Perceptions of Preparation:
Using Survey Data To Assess Teacher Education Outcomes

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As part of its ongoing process of formative evaluation, the Stanford Teacher Education Program (STEP) recently conducted a survey of four cohorts of recent graduates. The data from this survey are being used in concert with findings from other lines of inquiry to assess and improve the program. The discussion in this paper is centered on several research questions.

1. In what areas do graduates feel more and less well-prepared? Have these changed over time?

2. Do perceptions of preparedness co-vary with the types of schools in which graduates have taught?

3. What types of practices do graduates engage in? Are teaching practices related to sense of preparedness?

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4. How efficacious do graduates feel? Are feelings of efficacy related to sense of preparedness?

Use of Surveys for Evaluating Teacher Education Programs

Surveys of teacher education graduates are a frequently used method for examining the outcomes of teacher education programs (e.g., Connor & Killmer, 2000; Housego & Badali, 1996; Wingfield, Freeman & Ramsey, 2000). Surveys of beginning teachers in Missouri (Zelazek, Williams, McAdams & Palmer, 1998) and Kentucky (Kentucky Institute for Education Research, 1997) have examined how well prepared beginners feel, what practices they engage in, and what their plans are for remaining in teaching. National surveys, like the RATE studies conducted by AACTE, have been used to assess the quality of programs and perceived adequacy of preparation across programs and regions of the country (Howey, 1988). These surveys have been useful in tracking changes in perceptions of preparedness and in reported practices over time.

There are both benefits and tradeoffs in using survey research to evaluate teacher education programs (Zeichner, 1999). The advantages of using surveys include the ability to reach large numbers of graduates, the efficiency of data collection, the availability of another source of data for examining the frequency or incidence of trends noted in other kinds of studies (e.g., Harding, McLain & Anderson, 1999), and the ability to compare programs to one another or to a national sample (Darling-Hammond, 2000; Howey, 1988; Imbimbo & Silvernail, 1999). Disadvantages of survey research include possible inaccuracies in self-reporting, issues with the validity of survey questions, and the small sample sizes and poor response rates that sometimes characterize studies of individual programs (Connor & Killmer, 2000).

This study claims much of its lineage from a study by the National Center for Restructuring Education, Schools, and Teaching (NCREST) of seven teacher education programs that are considered exemplary (Darling-Hammond, 2000). The researchers used surveys of graduates and their principals, observations of programs in operation and graduates in classrooms, and interviews of providers, participants, and consumers of teacher education to evaluate these programs. They also conducted a national survey of beginning teachers as a basis for comparison. The surveys played an important role in comparing attitudes, beliefs, and practices of graduates across programs. A later survey of New York City teachers borrowed from the NCREST study to evaluate and compare the attitudes, beliefs, and practices of new teachers who came from a variety of teacher education programs and pathways.

(Imbimbo & Silvernail, 1999; Darling-Hammond, Chung & Frelow, in press). In this study, we borrow many items from these earlier surveys, and we compare our results to the national comparison sample of beginning teachers used in the NCREST study.[1] The multi-method approach used in the NCREST study also informs the broader collection of studies represented in this volume.

Methods

The survey includes 83 questions regarding teachers' views about their preparation, beliefs, practices, and careers. Sixty-five questions were derived from the NCREST instrument noted above. Two additional questions about teacher's plans to stay in teaching were adapted from the Teacher Follow-up to the federal Schools and Staffing Survey (SASS). Other questions asked graduates about their career paths since graduation, including the types of schools in which they have taught, leadership roles in their school, satisfaction with teaching, and future plans. The survey also asked for graduates' reflections on the STEP experience.

The survey was administered to graduates of the classes of 1997, 1998, 1999, and 2000 during Spring and Summer of 2001.[2] All graduates for whom there was either mailing or email address information were contacted, for a total population of 224. A follow-up was emailed to the same list in June. Non-respondents were mailed a second paper survey later in the month. Finally, follow-up calls were made to graduates for whom we had phone contact information who had not responded as of August 2001. As of December, a total of 153 usable surveys were returned. The adjusted response rate was 69.2 percent.[3]

After administering the survey, we began the analysis with a range of descriptive statistics including item means, frequencies, and proportions. Items allowing multiple responses were analyzed using a multiple set method that reports frequencies as a percent of number of cases. T-tests were used to compare item means with graduates' ratings from a national study using the same survey items. Factor analysis methods were used to detect item response patterns. Logit regression was used to analyze potential relationships between school type and feelings of preparedness. Analysis of variance (ANOVA) was employed to detect significant differences in variation across the four graduate cohorts. We used Spearman's rank order correlations to examine relationships between graduates' feelings of preparedness and their sense of efficacy and current teaching practice. Detailed explanations of these analyses are presented below.

