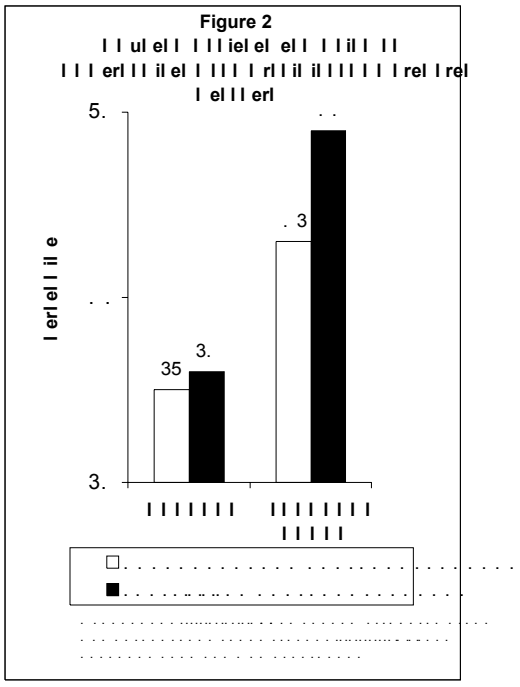
A recent Texas study (Fuller, 1999) found that students of licensed teachers were significantly more likely to pass the Texas state achievement tests, after controlling for student socioeconomic status, school wealth, and teacher experi-

Figure 1



ence. Two recent studies in California found similarly strong relationships between teacher training and student performance. In an analysis of mathematics test performance in California high schools, Mark Fetler (1999) found that, after controlling for poverty rates, students do substantially better in schools where there are fewer teachers on emergency certificates. Teacher experience exerts a positive but smaller effect on achievement. A study by the Los Angeles County Office of Education found that across all income levels, elementary students do better in reading when they are in schools with greater proportions of fully trained and certified teachers (LA County Office of Education, 1999) (See Figure 3.) The study concluded that, "Reading test scores were more highly related to the percentage of teachers who were untrained (uncertified) than to the percentage in their first and second year of teaching. This supports the finding that differing test scores are a teacher training issue and not merely due to new teachers' lack of classroom experience."

Figure 2



These findings are reinforced by those of a recent review of 60 production function studies which found that teacher education, ability, and experience, along with small schools and lower teacher-pupil ratios, are associated with increases

Figure 3

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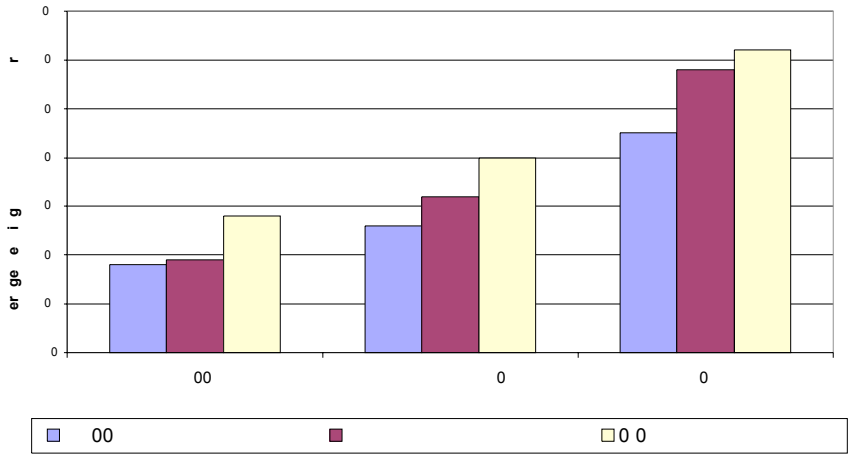

in student achievement (Greenwald, Hedges, & Laine, 1996). This study's estimates of the achievement gains associated with different kinds of expenditures found that spending on teacher education swamped other variables as the most productive investment for schools (See Figure 4).

Finally, more than 30 years of research demonstrate that both subject matter knowledge and understanding of teaching and learning matter for teaching effectiveness. Teachers who have more background in their content areas and have greater knowledge of learning and teaching methods are more highly rated and more successful with students in fields ranging from early childhood and elementary education to mathematics, science, and vocational education (for reviews, see Ashton & Crocker, 1986; Begle, 1979; Darling-Hammond, Wise, & Klein, 1995; Druva & Anderson, 1983; Evertson, Hawley, & Zlotnick, 1985; NCTAF, 1996). While subject matter knowledge is important, research consistently indicates that knowledge of how to teach is an equally powerful factor in teacher effectiveness and in some cases bears an even stronger relationship to teacher performance and student learning. For example, in a study that compared relative influences of different kinds of knowledge on teacher performance for more than 270 teachers, Guyton and Farokhi (1987) found consistent strong, positive relationships between teacher education coursework performance and 12 dimensions of teacher performance in the classroom, while relationships between classroom performance and subject matter test scores were much smaller (See Figure 5.)

Figure 4

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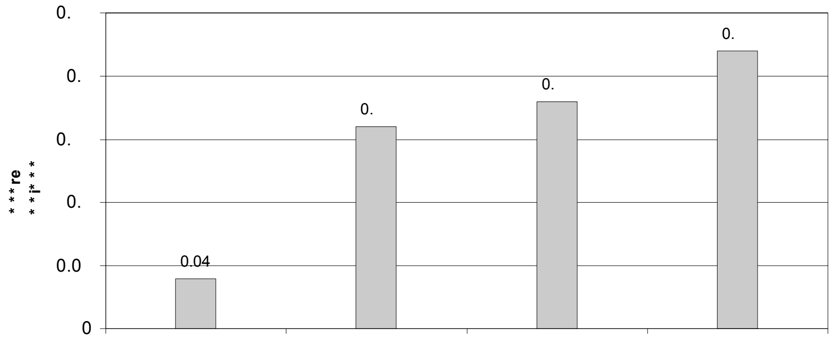
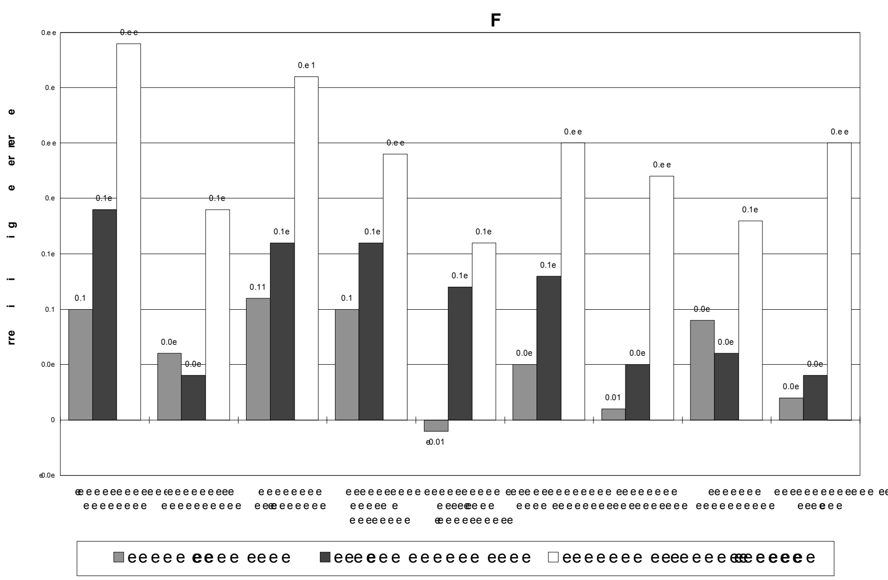


Figure 5



Source: Edith Guyton & Elizabeth Farokhi (1987, September-October). Relationships among Academic Performance, Basic Skills, Subject Matter Knowledge, and Teaching Skills of Teacher Education Graduates. *Journal of Teacher Education,* 38 (5), pp. 37-42.

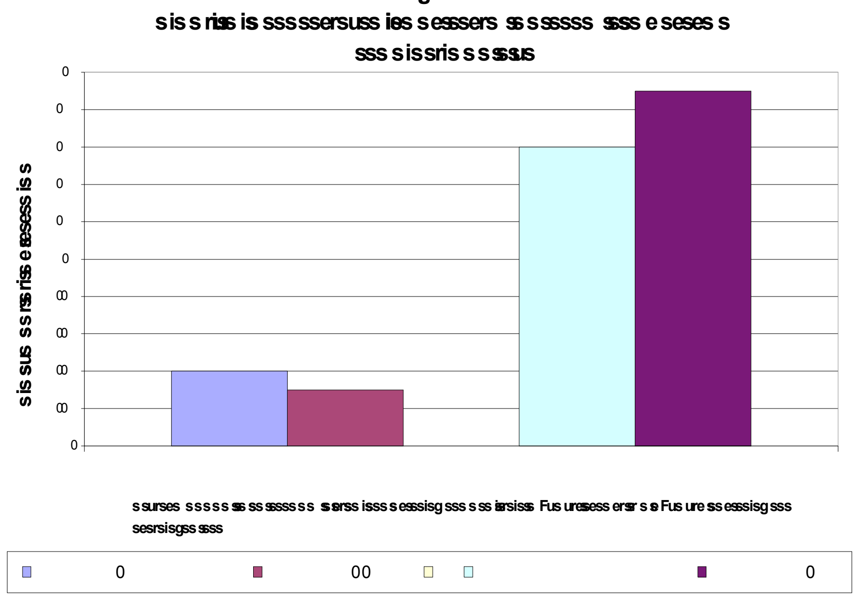
If it is increasingly clear that teacher learning is a linchpin of school reform, it should be equally apparent that teachers who are to negotiate the demands of new standards for more diverse students must have access to a deeper base of knowledge and expertise than most teacher preparation programs now provide. In contrast to many other countries the United States thinks of as peers or competitors, prospective teachers in the U.S. must fund their own preparation and frequently are allowed to decide how much and what kind of training they will undertake. In addition, by virtue of weak accountability policies and the absence of universal accreditation, universities in many states vary greatly in the content and quality of the training they offer. Because requirements for teacher education are dramatically uneven across the country, and because most states lower or ignore their standards whenever districts have trouble filling vacancies, teachers get radically different kinds and qualities of preparation depending on where and how they choose to enter the profession.

As a consequence, teachers' qualifications in the United States are tremendously uneven. Whereas many new teachers who attend recently redesigned programs are better prepared for teaching than ever, many others have inadequate training for their work. As one example of the range of differences, 84 percent of Wisconsin's high school mathematics teachers had a major and full certification in their field in 1994, but only 49 percent of California's did (Darling-Hammond, 1997). The differences among teachers in their content area preparation as well as their training in education are a function of differences in state licensing standards and university program requirements, as well as of the willingness of states to bypass their standards—whatever they are—and allow candidates to teach who are not fully prepared.

On virtually every measure, teachers' qualifications vary by the status of the children they serve. Students in high poverty schools are much less likely to have teachers who are fully qualified, and much more likely to have teachers who lack a license and a degree in the field they teach. (National Center for Education Statistics [NCES], 1997, p. 30). This is increasingly true in California, where schools with the greatest concentrations of low-income and minority students have 4 to 5 times as many unqualified teachers as the more affluent schools serving mostly Anglo students (See Figure 6.) This situation is most common in states where there are large inequalities in spending and salaries across districts and where policy makers have responded to increasing demand for teachers by lowering standards for entry rather than increasing the attractions to teaching.

These inequalities are exacerbated by the fact that states have very different standards for licensing teachers. Some, like Minnesota and Wisconsin, require a major in the field to be taught plus extensive study of learning, teaching, and student needs and clinical training of 15 weeks or more. Others do not require even a minor in the field to be taught and expect little knowledge of how students learn or how to teach. A few, including California, have authorized alternative certification programs that sometimes provide only a few weeks of training before teachers assume full responsibility for students.

Figure 6



These conditions often make it hard to improve the quality of teacher education, while the non- enforcement of quality standards in many states removes much leverage for change. Only three states require professional accreditation of education schools,[1] and few state agencies have the resources or capacity to evaluate programs rigorously and enforce high standards through their program approval process. Candidates are licensed if they graduate from a state-approved program, and virtually all programs, regardless of their quality, are state-approved.

