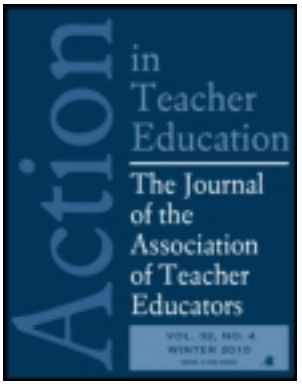

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Learning to Teach: Comparing the Effectiveness of Three Pathways

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Learning to Teach: Comparing the Effectiveness of Three Pathways

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This study examined the differential effectiveness of three pathways to an elementary teaching credential across a large public university system. The study compared traditional campus-based, intern, and online credential programs across a 22-campus system using ratings of program preparation by 12,590 graduates after their first year of teaching and by 3,781 principals who supervise them. Although no significant differences were found among principals' ratings of the teachers' preparation, teachers saw large differences with a statistically and clinically significant advantage for the online pathway. Features of the online pathway included a spiraling curriculum, candidates taught in cohorts across all coursework, fieldwork embedded in coursework, and extra mentoring available in addition to the usual university and district supervision.

INTRODUCTION

The work of teaching is complex and multifaceted, and preparing individuals to be effective teachers is a challenging endeavor without a universally agreed-upon methodology. The importance of an effective teacher though should not be underestimated. Strong research evidence suggests that good teachers are critical to student learning (Darling-Hammond, Berry, & Thoreson, 2006; Nye, Konstantopoulos, & Hedges, 2004; Rowan, Correnti, & Miller, 2002). Results of a study of first-year teachers indicated that districts found teachers prepared by different preparation programs possess dissimilar skills and perspectives on what constitutes best practice (Good et al., 2006).

University-based teacher preparation has been repeatedly challenged to prove its relevance and effectiveness in preparing teachers (Wineburg, 2006). The literature on learning to teach contains recommendations for a rigorous research agenda to meet this challenge. For example, Zeichner (2006) called for "further research to better understand the kinds of program, teacher education pedagogies, and curricular patterns that best prepare teachers for a broad range of desirable teacher and pupil outcomes" (p. 332). Darling-Hammond (2006) suggested that the

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complexity of learning to teach is an obstacle that must be addressed by teacher preparation programs.

This study investigated the question of whether there is a difference in the effectiveness of three pathways in learning to teach offered across the California State University (CSU) System. The independent variable is the pathway; the dependent variables are ratings of the quality of preparation by program graduates and their employment supervisors at the end of the graduates' first year of professional teaching.

California Context

California recognizes that learning to teach is a lifelong effort, and that initial teacher preparation is only the first step (Janssen & Janicki, 2011). The authority for approving institutions to award a teaching credential lies with the California Commission on Teacher Credentialing (CCTC). The Commission's purpose is to "ensure integrity and high quality in the preparation, conduct and professional growth of the educators who serve California's public schools. Its work shall reflect both statutory mandates that govern the Commission and research on professional practices" (CCTC, 2011, p. 7).

Unlike most states, California statutes prohibit colleges and universities from offering undergraduate degrees in education. Teacher candidates must complete a one-year postbaccalaureate program or an intern program to earn a preliminary teaching credential. In some cases candidates may "blend" the completion of their major with the credential program to begin a program prior to receiving a degree. In addition to earning a bachelor's degree, candidates for a preliminary elementary level credential must

1. Satisfy a basic skills requirement through examination
2. Complete a state approved teacher preparation program including successful student teaching and teaching performance assessment
3. Verify subject matter competence by achieving a passing score on the California Subject Matter Examination for Teachers: Multiple Subject (CSET)
4. Complete a course in the provisions and principles of the U.S. Constitution or pass an examination given by a regionally accredited college or university
5. Pass the Reading Instruction Competence Assessment (RICA)
6. Obtain clearance through the finger printing and character identification process.

