From Coherence in Theory to Coherence in Practice

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Historically, one of the central concerns that has plagued the field of teacher education is the observation that fragmentation *characterizes the experience of learning to teach. Too often, university-based teacher education programs consist of a set of disconnected individual courses; separate clinical work from coursework; and lack a vision of teaching and learning. Therefore, some teacher educators have argued that creating structurally and conceptually coherent programs will result in more powerful learning for prospective teachers. Yet, although empirical work on such programs is growing, there is little research on the nature of coherence and on how it might develop. To that end, this article documents one teacher education program's efforts to become more coherent, focusing on the ways in which the program tries to become more coherent and on the challenges of coherence. The article concludes with implications for teacher education program design and evaluation, with a focus on the power, complexity, and problems of coherence.*

INTRODUCTION

Across the country, university-based teacher education programs are restructuring and revising their work with preservice teachers (Carnegie Forum, 1986; Holmes Group, 1986; National Commission on Excellence in Teacher Education, 1985; Project 30 Alliance, 1991; Renaissance Group, 1996; Tom, 1997; Zeichner et al., 1998). The public demand for improved K–12 teaching, the rise of alternative teacher education programs, changing accreditation requirements, and the demographic shift in the public school student population have all motivated changes in how teacher education programs are preparing teachers (Darling-Hammond, Bransford, LePage, Hammerness, & Duffy, 2005; National Commission on Teaching & America's Future, 1996). At the same time, these reforms are also a response to concerns that many teacher education programs are not integrated or well organized conceptually. Scholars of teacher education have noted that historically, teacher education has consisted of a set of disconnected individual courses rather than a carefully constructed and integrated learning

experience informed by a cohesive vision of teaching and learning (Goodlad, Soder, & Sirotnik, 1990; Howey & Zimpher, 1989; Korthagen & Kessels, 1999; Lanier & Little, 1986; Tom, 1997).

To that end, some teacher educators argue that creating a coherent, integrated program will result in more powerful learning for their students. Tatto (1996) defined coherence "in terms of shared understandings among faculty and in the manner in which opportunities to learn have been arranged (organizationally, logistically) to achieve a common goal—that of educating professional teachers with the knowledge, skills and dispositions necessary to more effectively teach diverse students" (p. 176). Some teacher educators distinguish *structural* and *conceptual* aspects of coherence (Feinam-Nemser, 1990), although the lines between the two often blur. For instance, conceptual coherence might include entwining theory and practice purposefully and deliberately (Kessels, Koster, Lagerwerf, Wubbels, & Korthagen, 2001), developing a shared conception of teaching that undergirds and pervades the program (Tatto; Tom, 1997), and attending to the linkages or disconnects between program structure and program content (Feinam-Nemser). Structural aspects of coherence might include organizing and aligning courses and student teaching placements around a particular conception of teaching and learning in an effort to construct an integrated experience, or trying to create courses that build sequentially on one another and reinforce one another.

Studies of learning lend some support to arguments for coherence by suggesting that learning may be enhanced when learners encounter consistent ideas across learning experiences (Bransford, Brown, & Cocking, 2000; Bruner, 1960/1977, 1990). It is particularly important for learners to encounter consistent messages and theories that can help them make sense of the phenomena they experience and observe, rather than mixed messages and contradictory theories.[1] Repeated experiences with a set of conceptual ideas, along with continual opportunities to practice skills and modes of thinking and analysis, support deeper learning and the development of expertise (Ericsson, Krampe, & Tesch-Romer, 1993). Indeed, if learners can learn in an environment that makes clear how ideas are connected and related, it deepens their understanding and can make their learning experiences more meaningful. As Bruner (1960/1977) argued, "perhaps the most basic thing that can be said about human memory is that unless detail is placed into a structured pattern, it is rapidly forgotten" (p. 37).

Furthermore, recent research in teacher education suggests that programs that combine a conceptual approach with a more integrated strategy can have a greater impact on the initial conceptions and practices of prospective teachers (Darling-Hammond & Macdonald, 2000; Feinam-Nemser, 1990; Graber, 1996; Koppich, 1999; Merseth & Koppich, 1999; Miller &

Silvernail, 1999; Snyder, 2000; Tatto, 1996; Whitford, Ruscoe, & Fickel, 2000). For instance, Tatto found that several of the programs she studied as part of the Teacher Education and Learning to Teach (TELT) study seemed to have some "internal coherence" around constructivist practice, in which professional norms, philosophies, approaches to teaching, and connections to the classrooms were all focused on understanding and building on students' capacities. Graduates of those programs demonstrated beliefs that were consistent with a constructivist approach to teaching. However, there is little empirical research on the nature of coherence in practice (McDonald, 2005), nor has there been any research on how programs develop coherence. The current work on coherent programs either reports that programs "have it" or do not. As yet, no one has examined the process of becoming coherent or maintaining coherence. Furthermore, with several exceptions (Grossman et al., 2000), few studies have been conducted that directly examine the enacted classroom practices of teacher education graduates of programs that have been trying to espouse a coherent vision of practice.

To that end, to get a better understanding of what coherence looks like and how it develops, this article documents the efforts of one teacher education program—the Stanford Teacher Education Program (STEP)—to become more coherent over a 4-year period, 1999–2003. In this article, I look at both structural and conceptual coherence, exploring what the program has done to become more coherent, and examining evidence that indicates some of the ways in which the program was and was not coherent at the time. I include an examination of the teaching practices of program graduates in this analysis in order to look specifically at the degree to which students may have developed the key ideas that the coherence was supposed to promote. I also describe how the evidence from observing graduates' practices contributed to further efforts within the program to become more coherent. Finally, I consider the challenges that emerged from the work toward coherence, and the chances for success.