While some colleges have created very high quality programs, there are still many programs that operate with inadequate resources, knowledge, and motivation to improve. The National Commission on Teaching and America's Future (1996) noted the longstanding problem that many universities have treated teacher education as a "cash cow" that is conducted on a shoestring and used to fund programs in other fields. This problem continues to exist. A 1997 study confirms earlier research which found that education programs are funded well below the average, generally near the bottom ranks of departments and well below the level of most other professional preparation programs (Howard, Hitz, & Baker, 1997; see also, Ebmeier, Twombly, & Teeter, 1991).

Universities that are investing in high quality teacher preparation, often without external supports, are exercising critically important moral leadership that is necessary to transform an entire field of work. Teacher education today is almost precisely in the situation that medical education occupied in 1910, before the

Flexner report called for sweeping reforms. At that time, would-be doctors could undertake a 3-week course of study, much like some of today's alternative routes into teaching, in which they memorized lists of symptoms and purported cures ("a shivery back treated by a round of calumel") and then could hang out their shingle to practice on patients. Or they could pursue graduate level medical education based on the emerging sciences of medicine at Johns Hopkins University which had also invented a clinical site called the teaching hospital, much like today's extended teacher education models that feature a year-long clinical placement in a professional development school.

Although there was increasing knowledge about the origins of disease and its treatment, in 1910 relatively few physicians had access to this knowledge. Licensing standards were weak to nonexistent. Many believed that physicians were born and not made. Ambivalence about the worth of medicine as an occupation and medical education as a field was widespread. Affluent parents did not urge such an undertaking upon their sons, and prestigious schools like Harvard University were unconvinced that medicine was a respectable field of study. Just as the concerted efforts of universities, accrediting bodies, and philanthropic institutions were needed to transform medicine into a field that could move beyond treating fevers with leeches, so the forces of collaborative effort and moral suasion will be needed to transform teaching into a field that can support learning for all kinds of learners.

What Matters and What Works in Teacher Education

In recent years, schools, colleges, and departments of education have been variously criticized as ineffective in preparing teachers for their work, unresponsive to new demands, remote from practice, and barriers to the recruitment of bright college students into teaching. (For recent analyses, see Goodlad, 1990; Howey & Zimpher, 1989; Zeichner, 1993). A major aspect of the critique is that, particularly after normal schools were incorporated into universities in the 1940s and 1950s, many teacher education programs began to separate theoretical studies from application. In many places, teachers were taught to teach in lecture halls from texts and teachers who frequently had not themselves ever practiced what they were teaching. Students' courses on subject matter topics were disconnected from their courses on teaching methods, which were in turn disconnected from their courses on foundations and psychology.

Students completed this coursework before they began student teaching, which was a brief taste of practice appended to the end of their program with few connections to what had come before. When they did their student teaching, many encountered entirely different ideas from those they had studied, because university and school-based faculty did little planning or teaching together. Usually, their cooperating teachers were selected with no regard for the quality or kind of practice they themselves engaged in. This was also often true of their professors as well. When

new teachers entered their own classrooms, they could remember and apply little of what they had learned by reading in isolation from practice. Thus, they reverted largely to what they knew best: the way they themselves had been taught.

While this description is offered in the past tense, it is unfortunately still true in some colleges and universities. As characterized by the National Commission on Teaching and America's Future (1996), the often-repeated critiques of traditional teacher education programs include:

> **Inadequate Time.** The confines of a four-year undergraduate degree make it hard to learn subject matter, child development, learning theory, and effective teaching strategies. Elementary preparation is considered weak in subject matter; secondary preparation is considered weak in knowledge of learning and learners.
>
> **Fragmentation**. Elements of teacher learning are disconnected from each other. Coursework is separate from practice teaching; professional skills are segmented into separate courses; faculties in the arts and sciences are insulated from education professors. Would-be teachers are left to their own devices to put it all together.
>
> **Uninspired Teaching Methods**. For prospective teachers to learn active, hands-on and minds-on teaching, they must have experienced it for themselves. But traditional lecture and recitation still dominates in much of higher education, where faculty do not always practice what they preach.
>
> **Superficial Curriculum**. "Once-over-lightly" describes the curriculum. Traditional programs have focused on subject-matter methods and a smattering of educational psychology. Candidates do not learn deeply about how children learn or about how to understand and handle real problems of practice.
>
> **Traditional Views of Schooling.** Because of expectations that teacher education should prepare candidates for schools as they are, most prospective teachers learn to work in isolation rather than in teams, and to master chalkboards and textbooks instead of computers and CD-ROMS. In their clinical experiences and/or coursework, many learn traditional teaching and assessment methods instead of more powerful strategies that would dramatically heighten learning. (NCTAF, 1996, p. 32)

Over the past decade, many schools of education and school districts have begun to change these conditions. More than 300 schools of education have created programs that extend beyond the confines of the traditional 4-year bachelors degree program, thus allowing more extensive study of subject matter along with education coursework that is integrated with more extensive clinical training in schools. Some are 5-year models that allow an extended program of preparation for prospective teachers who enter teacher education during their undergraduate years. Others are one- or two-year graduate programs that serve recent graduates or mid-career recruits. In either case, because the fifth year allows students to devote their energies exclusively to the task of preparing to teach, such programs typically allow for year-long school-based clinical studies that are integrated with coursework on learning and teaching.

Programs that provide a bachelor's degree in a disciplinary field plus intensive

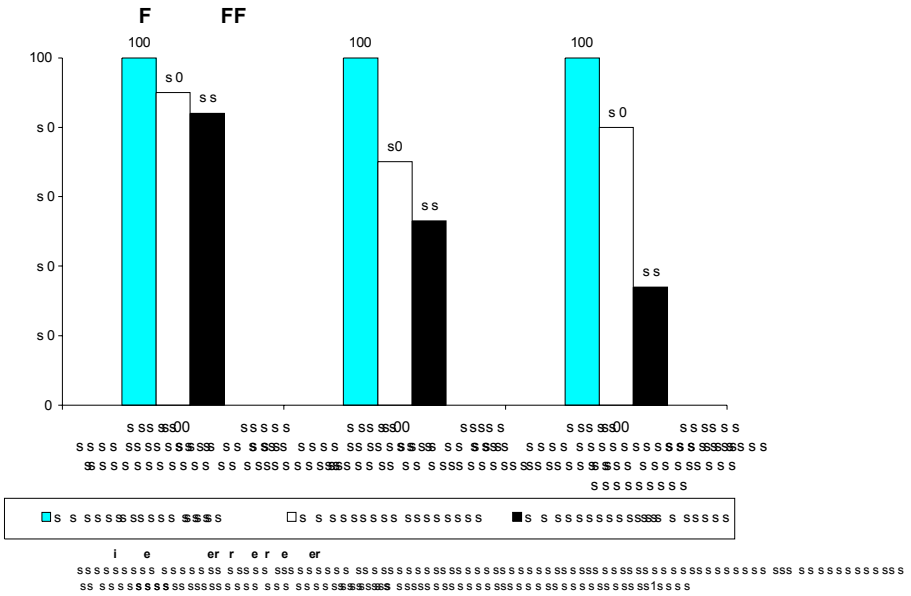
study of teaching at the graduate level are often better able to resolve several traditional dilemmas of teacher education: They create time for study of both subject matter and pedagogy, rather than trading off one against the other. They create room for much more extensive clinical experience—typically 30 weeks or more rather than the traditional 10 to 12 weeks of student teaching. And they reduce fragmentation of the curriculum by interweaving coursework with practical experiences, rather than front-loading theory disconnected from practice.

A number of recent studies have found that graduates of extended 5-year teacher education programs are not only more satisfied with their preparation, they are more highly rated by their colleagues, principals, and cooperating teachers, are as effective with students as much more experienced teachers, and are much more likely to enter and stay in teaching than their peers prepared in traditional 4-year programs (Andrew, 1990; Andrew & Schwab, 1995; Arch, 1989; Denton & Peters, 1988; Dyal, 1993; Shin, 1994). In fact, the entry and retention rates of these programs are so much higher than those of 4-year programs—which are in turn much higher than short-term alternative programs[2]—that it is actually less expensive to prepare career teachers in this way. Taking into account the costs to states, universities, and school districts of preparation, recruitment, induction, and replacement due to attrition, the actual cost of preparing a career teacher in the more intensive five-year programs is actually significantly less than that of preparing a greater number of teachers in shorter-term programs who are less likely to stay – and, not incidentally, are also less successful in the classroom (See Figure 7).

Many of these new, extended programs have joined with local school districts to create professional development schools. Like teaching hospitals in medicine, these schools aim to provide sites for state-of-the-art practice which are also organized to support the training of new professionals, extend the professional development of veteran teachers, and sponsor collaborative research and inquiry. In the most highly-developed sites, programs are jointly planned and taught by university-based and school-based faculty. Cohorts of beginning teachers get a richer, more coherent learning experience when they are organized in teams to study and practice with these faculty and with one another. Senior teachers report that they deepen their knowledge by serving as mentors, adjunct faculty, co-researchers, and teacher leaders. Thus, these schools can help create the rub between theory and practice that teachers need in order to learn, while creating leadership roles for teachers and knowledge that is more useful for both practice and ongoing theory-building (Darling-Hammond, 1994).

A study of extraordinarily successful teacher education programs by the National Commission on Teaching and America's Future found that, despite their institutional differences (the programs are public and private, undergraduate and graduate level, urban and non-urban), there are common features of programs that prepare teachers who are successful at teaching diverse learners to high standards.[3] These include:

Figure 7



A common, clear vision of good teaching that is apparent in all coursework and clinical experiences. In contrast to the fragmented courses and agnostic sense of purpose present on most campuses, faculty in these programs have hammered out their view of what matters for good teaching and have constructed a series of courses and experiences that ensure all of the building blocks for such teaching are present and reinforced. This vision includes an ethical commitment to the education of all students along with study and application of teaching strategies that address the needs of a wide range of students.

Well-defined standards of practice and performance that are used to guide and evaluate coursework and clinical work. Along with a common vision of good teaching are explicit standards for what professional teachers should know and be able to do to meet the needs of diverse students and to teach their subject matter(s) in powerful ways. These standards guide decisions about learning experiences, assignments, and ongoing assessment of students' learning and performance in both the college classroom and the school classroom. Students have many examples of the kind of practice they are trying to develop, and they have many opportunities to get feedback about how they are progressing toward those goals.

A rigorous core curriculum. Unlike programs criticized for "mushy" education courses that have an unclear knowledge base and mostly pass on unexamined teaching lore, these programs have developed a systematic program of study grounded in

substantial knowledge of subject matter content, child and adolescent development, learning theory, cognition, motivation, social contexts, and subject matter pedagogy, taught in the context of practice. Students do not report that their only valuable experience was student teaching. Instead, they report that their courses were intellectually engaging, theoretically well-grounded, and practically useful.

Extensive use of problem-based methods, including cases and case studies, teacher research, performance assessments, and portfolio evaluation. Like the strategies used in good schools of business, law, architecture, engineering, and medicine, these methods help teachers apply general propositions derived from research and theory to real problems of practice, thus supporting their developing abilities to reason pedagogically. Learning to think like a teacher requires the combination of multiple kinds and sources of knowledge with a diagnostic eye on both curriculum goals and student needs. Problem-based methods support the development of teaching judgment and tools for inquiry as they are used in practice.

Intensely supervised, extended clinical experiences (at least 30 weeks) which are carefully chosen to support the ideas and practices presented in simultaneous, closely interwoven coursework. In contrast to traditional programs' weak student teaching experience of 8 to 12 weeks, these candidates have a full academic year to develop, test, and problem solve more sophisticated forms of practice under the guidance of master teachers. Their practice has an opportunity to take root and grow strong, so that it is not blown over like a thin reed when they enter difficult teaching circumstances as a first-year teacher.

Strong relationships with reform-minded local schools that support the development of common knowledge and shared beliefs among school- and university-based faculty. These partnerships support co-reform of both the school and the university teacher education program and create sites for state-of-the-art practice, training, and research.

A critically important feature of these programs is that they allow teachers to learn *about* practice *in* practice (Ball & Cohen, 1999), in settings that deliberately construct integrated studies of content, learning, and teaching, and create strong connections between theory and practice. Teachers learn just as students do: by studying, doing, and reflecting; by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see. This kind of learning cannot occur either in college classrooms divorced from engagement in practice or in school classrooms divorced from knowledge about how to interpret practice. The programs engage prospective teachers in both studying research and conducting their own investigations of student learning and evaluations of teaching strategies and their effects. The "rub between theory and practice" (Miller & Silvernail, 1994) occurs most productively when questions arise in the context of real students and real work-in-progress where research and disciplined inquiry are also at hand.