Findings

Graduates' Career Paths

Program demographics changed substantially across the four cohort years: Minority enrollment declined from 32 percent to 13 percent between 1996 and 1998 as a function of state testing policies and scholarship availability (Fetterman et al., 1999), then climbed to 40 percent in 2000 and reached 48 percent in 2001 in response to aggressive recruitment, expanded scholarships, and a focus on teaching for social justice. Respondent demographics reflect an average of these cohort characteristics over the four years, except that African American students are underrepresented in the sample. Eighty percent of respondents identified themselves as female, 74 percent as white, 12 percent Asian, 12 percent Hispanic, and l percent as black. Most (80 percent) are between the ages of 25 and 35. The responses to the survey provided a sample that is reasonably well distributed across the four target cohorts, with 32, 37, 48, and 36 respondents from the four classes, respectively.

Eighty percent of the respondents reported they are currently teaching, and 89 percent reported they are working in the field of education. Most respondents (87 percent) are involved in school leadership. Of 133 respondents to a question about leadership roles, 78 percent reported involvement in curriculum development,[4] 65 percent reported participation in reform or improvement committees, and 17 percent indicated they had taken on a department chair or other leadership position.

Perceptions of Preparedness

The first section of the survey asked respondents to indicate how well STEP prepared them to engage in 36 domains of teaching and how well prepared they felt overall. To identify areas of program strengths we looked at the proportion of respondents who indicated that the program prepared them sufficiently, as indicated by a response of "adequately," "well," or "very well" to each item. At least 90 percent of STEP graduates felt adequately or better prepared on 27 of 36 dimensions of teaching, including instructional strategies, developing curriculum, using a variety of assessments, and responding to students' needs (see Appendix A). These data also indicate that graduates had a favorable overall assessment of how well STEP prepared them for teaching: Most graduates felt "well" or "very well" prepared for teaching (mean = 4.06, SD=.83). We compared these data to findings from a 1997 survey of a national comparison group of beginning teachers with 1 to 3 years of teaching experience (Silvernail, 1997). STEP graduates report feeling significantly better prepared overall than teachers from the national comparison group (mean = 3.77[5], SD=.90, p<.001). [6]

Areas of Strength. STEP graduates felt significantly better prepared than the national sample of beginning teachers on nine specific dimensions of teaching:

(1) Teach the concepts, knowledge, and skills of your discipline(s) in ways that enable students to learn (x=4.09, SD= .80, p <.01);

(2) Use instructional strategies that promote active student learning (x= 4.30, SD=.68, p<.05);

(3) Use knowledge of learning, subject matter, curriculum, and student development to plan instruction (x=4.10, SD=.79, p<.01);

(4) Use a variety of assessments (e.g. observation, portfolios, tests, performance tasks, anecdotal records) to determine student strengths, needs and programs (x=4.09, SD=.80, p<.01);

(5) Choose teaching strategies for different instructional purposes and to meet different student needs (x=3.97, SD=.73, p<01);

(6) Evaluate the effects of your actions and modify plans accordingly (x=3.95, SD=.89, p<.05);

(7) Encourage students to see, question, and interpret ideas from diverse perspectives (x=3.78, SD=.86, p<.0 1);

(8) Teach in ways that support new English language learners (x=3.71, SD=1.05, p<.001);

(9) Help students learn how to assess their own learning (x=3.40, SD=.82, p<.01).

In addition to these areas, STEP teachers felt especially well-prepared to "engage students in cooperative work as well as independent learning" and "develop curriculum that builds on students' experiences, interests and abilities." Although these ratings were very high (above 4.0), they were not significantly different from the national sample.

The areas in which graduates felt best prepared primarily fall into two broad categories: (1) curriculum knowledge and pedagogical skills for planning and managing instruction in the content area in ways that engage students in active and cooperative learning, independent thinking, and self-assessment, and (2) supporting the learning of a wide range of students. The areas in which STEP graduates felt best prepared are a focus of curriculum and instruction courses and fieldwork components of STEP, both of which were repeatedly cited as helpful in the open-ended response portion of the surveys.

Areas for Improvement. Although more than 70 percent of STEP graduates felt adequately prepared in each area addressed by the survey, we wanted to examine areas where program improvements may be warranted. There were six areas in which 80 percent or fewer of the respondents felt adequately prepared (Table 1).