METHODS

To examine the conceptual coherence of the program and how it developed, I identified and documented the initial vision of the program. This included the review of program materials, the observation and documentation of key faculty meetings, and interviews with core faculty who had participated heavily in the initial reform of the program. Program documents reviewed included grant proposals for funding to support the redesign, materials prepared for the program's recent National Council for

the Accreditation of Teacher Education (NCATE) review, and all course syllabi. In addition, I observed and documented weekly "cabinet" meetings[2] of staff in which the program director, some faculty, and program staff discussed the ongoing reform efforts.

In light of this evidence, I conducted interviews with 4 faculty members, including the program director, two of the five faculty teaching the Curriculum and Instruction (C&I) or subject matter methods teaching sequences, and one of the three instructors of the Equity and Democracy course, a core or foundations course in the program. These interviews focused on their experience and understanding of STEP's reform process and on the courses that they taught. I also conducted interviews with 4 of the 18 supervisors and with 2 cooperating teachers about their experience and understanding of STEP's reform, and the clinical experiences that they provided for student teachers. These 10 interviews allowed me to examine the degree of consistency and shared understanding of the STEP vision across members of the program. Interviews with the 4 university-based faculty enabled me to look carefully at the degree of "internal" coherence of the program—in other words, how well the program was able to develop shared understandings about the vision of the program across individuals within the program. Interviews with the 6 school-based faculty (the supervisors and cooperating teachers) enabled me to look more closely at the "external" coherence of the program—in other words, the degree to which the program was able to develop some alignment of vision across individuals from different institutions. Finally, observations of the teaching of 10 graduates of the program enabled me to look for evidence that the ideas that the redesigned program was trying to promote could be seen in these teachers' practices. I supplemented my observations of graduates with interviews and also collected a variety of artifacts, including lesson and unit plans and samples of their students' work. The 10 participating teachers were selected to represent a range of graduates so that they varied by gender, cultural and ethnic background, subject matter, and school site.

To examine the structural coherence of the program—the alignment of key ideas and goals across coursework and clinical work—I documented the redesign of the coursework and clinical experiences and then examined them for alignment. Were students encountering some of the same key ideas in courses and in their clinical work? What efforts were being made to ensure that clinical work and coursework reinforced one another? Documenting the redesign (and development) of several of the foundations courses also enabled me to examine the ways in which the program faculty attempted to reorganize the program's whole curriculum, both within and across courses, to promote and build understanding of key concepts and ideas across the program over the academic year.

FINDINGS

INITIAL EFFORTS TO DEVELOP COHERENCE

The reform efforts of the STEP, which began in 1999, were specifically designed to bring more coherence to a program that traditionally had many strengths but also had a number of problems related to lack of structural and conceptual coherence. STEP's strong points included the involvement of senior faculty throughout the program; an emphasis on content pedagogy and on learning to teach reflectively; and a yearlong clinical experience running in parallel with coursework in the 1-year credential and master's degree program.[3] However, an evaluation of STEP conducted in 1997–1998 (Fetterman et al., 1999) found a number of problems that suggested a lack of structural and conceptual coherence (see Table 1).

Table 1. Concerns Identified by the Evaluation of STEP in 1998

- Faculty and staff did not appear to share a common view of the purpose or mission of STEP, resulting in "contradictory practices and mixed messages" (Fetterman et al., 1999, p. 9).
- Placements in schools were often not well matched to the teaching vision embodied in STEP courses because STEP faculty or supervisors had not been involved in selecting cooperating teacher (CT) placements based on direct firsthand knowledge of the teachers' practices.
- Large gaps existed in the curriculum.
  - For instance, at the start of the 1998–1999 school year, there was no systematic coursework on principles of learning or student assessment, the teaching of special needs students, language and literacy development, or subject-specific methods for teaching second-language learners.
  - In addition, technology training was sparse, and few research courses and activities were included.
  - Finally, during the critical fall quarter, when students were beginning their student teaching and intern placements, there was no instruction in teaching methods.
- The curriculum sequence within existing courses was not guided by a concept of the developmental progression of teaching knowledge and skills or by state or national standards for licensing, certification, or accreditation.
- Coursework, supervision, and field placements were not integrated and were conducted as wholly independent events, with little communication among the parties engaged in them.
- The STEP portfolio did not serve as a unifying force or final assessment.
  - Many parts were never reviewed or assessed by anyone.
- Finally, STEP students frequently noted a lack of connection between theory and practice: Many missed opportunities to make this link were observed by evaluators, particularly in foundations courses in which the connections need to be explicit, frequent, and anchored in activities that help students learn to apply theoretical constructs to their classroom practice.

In order to address the needs of STEP as well as to build on the strengths, STEP faculty initiated a number of changes in the program. One of the first and central elements of redesigning STEP included efforts to develop a common vision of what good teaching looks like—what a STEP graduate should be able to do—as well as a common vision of the pedagogy and practice that contributes to that development. In essence, the entire reform of STEP was designed around this vision of good teaching.

THE STEP VISION: EVIDENCE OF GROWING COHERENCE

My review of program documents and interviews with faculty members suggested that the program indeed made some headway in focusing on a core set of ideas, concepts, and approaches, which were evidenced in a number of different contexts. For instance, reviews of program documents (grant reports, program descriptions, Web documents, and NCATE and California Commission on Teacher Credentialling [CCTC] accreditation materials) indicated that the program had been redesigned around a common vision that focused on graduating teachers who were prepared to work with diverse learners, reflect on their practice, and inquire systematically into questions of teaching and learning that arose in their work with students. Program documents consistently suggested that the program emphasized a teaching stance concerned with assessing, understanding, and responding to student needs in the light of challenging curricular goals rather than merely "getting through the book" or implementing teaching routines. All the materials reviewed suggested that STEP focused on teaching practices that were informed by research on learning, development, culture and context, and families and communities. The materials also consistently emphasized that STEP had been redesigned to graduate teachers who not only practiced effectively in the classroom but who also could take into account the bigger picture of schools and schooling, and who were able to consider how what they do might be supported and reflected in school organizations and reform work more broadly. In sum, according to a grant report, the STEP mission was redesigned to focus on helping prepare its teachers to practice state-of-the-art teaching and to be agents of change in their school communities.