These extraordinary programs resemble those that have resulted from reforms of teacher education abroad. Countries like France, Finland, Germany, Belgium,

and Luxembourg require from 2 to 3 years of graduate level study for prospective teachers on top of an undergraduate degree—sometimes with two disciplinary majors—in the subject(s) to be taught. Education courses include the study of child development and learning, pedagogy and teaching methods, plus an intensively-supervised internship in a school affiliated with the university. Prospective teachers conduct research that leads to a full-blown thesis on an aspect of teaching as well as learning about learning and teaching methods. Many other European nations, including Ireland, Italy, the Netherlands, New Zealand and Portugal, have recently launched similar reforms (Organization for Economic Cooperation and Development, 1995). Japan and China have also undertaken major teacher education reforms that include both university- and school-based training. In Japan, first year teachers experience a highly structured internship that includes a reduced load, 60 days of inservice education, and intensive mentoring from veteran teachers.

In most of these countries, teacher education is heavily subsidized by the government and candidates pay little or nothing for this extensive training. Although many U.S. institutions are taking steps to overhaul teacher education because they believe it will enable them to prepare more effective teachers and they feel a strong commitment to the public schools in their communities, they lack the systemic policy supports for candidate subsidies and program funding that their counterparts in other countries enjoy.

High Quality Teacher Education Programs in California

There are a number of teacher education programs in California that illustrate the principles of high quality teacher education described above. These exist in the California State University System, the University of California, and in private independent institutions in the state. While the programs take diverse forms, they share a common conception of the knowledge base for teaching, feature a rigorous core curriculum and strong school-university partnerships, involve teachers in inquiry and reflection about student learning in relation to teaching, emphasize effective methods for teaching challenging content to diverse learners, ensure strong modeling and coaching from expert practitioners in settings that reflect state-of-the art practice, and use clear standards along with performance-based assessments to guide their efforts.

The programs described here (see vignettes on following pages)—a blended 4½ to 5-year undergraduate/graduate program at California State University, Chico, a high-quality postbaccalaureate internship model operated by California State University, Hayward with the New Haven Unified School District, and 1½ to 2-year graduate-level programs at University of Califronia, Santa Barbara, University of California, Los Angeles, and Mills College—are just a few of much larger number representing the strong commitments of many California campuses to top-flight teacher education.

California State University, Chico

The Northern third of the state of California appears ripe for teacher shortages. It covers a vast geographic area of small communities, has a large percentage of second language learning students, and includes its fair share of special needs children requiring specially prepared educators. In addition, the entire region possesses but one California State University campus to serve more than 40,000 square miles. Yet, in large part because of the efforts of Chico State University, these counties hire many fewer teachers on emergency credentials than the rest of the state. CSU-Chico has taken seriously its dual responsibilities for quality *and* quantity of teachers by creating and maintaining multiple entry points and pathways for high calibre candidates to meet high standards for the teaching profession — without sacrificing the educational needs of students.

The Chico-Durham **Tri-Placement Program**, a program operated in partnership with the Chico and Durham Unified School Districts, has twice been awarded the Quality of Education Award from the California Council on the Education of Teachers (1988 and 1999). Its graduates rate the quality of their preparation 6 or above (on a 7-point scale) on 96% of items in surveys of graduates. Graduate surveys and district data show attrition rates far below the norm, and 70 percent of recent graduates serve in such leadership roles as mentors, negotiators, reading specialists, or staff developers.

The Tri-Placement Program is a 5th-year pathway into teaching with connections to the undergraduate curriculum through two undergraduate prerequisite courses that include field experience, one of which serves as a screen and feeder to the program. The program uses a professional development school model in which teacher candidates apprentice with expert, veteran teachers in three different classrooms for four and one half days each week for one full public school year while taking coursework. The model is premised on the belief that professional preparation is best accomplished with careful mentoring in the context of classrooms within strong school-university partnerships. In addition to having lengthened the clinical training period to an entire academic year with gradually increasing responsibilities in classrooms serving diverse students, the program includes coursework and seminars that are carefully tailored to the candidates' strengths, interests, and needs, and sophisticated sources of assessment and feedback based on the California Standards for the Teaching Profession.

A new blended model of undergraduate and graduate teacher education, the **Integrated Teacher CORE Program**, launched with its first cohort of freshmen in 1996, is a 9-semester pathway for "early-deciders." The program was designed and implemented by The Northstate Partnership for Interdisciplinary Teacher Education that includes representatives of three school districts (Paradise Unified, Chico Unified, and Oroville Elementary), academic departments at California State University, Chico and community service agencies to improve teacher education. Its goals are to identify and recruit exemplary pre-collegiate students intent on becoming teachers and offer them an interdisciplinary course of blended content and professional studies. The program includes field experiences that link university courses with elementary teaching in rural, suburban and urban schools. Students participate in a Partner Reading Tutoring Program in Chico elementary schools that introduce them to beginning strategies to help children in their reading skills. Faculty from the arts and sciences, education, and K-6 teachers work together to relate the content of the general

education courses to its presentation in elementary schools. In addition, internships with community service agencies, like Child Protective Services, Public Health, and local mentoring programs help prospective teachers better understand issues that impact the lives of children in and out of school.

Candidates in the program report, and their work provides corroborating evidence, that they make connections between their general education courses and their teacher education experiences. School and college-based educators report benefits from the opportunities provided to work together across school, college, and department boundaries. In addition, earlier and better educational guidance and blended undergraduate studies and teacher preparation result in less time and expense on the route to becoming a teacher. The program provides for earlier identification and recruitment of exemplary teacher candidates and for earlier and more grounded decisions for some who will decide *not* to enter the profession. This is better for them and for students in the long run, and it creates more efficient as well as effective pathways into teaching.

California State University, Hayward-New Haven Unified School District

"During the last few years, I've often heard new teachers saying they didn't learn much while preparing for their credential. So, I reluctantly looked for a credential program knowing that I just had to fulfill this requirement to become a teacher. … In the last two months, I have radically changed my mind about the opportunities for excellence in education and training for future teachers. I consider myself lucky to be part of the cohort at New Haven. Being in the program has already been a rewarding experience. Indeed, prospective employers seriously consider my candidature because I am being educated in New Haven" (SSPP Candidate, 1997-98 Cohort).

New Haven Unified School District in Union City is midway between Oakland and San Jose. Serving more than 14,000 very diverse students, the district was once the lowest-wealth district in the county and had a reputation to match its wealth. Today, NHUSD, while still a low-wealth district, has a well-deserved reputation for excellent schools. Where once students transferred out when possible, the district has had to close its doors to out-of-district transfers because the schools are bulging at the seams. Of the many factors contributing to the district's success, one key was New Haven's realization that if they wanted good teachers, the district would have to enter into the business of teacher development from recruitment to retirement. In 1993, the New Haven Unified School District joined with California State University, Hayward to design the Single Subject Partnership Program (SSPP). SSPP is an innovative combined pre-service and internship program based in district secondary schools that simultaneously educates teachers while protecting and providing a quality education for students.

Personnel director Jim O'Laughlin is quick to credit California State University, Hayward for the calibre of the district's preservice teacher development efforts, "The uniqueness of our program is based on the unique collaborative relationship we have developed with Cal State Hayward. This is dependent upon their willingness to collaborate and truly partner with a school district in teacher preparation." The SSPP combines elements of internships and traditional preparation routes. SSPP teacher candidates can be either traditional teacher education candidates or serve as part time interns. The program

requirements are the same for both. The curriculum is jointly planned and delivered by university professors and district faculty to provide for close articulation of district, school, and university activities. Because of the full integration of university and district in the preparation program, it is difficult to distinguish "university components" from "school components" of the program. With the exception of the content-specific pedagogy courses at the university, SSPP teacher candidates remain in their cohort, participating in other coursework and field experiences in the district. This models the conceptual melding of theory and practice.

The Hayward-New Haven program is the one of a relatively few in the state that does not allow candidates to serve, unprepared, as full-time instructors of record. According to a CSUH instructor, "Full time internships are a poor practice—also a reality—but not in New Haven." The selection of part-time interns who teach one or two periods per day is not made until after a month of coursework in the summer (co-taught by university and school faculty) and at least a month or more of student teaching. Those selected as interns after careful screening work under close supervision from partner teachers and support providers who have released time for this purpose. Others continue as student teachers. All take the same rigorous set of courses that candidates complete in traditional programs.

Jim Zarrillo, former Chair of the CSUH Department of Teacher Education, summarizes the nature of this university-district collaboration in teacher education: "New Haven identifies teacher preparation as part of their reason for being, as much as teaching third graders how to write in cursive .... This is the Shangri-La of partnerships: It is standards based. Everybody working with the program does everything—teaching teachers, supervising teachers, teaching K-12 students, researching. It articulates teacher education with professional development and school practice."

University of California, Santa Barbara

The teacher education programs at the University of California, Santa Barbara (UCSB) offer a combined Master's-Credential program serving approximately 90 candidates each year. The program is a "fifth-year plus" model requiring 6 quarters—3 contiguous academic quarters plus 3 summer quarters—to receive a B/CLAD credential and an Masters in Education. The program's vision for preparing teachers to teach challenging content to diverse learners is infused throughout a tightly constructed program conducted by a joint faculty of university-based teacher educators and faculty in 7 professional partner schools where all recruits are placed for a year-long clinical experience. The coursework and clinical work aim to develops teachers' capacity to learn from teaching via autobiography and the development of an educational philosophy, the close study of children and schools, the development of pedagogical competence, understanding of diversity, and continual collaboration and reflection.

In surveys and follow-up studies of graduates derived from the National Commission on Teaching's Exemplary Teacher Education Study, UCSB graduates rated their preparation as significantly superior to those of a national random sample of beginning teachers on 32 of 37 measures of teaching knowledge and skill items. The graduates scored comparably with those of a national sample of exemplary teacher education programs on 33 of 37 measures and ranked higher on measures evaluating their preparation to teach the concepts, knowledge, and skills

of their discipline(s) in ways that enable students to learn, to use a variety of assessment techniques, to teach in ways that support new English language learners, and maintain an orderly, purposeful classroom environment. In-depth follow-up studies of graduates by researchers who observed them in the classroom reported that they perform at the top levels of performance measures of the California Standards for the Teaching Profession.

This strong preparation is a product of carefully constructed curriculum tied to field assignments in schools that engage students in the study of content and pedagogy, cross cultural education, human development, language and culture, the needs of special needs students as well as the study and use of inquiry techniques like ethnography.

Both elementary and secondary teachers develop and enact an integrated curriculum unit that incorporates interdisciplinary studies, strategies for meeting the needs of English language learners and other students with special needs, and the use of technology. They also complete a "school service project" which helps candidates develop leadership skills, learn about school change, and become more fully participating members of the school community in which they are student teaching.

Ongoing assessment includes both a Credential Portfolio and a Master's Portfolio. For the Credential Portfolio, candidates collect artifacts documenting their growth over time in each of the six domains of the California Standards for the Teaching Profession and examine these and other indicators of their progress at several points throughout the year with their cooperating and supervisor. This becomes a key part of the final evaluation of performance for the credential. The Master's Portfolio is a candidate driven inquiry developed over the course of at least eleven months that involves candidates in learning how to conduct research and then developing a classroom-based research project that helps them develop skills of investigation and analysis. The project is structured to encourage them to use theory to inform practice and practice to inform theory. Finally, the process of evaluation is organized to ensure multiple perspectives on the question, including those of parents or community members, and feedback from various sources. The goal is the development of a professional educator who has tools to inquire into and address problems of practice throughout his or her career.

Center X, University of California, Los Angeles

Seven years ago in a high rise with a panoramic view of the city, the faculty of UCLA's Graduate School of Education sat, as Jeannie Oakes describes it, "squabbling in its usual fashion over its agenda of bureaucratic minutiae." As the squabbling continued, faculty members began to notice fire after fire after fire. They were, in fact, watching the city go up in smoke in the aftermath of the Rodney King verdict. Rather than fiddle as the city burned, several faculty members decided to do more than put out the immediate flames; they made a personal commitment to reconstruct the teaching profession's social contract with its community. Center X was born when these faculty decided to develop the pre- and inservice teacher education programs that could make a difference for children in central city Los Angeles.