Two of these items—"identifying and addressing special learning needs" and "working with parents and families"—were areas specifically targeted by the STEP redesign beginning in 1998-99, and both showed marked improvement in graduates' sense of preparedness with the curriculum adjustments that occurred in that year. Starting in 1998-99 a multi-week module on learning disabilities and special education needs and a set of activities to support work with parents and families were added to the Practicum course. In each area, the proportion of STEP graduates feeling adequately prepared increased from around 70 percent to more than 80 percent between the 1998 and 1999 cohorts.

Use of technology has become a more explicit focus of STEP since 1999-2000 when the program began integrating California's new technology training standards and secured a federal grant for "preparing teachers for tomorrow's technology." The program added technology workshops, infused technology uses into Curriculum and Instruction courses, launched the development of digital portfolios, and focused on the use of technology at clinical placements. Graduates from the class of 2000 were the first beneficiaries of these changes, and they felt much better prepared in terms of technology (89 percent felt adequately prepared) than their peers in the class of 1999 (only 67 percent felt adequately prepared).[7] Evidence from other studies suggests that gradu-

Table 1
Proportion of STEP Graduates Feeling
Adequately Prepared in Selected Areas

	1997	1998	1999	2000	Overall
Identify and address special learning needs and/or difficulties.	75%	73%	85%	83%	80%
Work with parents and families to better understand students and to support their learning.	72%	67%	88%	83%	78%
Use technology in the classroom.	81%	69%	67%	89%	76%
Create interdisciplinary curriculum.	75%	78%	75%	61%	73%
Resolve interpersonal conflict.	84%	69%	79%	69%	76%
Assume leadership responsibilities in your school.	84%	78%	77%	69%	77%

ates of teacher education programs generally feel less prepared in the area of technology than other areas (Darling-Hammond, et al., in press). Prior to 2000, STEP graduates felt about as well prepared as other beginning teachers. In 2000, STEP graduates felt better prepared to use technology (mean=3.41, SD=.95) than the national sample (mean=3.19, SD=1.66), although the difference was not statistically significant.

Two other areas in which STEP graduates felt relatively less well prepared were "creating interdisciplinary curriculum" and "resolving interpersonal conflict." With respect to creating interdisciplinary curriculum, STEP graduates felt significantly less prepared than the national sample, which included elementary as well as secondary teachers. STEP's secondary teacher education program is heavily focused on subject matter pedagogy within the disciplines, with a 3-quarter course series one of its strongest features. However, this allows little time within the course of a 12-month program to explore interdisciplinary applications. As secondary teachers in a state where student learning standards and school organization favor disciplinary instruction over interdisciplinary learning, there are few incentives to pursue this kind of work. Nonetheless, prior to 2000, more than 70 percent of STEP graduates felt adequately prepared to create interdisciplinary curriculum. We suspect that the sharp drop in 2000 (to 57 percent) occurred when a course that once encouraged the creation of interdisciplinary curriculum projects was redesigned to fit more tightly with the discipline-based Curriculum & Instruction courses. This issue is on the agenda for future deliberation, particularly as new small schools being created in the Bay Area—one of which is a professional development school partner with Stanford—provide settings for work on interdisciplinary curriculum strategies. Also on the agenda is the development of a module on conflict resolution strategies for candidates as well as veteran teachers in partner schools. This may address the area of "resolving interpersonal conflict" which has been underdeveloped in the curriculum in the past.

Finally, graduates felt less prepared to assume leadership positions in the school than they did to teach effectively in the classroom. (There was no significant difference with the national sample of beginning teachers.) Interestingly, while 69 percent of immediate graduates felt adequately prepared for leadership roles, about 84 percent of those who were 4th year teachers at the time of the survey and 77 to 78 percent of second and third year teachers felt adequately prepared. In this case, conversations with graduates and data about career paths lead us to believe that feelings of adequacy increase after the first year of teaching, when teachers are focused primarily on managing the intense realities of adjusting their new profession. After the first year, most STEP

graduates have begun to feel comfortable assuming leadership roles in areas of curriculum and school reform and feel well-prepared to do so.

Differences in Preparedness Among Cohorts. Beginning in 1998-99, the STEP program began several reforms aimed at creating a more coherent curriculum, linking theory and practice more purposefully, and enhancing preparation for teaching diverse learners. In addition, beginning in 1999-2000, reforms focused on integrating the use of technology into the curriculum and on training student teachers how to use technology in their classrooms. In analyzing the survey data, we looked for patterns in graduate perceptions that may be associated with these reforms. We note above some specific changes that seem to have resulted in differences in candidates' feelings of preparedness in recent years. Beyond these, however, an analysis of variance showed no significant overall differences in feelings of preparedness across years. Since implementation of major changes generally takes 3 to 5 years to be well-instantiated, we will continue to look at trends over the coming years.