Four years after some of these documents were written, a recent cabinet meeting of faculty and staff reiterated these same elements of the vision. Although these documents presented a consistent set of messages about what STEP faculty were attempting to teach students about good teaching, it is also worth noting that many of the program documents, such as grant reports and NCATE and CTC reports, were authored by a few core faculty. Therefore, although STEP clearly put forth a more coherent vision in such materials—and the same elements could be seen across different sources—it

is also important to qualify that it is possible that the strongest and clearest vision may have been held by these core faculty.

Other evidence, however, did indicate that this common vision was also shared by a broader range of faculty. For instance, a number of STEP faculty helped design the new curriculum to include a much stronger emphasis on learning—a central part of the STEP vision of good teaching according to grant proposals—including particular attention in the curriculum to learning differences and disabilities; first and second language acquisition and development; reading and writing across the curriculum; child and adolescent development; parent and family involvement; and culture and social context (Table 2).

Courses were added in subject matter pedagogy (increased to three quarters of instruction from two), classroom management, and school reform.[4] The curriculum was also redesigned to increase the opportunities for purposeful reflection on practice and to make connections across classwork and clinical experiences. For example, the Adolescent Development course involved a team of faculty and graduate students and consisted of one core faculty member and two School of Education faculty who teach in STEP and was redesigned to focus on the development of an adolescent case study. This case study required ''shadowing'' a student throughout a

Table 2. STEP Curriculum, 2000–2001

Strand	Summer	Fall	Winter	Spring
Foundations	Educating for Equity and Democracy	Adolescent Development	Principles of Learning for Teaching	School Reform *or* The Ethics of Teaching
Curriculum and Instruction	Curriculum and Instruction (C&I) (*meets in subject matter groups*)	Curriculum and Instruction (C&I)	Curriculum and Instruction (C&I)	*students can take an elective in their subject field*
Language and Literacy	The Centrality of Literacies in Teaching and Learning	Teaching and Learning in Heterogeneous Classrooms	*ESL Methodology* (*elective*)	Second Language Practices and Policies
Practicum and Student Teaching	Practicum *Introduction to teaching as a profession, standards, & inquiry*	Practicum *Developing learning environments; communicating with parents*	Practicum *Assessment of student work and learning*	Practicum *Meeting the needs of exceptional learners; Assessing one's own teaching*
Pedagogical Strategies	Uses of Technology	Classroom Management (*half the class*)	Classroom Management (*other half of class*)	Literacy Development for Struggling Students

school day and included interviews about the teenager's work and life, which were to be incorporated into a final paper that explored the focal student's development in light of youth development theory (Roeser, 2002). As another example, in the Principles of Learning for Teaching course, the central project for the course—the curriculum case study, which had been a core assignment in STEP in the past (Shulman, 1996) and had provided opportunities to connect theory with practice—was honed even more to emphasize the relationship between teaching and learning. This study also had a new requirement: that case authors use considerable evidence of student learning from their student teaching experiences in their cases (Hammerness, Darling-Hammond, & Shulman, 2002). In one of the practicum classes that I observed, students were asked to bring in samples of work from an English language learner (ELL) in their class. They were also asked to brainstorm strategies that they could use to support the students' developing language use based on the articles that they had read for class and on their experiences in the classroom with that student.

Review of syllabi also provided evidence that additional practice in inquiry had also been infused into the curriculum, with the expressed intent that students learn how to ask good questions about the teaching and learning in their classrooms and how to go about exploring those questions in fruitful ways. For instance, in the Principles of Learning for Teaching class and in all five subject area C&I sequences, new assignments were added that involved students in analyzing samples of student work, in analyzing teaching (videos of other teachers teaching and videos of their own classroom practice) and in written assignments that require students to assess and then revisit their own teaching according to shared standards of practice. In both of the C&I classes that I observed, students were in the process of sharing video of their teaching with their colleagues in order to reflect on their teaching and to relate it to principles of good teaching. Review of syllabi also indicated that students in all C&I courses used the same central text, Wiggins and McTighe's *Understanding by Design* (1988); assignments in all classes focused on the concept of "backwards design"; and all C&I instructors used the same rubric to assess students' unit plans.

In addition, the 10 interviews with a sample of all the university and clinical faculty also substantiated many of the common themes of the vision of teaching that were emphasized in STEP documents. For instance, an interview with a supervisor indicated that she saw the program being redesigned "with high standards that adhere to the California standards; a closer relationship between cooperating teachers and University; assignments like the case study that have really challenged students to look at their teaching; and a real push towards meeting the needs of a diverse population." Of course, it is important to remember that the relationship between the elements in a vision (in terms of what gets emphasized) and the

definition of what certain terms like *diversity* actually mean in practice can vary a great deal even across faculty who may seem to agree on the concepts underlying a vision of good teaching (Smagorinsky, Cook, & Johnson, 2003).

In terms of structural coherence, observations of weekly cabinet meetings (meetings of faculty staff in the program who dealt with curricular and programmatic issues) and program document review revealed that the program faculty were making efforts to reshape the clinical experiences of students in the program to bring more coherence to that central aspect of the program. In the past, mentor teachers, which STEP calls cooperating teachers (CTs), had been selected by a process of nomination by their principals or by colleagues, or sometimes had volunteered themselves. Yet it had not been program practice to observe potential cooperating teachers in their classrooms to gain a sense of whether their teaching practices were consistent with what students learned in STEP. Furthermore, student teachers' induction experiences had ranged from thoughtfully constructed coteaching experiences in which student teachers gradually took over teaching responsibility over a period from fall to spring, to experiences in which the student teachers were immediately assumed to be fully responsible for teaching the entire class period on the very first day of school, and the cooperating teachers did not remain in the class for support or observation.