Both pre- and inservice programs seek to demonstrate that schools for low-income minority children can become rich, rigorous, and caring communities where all children succeed. They focus on a social justice agenda that works simultaneously on professional education, school reform, and re-inventing the university's role in K-14 schooling, aiming to blend theory and practice and bring together educators' and students' needs for in-depth

content knowledge, powerful pedagogies, and school cultures that enable serious and sustained engagement in teaching and learning. The programs also aim to construct diverse, socially responsible learning communities in which all members, regardless of race, class, gender, and age can participate fully in a society that affirms and sustains the principles of equality and social justice.

The preservice teacher education program offers a Master of Education degree and a CLAD or BCLAD Credential in a combined, full-time, two-year program that integrates research-based methodologies with classroom practice by providing advanced study in such areas as cultural foundations, instructional decision-making, and curriculum development. The credential course sequence is integrated with a set of student teaching experiences in racially, culturally, and linguistically diverse school sites, focusing on classrooms with new English language learners. Partnerships have been forged with urban districts including Centinela Valley, Inglewood, Lawndale, Lennox, Los Angeles Unified, and Santa Monica. Between academic years, it is mandatory for students to participate in a subject matter institute through the Center X professional development programs. During the second year, when they are now fully credentialed and while simultaneously completing their final program course work and portfolio defense for the M.Ed., students participate in a paid teaching residency at partnership schools. In this way, the program assures the children in these schools fully qualified, fully supported teachers while supporting novice teachers with the ongoing professional development that can launch a successful career.

One key indicator of the program's quality is that its graduates are entering, staying, and succeeding as teachers in urban schools. The program has received feedback from 180 of its initial 227 graduates. Of those 180, 167 are working in urban schools and 11 are working in education-related fields. Of its 1999 cohort, over 92 percent of the respondents are teaching in urban schools. A second indicator emerged from a study of beginning teachers' influences on student learning gains in an urban elementary school that used longitudinal performance assessments to evaluate student literacy development. In this study, graduates of UCLA's program were as strikingly effective as those of another widely-recognized two-year graduate level teacher education program: the University of California at Berkeley's Developmental Teacher Education program, one of seven studied in the National Commission on Teaching's Exemplary Teacher Education study. A third indicator is the strong evidence that practices in partnership schools are changing on a wider basis. As one principal commented, echoing the sentiments of many of her peers, "Through the university-school connection, we anticipated that the master and student teacher relationship would create an exchange of ideas. Little did we anticipate how powerful the change process would be for the participants. Our school site has been transformed by the focus on social justice and raising expectations for all of our students."

Mills College, Oakland

"I arrived at my first permanent teaching job five years ago, mid year, in a district a month away from a bitter strike. The 1st grade classroom in which I found myself had some two dozen ancient and tattered books, an incomplete curriculum, and an incomplete collection of outdated content standards. Such a placement is the norm for a beginning teacher in my district. I was prepared for this placement, and later came to thrive in my profession, because

of the preparation I received in my credential program. The concrete things Mills gave me were as indispensable to me in my first year as they are now: my understanding of grade level expectations and my knowledge of the state standards, the practice I received developing appropriate curricula, my understanding of developmental learning levels, refinement of my content knowledge, rigorous exposure to assessment strategies, exposure to a wide range of learning theories, a deep understanding of cultural differences and their implications, training in working with non-English speaking students and children labeled "at risk", my familiarity with the functioning of a school site and district, and an understanding of the importance of appropriate goals, objectives, and expectations. It is the big things, though, that continue to sustain me as a professional and give me the courage to remain and grow while so many of my colleagues quietly disappear or fall prey to cynicism: My understanding of the importance of learning from and continually asking questions about my own practice, the value I recognize in cultivating collegial relationships, and the development of a belief in my moral responsibility to my children and to the institution of public education. In an environment that so easily diminishes the individual who is the teacher, I find myself sustained, and I attribute this wholly to the training, education, and support provided to me by Mills" (A current Oakland teacher and 1995 Mills graduate).

This kind of testimony, typical of graduates' views of Mills College's Teachers for Tomorrow's Schools program, says more about the program than dozens of brochures could reveal. Equally revealing is the fact that, like other high-quality extended teacher education programs, most graduates enter and remain in teaching, the vast majority of them in urban schools. Of 1998 and 1999 graduates, over 90 percent are still teaching; of graduates who entered the profession as long as seven years ago, 85 percent are still teaching while many others are in education-related jobs. As a veteran teacher notes, Mills College's intensive two-year graduate level credential and Masters program "provides students with a rigorous academic program but also prepares them to work in a real classroom."

Located in the heart of Oakland, Teachers for Tomorrow's Schools is committed to urban education and to an ethic of care and social justice, equity, and access. The program recognizes the central importance of understanding learners and building academic programs that are developmentally appropriate and inclusive. Its coursework and fieldwork are interconnected in a cohort model that emphasizes collaborative learning for teachers as well as students. The one-year credential program—with a full-year of student teaching wrapped around coursework that emphasizes learning, development, and assessment as guides to teaching—is followed by a second year masters program while students are engaged in full- or part-time teaching. Its standards-based approach emphasizes deep understanding of subject matter content and how to make it accessible to learners, understanding of learning as a constructivist enterprise, understanding of teaching as inquiry and reflection on the relation between teachers' actions and students' learning, and an appreciation of teaching as a moral enterprise and a collegial and political act that has far-reaching consequence for social welfare and equity. Candidates are involved in rigorous coursework and intensive student teaching simultaneously in classrooms where there is strong connection between university and school-based faculty. The strength of this relationship is reflected in one cooperating teacher's comment in a recent study: "I wouldn't accept a student teacher from any other college!" Another cooperating teacher summed up the feelings of most educators who work with the teacher education program: "Mills makes a heroic effort to prepare the best educators for the state of California: It is a model to follow."

The opportunity to develop more high-quality programs in the state has been increased by the recent removal of the long-time state proscription against undergraduate involvement in teacher education. This separation of subject matter studies from the study of education had created a system of mostly 9-month post-baccalaureate credential programs that were disconnected from the undergraduate curriculum. This made it difficult to integrate arts and sciences coursework with preparation in content pedagogy. It also made it difficult for prospective teachers to begin earlier coursework that would enhance their knowledge about and familiarity with teaching and to receive appropriate advisement regarding both their subject matter and educational studies. The recent regulatory changes create new opportunities for California colleges and universities to combine undergraduate and graduate studies, to connect content and pedagogy, and to create more extended clinical practice experiences. These changes could enable campuses to create more powerful integrated models like the 5-year blended programs that have proven successful elsewhere in the country.

Many California campuses have begun to move affirmatively toward the creation of these more powerful programs. In addition, California campuses pioneered the development of two-year post-baccalaureate models of preparation that develop sophisticated forms of student-centered practice by tightly linking theory and pedagogical coursework to extensive and intensively supervised clinical practice in both "traditional" and carefully designed "internship" models of training. However, the overall quality of teacher preparation in California has been threatened in the last few years by the widespread hiring of unprepared teachers and by increasing pressures to reduce the amount and quality of preparation in response to high teacher demand. The supply situation and the State's approach to managing it are profoundly influencing the nature and availability of productive learning opportunities for teachers.

Teacher Supply and Demand

Throughout the 1990s, California has had steeply increasing demand for teachers due to growing enrollments, increasing retirements, and high attrition rates, especially for beginning teachers. In addition to its burgeoning pupil population and its older-than-average teaching force, California's teacher hiring needs were spiked by the state's 1996 class size reduction initiative reducing class sizes to 20 students in the early elementary grades. As a consequence of these factors, California's teaching force is expected to grow from about 275,000 in 1999 to nearly 300,000 in 2008. Analysts estimate that California will need to hire about 25,000 teachers annually over the next decade (Shields, et al., 1999) if attrition rates remain the same.[4]

This steep growth and the widespread issuance of emergency credentials in the last 3 years since the class size reduction initiative have led to a common perception that there are severe teacher shortages in California. This perception appears well-

founded. According to the California Department of Education, in 1998-99, there were more than 34,000 teachers teaching on emergency permits (about 12 percent of the state's teaching force).[5] While some of these were fully trained out-of-state entrants who had not yet satisfied one or another requirement unique to California, most lacked the essential preparation for their jobs. In addition, more than 3,500 teachers were teaching on waivers, a majority of whom had not even satisfied the basic skills testing requirement for an emergency permit. Tragically, these teachers are disproportionately assigned to schools serving the greatest numbers of low-income and minority students.

As demonstrated earlier, teachers' underpreparation is strongly related to lower achievement for students. Given the strong influence of teacher expertise on student learning, this circumstance deprives these students of their right to an equal education opportunity at the very time when the state is prepared to deny them a diploma if they do not meet common standards of educational performance.

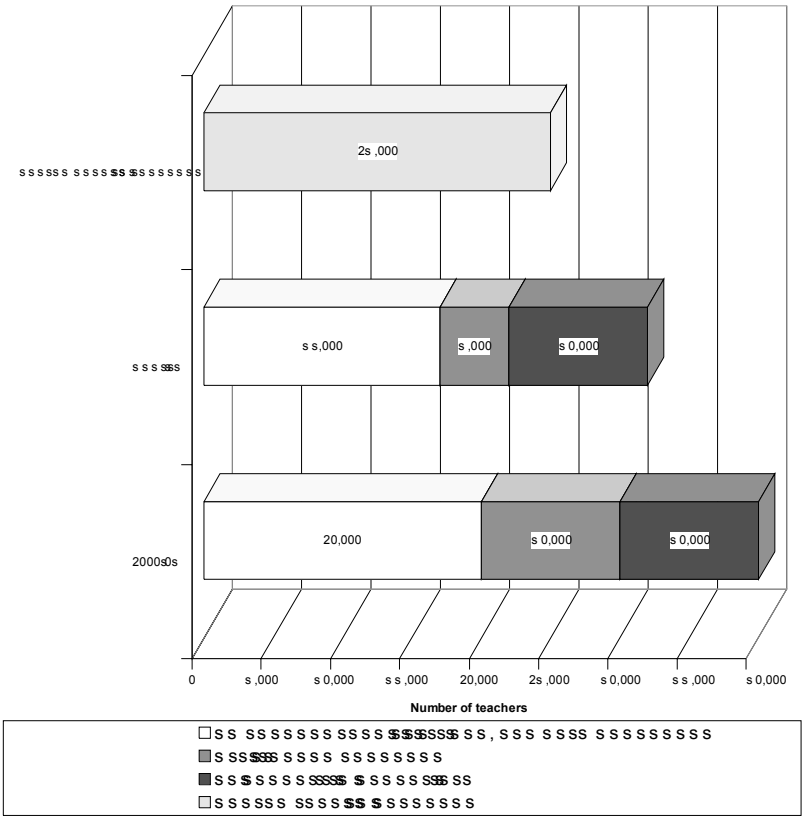
Ironically, though, the problems in staffing California schools are not the result of labor market shortages. There are actually more fully qualified teachers available to teach in California schools than there are positions to be filled. In 1997-98, for example, even before recently enacted policies that will expand the teaching pool, there were at least 32,000 fully qualified teachers available to enter California's teaching force. This number included approximately 17,000 first time, new type credentials issued by California colleges and universities, more than 5,000 out-of-state entrants who received licenses, and 10,000 re-entrants from the reserve pool of teachers in the state.[6]

Since then, the California State University system has pledged to expand its production of teacher education graduates to 15,000 annually (up from about 12,000 in 1997) and the University of California system has committed to increase its graduates to 2,500 (from about 800 per year currently), loans and grants for individuals preparing to teach in California have been substantially expanded, and the legislature has enacted a bill to create inter-state reciprocity for teachers prepared in other states. The expansion of teacher education in California could make an important difference in the availability of well-qualified teachers if high-need fields and locations are emphasized and if high-quality models of preparation are pursued.

