

Teachers as Researchers: developing an inquiry ethic

SHARON H. ULANOFF

California State University, Los Angeles, USA

LILLIAN VEGA-CASTANEDA

California State University, Channel Islands, USA

ALICE M.L. QUIOCHO

California State University, San Marcos, USA

ABSTRACT

This article explores the process through which teachers go as they engage in teacher research that attempts to answer ‘burning questions’ about their practice. It reports on the experiences of 45 in-service teachers enrolled in an MA in Education program as they develop an inquiry ethic while engaging in research projects that require them to collect and analyze data, interact with instructors and peers, engage in dialogue surrounding inquiry, and draw conclusions from their data collection and analysis during a semester-long course. Based on data collected over a two-year period, the authors attempt to pose a framework for the development of such an ethic, positing the dimensions of the stance that teacher researchers demonstrate as they begin to view themselves as part of the ongoing dialogue between theory and practice. It further describes the nature of each dimension as well as the products of the teacher research projects.

Framing the Question

The relationship between teaching and research is often viewed from varying perspectives. While some argue that research informs teaching, it is clear that that same research is dependent upon the actual teaching that takes place in the classroom. Too often, though, the knowledge base of teaching is constructed by *outside experts* who expect teachers to embrace their findings and act accordingly in the classroom (Cochran-Smith & Lytle, 1993). Teacher research that engaged in by practitioners in the field, serves to add to the body of knowledge that exists in relation to classroom practice by offering a unique perspective on teaching and learning (Cochran-Smith & Lytle, 1993) as teachers examine and attempt to understand what is happening in their own school settings (Patterson & Shannon, 1993). As teachers grow to better understand their own practice they are better able to effect change in instruction to meet the needs of their students. While the viewpoint of a practitioner is not inherently superior to that of a researcher, the difference is necessary to help us to fully understand what happens in classrooms (Fecho, 2003).

When teachers engage in the practice of examining data collected through the daily practice of teaching, they can use these data to analyze and improve their own teaching (Pérez et al, 1998; Cochran-Smith & Lytle, 1999). While teachers are familiar with the contexts of their own schools, they are often 'excluded' from the practice of research, which is traditionally carried out by researchers who may have little knowledge of the school context (Hammersley, 1994) and therefore conduct general, rather than specific, studies.

Teacher researchers who begin to understand the link between theory and practice examine the process and product of their research through two different lenses, practitioner and investigator. This unique perspective affords the teacher researcher an insider (emic) perspective in terms of the data s/he gathers and analyzes. This data gathering and analysis, in turn, serves to assist the teacher in uncovering and clarifying his/her own 'implicit assumptions about teaching, learning and schooling' (Cochran-Smith & Lytle, 1990, p. 4; 1999, p. 16) and further gives them a means of working toward solving various problems within the framework of the educational system on both macrolevels and micro-levels. These teacher researchers use their own classrooms as research labs and in collaboration with their students act as 'extended professionals' (Stenhouse, 1994, p. 223), who, in addition to being competent teachers, go beyond their classroom responsibilities to take an active role in the greater school, community and societal contexts.

Within the framework of teacher education, notions of practitioner inquiry are situated in social inquiry and politics, moving toward school change and setting out to transform, rather than merely describe, practice (Cochran-Smith & Lytle, 1990). Rather than consider research as something that is foreign to their practice or something that attempts to discredit their expertise, teachers engaged in inquiry begin to view research as a place where both practitioners and researchers can work together toward common goals (Teitelbaum & Britzman, 1991) and therefore begin to engage not only in the conversation, but in promoting change as well.

Both practitioners and researchers bring their own perspectives and agendas to the inquiry. While practitioners and researchers generally follow different paths, both, for the most part, are consistently as methodical, precise and explicit as they need to be in order to answer their own questions and the results from each type of research vary depending on the different perspectives and relationships to the context of the investigation (Hammersley, 1994). Their findings are situated within this context and address issues of importance that are relevant to the individual: researchers seek to publish their findings for the educational community and make a more general impact on education, practitioners seek change that will impact their stakeholders, their own students, schools, districts. Some question the *rigor* of teacher research, arguing that it might not be research at all, specifically criticizing teachers' insider perspectives and their relationship to objectivity in the research process (Huberman, 1996).