California State University Teacher Preparation

The California State University (CSU) system is the nation's largest university system. The CSU comprises 23 regional campuses serving 433,000 students while employing 44,000 faculty and staff. In response to accreditation standards and credential requirements, 22 campuses of the CSU have successfully designed and implemented state-accredited teacher preparation programs. During the 2009 to 2010 reporting period, the 22 campuses recommended a total of 8,432 teacher candidates for credentials, 3,086 of whom were at the elementary level. This represents more than one half of all teachers credentialed that year by the state (CCTC, 2011).

Because of the rigorous accreditation requirements stipulated in California's program standards and Teaching Performance Expectations, teacher preparation programs across the CSU system have many features in common, including

- Coursework equivalent to no more than one year of full-time study at the institution
- Alignment of coursework with the 13 Teacher Performance Expectations
- Passage of an approved Teacher Performance Assessment
- Alignment of course syllabi, particularly reading methods courses, with RICA domains
- Strong emphasis on the effective use of current and emerging instructional technologies and on preparation to teach English learners and learners with special needs in inclusionary settings
- Annual data collection from graduates and the employers of graduates
- Documented use of data for continuous program improvement.

Intern Preparation Programs

Over the past several decades, many states have faced teacher shortages due to factors such as retiring baby boomers, increasing college tuition costs, low teacher salaries, low retention rates, school organization issues, and the working conditions of schools (Futernick, 2007). More recently, No Child Left Behind (NCLB) has moved teachers who are not "highly qualified" out of the classroom, creating a new difficulty for those attempting to retain and recruit teachers (Brownell, Bishop, & Sindelar, 2005). In California, class size reduction in the primary grades created a need for many more elementary teachers. One response to teacher shortages has been to allow individuals who have completed undergraduate degrees to enter the teaching profession via nontraditional, alternative routes. These might offer a quicker route to certification or allow a candidate to earn a salary while enrolled. Generally, such teachers are placed in classrooms while completing certification requirements (Shaw, 2008).

In an effort to alleviate the teacher shortage in California, the Teacher Education Internship Act of 1967 established university internship programs, and in 1993 the state established funding programs to support them (Guha, Shields, Tiffany-Morales, Bland, & Campbell, 2008). Intern programs had two purposes: to expand the pool of qualified teachers by attracting career changers and other persons into teaching who might not otherwise enter the classroom (CCTC, 2009), and to enable K-12 schools to respond immediately to pressing staffing needs while ensuring that interns participated in professional preparation that was extensive and systematic.

In 2001, a few years after the state-mandated reduced class size in Grades K-3, there were approximately 42,000 teachers teaching without a credential. Although the teacher shortage in California, particularly for elementary teachers, is now less acute, there is a continuing need in some areas for highly qualified teachers. By 2010, 6,980 interns were enrolled in university programs and another 1,407 in district-based programs (CCTC, 2011). Does this learning to teach pathway prepare teachers as effectively as more traditional programs?

Online Teacher Preparation

Online teacher preparation addresses a need for greater access to teacher preparation for those who are geographically isolated and those who desire more flexibility in the delivery of their program. Advantages for online learning include the greater flexibility it offers, the opportunities it provides the learner to utilize resources that might not be locally available, and the opportunities it provides for "just in time" support and reflection (Dede, Ketelhut, Whitehouse, Breit, &

McCloskey, 2009). Tallent-Runnels et al. (2006) found that not only do students generally have positive attitudes toward online learning, they may also increase their learning time, which could have a positive impact on their overall learning outcomes. Is there evidence that teachers prepared in online programs are as effective as those prepared in more traditional programs?

Significance of the Research

The key questions in this study are "Do differences in learning to teach pathways matter? Do teachers' skills differ when they enter through distinctive programs or pathways?" Such questions can only be answered by the examination of convincing data (Darling-Hammond, Chung, & Frelow, 2002). To assess the factors and traits that make an educator effective and of high quality requires discerning observers who spend time watching teachers teach. This form of assessment is costly in time and money (Berliner, 2005). Supervisor and employer ratings are a feasible way to obtain such a measure of these factors and traits (Darling-Hammond, 2006; Lotan & Marcus, 2002).