In addition, since there is a substantial surplus of teachers in many other states, reciprocity coupled with aggressive recruitment could make an important contribution to California's need for well-qualified teachers. Whereas California enrollments are projected to increase by more than 20 percent by 2007, enrollment declines are anticipated in most parts of the Northeast and Midwest, and other states will have stable enrollments (NCES, 1998). Many of these states have a large number of teacher education institutions and regularly produce more teachers than they can hire. The American Association of Employment in Education's annual surveys (AAEE, 1998) report surpluses of teachers in most fields in the Northwest, Rocky Mountain, Northeast, and Middle Atlantic states. Elementary education has been

a field of national surplus for a number of years, along with fields like English, art, business education, health education, physical education, and social studies. Fortunately, many of the states with the largest surpluses (e.g. Wisconsin, Minnesota, Kansas, Connecticut, Maine) have among the strongest teacher licensing standards and preparation programs in the country as well. On the other hand, fields like mathematics, physical science, special education, and bilingual education register mild to serious levels of shortage across different regions of the county. Given only those policy interventions that have already been enacted, the pool of potential teachers should, under conservative assumptions, reach at least 40,000 annually by 2001, substantially more than the annual demand (See Figure 8.)[7]

Figure 5



These estimates do not include the potential effects of policies like increased salaries, improved working conditions, improved teacher education and mentoring, targeted recruitment incentives, and better supports for teachers that California has begun to use to dramatically increase the supply of qualified teachers.

If California does not have a labor market shortage of qualified individuals interested in and prepared for teaching, why are there so many underqualified teachers in California schools? The major problem is that the pipeline to a teaching career in California actually operates as a sieve. Teachers want to work in schools that pay them adequately and support their efforts well. Qualified teachers also need to be able to find and gain access to the jobs that are available.[8] Finally, teachers are most likely to stay in schools where they feel successful in their work. In contrast to some states that have enacted comprehensive policies to improve and equalize teaching salaries and conditions across schools and districts, teaching supports are unevenly available across California's schools.

Although they want to teach, many California-trained teachers (as well as many out-of-state entrants) ultimately do not enter or stay in teaching within the state. Estimates of the number of California-trained teachers who actually enter teaching in the state range from about 50 percent to 85 percent. Based on several sources of data, a reasonable estimate of current entry rates is around 70-80 percent, a figure that is similar to entry rates for individuals graduating from teacher education programs nationally.[10] Among those who do not accept jobs in California after they graduate, some unknown number leave the state to teach elsewhere, some pursue additional studies and enter teaching later—nationally, delayed entrants comprise almost one-third of new hires (Boe et al., 1998) and some choose other occupations altogether. The likelihood that these individuals will eventually enter teaching is heavily dependent on salary levels and working conditions.[11]

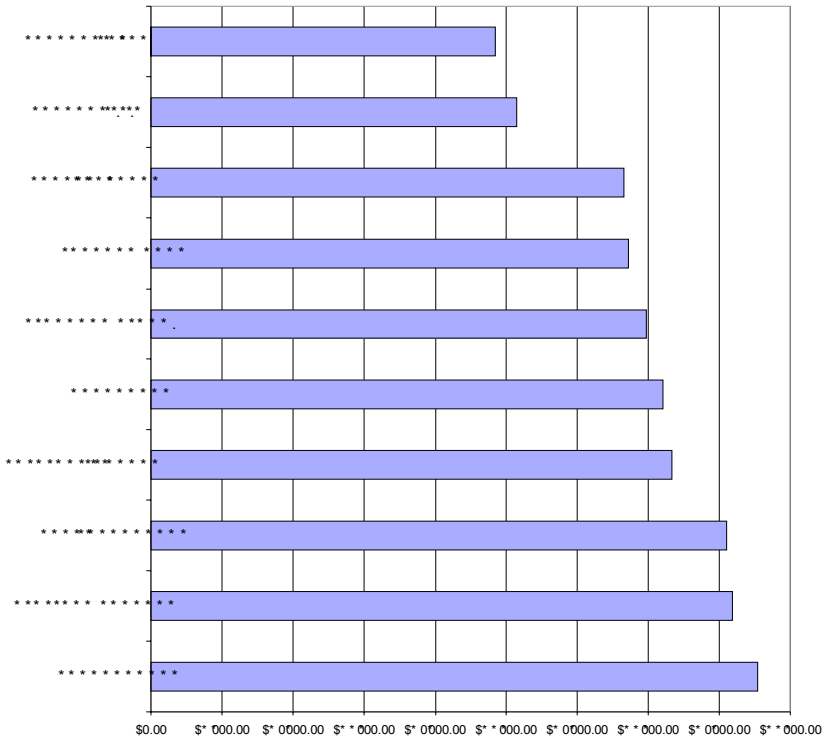
In addition to the fact that not all individuals who prepare to teach enter the field, large numbers of teachers leave the profession early in their careers. National data suggest that about 30 percent of beginning teachers leave teaching within 5 years—a rate that is sharply reduced by access to mentoring supports in the early years. Survival rate data through 1995 indicated that about 40 percent of California's beginning teachers leave within that time frame (Fetler, 1997),[12] a rate than may have increased in recent years with greater hiring of new teachers and individuals who are unprepared, groups that have higher attrition rates. California's teacher supply problems have been a function of several factors:

Noncompetitive teacher salaries that are also substantially unequal across districts. Beginning and average teacher salaries in California, adjusted for cost-of-living, lag behind those for liberal arts graduates by 25 percent and behind those for computer science graduates and engineers by 40 percent (See Figure 9). These differentials contribute to high non-entry and retention rates for the teaching generally and for fields like mathematics, science, and computer technology particularly. In the region, California's beginning salaries, when adjusted for cost of living differentials,

compare poorly to those of surrounding states, as shown in the table below.[13] Teachers' salaries have slipped steadily both in real dollar terms and as a share of the education budget for more than two decades. As of 1998, California ranked 44th in the U.S. in the share of its education budget devoted to teachers' salaries (only 34%). Finally, beginning teachers' salaries in California vary by more than 50% across districts, and by as much as 35% within a local labor market, creating labor market imbalances within and across regions (Pogodzinski, 1999).

1997-98 Teacher Salaries Adjusted for Cost-of-Living	Beginning Salary	Average Salary
Nevada	28,813	40,816
Alaska	26,529	38,620
Oregon	26,225	42,556
California	24,219	38,635
Washington	23,165	37,408

Figure 9 Beginning Salaries in Teaching and Other Occupations



Dismal working conditions in many schools, especially those serving the least advantaged students. Teaching conditions steadily worsened after the passage of Proposition 13 in 1979, especially in the least wealthy districts, leading to what has been called the "Mississippication of California schools" (Schrag, 1999). By the late 1990s, California ranked 45th or lower among states on student achievement, class sizes, staff/pupil ratios, libraries, and most other school resources. Even after class size reduction, class sizes above the 3rd grade continue to be among the nation's highest, and working conditions in low-income districts among the worst. Large classes, severe overcrowding of facilities, and inadequate stocks of books and materials have converged with pressures for test score increases on measures that are not aligned to the state curriculum to create stressful settings for teaching in many schools, especially those that serve the most economically disadvantaged students. In many schools, beginning teachers are routinely given the largest course loads with the most educationally needy students and the least planning time. Not surprisingly, these schools have difficulty retaining teachers.

Dysfunctional personnel practices that undermine the hiring and retention of qualified teachers, especially in many urban school systems. Evidence nationally and in California indicates that the hiring of under-qualified teachers in many communities is often caused by cumbersome hiring procedures that can take months, late hiring caused by seniority transfer provisions and late budget decisions, and preferences for hiring untrained, inexperienced teachers who cost less money (NCTAF, 1996; Shields et al., 1999). In California, nearly 50 percent of newly hired teachers in 1998 were hired after August 1, and 25 percent were hired after the start of the school year (Shields et al., 1999). In the six California districts that account for most of the state's emergency hiring, these problems are commonplace.[14] Qualified candidates who apply to teach in these districts often find that they cannot get answers to their questions about vacancies, are unable to get scheduled for interviews, and have their files lost. A recent PBS documentary interviewed a number of qualified science teachers who had applied to teach in the Oakland Public schools but had never been called for a job. Meanwhile, the district was hiring hundreds of teachers on emergency credentials.[15]

Local schools of education often report that their graduates who want to teach in urban areas cannot negotiate the poorly functioning personnel systems in high-need city districts. Many candidates who want to teach cannot wait until August or September for an answer and must take offers from other districts or private schools if they are to be guaranteed a job in the fall. This results in the late hiring of much less-qualified candidates than the district's original pool of applicants. In addition, many districts will bypass well-qualified applicants with greater education and experience in order to hire untrained teachers who cost less. Finally, some districts do not value the expertise of the teachers they already employ. Since 1990, several large districts in California have used early retirement incentives to buy out the contracts of thousands of qualified veteran teachers and then hired unqualified teachers to replace them. In states with highly-qualified teaching forces, these practices are prevented by the state standards board or department of education. In California, the Commission on Teacher Credentialing (CCTC) has not had the authority or resources to investigate the hiring practices of individual school districts. Consequently, emergency hiring requests are approved in bulk without evaluation of their need or appropriateness.

Licensing policies that sometimes create unnecessary barriers without ensuring quality. The lack of reciprocity with other states, the separation of undergraduate education and post-baccalaureate teacher education, and the state's testing policies have created unintentional barriers to entering teaching in California. Pogodzinski (1999) notes that California's is one of the most complex licensing and accreditation systems in the country, which creates substantial costs and time delays. In addition to the paperwork processes that can be cumbersome, out-of-state entrants have had to take and pass 3 or 4 separate test batteries[16] in order to become certified in California, even if they are fully prepared and have taken licensing tests elsewhere. In addition to the time and expense involved in taking so many different examinations, most of the tests are unique to California and are difficult to access from out-of-state. Additional coursework may also be required of some candidates. This may soon change, since the legislature enacted a reciprocity bill in 1998, and, in the spring of 2000, the CCTC approved a list of states with which it would seek to establish reciprocity. However, the decision to establish reciprocity only with states that require a test "comparable to CBEST" (CCTC, Spring 1999, p. 2) could eliminate from consideration a number of states with high standards that do not use basic skills tests.

Meanwhile, however, candidates from California colleges and universities who have not completed a specific program of subject matter studies formally approved by the CCTC[17] must still take and pass two or three of these tests to be admitted to a teacher education program and undertake independent student teaching, even if they have a major in the field in which they would like to teach. Cut-off scores on the two batteries of subject matter tests have been set substantially above those elsewhere in the country, such that only 15 percent of all candidates passed both of the mathematics test batteries, only 26 percent passed the social science batteries, and only 45 percent passed the English batteries in 1997-98 (Brunsman & Carlson, 1999).[18] While candidates who fail the examinations are discouraged from entering teacher education, individuals who have no preparation at all can be hired to teach on emergency permits and waivers.

Finally, the long-enforced separation between undergraduate subject matter preparation and post-baccalaureate teacher education has meant that on many campuses, candidates did not receive advisement about the courses they need to enter teacher preparation after they graduate, and opportunities for blending content preparation with pedagogical preparation were missed. This, too, could change with the recent lifting of the proscription against undergraduate teacher education courses, depending on what kind of programs emerge.

Inadequate recruitment incentives for high-need fields and locations. The barriers described above are problematic in all fields, but are especially so in high-need fields like mathematics, science, computer technology, special education, and bilingual education/English language development where there are genuine undersupplies of candidates. During the 1960s and 1970s when the last major increases in teacher demand occurred, the federal government initiated a variety of targeted scholarship and forgivable loan programs, as well as teacher education supports, to help ensure an adequate supply of programs for high-need fields like mathematics, science, and special education and for high-need locations like cities and poor rural districts. These programs were successful in nearly eliminating the hiring of underqualified teachers during the 1970s; however, they were repealed in the early

1980s. Since teacher demand has increased again, many states have instituted similar programs to subsidize the preparation of individuals who will teach for several years in high-need fields and locations. Until 1998, California offered few targeted incentives for individuals to prepare to teach in fields and areas where they are most needed. The 6,500 Assumption Program of Loans for Education (APLE) awards authorized in 2000-01 — which focus some support on those who pledge to teach in understaffed schools and in shortage fields — will help in this regard, as will the expanded number of Cal Grant "T" Program (Cal T) grants for students enrolled in teacher education programs, but more sizable assistance is needed.