The notion of changing instruction is critical in terms of inquiry in the classroom. Teachers who engage in research themselves are likely to see the relationships between teaching and research as they uncover answers related to their own curriculum and instruction. Furthermore, there are connections between *what* teachers are learning in their classrooms and *how* they are teaching in their classrooms. As novice teachers

engage in teacher research they come to understand the classroom culture. As more experienced teachers participate in inquiries in their own classrooms they begin to negotiate changes in both what and how they teach. Teacher researchers formulate ideas that are ready to use without adaptations since they are generated from the practice they examine (McFarland & Stansell, 1993). The nature of the evolution of teachers' own practice, based on teacher research, has implications for both teaching and learning.

As teacher educators and former teachers ourselves, we are constantly confronted and challenged by the dynamic relationship between theory and practice. As a result of the experiences we bring to the task of preparing teachers to succeed in educating students in the twenty-first century, we strive to engage our students as reflective practitioners who see themselves as inquirers in the classroom and thus pose questions regarding the curriculum and instruction they impart to their young charges. We encourage our students, teachers in the field, to examine their own roles as researchers within the classroom context and also to explore the relationship between their research, their own practice and education in general.

This article explores the process through which teachers go as they engage in teacher research, which Cochran-Smith & Lytle (1993) define as 'systematic and intentional inquiry carried out by teachers' (p. 7). As a result of this exploration, as well as observations on the reflections and actions of teachers as they 'become' teacher researchers, we attempt to describe a framework that looks at important dimensions embedded within this notion of an inquiry ethic. We use the term 'inquiry ethic' to describe what teachers do to establish a clear relationship between theory and practice. It further involves the process of asking questions, specifically those that we call 'burning questions,' and seeking answers to those questions through projects that require teachers to observe students, examine student artifacts (e.g. test scores, writing samples, reading miscues, responses to interview questions, surveys, etc.). It is taking on an inquiry stance (Cochran-Smith & Lytle, 1999), one that impels teachers to deeply examine their own practice and the effects this practice has on their own students.

This notion of burning questions is an interesting one. By burning questions we mean those questions that haunt teachers for a variety of reasons. Perhaps the questions are related to the total lack of success of a lesson/unit or the partial success of the same. Burning questions are also the result of observations that one group of students, or one student in particular, does not make connections with what is being taught or is not making connections with the teacher or other students. Burning questions result from disequilibrium in the world of the teacher. Some feel that instruction *should* be successful (or unsuccessful) and question 'surprising' results. Others might react to specific curriculum that is imposed by the district. Nevertheless, they are issues that give rise to the burning questions that haunt teachers, that keep them up at night, that are sources of frustration. Teachers either avoid addressing the sources of frustration and blame students for not engaging in learning or they begin to ask questions that prompt them into a process of analyzing why some practices work and others do not. In this process, they focus on what they, themselves, do as teachers.

The idea of questioning is discussed extensively in the literature on inquiry-based instruction (Harste, 1993, 2001), which describes classroom practice that 'provides an opportunity for learners to explore collaboratively topics of personal and social interest ...

for purposes of producing a more equitable, a more just, a more thoughtful world' (2001, p. 1). It is instruction where students are engaged in the learning process through the use of questioning and seeking ways to answer those questions. In this article we explore the notion of inquiry-based instruction in the university classroom as both a means of moving our students, all teachers, toward developing an inquiry ethic and also as one way to model such instruction as a means of promoting its usage in their own practice. We ask our students to pose their own questions in order that they may plan and implement research to examine answers to those questions (Rosebery et al, 1992). We want our students to be reflective practitioners (Schön, 1983; Zeichner & Liston, 1996) & engage in *inquiry as stance* (Cochran-Smith & Lytle, 1999), asking questions about their practice in order to promote change.

This task is a challenging one and we reflect on the processes and products of teachers as we explore the relationships between research and teaching, between theory and practice and between process and product, as they exist within the framework of classroom research. This article thus examines teacher researchers as they develop an inquiry ethic while engaging in research projects that require them to collect and analyze data, interact with instructors and peers, engage in dialogue surrounding inquiry, and draw conclusions based on their own data collection and analysis. It further seeks to pose a framework for the development of such an ethic, positing the dimensions of the stance that teacher researchers demonstrate as they begin to view themselves as part of the ongoing dialogue between theory and practice. This article asks the following question: How do teachers develop an inquiry ethic through the process of teacher research in their own classrooms?