This study utilized data collected across the CSU system from 12,571 teachers and 3,709 of their employment supervisors at the end of the teachers' first year of professional practice. Teachers all received their teaching credentials from a CSU through one of three preparation pathways: traditional campus-based program, intern program, or a statewide online supported program.

METHOD

Participants in the Study

This survey research utilized data collected annually over a 7-year period, from 2004 to 2010, from graduates of all elementary credential programs in the CSU system at the end of their first year of professional teaching employment and from their employment supervisors. This provided two sets of data examining the quality of preparation that each teacher received from his or her credential program.

All graduates surveyed were prepared in a postbaccalaureate elementary credential program. They entered their programs meeting application requirements which included a designated BA/BS major, an Introduction to Teaching course, a passing score on an accepted test of basic skills (reading, mathematics, and writing), passing scores on the three sections of California Subject Examination for Teachers (CSET), a minimum GPA of 2.75 on a 4.0 scale, an interview with an education faculty member, a medical clearance, and a character and identification clearance.

Learning to Teach Pathways

System-wide traditional (ST). The ST programs are elementary credential programs that do not include candidates from the other two pathways. Programs have a number of common characteristics, including daytime or evening classes at the university and student teaching in public and charter schools. A university supervisor is assigned to each fieldwork experience and

candidates are primarily evaluated in face-to-face observations and conferences involving a master teacher and university supervisor. The specifics on some campuses include cohort options or other special arrangements but are generally more traditional in format. They all follow the CCTC and CSU standards for the preparation of teachers.

System-wide internship (SI). The internship pathway involves candidates who have a contract as the teacher of record while participating in a preparation program. Intern programs are designed to provide effective supervision and intensive support so each intern's learning can be targeted to her or his needs and so interns can extend, refine, and apply in the classroom what they learn about teaching in the course of their initial preparation. The goal of intern programs is to invest in these teachers so that they have the skills to succeed and the commitment to stay in challenging and high-need classrooms (CCTC, 2009).

Entry requirements include prior coursework on teaching English Learners and classroom management. Interns take credential courses in the evening or on weekends, generally in classrooms with students from traditional pathways. They are supervised throughout the program by a university faculty member whose observations are at the school of employment. By default, the supervision and teaching experience is all in the same school and classroom. The intern programs, offered on 19 CSU campuses, all meet the standards of the CCTC and the CSU.

CalStateTEACH. CalStateTEACH (CST) is an alternative, online-supported four-term program that serves students throughout the state. The design of the CST academic work is consistent with Bruner's (1977) spiral curriculum in which basic ideas are presented in a spiraling, iterative manner. This design enables teacher candidates to revisit basic ideas repeatedly, building upon them until they have grasped the complexities that are associated with them (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005). Rather than separate courses, CalStateTEACH candidates take one 10-unit course each term in a coherent combination of coursework and fieldwork. The academic content is organized in online modules. All curriculum is fully online, and within that structure and candidates are given a pacing guide to assist them in completing assignments in a timely manner. Candidates are in a classroom each term spending 360 hours in clinical fieldwork and 525 hours in student teaching.

A faculty member is assigned a cohort of students in a geographical subregion as much as 500 miles from the home campus. Faculty observe classroom teaching and regularly communicate with students through e-mail, videoconferencing, and discussion boards. Classroom visits occur at least four times per term, either virtually or in person and include a pre- and postconference dialog. Candidates participate in asynchronous discussions and attend Saturday seminars once per term. Candidates submit work for evaluation through an online work folio, and the faculty member evaluates and provides feedback to the candidate (Chiero & Beare, 2010).

Data Collection

Beginning with the 2000 to 2001 academic year, the California State University (CSU) has conducted an annual evaluation of teacher preparation termed the Systemwide Evaluation of Professional Teacher Preparation Programs (SEPTPP). The purpose of the evaluation is to monitor the effectiveness of the system's 22 colleges and schools of education and to provide data to help programs make needed improvements in the preparation of teachers.