As a first step, STEP faculty made arrangements for all CT candidates to be observed teaching at least once before choosing them as CTs, to assure that students would experience the kinds of practices in their classroom that they were learning about in their coursework. Observation protocols were designed for this purpose that asked observers to look for particular aspects of practice to examine the ways in which the teacher's practice may or may not have been consonant with the STEP vision. Second, STEP faculty articulated a new model of graduated responsibility that emphasized a more gradual and supported transfer of teaching tasks from CT to student teacher, with yearlong coplanning, coteaching, mentoring, and feedback. Faculty designed yearly informational meetings and orientations for CTs that introduced the model of graduated responsibility. This involved opportunities to discuss videos of coplanning by current cooperating teachers and students and to examine the challenges and successes of mentoring new teachers.

The explicit articulation of graduated responsibility also included the new design of a contract that student teacher and CTs were then both asked to sign. The contract explained that CTs were required to gradually hand over responsibility for teaching over the year but that CTs were expected to remain in the classroom for the entire school year, helping to support the student teacher, giving feedback, and sharing responsibilities for curriculum planning.

In addition, STEP faculty reshaped the supervisory role so that instead of observing student teachers three times over a quarter, as in the past, supervisors were to observe student teachers a minimum of nine times each quarter. Student teachers were required to write a reflective response to each observation. This required observation and response was intended not only to foster more opportunities for students to reflect on their practice but also to create more dialogue among supervisors and students about the dilemmas and challenges of teaching. For those observations, STEP faculty developed an observation protocol based directly on the California Standards for the Teaching Profession, which all supervisors used and which all students used to evaluate their practice. STEP faculty felt that it was important to have public shared criteria about good practice, an approach that they also addressed in coursework when talking about student learning. Monthly meetings for all supervisors were initiated to share challenges of mentorship, and the first of these meetings each year involved an introduction to the standards and discussion of what they might look like in practice.

As part of an effort to connect CTs and university supervisors more closely in their shared mentorship of student teachers and to tailor the graduated responsibility more individually to each student teacher, STEP staff required CTs, student teachers, and supervisors to meet once a semester. These meetings were to involve explicit discussion of the management of graduated responsibility, focusing on the particular progress of the student teacher, the assessment of the distribution of current planning and teaching, and planning for the shift in teaching roles and responsibilities to the student teacher.

Finally, STEP faculty worked to gradually decrease the number of school sites in which students were placed, so that students were no longer spread across the approximately 35 different school sites, as they had been prior to 1999. Rather, they were placed in smaller groups of schools that had reforming agendas consistent with the vision of teaching being articulated in coursework in STEP. Efforts were also made to ensure that schools where students were placed were those that not only had a sizably diverse population of students (so that students would have opportunities to work with a diverse group of students) but also so that these schools had records of success with students of color. STEP faculty felt that it was important for students to have cohorts of classmates at the same school so that students could share insights, experiences, and knowledge about the school. Over the subsequent years, STEP faculty and staff gradually worked to place all its students in a smaller number of schools that most clearly reflected elements of the STEP vision and good teaching. By the 2001–2002 school year, all 60 students had been placed in about 15 local schools.

Altogether, this examination of faculty interviews, program documents, curriculum additions and changes, and observations of weekly cabinet

meetings suggested progress toward more structural and conceptual coherence. In particular, the articulation of a program vision; programmatic changes such as new classes and additional coursework in key areas; efforts to both develop new assignments and revise existing ones to be more consistent with STEP's vision; and steps to reshape clinical experiences in light of the program vision and coursework were well supported in my interviews, observations, and document review.

ELEMENTS OF THE STEP VISION IN STEP GRADUATES' PRACTICES

As a final means of examining conceptual coherence, I looked at the practices—and key teaching artifacts like lesson plans, unit plans, and student work samples—of 10 STEP graduates to see if I could identify some evidence of the STEP vision. Did STEP graduates demonstrate that they had learned some of the ideas and concepts that the more coherent program was trying to promote? In particular, was it possible to identify some central elements of the STEP vision in their teaching practices? In this section, I describe the number of graduates for whom I found strong evidence of these elements of the STEP vision in their teaching practice, and I also share the numbers of graduates who exhibited fewer of these teaching dimensions. I looked specifically at STEP graduates' practices for evidence in the following five areas, which I had identified as key aspects of the STEP vision: concern for student learning, use of content pedagogical strategies, commitment to equity, capacity to reflect, and commitment to change and reform. For each of the five areas, I developed subcategories that represented observable aspects of teaching[5] and then evaluated the graduates' practices in terms of *strong*, *some*, and *little evidence* of each category.

CONCERN FOR STUDENT LEARNING

As a group, I found strong evidence for many STEP teachers in terms of their attention to student learning in their practice (Table 3). Of the 10 graduates observed as part of this study, for instance, 6 graduates demonstrated strong evidence in nearly every category. Only one graduate demonstrated strong evidence in just one. For instance, across the board, STEP graduates demonstrated in observations that they built on and valued students' backgrounds, prior knowledge, and interests in their teaching. STEP teachers frequently started lessons by asking students to write about their own ideas about and experiences with the topic in order to provide students with some time to clarify their thoughts and to draw on what they know already about a topic. The role of students' prior knowledge in learning—and the importance of designing instruction that surfaces, connects to, and builds on students' ideas, needs, and interests—is a central idea addressed

Table 3. Numbers of STEP Graduates Showing Evidence of Concern for Student Learning

Subcategory	Strong Evidence	Some Evidence	Little Evidence
Plan instruction and teach in a way that draws on and values students' backgrounds, prior knowledge, and interests (CS standard 1)	10	—	—
Teaching concepts and skills in ways that encourage students to apply them in meaningful contexts that make subject matter meaningful (CS standard 1)	10	—	—
Active engagement in problem solving and critical thinking	9	—	1
Clear expectations that demonstrate a focus on understanding and learning	9	—	1
Evidence of pushing students to think beyond/ pushing students' thinking	6	3	1
Use of alternative and varied forms of assessment	6	2	2
Attention to students' multiple intelligences	4	4	2
Use of open-ended questions	4	3	3

in the Principles of Learning for Teaching class in STEP, and in the sequence of C&I classes in STEP.