Differences in Perceptions by Teaching Location. We were also interested in exploring whether teachers' feelings of preparedness were associated with their work in different types of schools. We wondered whether those teaching in schools serving more and less advantaged students and families might feel differently about the adequacy of their preparation, given the greater challenges associated with teaching in schools with fewer resources and greater needs. We conducted a Logit regression analysis using overall preparedness as the dependent variable and the types of schools teachers reported having taught in (by urbanicity, proportions of minority students, private/public, and income level) as independent dummy variables. This analysis showed no significant differences in feelings of preparedness associated with the types of school in which graduates have taught. A recent analysis of beginning teacher data in New York City produced similar findings (Darling-Hammond et al., in press). This could mean that teachers' feelings of preparedness have more to do with the program they experienced than the nature of the school in which they teach. It could also mean that these survey instruments do not capture the variables that would reveal the most significant differences in either the teachers' feelings of preparedness or in their teaching settings.

Patterns of Preparedness. In order to identify patterns in graduates' feelings of preparedness, we used exploratory factor analysis techniques to examine the factor structures in items 1-36 of section A of the survey.

Listwise deletion of missing data was used. The first rotation was set to yield a five component model and a second rotation was set to yield a six component model. The five component model had Eigen values from 14.33 to 1.35, explaining 56.87 percent of the variation in the 36 items. The six component model had Eigen values from 14.33 to 1.29 and explained 60.46 percent of the variation in the items. We compared the reliability of the two models at three different loading value cut points (.5, .45, and .40) and qualitatively examined the structures of the models. While each model had fairly high alpha scores (ranging from .709 to .922), we found the five-factor model with a cut point of .45 produced the most internally consistent results.[8] The five factors are as follows:

> 1: *Designing curriculum and instruction* to promote learning—applying pedagogical and content knowledge to curriculum development and instructional practice;

> 2: *Supporting diverse learners*—adapting teaching to the needs of different students;

> 3: *Using assessment* to guide learning and teaching—supporting students in assessing their own learning and using assessment of students, information from parents, and reflection on one's own practice to inform curricular, pedagogical and content choices;

> 4: *Creating a productive classroom environment*—creating a positive, productive environment, setting high expectations for students, motivating students, and effectively managing classroom activities;

> 5: *Developing professionally*—working with others to plan and solve problems, resolve conflict, and take leadership. (Use of technology also loads on this factor.)

The analysis of preparedness shows that STEP's areas of strength map most directly onto Factor 1, Designing Curriculum and Instruction, and Factor 2, Supporting Diverse Learners. The areas in which graduates felt less prepared correspond to Factor 5, Developing Professionally, which deals with resolving interpersonal conflict, asserting leadership, and using technology. However, even in factor 5, all item means were above 3, indicating that graduates felt at least "adequately" prepared in each of the areas. These factor structures are similar to those that emerged in Silvernail's (1997) analysis of the similar survey data set mentioned earlier.[9]

The factors also correspond to the individual standards of the California Standards for the Teaching Profession (CSTP), which have

been adopted as a major focus of the STEP curriculum and assessment system (Table 2). For example, the first three items in factor 3 ("help students learn how to assess their own learning," "give productive feedback to students to guide their learning," and "use a variety of assessments to determine student strengths, needs and programs") match standards 5.3, 5.1/5.5, and 5.2 from the CSTP. The most important exception is that our factor 5, Developing Professionally, deals less with ongoing learning as an individual teacher and more with relationships with colleagues beyond the classroom.

The overlap between the factor model and the standards provides insight into the degree to which STEP is meeting the various standards and allows us to make connections between the survey data and broader program goals. Lotan and Marcus (this issue) have reported how STEP student evaluations gauge progress in proficiency over the course of the year on each of the CSTP standards. By the end of the year, STEP students in the class of 2000 were rated proficient or higher on all six standards, but were rated highest in subject matter knowledge, making pedagogical decisions, and classroom management (standards 3, 4, and 2; factors 1 and 4). These were also factors on which STEP students rated their preparedness most highly.

Current Teaching Practices and Preparedness

Graduates who are currently teaching were asked to report on their teaching practice. Analysis of these data show that over 90 percent of teachers report they adjust their teaching based on student progress and to address different learning styles, share ideas about instructional approaches with other teachers, and have their students work in cooperative groups.[10] A somewhat smaller proportion, but still a large majority (79 percent or more), indicated that their students complete portfolios or projects as well as take tests or quizzes, are involved in self-assessment, are encouraged to revise their work for re-evaluation, and serve as tutors for other students. Fewer teachers (about two-thirds) report that their parents are involved as partners; that students participate in setting goals for their learning; or that they use research in making decisions. Very few graduates (37 percent) said they group students of similar ability together for much of their instruction. This likely relates STEP's emphasis on heterogeneous teaching.