Situating the Development of an Inquiry Ethic

As faculty in a small, fairly new state university in southern California, three practitioner researchers (Fecho, 2003), one professor, one associate professor and one assistant professor at the time of data collection, bring to our positions an inquiry stance. That is, we approach our own teaching from a perspective of reflective practitioner, hoping to engender reflection in our students, classroom teachers themselves. All three of us also bring years of experience as classroom teachers to our work as teacher educators.

Approximately 45 K-12 (i.e. compulsory education) teachers in three cohorts at one small state university in southern California participated in the study. All teachers were graduate students pursuing the MA in Education with either an option in Multilingual/Multicultural Education, Literacy Education or Learning and Instruction. Forty-two of the participants were full-time teachers during the time of data collection.

Data were collected in three courses during two academic years between August 1998 and August 2000. Those participants without their own classrooms were required to find classrooms in which they could conduct research. All teachers took one of the following courses: Research Methods in Education, Ethnography in Education or Literacy Development for Students Who Speak English as a Second Language (ESL Literacy). One or more of the authors of this article taught each of the courses. While the ethnography in education course was taught by one of the authors, the research methods and ESL literacy courses were team-taught by two of the authors of this article.

The teachers in the sample varied from novices to experts in the amount of teaching experience that they brought to the courses and to the program. Teaching experience ranged from three months at the beginning of the MA program to 25 years of teaching in the same district. One participant was a former school board member in the district where she had taught for the previous 15 years. Five of the forty-five participants had less than one year of teaching experience; another six had between 20 and 25 years of experience. The rest ranged from one to nineteen years. Nineteen of the participants were certified bilingual teachers; eight of them were teaching in bilingual settings. Forty-two of the participants were women. Forty participants taught in self-contained classrooms in elementary settings, three taught middle-school language arts and the remaining two were high school English teachers. One of the elementary teachers with 25 years of experience became a bilingual coordinator during data collection and thus moved out of the classroom.

For the purposes of this article we identify an expert teacher as one who has been teaching for more than three years. An expert in this study is someone who has had the opportunity to be solely responsible for her/his own classroom over this period. An expert has also been provided with opportunities to receive professional development (mandatory in California) as well as time to talk and think about classroom practices. A novice teacher is a beginner, one with limited experience in the field.

The participants in this study all had a variety of inquiry-based experiences, from novice to expert. Twenty-nine participants were graduates of the licensing program at our own university. Within our credential program students are routinely asked to reflect on practice both within the context of course activities (see Prado-Olmos et al, 2003, for one discussion on the use of narrative reflections in a prerequisite course at the same university) and course assignments (see Ulanoff et al, 2000, for a description of an inquiry project used at the pre-service level) and therefore have had experience with examining classroom practice, albeit not their own. Six others engaged in inquiry projects in other programs. The rest had differing opinions about what they considered *research*, ranging from thinking of research as something to fear, something from outside, something that had little relationship to practice, to thinking of research as something completely foreign to their own lives. Those teachers with no prior inquiry experience also viewed research as completely quantitative, involving large samples. In this article a novice inquirer/researcher is someone with limited or no experience with inquiry, while an expert is defined as someone who has engaged in one or more inquiry-based projects where s/he posed a burning question and then carried out an inquiry to look for answers.

Teachers in all classes were asked to think about a question that they wanted to answer in relation to the classroom where they were teaching and/or observing. The teachers were consistently encouraged to focus on burning questions regarding their practice and class time was devoted to sharing and examining questions in addition to reviewing questions used in previous inquiries. While those teachers enrolled in the research methods and ethnography courses were given formal instruction in research methodology, teachers in the ESL literacy course were given a brief overview of methodology and instruction related to reliability, validity, objectivity and subjectivity, but were asked to focus more on the process of their own inquiries.

During the first three weeks of each semester the inquiry assignment was formalized in order to facilitate the research process. While the teachers were given great latitude in terms of questions and methodology, all were asked to use a similar format (although there was room for other formats if appropriate). Teachers were asked to include the following sections in their papers: research question(s); setting and sample; theoretical framework (what others have to say about their topic); methodology (how they intend to answer the question); instrumentation; data collection and analysis; findings; and conclusions. We chose a structured approach in order to facilitate the research process given the time constraints presented during a semester-long course.

The assignment was structured so that the teachers would complete one part (e.g. setting and sample or methodology) of the assignment almost every week. This allowed for discussion and feedback in writing groups and wholeclass discussions during class time. It also made the assignment seem less overwhelming and kept teachers on task as they felt a commitment to be prepared for participation in their groups and also looked forward to peer feedback.