STEP graduates asked students to draw on their own lives and experiences before evaluating the experiences of another. In two units (both of which happened to be designed around Elie Wiesel's *Night*) that I gathered from two teachers, one a social studies teacher and the other an English teacher at different schools, each separately had devised a series of activities around identity, a central theme in the book. One teacher had asked her students to conduct interviews with family members as a way to begin to understand the relationship between personal story and history, at the same time building on students' own "funds of knowledge" (Moll, Amanti, Neff, & Gozalez, 1992). She also asked students to construct an "identity box" that displayed key artifacts, items, and symbols about their own selves, and then later asked them to do the same for the author, Elie Wiesel. The other teacher asked students, in preparation for talking about how the Holocaust stripped Jews of their identities, to make a quick "identity map" in class that would reveal some of the key aspects of their own personalities. These strategies are a strong means of helping students make initial connections to their own experiences, which then provide opportunities for them to "transfer" their learning to new situations (Bransford et al., 2000).

Another area in which STEP graduates were particularly strong was in teaching concepts and skills in ways that encourage students to apply them in meaningful contexts that make subject matter meaningful. STEP

teachers achieved this in a variety of ways. For instance, evidence from one of the STEP science teachers' unit plans for her heterogeneous science class showed that in her unit on physiology, Sue[6] had begun her entire semester with questions such as, "What do you really need to stay alive?" Beyond food, water, and shelter, they discussed the effects that nutritional supplements have on the body's health. She asked students to then conduct research on a particular supplement (calcium, gingko biloba, kava, and so forth) and to evaluate the negative and positive effects that it might have on one's health. Knowing that her students were often interested in vitamins, bodybuilding supplements, and other nutritional enhancements, she chose this as an intriguing and current entry point into their explorations of the body in an effort to make their studies relevant to them and their own lives. This idea of making subject matter meaningful is a central idea explored in STEP's C&I courses and is also emphasized in the Principles of Learning for Teaching class, when students explore questions about "authentic learning" and how to support it.

Finally, although 6 STEP graduates demonstrated strong evidence of the use of a variety of assessments—their unit plans included a range of assessments from group quizzes, individual assessments, and performance assessments, and all used rubrics with clear criteria to assess their students' work— an examination of these tools from their unit plans and materials revealed some variation in their character and execution. One ELL teacher's unit plans provided an example of somewhat inconsistent assessment design: She had used very thoughtful and detailed rubrics to assess an interpretive essay with each cell carefully filled in and with clear requirements about structure, style, use of evidence from the text and overall effect, and very appropriate language for students that suggested that their work was in development. Yet for another essay—a personal reflection, a type of writing for which one might not necessarily need a rubric—she had chosen a rubric that had the categories of Below Grade Level, At Grade Level, and Above Grade Level. STEP teachers themselves felt less comfortable with their assessment skills. In interviews, STEP teachers consistently identified assessment as the area in which they felt the least confident. Many pointed out that although they used rubrics, they had concerns about how well designed they were and whether they were as useful for students as they wished. Their concerns make sense given that until the 2001–2002 school year, STEP did not offer a course on assessment, and STEP faculty acknowledged that the concept of assessment was not as thoroughly addressed as they would have liked.

PEDAGOGICAL CONTENT STRATEGIES

Another element of the STEP vision that many STEP teachers demonstrated frequently in their classrooms and unit plans was the use of pedagogical

content strategies. Half of the STEP graduates demonstrated strong evidence in every category; 7 demonstrated strong evidence in three of four categories, and 9 in two of four categories (Table 4). Two areas in which STEP teachers demonstrated the most evidence were in designing units and lessons around issues that are central to the discipline (i.e., essential questions, or identifying key ideas that were central to their discipline) and the selection of powerful and generative materials. Nine STEP teachers provided strong evidence for both categories. Many STEP teachers had identified "essential questions" or big issues that their units focused on. For instance, a review of Lindsey's *Night* unit designed for her ELL students revealed that she had focused on the essential question, "What is the relationship between our stories and our identity?" and "How is each of us a 'witness of history' and a 'messenger to humanity'?" Lindsey had selected powerful materials to supplement her unit: materials from the Facing History project, such as a videotape of an interview with Elie Wiesel conducted by high school students (she felt that this film would be particularly compelling to her own high school students); a film of Holocaust survivors by Steven Spielberg; and a written interview with one of the concentration camp commandants. All these materials were extremely rich and enabled students to gain multiple perspectives on the experience that Wiesel describes in *Night*.

Julie, an eighth-grade science teacher, had designed an entire unit on sound waves focused on the central question, "How do we hear?" In her unit, she engaged the students in constructing models of the ear and drawing an "earbook" that required students to create their own representation of the ear. Because students became quite interested in echoes, Julie teacher revised her curriculum to add a few days of exploration of echoes and how the human ear experiences them. The concept of the essential question and of designing curriculum around generative topics that are of deep importance in one's discipline and that provide intriguing entry points to students

Table 4. Numbers of STEP Graduates Showing Evidence of Pedagogical Content Strategies

Category	Strong Evidence	Some Evidence	Little Evidence
Designing units and lessons around issues that are central to the discipline (i.e., essential questions and thinking about the structure of a discipline)	10	—	—
Selection of powerful and generative materials	9	—	1
Engaging students in the modes of inquiry of the discipline	7	3	—
Critical thinking within the discipline	7	2	1

was an idea that all STEP student teachers engaged with when they read Wiggins and McTighe's (1998) *Understanding by Design*, the core text in all STEP C&I classes.