Teachers' overall sense of preparedness is significantly correlated with certain teaching practices. Teachers who felt most prepared were most likely to adjust teaching based on student progress and learning styles, to use research in making decisions, and to have students set some of their own learning goals and to assess their own work. These beliefs

Table 2
Factors with Item Loading Values,
Means, and Standard Deviations

	Loading Value	Item Mean(SD)
Factor 1: Design Curriculum and Instruction to Promote Learning (CSTP Standards 3,4)		
A5: Develop curriculum that builds on students' experiences, interests and abilities.	0.720	4.02 (0.79)
A7: Create interdisciplinary curriculum.	0.694	3.24 (1.13)
A1: Teach the concepts, knowledge, and skills of your discipline(s) in ways that enable students to learn.	0.641	4.09 (0.80)
A25: Use knowledge of learning, subject matter, curriculum, and student development to plan instruction.	0.582	4.10 (0.79)
A9: Relate classroom learning to the real world.	0.581	3.72 (0.94)
A14: Provide a rationale for teaching decisions to students/parents/colleagues.	.500	3.93 (0.96)
A6: Evaluate curriculum materials for their usefulness and appropriateness for your students.	0.484	3.76 (0.95)
A18: Develop students' questioning and discussion skills.	0.457	3.68 (0.91)
A8: Use instructional strategies that promote active student learning.	0.455	4.30 (0.68)
Factor 2: Support Diverse Learners (CSTP Standard 1)		
A26: Understand how factors in the students' environment outside of school may influence their life and learning.	0.707	3.91 (0.90)
A21: Teach students from a multicultural vantage point.	0.690	3.72 (.090)
A24: Encourage students to see, question, and interpret ideas from diverse perspectives.	0.630	3.78 (0.86)
A10: Understand how students' social, emotional, physical, and cognitive development influences learning.	0.552	3.95 (0.83)
A19: Engage students in cooperative work as well as independent learning.	0.507	4.27 (0.75)
A2: Understand how different students are learning.	0.472	3.97 (0.84)
Factor 3: Use Assessment to Guide Learning and Teaching (CSTP Standard 5)		
A29: Give productive feedback to students to guide their learning.	0.669	3.68 (0.87)
A30: Help students learn how to assess their own learning.	0.643	3.41 (0.82)
A27: Work with parents and families to better understand students and to support their learning.	0.582	3.14 (0.86)
A28: Use a variety of assessments (e.g. observation, portfolios, tests, performance tasks, anecdotal records) to determine student strengths, needs and programs.	0.488	4.09 (0.80)
Factor 4: Create a Productive Classroom Environment (CSTP Standard 2)		
A34: Maintain discipline and an orderly, purposeful learning environment.	0.739	3.63 (0.93)
A4: Help all students achieve high academic standards.	0.671	3.62 (0.83)
A3: Set challenging and appropriate expectations of learning and performance for students.	0.603	3.85 (0.88)
A15: Help students become self-motivated and self-directed.	0.482	3.43 (0.92)
A12: Teach in Ways that support new English language learners.	0.468	3.71 (1.05)
A20: Use effective verbal and nonverbal communication strategies to guide student learning and behavior.	0.458	3.87 (0.89)
Factor 5: Develop Professionally (CSTP Standard 6)		
A36: Assume leadership responsibilities in your school.	0.700	3.32 (1.12)
A35: Plan and solve problems with colleagues.	0.572	3.42 (1.06)
A16: Use technology in the classroom.	0.566	3.21 (1.00)
A33: Resolve interpersonal conflict.	0.528	3.14 (1.07)

Table 3
Teaching Practice—Proportions using Certain Practices*
Means and Correlations (Spearman's rho)
with Overall Sense of Preparedness

Question	N	Proportion responding 3,4, or 5[#]	Mean	Mean Standard Deviation	Spearman's Correlation w/ overall preparedness
I adjust my teaching to address different teaching (learning) styles.	123	100%	4.11	0.70	.405***
I adjust my teaching based on student progress.	126	98%	4.12	0.71	.290**
Students work in cooperative groups.	120	96%	3.83	0.73	.120
I share ideas about instructional approaches with other teachers.	126	94%	4.02	0.91	.183*
Students take written tests and quizzes.	126	90%	3.56	0.86	.174
Students complete portfolios or projects to show their learning.	126	86%	3.60	1.01	.125
Students participate in assessing their own work.	125	84%	3.22	0.84	.265**
Students may revise their work for re-evaluation.	124	81%	3.56	1.14	.080
Some of my students are tutors for other students.	126	79%	3.21	0.97	.126
I use research in making classroom decisions.	124	66%	2.95	1.01	.331**
Parents are involved as partners in educating their children.	125	66%	2.94	0.99	.098
Students are punished for misbehavior.	123	66%	2.93	0.95	.023
Students participate in setting goals for their learning.	126	63%	2.89	0.92	.345**
Students of similar ability are grouped together for much of their instruction.	126	38%	2.31	0.82	.191*

[#]Proportion reporting "sometimes," "often," or "nearly always"
Significance levels (*p<.05, **p<.01, ***p< .001).

and practices are consistent with STEP's philosophy of focusing on the student as learner and in building communities of practice.