Ongoing reflection was an integral part of the teachers' work throughout the semester. Teachers were asked to complete informal reflections about their research on a weekly basis at the end of each class session, and to complete more formal reflections in the form of an open-ended survey twice a semester. Teachers were not required to put their names on either type of reflection, but they often wrote their names and openly discussed their reflections with us. Teachers also engaged in reflection during weekly class meetings, both with peers and instructors during class discussions surrounding the inquiry projects and those students in the ESL literacy course participated in a listserv where questions/problems regarding the research projects could be discussed with the entire class. The teachers in the ESL literacy and research methods courses were assigned to writing groups that met weekly as a regular class activity. The purpose of these writing groups was to share and give feedback about the inquiry projects. The instructor circulated around the room during the writing group meetings and was also available for individual conferencing.

Teachers were observed on a weekly basis in each course from August 1998 to August 2000 (each course met for 15 weeks and observations took place from week two through week fifteen) during aforementioned group and whole-class discussions. In-class discussions were held at every class meeting. Classes met for three hours each week. An average of 30 minutes was devoted to these discussions which included questions, successes and struggles that the teachers were experiencing in developing and pursuing their classroom inquiries. The instructors asked probing questions to help the teachers shape their inquiries and also gave some guidance regarding issues of reliability and validity in research. In the research methods and ESL literacy courses, which were team-taught, instructors took turns taking observational field notes of class instruction and activities.

Instructors collected field notes during all relevant interactions inside and outside of class. Email correspondence was collected and added to the data set. As part of their required readings, teachers in each of the courses were assigned an anthology of research projects completed by other teachers in a previous section of the ESL literacy course.

Articles and books on the subject of teacher research as well as the content area of each course were also assigned. Graphic organizers such as process grids were used to help students examine each other's burning questions and a variety of strategies including read-around groups and peer conferencing were also employed. Table I describes data collection procedures and products in each of the courses.

Projects were dynamic and often changed several times during the semester as the teachers continually discussed notions of teacher research, along with possible methodology and structure for their projects. Teacher research projects were presented at the end of the semester and, in the case of the ESL literacy course, compiled into an edited research anthology published for class members.

Tools	Research methods	Ethnography	ESL literacy
Field notes from small-group discussions	X	X	X
Field notes from whole-class discussions	X	X	X
Field notes from writing groups	X		X
Teacher reflections at the end of each class session	X	X	X
Teacher reflections in the form of surveys completed twice a semester	X		X
Online discussions		X	X
Mini-inquiries conducted in teachers' classrooms	X	X	X
Literature about teacher research and research done by teachers	X	X	X
Read-around groups of inquiry design and/or findings	X	X	X
Class discussions on the meaning of inquiry findings and struggles encountered	X	X	X
Lessons and demonstrations about reliability and validity in research	X	X	X
Probing questions to help teachers shape their own questions	X	X	X
Observational field notes collected during faculty peer observations	X		X
Process grid to examine projects			X

Table I. The tools used to analyze the inquiry process and collect data.

Examining Teacher Research Projects and Reflections

We examined a variety of artifacts including research papers and original data in the form of surveys and questionnaires, teacher reflections and other assignments that engaged them in data collection, teacher/instructor dialogue through email, observational field notes taken by instructors, and anecdotal records. Throughout our examination of the data it was our intent to understand the process of developing an inquiry ethic as well as the direction in which our teachers' research took them.

Data analysis was based on a review of all observational field notes (both of our students and peer observations of each other), student reflections, both written weekly

reflections and student surveys, email discussions and student artifacts including inquiry papers and their respective drafts. The instructors read all reflections on a weekly basis. They read the entire body of reflections for a second time at the end of each semester along with the inquiry papers, looking for patterns and themes. The data were coded for specific struggles reported by the teachers, commentary from group and class discussions and peer observations, and inquiry topics.

Throughout data collection and analysis we explored issues of question generation as well as concerns related to the connections between theory and practice. Patterns related to questioning and struggling were thus identified as they surfaced and these were used to further identify salient themes, and (later) categories within and across each data set. Propositions were formulated from this process of data analysis and were further developed to address the research question. Questioning and reflection on the data was a recursive process used as a way of allowing the findings to be firmly grounded in the data.