Annually, each campus forwards to the CSU Chancellor's Office (CO) Center for Teacher Quality (CTQ) a list of former teacher candidates at that campus who, during a prior 12-month period, met the standards for state certification as K-12 teachers. The CO enlists the assistance of state agencies to identify the school sites of the completers, resulting in the identification of approximately 55% of the sites. The CTQ and campuses follow up this initial identification with a second effort to find the school locations of additional teachers by directly contacting approximately 1,000 school districts and 50 county offices of education. This effort yields information for an additional 30% of recent program completers (CTQ, 2009), resulting in the successful location of approximately 85% of program completers.

Instrument

The instruments used to collect data used in this study were separate but parallel 110-item surveys, one for program graduates after their first year of teaching, and the second for their employment supervisors. The instruments were designed to collect information about the extent to which the teachers perceived the effectiveness of their program to prepare them for important teaching responsibilities, and the extent to which their program coursework and fieldwork were professionally valuable and helpful to them during their initial year of teaching (CTQ, 2009). Graduates and their supervisors were asked about the teachers' preparation for important responsibilities commonly associated with K-12 teaching. Graduates were also queried about the extent to which major features of their preparation programs, such as pedagogical coursework and fieldwork activities, proved to be valuable and helpful during their first year of teaching. In addition, all graduates were asked questions about the quality of their credential program in relation to prominent standards for state and national accreditation.

Ratings were indicated on a 4-point Likert-type scale with the following choices: *well prepared, adequately prepared, somewhat prepared, and not at all prepared.* In 2003, the CSU Deans of Education grouped into composites survey items that were substantively related to each other. For example, the survey includes several items related to preparing teachers for diversity in education. These items were grouped together in a composite called Preparing for Equity and Diversity in Education. The grouping of items in composites represents an important aspect of teaching and facilitates the analysis and interpretation of large amounts of complex data. Table 1 lists the 15 composites for supervisors and 17 for teachers. The composites are divided into five areas: (1) overall effectiveness, (2) preparation to understand and teach core subjects, (3) preparation in general pedagogy, (4) preparation to teach diverse groups, and (5) overall quality and value of the program.

Development and validation of the instrument. The Deans of Education in the system reviewed instruments used by other universities and by research centers to develop an extensive set of items. Alignment of items with state content standards, state expectations for newly credentialed teachers, and state and national accreditation standards strengthened validity. This alignment was performed by individuals who had participated in drafting and implementing the state's accreditation standards for universities and its performance expectations for teachers (CTQ, 2006). "The validity of the CSU composites derives substantially from the Deans' extensive efforts to ensure that each composite consists of questions that are conceptually related to each other and that address important issues in the preparation of K-12 teachers" (p. 8). In 2003,

TABLE 1
Number of Respondents, Means and Post Hoc Results for Three California State University (CSU) System-Wide Groups: Traditional (ST), Intern (SI), and CalStateTEACH (CST)

	Supervisors			*Teachers*		
	ST	*SI*	*CST*	*ST*	*SI*	*CST*
N	2699	936	146	9417	2703	470
Composites						
1. Overall effectiveness of basic teaching credential programs in the CSU system						
A1 Overall effectiveness of multiple-subject credential programs	81	82	82	74[d]	71	85[a]
2. Preparation to understand and teach core subjects of school curriculum at distinct levels						
B1 Preparation to understand and teach reading-language arts	83	83	84	83[d]	76	88[b]
B2 Preparation to understand and teach mathematics	85	85	87	82[d]	77	87[b]
B7 Preparation to understand and teach other subjects	81	83	81	65	66	76[a]
3. Preparation in general pedagogical principles and practices across subjects and school levels						
C1 Preparation to plan instruction for all students & subjects	84	85	86	81[d]	76	90[a]
C2 Preparation to motivate students to be active learners	84	85	84	80[e]	78	88[a]
C3 Preparation to manage instruction for learning	82	83	83	74[d]	71	86[a]
C4 Preparation to use education technology effectively	81	82	86	62	60	76[a]
C5 Preparation to use good pedagogy across the curriculum	83	85	84	75[d]	72	87[a]
C6 Preparation to assess and reflect on K-12 teaching	81	82	84	75[d]	71	90[a]
4. Preparation to teach California's students in diverse groups and stages of development						
D1 Preparation for Equity and diversity in K-12 education	78	80	80	74[d]	72	87[a]
D2 Preparation to teach young children in grades K-3	83	85	82	78[d]	73	88[a]
D3 Preparation to teach middle-grade students in grades 4–8	81	83	82	75[d]	71	88[a]
D5 Preparation to teach English learners in grades K-12	80	82	81	77[d]	73	88[a]
D7 Preparation to teach special learners in inclusive schools	78	80	81	71[e]	69	85[a]
5. Overall quality and value of CSU teacher preparation in basic credential programs						
E1 Overall value of CSU professional coursework in education				79[e]	77	86[a]
E2 Overall value of quality of fieldwork experiences in education				86[d]	78	88[c]