Overreliance on pathways into teaching, such as emergency hiring and short-term alternative routes, that have extremely high attrition rates. As a consequence of the factors described above, California has begun to rely on pathways into teaching that have extremely high turnover rates. About 40 perent of California's emergency credentialed teachers leave within a year (more than three times the rate for credentialed teachers), and at least 40 percent of those who enter through short-term alternative routes leave within three years (at least double the rate of those who enter through traditional preparation programs).[19] High turnover is a function of both lack of training, which leads to discouragement and burnout, and lack of commitment on the part of those who enter because the job is readily available rather than because they are really interested in teaching. About 25 percent of California's teachers now enter the occupation with emergency permits or waivers. A small but growing share enter through internship programs, some of which are carefully structured to ensure high quality coursework and assisted clinical learning, while others offer largely unmentored entry and incoherent collections of courses that do not represent up-to-date knowledge about teaching. In some districts, more than half of newly hired teachers enter through these routes. This creates a revolving door of teachers into and out of teaching, rather than a stable teaching force.

In recent years, the state has established more incentives for individuals to enter teaching through backdoor routes than through quality preservice teacher education. Before the expansion of the Cal T grants and APLE loan programs in 1999, there were relatively few supports for individuals who wanted to become well-prepared before they enter teaching in California. These supports are still less well-funded than the incentives for candidates to enter prior to preparation. For example, the $23 million allocated to APLE and Cal T in 2000-01 was only half of the amount allocated to pre-intern and intern programs that encourage districts to hire teachers before they are prepared.

Inadequate supports for beginning and veteran teachers. In addition to the attrition caused by the large number of emergency hires and others with minimal training, teacher turnover in California has also been related to the unavailability of support for novices, only 16 percent of whom were working with a mentor teacher on a regular basis in 1998 (Shields et al., 1999). This may change as the Beginning Teacher Support and Assessment (BTSA) program expands in coming years if care is taken to adapt program models to the needs of local schools with large numbers of new teachers. However, many districts are using the program to provide after school workshops for beginning teachers, rather than on-site mentoring, the most powerful component of the early pilot programs. Finally, the lack of resources for

> both teaching and teacher learning in many districts contributes to higher than average rates of teacher attrition in California. Teachers in some districts lack even basic resources like textbooks and materials. Most do not have the opportunity to engage in sustained, high quality professional development that will enable them to help their students meet the new learning standards in their subject area, and few have any regular time for shared planning and collaboration with other teachers to help them solve problems of practice (Shields et al., 1999).

These factors combine to produce lower than desired entry rates for newly prepared teachers and unusually high attrition rates for all teachers, especially beginners. While some districts with attractive salaries and working conditions, good supports for teaching, aggressive recruiting, and streamlined hiring procedures, have many more applicants than they can hire, others are unable—and sometimes unwilling—to seek out and find qualified teachers in all fields, to hire those who apply in an efficient manner and timely way, and to treat those they hire with enough care so they will stay. Recently enacted policies address some but not all of these problems.

In particular, the framing of the problem as a need to prepare more and more teachers as quickly as possible, in large part by conducting teacher education faster, more cheaply, and less coherently could actually exacerbate the problems California faces. First, the press to prepare more teachers quickly (rather than to get prepared teachers to enter and stay in teaching in the places they are needed) has begun to undermine high quality teacher education programs in California, causing them to dismantle many of the features that have made them most successful—including features that support higher rates of entry and retention as well as greater competence.

It has also encouraged the proliferation of programs and pathways that create a revolving door of underprepared teachers who enter and leave at rapid rates, practicing at the start of their careers with little knowledge or skill, mostly at the expense of the state's neediest students. Because of their short tenures and the weaknesses of the training they have received, it is likely that many of these teachers will never become highly competent. Furthermore, for those students in low-income schools who experience a steady parade of underprepared, inexperienced, and short-term teachers throughout their school careers, the fact that some of them may eventually become more skilled after they have moved on is little consolation for the inadequate teaching these students have already received.

Equally unfortunate, this misdiagnosis of the problem has tended to deflect attention away from the factors that need to be addressed in order to attract and keep the already potentially adequate supply of qualified teachers in California's schools: competitive and equitable salaries and working conditions, functional district hiring procedures and supports for teachers, sensible state licensing policies, and targeted incentives for recruiting teachers in shortage fields and locations. These conditions conspire to weaken the quality of teaching practice in the state as a whole and the prospects for achieving educational excellence and equity.

Issues Facing Teacher Education in California

While high-performing states elsewhere in the country are investing in more rigorous teacher education programs that provide more coherent and comprehensive training, a substantial portion of the teacher training system in California is moving in the opposite direction. States like Connecticut, North Carolina, and Kentucky that sharply improved student achievement during the 1990s launched reforms more than a decade ago that reduced or eliminated teacher shortages and improved teacher quality by increasing and equalizing salaries, strengthening teacher education coursework and accreditation, and instituting beginning teacher mentoring programs, among other reforms.

For example, Connecticut eliminated shortages and created surpluses of teachers by raising and equalizing salaries across districts while enacting rigorous licensing standards, providing scholarships and loans for teachers in high-need fields and locations, improving teacher education, eliminating emergency hiring, and instituting a statewide beginning teacher mentoring program that has boosted teacher competence and teacher retention. Connecticut's student achievement gains since these policies were instituted in 1986 have placed it number one in the nation in elementary math and reading, an accomplishment recently acknowledged by the National Education Goals Panel and attributed to its decade-long investments in teacher quality (Baron, 1999).

Other states are following suit and instituting major improvements in teacher education. New York, like Connecticut, now requires all teachers to gain a masters degree as the basis for a professional license in addition to a major in the field to be taught and coursework in teaching that ensures deep knowledge of learning, teaching, and the needs of a wide range of learners. Like North Carolina, New York will require national professional accreditation for all of its programs, and it is eliminating the practice of in-state certification by "transcript review," a form of alternative certification that allowed candidates to take individually determined courses while teaching on an emergency credential

North Carolina has required and funded all of its colleges and universities to create professional development school partnerships that will be the basis of year-long student teaching placements for all entering teachers. Colorado has also just enacted a requirement for year-long student teaching placements. Kentucky is launching a multi-million dollar initiative to encourage school-university partnerships and to ensure integration of arts and sciences courses with education courses in blended programs. Georgia has made teacher education improvements the cornerstone of its P-16 Council efforts with an emphasis on developing more coherent programs that connect content and content pedagogy and extending clinical training in partner schools. Wisconsin, Ohio, Maryland, Indiana, and Minnesota are other states that have recently undertaken reforms that will strengthen teachers' content

and pedagogical knowledge and their clinical experience by extending, deepening, and connecting teachers' theoretical and practical preparation.

Pressures to Reduce Preparation and to De-Couple Coursework and Clinical Training

Meanwhile, in California, reforms in the last year or two have focused more on reducing the duration of teacher education and eliminating the requirement that it occur before teachers practice on children than on ensuring that teachers receive high quality preparation that will enable them to succeed. In the name of "flexibility," curriculum expectations and clinical training are being weakened. In the past year, two-year post-baccalaureate programs, such as the widely respected program at the University of California at Santa Cruz, have considered reverting to one-year programs, and planned 5-year models are reverting to 4-year models of the kind that other states have begun to abandon—programs with front-loaded, disconnected coursework followed by a short dollop of student teaching. Some internship programs are offering fewer content-related courses and less supervised clinical practice; and districts often advise candidates to enter teaching on emergency credentials and then pick up credits as they work.

"Fast tracking" allows some teachers-in-training to shorten their clinical preparation to take paid jobs part way through through their student teaching cycle. A recent study sponsored by Center for the Future of Teaching and Learning (Shields, et al., 1999) notes the recent trend in California to get teachers into classrooms quickly by both shortening student teaching and allowing the emergency permit to substitute altogether for formal student teaching, despite the fact that research identifies practice teaching as one of the most important components of preservice preparation. The study notes:

> Of particular concern is the trend in areas of high demand for fewer teacher candidates to participate in traditional fifth-year programs with student teaching components. Instead, candidates are increasingly choosing to take teaching jobs before earning a credential. For prospective teachers willing to work in districts with severe shortages, there are virtually no incentives to enter a credential program. For example, of the 292 multiple and single subject teacher candidates at Cal State-LA participating in their clinical experience during spring 1999, only 33 were not already full-time teachers of record.... By employing an on-the-job training model, we have solved the problem of unattended classrooms but have eliminated incentives for candidates to be prepared to teach. One result is that many teacher preparation programs in California have a new and disheartening mission: to prepare the unprepared while they teach. Of course, the biggest losers are the students denied access to a high-quality teacher. (p. 76)

Recent California studies have found that candidates who replaced all or part of their student teaching with the emergency permit option are less satisfied with their preparation, and a significant number would change their decision if they had the opportunity to do it over again (Stone & Mata, 1998; Turley & Nakai, 1998).

When candidates enter teaching as emergency hires, they sacrifice the opportunity to learn to teach by observing expert veterans in action and by systematically learning to apply theory to practice. Even when these teachers make their way through the credentialing system, they often continue to have major gaps in their knowledge and skills because they take courses on an ad hoc basis that are unconnected to one another and to their teaching experience. Night and weekend courses are typically taught by adjunct faculty who, even when they are veteran teachers with much to offer, are not involved with others in planning a coherent curriculum. Course content is erratic, and field placements are generally not supervised in any serious or sustained fashion.

Studies in California and elsewhere show that teachers who enter the profession without completing a teacher education program feel significantly less well prepared (Shields, et al., 1999; Silvernail & Imbimbo, 1999). More importantly, evidence suggests that many do not learn to teach proficiently but learn to cope in ways that are counterproductive to student learning (Grossman, 1989; Lenk, 1989; Shapiro, 1993). A number of studies suggest that the typical problems of beginning teachers are greater for those who have not had adequate preparation prior to entry (Adams, Hutchinson, & Martray, 1980; Glassberg, 1980; Taylor & Dale, 1971).

A substantial body of research indicates that teachers admitted with less than full preparation are not only less satisfied with their training, they have greater difficulties planning curriculum, teaching, managing the classroom, and diagnosing students' learning needs. They are less able to adapt their instruction to promote student learning and less likely to see it as their job to do so. Principals and colleagues rate them less highly on their instructional skills, and they leave teaching at higher-than-average rates. Most important, their students learn less, especially in areas like reading, writing, and mathematics, which are critical to later school success (Bents & Bents, 1990; Darling-Hammond, 1992; Darling-Hammond, Hudson, & Kirby, 1987; Feiman-Nemser & Parker, 1990; Gomez & Grobe, 1990; Grady et al, 1991; Grossman, 1989; Jelmberg, 1995; Lenk, 1989; Mitchell, 1987; National Center for Research on Teacher Learning, 1992; Rottenberg & Berliner, 1990).

Learning from practice by trial and error does not teach what learning from supervised experience does. Often unmentored teachers are so concerned about their own survival that they learn to blame students for their own lack of skills. Even if they learn to manage a class and get through activities, they may never have the opportunity to learn how to work effectively with students for whom academic learning does not come easily. It is not clear that teachers who learn to teach in this way as a means of surviving will acquire other strategies later in their careers. One researcher's account of a well-meaning Teach for America recruit, one of a number of bright college graduates assigned to teach in a central city school after a few weeks of summer training, illustrates how this can happen. The young man was fired after several weeks of teaching elementary school, having reverted to using teaching methods that were heavily rote oriented and worksheet-driven because he had no

other curriculum ideas. This, coupled with his inept and heavy-handed attempts at discipline, lost the class. At the end he concluded: "I don't think (the students) hated me. I do think they thought I hated them" (Shapiro, 1993, p. 74). What he learned from this unguided experience was revealed when he began a new teaching assignment in yet another school. He started off his new job by taking away the children's recess, so they would know who was boss. As the researcher described it:

> And that is how it begins. Or how it begins to end. You come to your first class and they eat you up and you vow that it will not happen again. And you learn what you have to learn to make sure it doesn't. You learn the value of workbooks because even if they're numbingly dull they keep the kids busy and if the kids are busy they are not making trouble for you. (p. 89)

A number of studies have found that teachers who are better prepared tend to be more able to use teaching strategies that respond to students' needs and that encourage higher order learning (Hansen, 1988; Perkes, 1967-68; Skipper & Quantz, 1987). Since the novel tasks required for problem-solving are more difficult to manage than the routine tasks associated with rote learning, lack of knowledge about how to manage an active, inquiry-oriented classroom can lead teachers to turn to passive tactics that "dumb down" the curriculum (Carter & Doyle, 1987; Doyle, 1986), busying students with workbooks rather than complex tasks that require more skill to orchestrate (Cooper & Sherk, 1989). It is not clear that limited course-taking unconnected to practice can overcome these habits that are developed in the press to gain classroom control when models of effective teaching methods are absent.