Graduates' Feelings of Efficaciousness

The data show that STEP graduates feel efficacious with respect to making a difference in their students' lives (99 percent), handling discipline problems in the classroom (98 percent), having the ability to get through to most of their students (91 percent) and to teach all students to high levels (89 percent) (see Appendix A). The degree to which STEP graduates feel efficacious may relate to STEP's emphasis on applying theory to practice, understanding how to reach students, and on classroom management skills tied to teaching strategies. STEP has both a year-long clinical placement and summer clinical work during which STEP students work with adolescents.

Despite high mean scores and frequencies on these items, respondents in the national sample had even higher ratings on two of these items. The national sample included elementary teachers as well as secondary teachers, who generally tend to feel more efficacious on these measures than secondary teachers (see e.g., Darling-Hammond et al., in press). In addition, the data indicate a level of uncertainty in teaching *some* students. STEP students have a heightened sensitivity to the importance of reaching all students, and 75 percent indicated they feel "uncertain how to teach some students." Our study of clinical practice ratings found somewhat lower ratings, although still above the proficient level, in STEP students' abilities to "meet the needs of all students" as compared to their performance on less challenging standards (Lotan & Marcus, this issue).

The data from this section also provide insight into how STEP graduates make attributions for students' achievement. In general, they indicated far lower levels of agreement with statements that suggest they abdicate responsibility for their students' learning. For example, very few (29 percent) believed that home environments have more influence on student learning than teachers do; about half (53 percent) agreed with the statement that student's peers at least sometimes "have more influence on their motivation and performance than I do." On these items, and on an item suggesting that "students fail because they do not apply themselves," STEP graduates were much less likely than the national sample to blame the students, their homes, or their peers for lack of success and were more likely to assume teacher responsibility.

Like other research (Darling-Hammond et al., in press), our analyses point to a link between graduates' feelings of preparedness and their sense of efficacy. First, graduates attribute to STEP, more so than other

experiences, their beliefs about teaching. Eighty-seven percent report many of their ideas about teaching came from STEP, whereas 70 percent said many of their ideas about teaching came from their own experiences as K-12 students. Second, respondents who felt better prepared are also more likely to feel efficacious in teaching, to feel they can handle most classroom problems, get through to students, teach all students to high levels, and make a difference in their lives. Those who felt better prepared were less likely to attribute student performance to factors beyond their control. In addition, there was a strong and highly significant relationship (R = .57) between sense of preparedness and perceptions that many of respondents' teaching ideas come from STEP.

Conclusion

This analysis provided several insights into the use of using a survey instrument for assessing teacher education and graduates' perceptions of STEP, their beliefs, and current teaching practices. The instrument we used allowed us to gather responses from a large sample of graduates, compare our data with a national sample, and interpret other evaluation data.

Table 4
Spearman's Rho Correlations:
Efficacy Items with Overall Preparedness

	Spearman's Rho
If I try hard, I can get through to almost all students.	.219**
I am confident of my ability to handle most discipline problems that may arise in my classroom.	.259**
Students fail because they do not apply themselves.	-.173*
My students' peers have more influences on their motivation and performance than I do.	-.073
I am confident of my ability to teach all students at high levels.	.197*
I am confident I am making a difference in the lives of my students.	.287**
A lot of my ideas about teaching and learning come from what I learned in my teacher preparation program.	.567**
A lot of my ideas about teaching come from my own experiences as a K-12 student.	-.086
I am uncertain how to teach some of my students.	-.089
Most of a student's performance depends on the home environment, so teachers have little influence.	-.096

　　*p<.05, **p<.01 (2-tailed test).

The data indicate that graduates generally feel well prepared by the program, and feel particularly well-prepared in applying pedagogical and content knowledge to practice and teaching a range of students. They rated their preparedness more highly than a national sample of beginning teachers in many of these areas, perhaps, notably in teaching English language learners and, following recent reforms, in the area of using technology—two areas that have been weaknesses for teacher education nationally. Recent reforms also improved graduates' feelings of preparedness to teach special needs learners and to work with parents and families. One area in need of continued improvement includes preparation for resolving interpersonal conflicts. While STEP graduates also felt less well-prepared to create interdisciplinary curriculum than in other areas, the response to this finding is a bit more complex, as we need to evaluate the centrality of this goal to the mission of this secondary education program and its relative value as against other important uses of scarce program time.