a. Scheffe post hoc test indicates CST is great than SI at $p < .001$, and CST is greater than ST at $p < .001$.
b. Scheffe post hoc test indicates CST is great than SI at $p < .001$, and CST is greater than ST at $p < .01$.
c. Scheffe post hoc test indicates CST is great than SI at $p < .001$.
d. Scheffe post hoc test indicates ST is great than SI mean at $p < .001$.
e. Scheffe post hoc test indicates ST is great than SI mean at $p < .01$.

the CSU subjected the questions to a factor analysis to assess empirical validity of the Deans' conceptual groupings. The results of SPSS (version 20) varimax rotation suggested minimal changes by moving a few items. After review and discussion, the Deans accepted the changes bringing the SEPTPP to its present form. To expand validity, the Deans also completed an "alignment project" that enabled the CO to produce evaluation reports that explicitly aligned evidence of program outcomes with state and national standards.

Weighting. In the course of organizing the composites, the Education Deans decided that the questions were not of equal importance and assigned different weights to the questions to reflect their levels of importance in evaluating the preparation of teachers on a one to four scale (CTQ, 2006). The CSU's practice has been to use the weighted score composites when examining or comparing teacher preparation pathways. These scores have been transformed to a 0% to 100% scale for this study.

Additional validity. Beare, Marshall, Torgerson, Tracz, and Chiero (2012), in an analysis of responses from 19,050 employment supervisors statewide, found no significant correlations between principals' evaluation of graduate's preparation on the SEPTPP and certain characteristics of schools in which the graduates taught during their first year. Specifically, the percent of students eligible for free or reduced lunch, the percent of students who were English learners, school achievement level on state tests, or the percent of teachers in the school with emergency teaching credentials had no effect on the evaluation of the teachers by principals. Beare et al. concluded that these findings, devoid of extrinsic variables affecting the ratings, speak to the applicability of SEPTPP in establishing a culture of evidence for teacher preparation program improvement.

Reliability. Since the inception of the survey, each year's data set yields the percent of respondents who gave specified answers to the questionnaire and includes reliability estimates for each finding in the form of confidence intervals. These are based on the number of respondents and the concurrence, or homogeneity, of responses. The composite scores are substantially more reliable than are the evaluation of participants' responses to individual survey items, and many are sufficiently valid and reliable to serve as the basis for academic and professional decisions about teacher preparation by faculty and administrators at system campuses (CTQ, 2006). The reliability of the composite scores for the system, the online program, or the campus-based program range from zero to two percentage points at the 90% confidence level.

RESULTS

Research Design

Three pathways to teaching, Traditional (ST), Interns (SI) and CalStateTEACH (CST), were compared systemwide. Data from two perspectives, teacher and supervisor, are reported. The number of respondents, the means for percentages of ratings and the results of the post hoc Scheffe analyses are presented in Table 1.