Many STEP teachers were also strong in engaging students in the modes of inquiry of the discipline. A review of Sue's curriculum materials for her physiology course revealed a clear focus on the process of scientific inquiry. Her lab report form, which students used several times a month, emphasized hypothesizing, experimental design, data, results, and conclusions, but she had framed each of these elements in terms that her students would relate to. For instance, her form describes a hypothesis as "an educated guess to the problem that can be tested. Here you give your educated opinion on what you think the rest of the experiment will be. The hypothesis can be written in one of two ways: If (the test) . . . then (your opinion) . . . because (why you think you will see your predicted results) *or* I think . . . because." For the Results section, she wrote, "In this section, 'give words' to your data. This section is written in paragraph form and it should highlight the significant results seen in the data section." In describing the conclusions, she instructed students, "[provide] a summary of what you expected to happen" and "reflect on the overall meaning of the lab. What was learned from it that can be related to the outside world? . . . Relate your concluding thoughts to the big concepts you discussed in the introduction." She even suggested that they "comment on the lab—was it a good model to use for what was being tested?" STEP teachers' pedagogical content knowledge seemed well supported in my observations of their teaching and in my reviews of their course materials and assignments.

COMMITMENT TO EQUITY

Although a number of STEP graduates demonstrated strong evidence of commitment to equity, I did not find quite as much evidence of this element of the STEP vision coming through as I did of a focus on student learning and of content pedagogical strategies (Table 5). Of the 10 students observed, 7 graduates demonstrated strong evidence in half of the categories. Five graduates demonstrated strong evidence in more than half of the categories. One area in which STEP graduates demonstrated much evidence was in developing curriculum that addressed different learning styles. STEP teachers were clearly deliberate about including activities that were designed for visual learners, auditory learners, or kinesthetic learners. In particular, they demonstrated strong evidence particularly around introducing new ideas using a variety of modalities: visuals, oral descriptions, demonstrations, or hands-on activities. For example, in Janita's Spanish for Native Speakers class, although she had students working in groups for much of class time, she also included group presentations, demonstrations

Table 5. Numbers of STEP Graduates Showing Evidence of Commitment to Equity

Category	Strong Evidence	Some Evidence	Little Evidence
Curriculum is designed to address different learning styles	9	1	—
Equitable working structures for students	7	2	1
Knowledge is viewed critically (Ladson-Billings, 1994)	7	3	—
Development of curriculum that addresses issues of equity or social ills	7	3	—
Encouraging all students to participate in making decisions and working collaboratively	5	4	1
Creation of tasks that are complex and require group work	5	4	1
Teachers are cognizant of themselves as political beings (Ladson-Billings)	2	1	7
Students' real-life experiences are legitimized as they become part of the "official" curriculum (Ladson-Billings)	2	3	5

Note: Some of the subcategories are borrowed from Gloria Ladson Billings' (1994) descriptions of culturally relevant teaching practice.

of vocabulary concepts that drew on student volunteers, pair-share activities that included writing and speaking, and individual speaking and listening activities.

STEP teachers were also quite strong in developing curriculum content that addressed issues of equity in society or that in some way acknowledged societal equity issues such as racism, discrimination, prejudice, or inequality. Seven of the 10 observed demonstrated evidence for this category. For instance, on the day I observed Paula, a history teacher, she was asking her students in groups to critically examine the political strategies that certain marginalized groups—such as disabled citizens' groups, African Americans, Chicanos, Asian Americans, and lesbian and gay rights groups—had used to gain power and to achieve their own ends in the 1960s. The English and social studies classrooms that I observed that were both reading *Night* focused on questions about how to prevent the Holocaust from happening again.

Evidence demonstrating that STEP graduates encourage all students to participate in making decisions and in working independently and collaboratively (see Table 3) was more mixed. Five STEP teachers demonstrated strong evidence in this category, 4 demonstrated some evidence, and 1 did not demonstrate much evidence of this ability. Those STEP graduates who demonstrated strong evidence in this category achieved this in a variety of ways. For instance, in the eighth grade science class I observed, the class was very formally constructed for groupwork; every child had a role, from fa-

cilitator to recorder to "harmonizer." Children took their roles seriously and acted in ways consistent with their responsibilities—students asking one another for evidence as facilitators, recording diagrams if a recorder. Although they were in groups for over an hour together constructing a model of the ear, students rarely called on Julie for assistance, and if they did, she would often urge students to help one another rather than provide an answer herself, or remind students of their roles. Such reminders did not seem to frustrate students or stump them; they would turn back to their discussions and work without seeming confused or troubled. The importance of assigning roles and responsibilities to students and in helping students become more responsible for their own learning—which the faculty member called "delegating authority"—is a central idea that she addressed in her STEP course, Teaching and Learning in Heterogeneous Classrooms.

Although some might argue that this could be construed as an area in which STEP teachers were less successful, this may be an area in which few novice teachers would do well at all. Delegating authority to students in a meaningful way is a task that many teachers find extremely challenging; that a portion of STEP teachers and their students were able to accomplish this in sophisticated ways does seem to have some import.

CAPACITY TO REFLECT

Perhaps because it is harder to obtain evidence in this category from observations and unit plans, less evidence was available for STEP graduates' capacity to reflect (Table 6). Half of the STEP graduates observed, when asked why a unit or lesson had been altered or changed, described thinking carefully about what students had and hadn't learned in this unit and how they imagined teaching it again differently in such a way that students might learn better. One of the science teachers in this study, Sue, explained that she designed curriculum with a colleague from STEP who had graduated the same year that she had. The two of them plan all their curriculum together, adapting, revising, and discussing what they should do with their

Table 6. Numbers of STEP Graduates Showing Evidence of Capacity to Reflect

Category	Strong Evidence	Some Evidence	Little Evidence
Reflects on and analyzes teaching with an eye to improvement	5	2	3
Seeking out learning experiences to improve teaching (e.g., attending professional conferences)	5	—	5
References to theory and ideas from STEP	2	4	4

students. Sue noted that they had completely revised their physiology units from the previous year because she felt that its organization was not as intuitive or sequential in terms of scientific concepts as it could have been. So, she and her colleague reframed the course to be shaped around questions like, "What holds the body together?" "What does the body need?" and "How does our body move?"