It is possible that university programs that try to offer disconnected night-time courses to untrained teachers already engaged in classroom practice will inadvertently prove the point made by many critics of teacher training: that teacher education makes little difference in the effectiveness of teachers, at least when it is conducted in this fashion.

Incentives for Alternative Credentialing

An alternative to entering a traditional preservice program—or to entering teaching on an emergency credential (pathways that are increasingly blurred in California)—is entering through an internship program. The California legislature has recently allocated more than $10 million dollars for internship programs, in addition to $2 million for pre-internships for individuals teaching on emergency credentials who have not passed the basic skills or content tests needed to enter teacher education. There are potential advantages of such programs when they are responsibly organized, because they can be managed as school-university partnerships that integrate theory and practice, wrapping coursework around supervised clinical experiences that can, at least in theory, be well-supported.

The California State University, Hayward-New Haven Unified School District program described earlier is one example of a carefully constructed internship

program that provides reasonable safeguards for students as well as beginning teachers. Recruits take courses in the summer and start the year as student teachers in classrooms with expert teachers. They are carefully evaluated over the coming months for their readiness to take on internship placements. Only about half eventually move into part-time internships with their own classrooms and regular support from a mentor with released time. The others complete student teaching in master teachers' classrooms. Both groups complete coursework together over the course of the year with California State University, Hayward.

This model is unusual, however. Many programs allow interns to become teachers of record with full responsibility for classrooms after only a few weeks of summer training. As Shields and colleagues (1999) note: "Regardless of how well internships prepare new teachers, they—by definition—place underqualified teachers in classrooms. Although internship programs might train emergency teachers quite ably within a year or two, for the duration of the internship, the students in their classrooms are taught by someone who is learning as she goes" (I-54).

While internship programs are growing in California (about 7,000 teachers were in intern programs in 1999-2000, while another 6,000 who had not passed subject matter requirements were in pre-intern programs), there are reasons to be concerned about the quality of many of these programs. Whereas some retain a rigorous curriculum tied to carefully supervised student teaching and well-supported internship experiences in schools, others place interns as teachers-of-record without significant mentoring after a few weeks of summer training and water down coursework to a two-hour session of weekly "seat time" in which serious and difficult issues of teaching and learning cannot be well addressed. The reduction of traditional coursework and lack of student teaching in these programs is supposed to be compensated for by intensive mentoring and supervision in the initial months of full-time teaching. However, promised mentors do not always materialize. As a RAND report on nontraditional programs noted:

> ...Ironically, given that these (alternative certification) programs presumably emphasize on-the-job training *in lieu* of standard coursework, the alternative program recruits in our sample received substantially less assistance and supervision than recruits in any of the other types of programs. (Darling-Hammond, Hudson, & Kirby, 1989, 106)

In this study, fewer than a third of alternative certification recruits from short-term summer programs spent an hour or more each week working with a support person, as compared to three-quarters of the recruits in graduate school programs. Other studies have also commented on the unevenness of supervision in AC programs, particularly those that rely on local district resources (Adelman, 1986; Cornett, 1992).

Three recent evaluations of California intern programs have raised similar concerns about the lack of support interns receive. McKibbin's (1998) summary of two CCTC evaluations noted:

> The Commission's two evaluation studies showed that the quality and comprehensiveness of the curriculum in district intern programs varied a great deal… In the 1987 and 1994 studies, interns reported that the formal "mentor" support system is not supplying assistance at a level of intensity that would be beneficial….Twelve percent of the interns reported that they had not had contact with a mentor or other person formally assigned to them. Others reported that formal support was inadequate because their mentors were employed at schools some distance from their sites, or taught subjects in different areas or grade levels than the interns. The numbers of support conferences and observations were lower than what would reasonably be expected, and these numbers declined from 1987 to 1994…. As a result of the two studies, the Commission concluded that significant aspects of district intern programs must be improved, such as the unevenness of intern support and the use of District Intern Certificates to provide a convenient hiring mechanism rather than as a professional preparation program. (6-7)

A study of Los Angeles' education specialist program—a district intern program cited as one of the better models—found that 85 percent of interns did not receive any mentoring in the first month of teaching. On average, interns observed their mentors and were observed only four times per year (McKibbin & Giblin, 1999, pp. 39-40). Quite often the districts that hire the most interns have the fewest veteran teachers available for mentoring. As one district intern who taught high school English reported, "The mentor they assigned to me was a math teacher from a school 20 miles away. I never saw him" (Shields et al., 1999, I-56).

Some of these problems are long-standing. Problems resulting from inadequate preparation headed the list of complaints of the 20 percent of Los Angeles alternate route candidates who quit before they completed their summer training programs in 1984 and 1985, as well as many of those who remained but voiced dissatisfaction (Wright, McKibbin, & Walton, 1987). This evaluation found that in addition to the 20 percent of recruits who dropped out before completing the training, another 20 percent of the remainder left or were not deemed ready for employment by the end of year two when they would have been credentialed (Wright, McKibbin, & Walton, 1987). Stoddart's (1992) analysis revealed that 53 percent of Los Angeles' alternative certification recruits (prepared in an eight-week summer program run by the district) had left within the first five years of program operation. This track record is not unusual for alternative certification programs. Similar attrition rates have been found for alternative certification programs in other states (Darling-Hammond, Hudson, & Kirby, 1989; Lutz & Hutton, 1989).

One recent study of 53 recently funded California intern programs (a subset representing about one-fourth of the State's 200 internship programs) cites a retention rate of about 85 percent for program graduates over the period of what appears to be one year (McKibbin, 1998). This figure is based on program self-reports rather than first-hand empirical data collection, so its accuracy is difficulty to confirm. It also tallies only graduates who continue into teaching, rather than program participants, many of whom do not complete the programs. An analysis of

these data examining program participants indicates that only 70-80 percent of interns remain in teaching after a year and only about 60 percent remain by the 3rd year of teaching.[20] Data on the other 75 percent of California's intern programs were not included in this report.

From the point of view of students, the more important question is what recruits know when they begin teaching independently in the classroom. In California, as elsewhere, many alternative certification programs provide no opportunity for subject matter coursework or extended practicum experience; recruits' "practicum" consists of their first year(s) of full-time teaching. Pedagogical training tends to be minimal, focusing on generic teaching skills rather than subject-specific pedagogy, on singular techniques rather than a range of methods, and on specific, immediate advice rather than research or theory (see Stoddart, 1992; Bliss, 1992; Zumwalt, 1990). These constraints, and the current status of teaching knowledge in many of the districts that mount their own programs, lead to a predilection for teacher-proof approaches to training and curriculum that undermine most of the current reforms in teaching and learning. Packaged reading programs and strategies like Assertive Discipline—an approach to classroom management that has been characterized as "psychological child abuse" by the American Psychological Association—are used in some of the largest California intern programs (McKibbin & Giblin, 1999; Stoddart, 1992). Although these approaches do not help teachers to teach diagnostically or in ways that support the acquisition of higher order thinking skills, they can be "taught" in a day-long workshop and require almost no sophisticated knowledge or skill on the part of teachers. Unfortunately, when these programs fail to meet many of the teacher's goals and the students' needs, teachers prepared in this way often have few powerful theories or alternative techniques to marshall.

Interestingly, a state evaluation of the Los Angeles teacher trainee program compared several different kinds of teaching recruits, including one group of alternate route entrants who decided to enroll in regular university teacher education programs rather than the short alternate route summer program, while still receiving state-funded mentor support. This group of university-prepared candidates who received funded mentoring in their first year on the job far outscored any of the other recruits on every criterion of classroom effectiveness, suggesting the cumulative power of adding adequate preservice preparation to intensive on-the-job supervision (Wright, McKibbin, & Walton, 1987, 124).

Strategies for Sustaining High Quality Teacher Education in California

Lee Shulman (1987), president of the Carnegie Foundation for the Advancement of Teaching, notes that "the integral relationships between teaching and the scholarly domains of the liberal arts makes clear that teacher education is the responsibility of the entire university, not the schools or departments of education

alone." Presidents of U.S. colleges and universities are increasingly recognizing that their support of professional preparation for teaching—the profession on which all other professions depend—is a mission critical to the future of all communities and requiring the involvement of their institutions as a whole. In the fall of 1999, a broadly representative task force of the American Council on Education issued a report affirming ten action steps for presidents of colleges and universities. This agenda addresses the issues of institutional priority and coordination, program quality and accountability, support for recruitment and retention of teachers, and involvement in policy influencing teachers and their preparation for high quality teaching. It urged presidents to:

(1) Take the lead in moving the education of teachers to the center of the institutional agenda.
(2) Articulate the strategic connection of teacher education to the mission of the institution.
(3) Undertake campus-wide review of the quality of the institution's teacher education programs.
(4) Commission rigorous, periodic, independent appraisals of teacher education program quality.
(5) Coordinate Education Faculty and Courses with those in Arts and Sciences.
(6) Ensure that teacher education programs have necessary equipment, facilities, and personnel to educate future teachers in the uses of technology.
(7) Advocate for graduate education, scholarship, and research in the education of teachers.
(8) Strengthen inter-institutional transfer and recruitment processes.
(9) Ensure that teacher education graduates are supported, monitored, and mentored.
(10) Join with other opinion leaders to speak out on issues associated with teachers and teaching and to shape public policy.

A summit of California college and university presidents several months later resulted in a similar unanimous resolution that underscored higher education leaders' commitments to improve the quality of teacher education and work with policymakers to improve the conditions for teaching. Since then, regional consortia of universities have been forming to improve both teacher education practice and the supply of qualified teachers within and across labor markets.

These commitments are perhaps most important in California—the nation's largest, most diverse, and arguably most technologically-advanced state in which all of the challenges of 21st century education are most profoundly joined. Creating an infrastructure for high quality teaching in California will require both serious, sustained commitments from the state's universities to the creation of powerful programs of teacher education and equally serious, sustained commitments from the State's policy community to the creation of a profession of teaching that can attract, honor, support, and retain well-prepared teachers. This analysis points to at least three potentially productive areas of programmatic effort.

1. Support high-quality teacher preparation on individual campuses and in the state as a whole, especially for hard-to-staff schools:

(a) Ensure that teacher education programs have adequate and expert staffing, a strong, coherent core curriculum that represents up-to-date knowledge, incentives for collaboration among arts and sciences and education faculty, and support for high-quality clinical experiences.

(b) Provide incentives for the design and/or expansion of teacher education programs that reflect the features of effective programs, including extended (integrated 4½ to 5-year) models that provide entering teachers with adequate grounding in their content areas (the equivalent of a major in their teaching field at the secondary level or an appropriately distributed program of content studies at the elementary or middle level) and a thorough program of preparation for teaching that integrates subject matter and pedagogy, reflects student learning standards and up-to-date teaching standards, and takes into account the needs of diverse students. Such a program should include intensive coursework in language acquisition, literacy development, learning and learning differences, curriculum, assessment, and uses of technology along with extended and well-supervised clinical training (preferably a full year) under the guidance of expert teachers in sites where state-of-the-art practice is modeled. Clinical work should be closely linked to coursework on how children learn and how learners with different needs can be taught challenging content.

(c) Support school-university professional development school (PDS) and district partnerships that enable new and veteran teachers to develop state-of-the-art practice in settings that are focused on the support of both student and teacher learning. Wherever possible, develop such partnerships in high-need schools and districts so that new teachers are prepared to teach effectively in the areas where they are most needed.

(d) Expand preparation programs and increase candidate supports in areas of highest need, including mathematics, science, computer technology, special education, and teaching of English language learners as well as support for minority candidates and recruits who commit to teaching in hard-to-staff schools.

(e) Expand pathways into teaching for para-professionals and other students via community college to college, pathways featuring teacher preparation program articulation and student supports.

(f) Strengthen supports for program graduates, including mentoring assistance and ongoing professional development opportunities to support their growing content knowledge and instructional skill needed to prepare students to meet the new academic standards.

2. Support stronger accountability for all teacher education programs and pathways:

(a) Encourage serious external quality review of campus-based programs, including professional accreditation.

(b) Insist on rigorous standards for *all* programs that prepare teachers—including

both university-based and field-based programs — against a common set of professionally acceptable standards for teaching.