We also found that graduates' teaching practices are generally consistent with those encouraged in STEP and that graduates appear to feel efficacious in many aspects of their teaching practice. Both practices and feelings of efficacy tend to correlate with the degree to which graduates felt well-prepared by the program and the degree to which they felt they got many of their teaching ideas from the program. The better prepared candidates felt, the more professionally responsible and student-centered their beliefs and practices tended to be. These findings inspire even greater effort on the part of those who are striving for continual improvement in the quality of the preparation the program provides.

Notes

[1] The national sample was about equally divided between elementary and secondary teachers; the exemplary program sample was very heavily comprised of elementary teachers. For this reason, we compare STEP's secondary program to the national sample.

[2] Graduates of the class of 2001 were not surveyed because they had not yet started teaching at the time of the survey.

[3] Three respondents submitted duplicate surveys and another respondent not part of our survey population returned a survey. These surveys were not included in the analysis. One graduate was deceased; eight surveys were returned as undeliverable, but seven of these were contacted by email. The adjusted response rate is calculated as 153 out of 221 or 69.2%.

[4] This question asked respondents to "mark all that apply," so percentages total more than 100. The denominator is the number of cases, n=133.

[5] Silvernail's scoring scale of 0 to 4 was adjusted to match the scoring used for the STEP data (1 to 5).

[6] T-tests for the difference between means of two samples (with unequal sample sizes) were used to determine significance levels.

[7] Interestingly, graduates from 1997 (81 percent) felt better prepared than those in the subsequent two years. A technology course taught in 1996-97 but later changed had apparently supported graduates' skills.

[8] Following the methods used by Silvernail (1998), we applied a decision rule whereby those items that loaded onto multiple factors were dropped when the difference between them was less than .15. This was the case for two variables. Item A3 loaded onto both factor 1 and factor 4; it was dropped from factor 1. Item A28 loaded onto both factor 1 and factor 3, it was also dropped from factor 1. The alpha coefficients for each of the five factors ranges from .709 to .899, indicating a high level of reliability for the chosen factor structure.

[9] Silvernail created six factors from essentially the same items as appeared on the STEP survey. His factors were as follows: (1) promote student learning; (2) understand learners; (3) teach critical thinking skills; (4) develop curriculum; (5) assess student learning; (6) develop professionalism.

[10] As indicated by a response of "sometimes" "often or "nearly always."

[11] Where 3, 4, 5 is represents agreement with the item. See survey.

[12] Significance level for t-test comparing the STEP items means for STEP to the national sample means (*p<.05, **, p<.01, ***p< .001).

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Appendix A

Sections A:
STEP & NCREST National Sample Item Descriptives

Survey Item	STEP N	STEP % 3,4,5[11]	STEP Mean (SD)[12]	Comparison Mean (SD)
Teach the concepts, knowledge, and skills of your discipline(s) in ways that enable students to learn.	153	97%	4.09 (0.80)**	3.86 (0.91)
Understand how different students are learning.	153	96%	3.97 (0.84)	3.81 (0.93)
Set challenging and appropriate expectations of learning and performance for students.	151	93%	3.85 (0.88)	3.81 (0.90)
Help all students achieve high academic standards.	153	92%	3.62 (0.83)	3.62 (0.91)
Develop curriculum that builds on students' experiences, interests and abilities.	153	98%	4.02 (0.79)	3.92 (0.97)
Evaluate curriculum materials for their usefulness and appropriateness for your students.	153	92%	3.76 (0.95)	3.61 (1.05)
Create interdisciplinary curriculum.	153	73%	3.24 (1.13)***	3.63 (1.08)
Use instructional strategies that promote active student learning.	153	99%	4.30 (0.68)*	4.14 (0.86)