However, this type of formal reflection on their practice was something that most STEP graduates reported that they rarely had time to engage in. Many noted that they felt like they reflected all the time, but that they had little chance for formal reflection; STEP graduates often noted that they did reflection on the fly. This is a somewhat surprising finding given that one might argue that reflection is a cornerstone in the STEP curriculum, and opportunities to reflect are embedded throughout the curriculum ranging from the use of journals and logs in the literacy course, to logs about students in the Adolescent Development course, to reflections on being observed by their supervisors assigned in practicum, to a final reflection on their learning in STEP that is required for their final portfolio. On the other hand, it is particularly difficult to identify instances of reflection from observations of practice such as those in this study. Indeed, it may be that the methods used in this study were not as well suited for examining and obtaining evidence of reflection on the part of teachers.

COMMITMENT TO CHANGE

Although working with colleagues is a strong focus of STEP—opportunities for collaborative groupwork and group projects are spread throughout the STEP curriculum, and every STEP course involves some elements of groupwork daily—fewer STEP graduates demonstrated evidence that they continued to work with colleagues after STEP (Table 7). Four STEP teachers were in school situations in which they planned daily or weekly with colleagues, and 2 other STEP teachers planned occasionally with colleagues. Four STEP teachers said that they had fewer opportunities to work with

Table 7. Numbers of STEP Graduates Showing Evidence of Commitment to Change

Subcategory	Strong Evidence	Some Evidence	Little Evidence
Working with colleagues	4	2	4
Appreciation for how school context can shape learning	3	2	5
Evidence of Leadership in School site	2	2	6
Reflecting on what is and is not working at school for student learning	2	4	4

colleagues, and 1 math teacher said that he rarely had a chance to interact with colleagues about teaching in substantive ways. Of course, it is important to note that school context can also shape new teachers' opportunities for collegial relationships and for leadership.

Several STEP teachers had taken on some prominent leadership positions within their schools. For example, one English/ELL teacher was the coordinator of the ELL program in her second year of teaching. Although this may simply mean that her school did what many schools do—give young, inexperienced teachers the most challenging and least popular jobs—Lindsey was not only smoothly coordinating the ELL program but she had also begun two different programs for her ELL students: a tutoring program that met twice weekly and paired ELL students with student tutors, and what she had called a SIBS program (playing on the word "sibling") that was also designed to pair ELL students with mainstreamed students. It is worth noting that one of the reasons that Lindsey had come up with the SIBS program was that she had been concerned that her ELL students were marginalized because they were taking a different set of classes and were less able to access to other aspects of the school (social events, friends, sports, clubs and so forth) because they had so little contact with mainstreamed students. She came up with the idea that she could pair her ELL students with mainstreamed students in such a way that the mainstreamed students would have something to learn from the ELL students (i.e., get tutored in the ELL students' first language or learn about another country) and that the ELL students could learn from the mainstreamed students. She wanted the students to be in equitable relationships. Quite strikingly, her concerns about ELL students' marginalization reflect observations made by Guadalupe Valdes (1999) in an article, "The World Outside and Inside Schools," which all STEP students read in practicum that year. This capacity to "think about the big picture" of teaching and learning—of thinking about school culture and its impact on student learning—is a key idea addressed throughout STEP, but it is particularly addressed in the School Reform courses offered as electives in the spring quarter (Lindsey had taken this course).

So although STEP students demonstrated somewhat less evidence in this category, there were clearly instances of collegial work and developing leadership on the part of some—and perhaps as much as might be expected for new teachers in public school contexts.

DISCUSSION

This documentation of STEP's redesign over a 4-year period of the most heightened reform activity (from 1999 to 2003) reveals considerable

progress toward both conceptual and structural coherence. The core program faculty developed a vision around which the program could be redesigned, and the vision was clearly and consistently in evidence across key program documents and in interviews with them. Interviews with faculty who taught in STEP and in other departments also provided evidence of consistency and understanding regarding that vision, which suggested some internal conceptual coherence in the program. Furthermore, interviews with clinical faculty (such as cooperating teachers and supervisors), who corroborated aspects of the vision and an understanding of program goals, suggested some external conceptual coherence in the program.

The documentation of additional curricular and programmatic changes also provides some evidence for structural coherence. The redesign of coursework, the new use of shared texts across courses, and the refining and additions of new assignments help demonstrate the ways in which the program was reformed to gradually build some conceptual understandings of key ideas in the program through reorganization and more consistency across courses and coursework. Equally important, the reshaping of the clinical experience—which included explicit articulation of a model of student teaching, attention to the practices of the cooperating teachers and how well they related to the STEP vision, and a more elaborated and explicit model of mentorship and supervision—provides further evidence of structural coherence.

The observations of graduates' practices provides some further evidence for growing coherence. The analysis of graduates' practices demonstrated that one could identify some of the aspects of the STEP vision—concern for student learning; commitment to equity; content pedagogical strategies; capacity to reflect; and commitment to change and reform—in STEP graduates' practices. More important, although students took some different courses in STEP (their own particular subject matter C&I courses), students seemed to have encountered some similar messages and ideas about teaching and learning, which suggests some coherence in that it appears that different courses were able to provide opportunities for students to develop and understand some of the same ideas.

These findings regarding STEP teachers' practices seem to relate to the treatment of these issues in the STEP curriculum. For instance, the notion that teaching is not just about what the teacher does but how students learn—which involves strategies like designing authentic tasks, making connections to students, and building on students' prior knowledge—receives substantial treatment in STEP. These ideas are addressed in the sequence of practicum courses, the core course on learning, and in the sequence of C&I courses offered in their subject matter. The development of pedagogical content knowledge is also explored in a number of courses. Thinking about why one teaches and learns one's subject matter;

identifying and working with students around common misunderstandings or misconceptions in the subject; developing essential questions; the notion of planning backwards—all these issues are treated extensively in the C&I courses and in the learning course in STEP, and in practicum. Issues of equity were treated extensively in the Equity and Democracy class, and my review of syllabi and fieldnotes of class meetings revealed reinforcement of that topic in the Principles of Learning for Teaching classes and in C&I, practicum, and the heterogeneous classrooms courses. In turn, the areas that were not as visible in graduates' teaching had not received as much treatment in the program. For instance, assessment got short shrift in nearly every class; it was often reserved for the last class of the quarter, when there was less treatment and less attention, and the students had less time to focus on the ideas.