Demographic Information

The teachers whose preparation was evaluated in this research were predominantly age 22 to 40 and were 80% female. The largest ethnic group was White Non-Hispanic (60%), followed by Latino (28%). Their employment prior to credentialing was generally outside education or their college degree area. A demographic comparison of graduates in the three pathways showed no marked differences. The CST pathway had a higher percentage of female students (85% for CST vs. 72% for ST and 78% for SI). Employment in schools as teacher, intern, or teaching assistant was 100% for the SI whereas it was 57% for CST and 44% for ST prepared teachers. Other than professional role, no demographic data were collected from the employment supervisors.

Data were examined by grouping all teachers by the pathway to credentialing they had followed. Only the preparation of individuals who were employed as teachers during the year following completion of their credential program was analyzed. Although programs on individual campuses likely had some changes over time, the candidates from across all 7 years of data collection were grouped together.

Individual respondents were placed in only a single pathway for the purposes of this research. Some CST candidates were paid as interns but otherwise participated fully in CST and consequently were all categorized as CST for the analysis.

Results for employment supervisors. The means for employment supervisors who rated their teachers in their respective credential programs for each pathway are shown in Table 1. The *N*s varied widely, with 2,699 ST supervisors, 936 SI supervisors, and 146 CST supervisors responding. These figures are representative of the relative numbers of candidates who completed these pathways. Self-report data from the supervisors showed that essentially 100% were employed as elementary school principals. An examination of the 15 composite percentages showed that the CST and SI groups were each rated highest on six composites and were tied for highest on three others. The ST group was not rated higher than either of the other groups on any composite. The ANOVA results examining for differences between the pathways for the composite *A1 overall effectiveness* of the credential program was not significant ($F = .66$, $df = 2, 3167$, $p = .52$). Likewise, no statistically significant differences were found among the three pathways concerning the teacher's preparation for any of the 14 other composite areas rated by employment supervisors, with the F tests ranging from 0.07 to 2.20.

Results for teachers. The sample sizes varied between the three teacher groups, with 9,417 for the ST group, 2,703 for SI, and 470 CST respondents. As may be seen in Table 1, the highest means were achieved by the CST pathway on all 17 composites. The ANOVA results examining for differences between the pathways for the composite *A1 overall effectiveness* of the credential program found statistical significance ($F = 61.38$, $df = 2, 12546$, $p < .001$). All other composites were also significant with F tests ranging from 20.51 to 132.02.

The magnitude of advantage for CST preparation was consistent and noticeable. The Scheffe post hoc tests revealed that the CST group was significantly higher than the SI on all composites, and higher than the ST prepared group on 16 or the 17 composites. In addition the ST prepared teachers were significantly higher than the SI on 15 of the 17 composites.

SUMMARY OF RESULTS

This research examined the differential efficacy of three pathways to elementary teaching within the nation's largest university system. It utilized data from 22 campuses across 7 years gathered from 3,781 employment supervisors and 12,590 teachers. The teachers had completed one of three credential program pathways: CST, an online supported program; SI, an intern program where the teacher candidate was enrolled in evening courses while working as a paid teacher during the school day; and ST, traditional campus-based teacher preparation where candidates have classes on campus and are sent to various elementary schools in their region for two or three terms of student teaching. Preparation effectiveness was measured on 17 composites for program graduates and 15 for their supervisors, reflecting the complexity of learning to teach.

No significant differences were found among the ratings of the employment supervisors; however, the teachers identified consistent differences between the pathways on all composites. The CST pathway graduates rated their preparation the highest in every one of the 17 composites; the CST means were significantly higher than the SI means on every composite, and higher than ST means on all but one composite. The ST pathway scored higher than the SI path on all but two composites.

DISCUSSION

Employment supervisors did not perceive differences among the pathways in the preparation of the first-year teachers. Because all programs were designed to meet the same CCTC standards and all were within a single university system that provided oversight, the subtleties of preparation may not have been perceptible one step removed from actual program delivery, or the differences were so small that they were not detected. Perhaps the combination of standards from the state and system served to obliterate the differences in preparation at the supervisor level. It may also have been that by the end of a full year of teaching the shaping influences of the individual employment situation leveled out preparation differences. Screened by the great equalizer of classrooms full of children, teacher preparation may be too distant to overshadow the year of practice and induction that the teachers experience, at least from the principals' point of view.