(c) Provide support for examining the outcomes of individual teacher education programs, including placement efforts and outcomes, feedback from graduates and employers about preparedness, and graduates' practices on the job.

3. Contribute to high quality professional development:

(a) Continue to expand the supply of high quality professional development that is meeting teacher needs, especially in the most educationally needy school districts, such as the California Subject Matter Projects, professional development support for the pursuit of National Board Certification, and training for teacher leaders who assume roles as mentors, curriculum leaders, and

(b) Support new training programs for administrators that emphasize teaching and learning, instructional leadership, and the design of more effective schools that better support student and teacher learning.

In addition to supports for teacher education on college and university campuses, it will be important for all members of California's education and policymaking communities to support policies that will help attract and retain qualified and competent teachers for every child, including:

Higher and more equalized salaries for fully qualified teachers (competitive with salary levels of accountants and engineers) and more equal allocations of teaching resources across districts.

Expanded APLE loans and CAL T Grants that support the preparation of prospective teachers, especially for shortage fields and locations.

Targeted incentives for improving working conditions (smaller pupil loads, more shared planning and professional development time, more adequate teaching resources, more personalized school designs, and stronger mentoring) in hard-to-staff schools.

Reciprocity with other high standards states and recruitment from states with surpluses of qualified teachers.

Streamlined licensing and hiring systems and a redesigned licensure testing system featuring a parsimonious set of valid, high-quality tests that are strongly related to teaching ability and easily available to candidates at reasonable cost.

Incentives for eliminating the hiring of unqualified teachers, including phasing out of emergency permits and waivers over the next five years and re-allocation of funds currently used to support substandard pathways into teaching for the support of high quality preparation programs.

The support of elementary and secondary school teaching is a vital mission for institutions of higher education both for its influences on future college students and its influences on the strength of the nation as a whole. Work on the pedagogy

of teaching in the disciplines and the professions within higher education departments and schools is equally important to the preparation of future teachers and all other graduates of colleges and universities. Creating powerful teaching in educational institutions throughout this country will require the concerted effort of university and school-based faculty working with policymakers and community leaders who want to build a system of professional schools of education that rival our universities' schools of medicine, law, architecture, and engineering. It will also clearly require the leadership of university presidents and chancellors who agree with Vanderbilt University chancellor Joe Wyatt that, "Our nation's future depends on a high-quality public education system and a superior force of educators. There is no more important work."

Notes

1. Arkansas, North Carolina, and West Virginia require professional accreditation through the National Council for Accreditation of Teacher Education (NCATE) for all of their education schools. Kentucky, Indiana, Maryland, New York, and Ohio have recently enacted strong incentives for all education schools to become professionally accredited.
2. The programs for which published data provide the basis of these estimates include 5-year and 4-year programs from an 11-institution study (Andrew & Schwab, 1995), national data on entry and attrition from different pathways (NCES, 1996) and data from studies of the Los Angeles Teacher Trainee Program, the Dallas Internship Program, the Houston Internship Program, and Teach for America (Stoddart, 1992; Wright, McKibbin, & Walton, 1987; Lutz & Hutton, 1989; Md. State Dept. of Education). The full analysis can be found in Darling-Hammond (2000a).
3. The programs, at public and private universities across the country, operate at Alverno College in Milwaukee, Wisconsin; Bank Street College of Education in New York City; Trinity University in San Antonio, Texas; University of California at Berkeley; University of Southern Maine; University of Virginia in Charlottesville; and Wheelock College in Boston, Massachusetts. The study collected outcome data including reputational evidence about quality from scholars and from practitioners who hire program graduates; surveys and interviews of graduates about their perceptions of their preparation in comparison with a comparison group drawn randomly from beginning teachers across the country; surveys and interviews of principals about their perceptions of the graduates' preparation and performance; and observations of graduates' practice in their classrooms. Based on evaluations and observations of their practice, the graduates of these programs have developed pedagogical skills that enable them to teach the challenging material envisioned by new subject matter standards to very diverse learners.
4. The number of K-12 students in California schools is expected to grow from 5.7 million in 1998-99 to 6.2 million in 2007-08 according to the State of California, Department of Finance (1998). Assuming the current pupil-teacher ratio, this growth will require adding about 21,500 new teachers by 2007-08. California has a greater share of teachers over 55 (19 percent) than 49 other states (NCES, 1997). Current retirement rates averaging around 2 percent annually could rise to as high as 4 or 5 percent by 2007, resulting in a cumulative demand for as many as 50,000 replacement teachers from 1999 to 2007 (Shields, et al.,

1999). Retirements in combination with other sources of teacher attrition (non-retirement attrition averages about 6 percent annually), produce a yearly demand for about 22,000 replacement teachers. Class size reduction brought approximately 27,000 additional teachers into the California teaching force between 1996 and 1998.

5. California Department of Education, Educational Demographics Unit, *Statewide Classroom Teacher Credential and Experience Report by County, for the Year 1998-99*. Prepared October 26, 1999. <http://data1.cde.ca.gov/dataquest/TchExp1.asp>.

6. Data on licenses issued to in-state and out-of-state entrants from the California Commission on Teacher Credentialing, 1997-98 reports (CCTC, June 1998) and personal correspondence (L. Ford, October 1999). Estimate of number of re-entrants from Fetler (1997).

7. These estimates assume increases in the production of California-trained teachers of 3,000 annually, a conservative assumption which anticipates that the growth in California State University and University of California enrollments will be accomplished in part by shifts of enrollment from private institutions. The estimate also assumes a doubling of the number of out-of-state entrants from 5,000 to 10,000, also a fairly conservative assumption given that current entry rates exist with no reciprocity. At least 20 states have standards for teacher education at least as rigorous as California's and should be eligible for reciprocity; many of these have large surpluses of elementary teachers as well as teachers in secondary fields like English and social studies where California currently hires many underqualified teachers. There are an estimated 60,000 newly trained teachers each year nationally who are unable to secure jobs in the states where they train to teach, not including reserve pools of teachers trained in previous years. Finally, the estimate includes no increase in re-entrants from the reserve pool, which have been stable for many years at about 40 percent of total supply or 10,000 teachers. This rate of re-entry is comparable to national rates of re-entry and would probably be affected only by major changes in the attractions to teaching — improved salaries or working conditions — which we consider later.

8. The Center for the Future of Teaching and Learning's 1999 survey of California teachers found that while 59 percent of teachers reported proximity of the district they teach in to their home as important to their choice, 48 percent cited salaries and benefits, 40 percent cited the availability of a position, 33 percent cited previous experience with the district, 33 percent cited positive reputation of the district, and 30 percent indicated that support for new teachers was important in their choice (Shields, et al., 1999, p. I-41).

9. Cohen and Das (1996) and Fetler (1997) estimate entry rates of California-trained teachers at around 50 percent, based on inferences from licensing data rather than empirical data about actual entry rates. These estimates are likely to be too low because they assume that all emergency and out-of-state license holders enter and stay in teaching for at least a year at rates of 100 percent and then assume the remaining slots are held by California trained teachers. Other data suggest that 70 percent of emergency credential holders are gone within a year (McKibbin, 1998) and experiences in other states indicate that out-of-state entrants who apply for licenses do not always enter teaching, thus the licenses awarded to these categories of teachers may represent many fewer slots than the estimates presume and those awarded to California-trained teachers may represent a greater share of the total. Empirical data suggest higher entry rates. The California Commission on Teacher Credentialing (1999) found in a survey of recent graduates from California institutions that more than 90% seek jobs after graduation and of these, more than 90 percent take jobs in teaching. This finding replicates that of an earlier similar study (Tierney, 1993). However, the CCTC

survey response rate was relatively low (about 40 percent) and may have underrepresented individuals who left the state to work elsewhere or who did not take jobs.

10. The California Commission on Teacher Credentialing (1999) found in a survey of recent graduates from California institutions that more than 90 percent seek jobs after graduation and of these, more than 90 percent take jobs in teaching. This finding replicates that of an earlier similar study (Tierney, 1993). However, the CCTC survey response rate was relatively low (about 40 percent) and may have underrepresented individuals who left the state to work elsewhere or who did not take jobs. The Legislative Analysts Office in California estimates entry rates at 70 percent (Shields, et al., 1999), near the mid-point of other estimates. This is comparable to national entry rate data. National estimates of entry rates for bachelor's degree recipients of degrees in education in 1990 indicate that 73 percent were employed as educators a year later (Recent College Graduates Survey, 1991, as reported in *The Digest of Education Statistics, 1993*, National Center for Education Statistics, p. 397). Of newly qualified teachers in 1990 who held degrees in education, 78 percent were employed as teachers the following year (Choy, Bobbitt, et al., 1993; Gray et al., 1993).
11. Beaudin (1993, 1995).
12. Based on data for cohorts of first-time teachers from 1986-87 through 1995-96, Fetler (1997) estimates a survival rate of 62.7 percent of new teachers at the beginning of the 5th year (representing a 37.3 percent attrition rate at the start of Year 5 and a probable 40 percent attrition rate by the end of Year 5).
13. H. Nelson and K. Schneider, *Survey and Analysis of Teacher Salary Trends, 1998*. Washington, DC: American Federation of Teachers, 1999. Cost of living index from Table I-7, p. 14 applied to salary data from Table I-9, p. 16.
14. Together Los Angeles, Montclair, Oakland, Pasadena, Pomona, and Compton account for more than 60 percent of all emergency permits and waivers in California.
15. The Merrow Report, *Teacher Shortage: False Alarm?*
16. These include the CBEST, a basic skills test used only in California; Praxis II, a subject matter test offered nationally by the Educational Testing Service; the SSAT or MSAT (an additional subject matter test used only in California); and, at the elementary level, the RICA, a testing of knowledge about the teaching of reading, used only in California.
17. These approved programs of study, known as "waiver programs," are approved separately for each subject area on each campus. Different campuses have approved programs in different sets of fields; some lack approved programs altogether. In order for candidates to take advantage of such programs, they must be in a field in which their campus has an approved program and learn of the requirements during their undergraduate years in time to follow the requisite courses.
18. In addition to the extremely high cut-off scores, part of the problem may be that California has adopted only one module of the Praxis examination — the essay component — without adopting the other part of the test commonly used in other states and intended as a stabilizing element for scoring. As an indication that the validity of the testing program is questionable, among the group of candidates taking the mathematics examinations, those with undergraduate majors in mathematics passed at a rate of only 33.1 percent, and those with an undergraduate GPA of 3.5-4.0 passed at rate of only 36.4 percent (Brunsford, 1999).
19. CCTC reports 1-year attrition rates for emergency credentialedd teachers of 35 percent for elementary recruits and 48 percent for secondary recruits (CCTC Emergency Permit

Persistence Data, 1/9/98). From self-reported data derived from a subset representing 25 percent of California's internship programs funded in a recent grant program, McKibbin reports a retention rate of about 85 percent of *graduates* of internship programs after one or two years in the field. However, much of the programs' attrition occurs before graduation. Other analyses of these data show a retention rate for intern program *participants* of only 70-80 percent within the first year and about 60 percent over three years. Earlier data indicated that about 60 percent of intern program entrants actually graduated from the state's largest program, and only 47 percent remained in the district several years later (Wright, McKibbin, & Walton, 1987; Stoddart, 1992). National data from the Recent College Graduates Survey indicate that about two-thirds of unprepared entrants leave teaching within their first year (Grey et al., 1993). Other national indicate that about 60-65 percent of entrants through short-term alternative certification routes have left within three years (Darling-Hammond, 2000).

20. Empirical data, data sources, and methods are not described in this report (McKibbin, 1998), so it is not possible to evaluate the comparability of these statistics with others previously published. It appears that some district intern programs evaluated in some previously published studies are not included in this subset of programs. The data are from self-reports of programs rather than original data collection. The retention rates were reported for program graduates, rather than entrants. In other studies, much of the attrition for interns was found to occur during the one or two years of the program itself (i.e. during the first year or two of teaching while they are taking courses), which is also when most beginning teacher attrition occurs. Finally, the report contrasts the 85 percent in-district retention rate with a statement that only 50 percent of traditionally prepared entrants are retained. If this is an empirical measure (again, no data are offered), it presumably refers to in-district retention rates. A differential in in-district retention rates should be expected. Because they are fully credentialed, traditionally-prepared teachers are much freer to move to other districts in search of higher salaries or better working conditions than are interns who hold emergency credentials or intern credentials that cannot be carried to another district.

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