IMPLICATIONS: TOWARD GREATER COHERENCE?

The empirical evidence from these observations of STEP graduates, along with findings from other studies conducted in STEP, including a survey of graduates, led faculty to continue to refine their curriculum and the program to make it even more coherent. During faculty meetings set aside specifically for the purpose of revisiting the vision and the program, core faculty spent time discussing the vision of the program in light of how to address these gaps. To bring even more coherence to the program around attention to student learning, faculty decided to develop a required course, to be offered in the spring quarter, that focused on the concept of assessment guiding instruction. In that course, faculty would provide students with opportunities to take and critique state standardized tests; to develop, critique, and assess different kinds of rubrics; and to develop an understanding of norm and criterion-referenced testing. Core program faculty also developed a yearlong assignment called the Teaching Event, which required students to complete a series of assignments that included tasks like writing a paper in which they assessed the learning of an ELL student; one on the learning of a student who had special needs in the class; and one on the learning of a whole class on a particular task. However, when this additional work around assessment was added to the program the following year, some faculty also raised concerns. They felt that students had become overwhelmingly focused on the new assignment cycle to the detriment of other powerful experiences and assignments.

This additional evidence points to a challenging dilemma for STEP faculty in their quest for coherence. If the faculty hoped for all the elements of the program's vision to be visible in their graduates' practices, they might most logically work toward making sure that all aspects of the vision were

espoused, emphasized, and fully treated in the curriculum and clinical work. Yet the curriculum was already packed, faculty worried about students' divided commitments (to both coursework and clinical work), and students often raised concerns about being overwhelmed. So was it possible to further accentuate other aspects of the STEP vision without compromising what was already being emphasized?

In addition, the faculty's discussions about vision and coherence also led to conversations about the pitfalls of focusing too closely on a clearly articulated vision—and about the effect on the nature of teaching and learning in such a program. Of particular concern was whether the process of becoming a fully coherent program could lead to the exclusion of important opportunities for students to come to terms with alternative perspectives about teaching and learning for themselves. The STEP faculty are not alone in raising such concerns about coherence. Buchmann and Floden (1991) observed that in seeking coherence, there is a danger of becoming too regimented, rational, and even technically oriented, and they raised concerns that the persistent dilemmas and contradictions of teaching may not be fully plumbed by an overly "coherent" program. The discussions about coherence in STEP also raised questions about the purpose of having a common and shared vision, and a coherent program around such a vision. Did having a coherent, consistent vision mean having a "party line" that students felt that they needed to parrot back? Furthermore, was it the intention of program faculty to graduate students who all believed in a shared vision? Or was it the intention that faculty help support students who might leave the program with somewhat different visions of what good teaching looks like?

For STEP, in working toward coherence, discussions regarding what elements of a vision they felt were worth investing were particularly important. Consideration of how the vision was reflected in the program's curriculum, the understandings of the faculty, and the experiences of the students also stimulated changes in the program and the curriculum that became part of the work toward coherence. The framework developed as part of this study served as one valuable means of analysis for those involved in the program to assess their own work and reform efforts. And, for the STEP faculty who engaged in these discussions, the act of gathering data about the classroom practices of graduates generated a powerful conversation around a vision of STEP graduates and around what it means to be a coherent program.

Although coherence is not without skeptics, in many cases, it is viewed as a universal good. Yet an exploration of coherence in development and in practice reveals the possibilities of coherence and some core challenges not only regarding how much coherence is possible but also regarding what kind of coherence is desirable. This study suggests that perhaps coherence is not an outcome so much as it is a constant process of adjustment (Honig & Hatch, 2003). The process requires seeking evidence for coherence in key

places where one might want to see it, evaluating the evidence, and ensuring opportunities for debate and evaluation. In this way, coherence in teacher education programs should not be seen as summative results to be achieved that culminate in having "arrived at" coherence. Rather, efforts toward coherence should be understood as part of the steady work of such programs, a continuing and necessary effort of adjustment, revision, and calibration.

Notes

1 It is important not to ignore or downplay the important role that dissonance can play in learning, and the productive role that diverse perspective contributes to learning. Tatto (1996) argued, however, that having a "coherent program" does not necessarily require that all faculty "'think alike,' as diversity of thought brings about richness of learning experiences" (p. 156). She emphasized, rather, that coherence should abide in the common ground among faculty around professional norms and expectations, and in the way that learning experiences are organized and conceptualized.

2 These meetings were instituted to address not only the ongoing reforms but also the day-to-day workings of the program, and to focus on the administration of the program, including admissions, supervision and clinical work, and issues involving students.

3 The redesign was initiated in part by a new faculty member who joined the faculty in 1998 and became the "faculty sponsor" of the program, and by a new professor who was hired to direct the program (this position became an academic position rather than an administrative position).

4 At the same time, the STEP director and faculty advisor also made other key changes. Along with key STEP advisors, they made a commitment to increasing the diversity of the students attending STEP. Thus, over the past 4 years, although students of color constituted only 14% of the class of 1999, they constituted 40% of the class of 2000, 45% of the class of 2001, and 48% of the class of 2002.

5 Some of the subcategories were borrowed from the California Standards for the Teaching Profession (CSTP), which are used in STEP to evaluate and measure students' progress (they are also used in some of the school sites by CTs to evaluate and measure their own progress) because they represented aspects of classroom practices consistent with those that STEP intends to help its students develop. When this is the case, the appropriate standard is noted in parentheses after the subcategory (Table 3).

6 To protect their confidentiality, all names of STEP graduates and teachers in this article are pseudonyms.

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