One clear conclusion is that the principals viewed teachers as well or adequately prepared on almost all the composites, no matter which pathway was followed. The CSU Education Deans set the original benchmark or goal as 80% for each cluster (CTQ, 2006). In general this was met by the system. The only composites that received less than 80% were preparation for diversity and preparation for inclusion of special learners, and then only for the ST group. Prompted by low scores across the system, the CSU Education Deans targeted these two areas for special attention and starting in 2008 annually report improvement efforts to the Chancellor's Office.

Across the system, CST produced teachers who felt better prepared than did the other pathways. CalStateTEACH candidates were in a cohort each year, grouped with a CST faculty by geographic area. Although geographically dispersed, candidates had opportunities to meet together in person or virtually with their assigned faculty member and others in their group. In addition, faculty conducted onsite observations of their teaching. Most candidates maintained the same faculty member for all four terms, and such consistency may be related to the high CST means.

California's teacher preparation is abbreviated compared to other states, not permitting a major in education and thus more gradual induction into the profession. Credential programs must be designed to be completed in a year. The CST candidates were part of a single school for four terms, one term longer than the other pathways. They also generally attended workshops prior to the start of the school year and all teacher meetings while at the building. Intern candidates were in a single school, but it is not known if they had the other consistent support as is provided to the CST candidates.

The success of CST from the teachers' view is consistent with reviews that indicate that certain online learning conditions result in more effective learning than traditional instruction (Dede et al., 2009; Tallent-Runnels et al., 2006). The coursework integrates coursework and fieldwork as do other exemplary programs (Darling-Hammond et al., 2005). The online program is flexible to the candidate's personal life while enrolled. Instead of having disparate instructors, the online program employs specifically trained faculty who are continually updated and who have input on curriculum development.

CONCLUSIONS AND FUTURE ACTIONS

The CST graduates are prepared differently than the other groups. CalStateTEACH uses a spiral curriculum with one course per term for four terms, and a faculty member who attends to them in a closer collaboration than traditional students. Candidates experience close collaboration with their liaison and do not take courses on a university campus. The strong results may have been caused by a combination of online instruction, the spiral curriculum, the sense of camaraderie engendered by being in a cohort, having peers for support when needed, and having an extra mentor. The higher rated path had a tight connection of coursework to field experience.

The study did not consider the potential impact of individual differences among program graduates. Candidates who select CST might be more independent, self-directed learners with a stronger connection to the community in which they complete their field experiences—characteristics that might contribute to differences in ratings. Each CST applicant undergoes a rigorous interview process that emphasizes the need to be a self-directed learner. Although they receive substantial support from their faculty member, the major responsibility for academic work is on the candidates' shoulders. In addition, most CST candidates have a connection to the community in which they complete their field experiences, and that connection might contribute to their commitment to succeed. Further research on the influence of these and other individual characteristics would further deepen the insights provided by this study.

This study partially answers the question asked by Darling-Hammond (2000) and Howey and Zimpher (1989) about whether different types or forms of programs prepare teachers with varying skills. This research supports a spiral curriculum and embedding candidates in a single school. With these factors all parties, professors, teachers, and candidates, not to mention the K-12 learners, benefit. The lack of significance or any difference from the supervisors view is interesting but not particularly informative. The lack of significant differences among the pathways as indicated by supervisor ratings as opposed to those of graduates might be due to the commonalities among pathways, which are within a single university system and which respond to a common set of standards. Differences in the pathways might be less evident to a supervisor than to a graduate of

the program. Further research on supervisor ratings that includes ratings of programs outside the CSU system as well as those within would shed additional light.

Future research might also focus on the differential perceptions held by the supervisors and graduates to determine whose view of the preparation is more supportable. In addition, research that drills down to features of specific programs and their relationship to preparing candidates for the complexities of teaching and the diverse contexts in which they teach would contribute to the research agenda on effective teacher preparation.

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