Survey Item	STEP N	STEP % 3,4,5[11]	STEP Mean (SD)[12]	Comparison Mean (SD)
Relate classroom learning to the real world.	152	91%	3.72 (0.94)	3.88 (1.04)
Understand how students' social, emotional, physical, and cognitive development influences learning.	153	96%	3.95 (0.83)	3.97 (0.91)
Identify and address special learning needs and/or difficulties.	153	80%	3.25 (0.94)***	3.62 (1.09)
Teach in ways that support new English language learners.	153	90%	3.71 (1.05)***	2.59 (1.23)
Choose teaching strategies for different instructional purposes and to meet different student needs.	152	99%	3.97 (0.73)**	3.74 (0.90)
Provide a rationale for your teaching decisions to students, parents, and colleagues.	151	91%	3.93 (0.96)	
Help students become self-motivated and self-directed.	151	85%	3.43 (0.92)	3.59 (0.96)
Use technology in the classroom.	151	75%	3.21 (1.0)	3.19 (1.66)
Develop a classroom environment that promotes social development and group responsibility.	151	94%	3.90 (0.85)	3.86 (0.95)
Develop students' questioning and discussion skills.	152	91%	3.68 (0.91)	3.78 (0.94)
Engage students in cooperative work as well as independent learning.	150	99%	4.27 (0.75)	4.17 (0.87)
Use effective verbal and nonverbal communication strategies to guide student learning and behavior.	150	96%	3.87 (0.89)	3.99 (0.89)
Teach students from a multicultural vantage point.	151	91%	3.72 (0.90)	3.65 (1.10)
Use questions to stimulate different kinds of student learning.	150	90%	3.80 (0.96)	3.91 (0.89)
Help students learn to think critically and solve problems.	152	97%	3.88 (0.78)	3.74 (0.91)
Encourage students to see, question, and interpret ideas from diverse perspectives.	151	95%	3.78 (0.86)**	3.56 (0.91)
Use knowledge of learning, subject matter, curriculum, and student development to plan instruction.	151	97%	4.10 (0.79)**	3.87 (0.94)

Survey Item	STEP N	STEP % 3,4,5[11]	STEP Mean (SD)[12]	Comparison Mean (SD)
Understand how factors in the students' environment outside of school may influence their life and learning.	152	93%	3.91 (0.90)	3.93 (0.98)
Work with parents and families to better understand students and to support their learning.	152	78%	3.14 (0.86)	3.32 (1.13)
Use a variety of assessments (e.g. observation, portfolios, tests, performance tasks, anecdotal records) to determine student strengths, needs and programs.	152	98%	4.09 (0.80)**	3.78 (1.05)
Give productive feedback to students to guide their learning.	152	91%	3.68 (0.87)	
Help students learn how to assess their own learning.	151	87%	3.41 (0.82)**	3.26 (1.00)
Evaluate the effects of your actions and modify plans accordingly.	150	94%	3.95 (0.89)*	3.76 (1.02)
Conduct inquiry or research to inform your decisions.	151	87%	3.61 (1.04)	
Resolve interpersonal conflict.	152	76%	3.14 (1.07)	3.29 (1.06)
Maintain discipline and an orderly, purposeful learning environment.	152	90%	3.63 (0.93)	
Plan and solve problems with colleagues.	149	82%	3.42 (1.06)	3.30 (1.14)
Assume leadership responsibilities in your school.	151	77%	3.32 (1.12)	3.40 (1.21)
Overall, how well do you feel your program prepared you for teaching?	151	95%	4.06 (0.83)***	3.77 (0.90)

How satisfied were you with your:%

		Satisfied		
Student teaching placement	151	88%	3.90 (1.17)	
Supervisory support	153	94%	4.21 (0.94)	
Coursework	153	89%	3.42 (0.86)	
Overall program design: Integration of courses, fieldwork, and supervision	151	95%	3.73 (0.77)	

Survey Item	STEP N	STEP % 3,4,5[11]	STEP Mean (SD)[12]	Comparison Mean (SD)
To what extent do you agree with the following statements:		**% Agreeing**		
If I try hard, I can get through to almost all students.	150	91%	3.91 (0.85)**	4.14 (0.77)
I am confident of my ability to handle most discipline problems that may arise in my classroom.	150	98%	4.17 (0.78)	4.29 (0.69)
Students fail because they do not apply themselves.	149	67%	2.98 (1.03)*	3.19 (1.17)
My students' peers have more influences on their motivation and performance than I do.	150	53%	2.75 (0.84)	2.82 (1.01)
I am confident of my ability to teach all students at high levels.	149	89%	3.83 (0.92)***	4.11 (0.75)
I am confident I am making a difference in the lives of my students.	149	99%	4.04 (0.79)***	4.43 (0.66)
A lot of my ideas about teaching and learning come from what I learned in my teacher preparation program.	149	87%	3.81 (1.00)**	3.51 (1.12)
A lot of my ideas about teaching come from my own experiences as a K-12 student.	150	70%	3.35 (1.14)*	3.58 (1.10)
I am uncertain how to teach some of my students.	150	75%	3.42 (0.99)***	3.04 (1.05)
Most of a student's performance depends on the home environment, so teachers have little influence.	149	29%	2.21 (0.74)	2.31 (0.93)