The teacher researchers we worked with were concerned about a variety of issues in their classrooms and also were eager to find solutions to burning questions related to practice. Several underlying themes formed the basis for their inquiries. The teacher researchers consistently examined questions related to their classroom, school and district contexts for learning. They examined a variety of strategies and their impact on academic success. There was also a focus on emergent literacy and biliteracy. Burning questions/issues included:

1. What happens when students are pulled out for ESL programs?
2. How does vocabulary development impact second-language reading success?
3. How does second-language writing develop?
4. How does early transition impact reading and writing in the primary language?
5. What is the relationship between first-language and second-language reading?
6. How do the sociopolitical attitudes affect the learning climate for students from ethnolinguistically diverse backgrounds?

The teacher researchers in our classes engaged in inquiry projects that would help them to better understand their own classrooms, schools and districts. They were concerned with the evolution of their questions and also with links between their own findings and previous research on the same or a similar topic. As teacher researchers they felt that the inquiry assignment helped them to come to better understand their students, classrooms, schools and/or districts and that this understanding was valuable in terms of effecting change in their own practice. They expressed concern with their own expertise as researchers and with their ability to objectively examine the data they collected. They further struggled with a variety of issues related to both their own competence as researchers and the larger school context that they were encountering as they engaged in their inquiries.

Table II summarizes selected participants' inquiry paper topics. While not all papers are represented here, as the list would be too extensive, this summary serves as a representative sample of student topics, findings and future steps.

Title/question	Sample	Method	Findings	Future steps
1. Can a kindergarten (K) program replace the need for an ESL program?	1 K student 1 teacher aide	Observation Interview	There are more opportunities for language learning in K class than in pull-out.	Teacher will keep students in K class. Teacher is restructuring K instruction to meet L2 learners' needs.
2. Encouraging social interaction among culturally different school children.	Kindergarten class: English speakers; middle-class Spanish speakers bussed in and poor; looked at Spanish speaking children.	Observation w/ observational checklist. Interviews	Communication is a big influence; when students couldn't communicate they didn't play together; children also didn't want to play with others whose actions were deemed inappropriate.	Teachers should structure activities to encourage interaction. Teachers should teach strategies for dealing with inappropriate behavior
3. Daily home reading: does it improve concepts of print?	Six kindergarten students and their parents	Pre-tests and post-tests	Home-school partnerships positively influenced student success.	Teacher will maintain program with students.
4. Second-language literacy development teaching strategies for ESL and all-English classrooms.	Two first-grade Spanish-speaking students in ESL and regular classrooms	Observation; behavior checklist for teacher in each classroom.	First-grade teacher and ESL applied most of the L2 teaching strategies on behavioral checklist. Advantage of ESL class is low student-teacher ratio.	ESL teacher should join regular classroom for instruction in the regular classroom.

9. Transition students: How do they apply L1 strategies to their L2 writing?	Ten fourth-grade transition students, all native Spanish speakers; five transitioned at the beginning of third grade, five at the beginning of fourth	Student writing samples (dialogue journals) were analyzed.	Both first and second year transition students regularly employed strategies from L1. They all made progress toward acquiring rules in their L2	Students should be given the opportunity to use all resources available as they learn to read and write in their L2.
10. The gift of time: results of an early transition program.	Nine sixth-grade students who transitioned to all English instruction (from Spanish) in the second grade	Pre-test of reading abilities in English. Review of English writing samples. Interviews. Review of Idea Proficiency Test scores in English and students' cumulative records.	While some students successful others are struggling. Only three are biliterate in English and Spanish.	Questions effect of transitional programs that push students into all English instruction at an early age.
11. An examination of collaborative learning through an authentic language arts activity.	Eleven fifth and sixth grade Gifted and Talented Education students enrolled in one-week Winter Break Play Production Workshop	Student self-assessments of strength; pre-workshop and post-workshop.	After the workshop students shifted beliefs about strengths. More felt they were capable writers.	Teachers should use collaborative learning strategies.
12. The effect of dialogue journal writing on essay writing.	Two students, one aged 16 and one aged 17 from a class of nine at-risk youth who are high school drop-outs and economically disadvantaged. One bilingual student and one English-only student	Examination of writing samples (dialogue journals and essays) over five-week period.	No major improvements were seen in post-essay, but there were attempts to make the essays more interesting and more 'essay-like.' Journal entries increased in length.	Essays need to be examined more carefully; more time is needed to identify change.

13. What would a survey to US publishers reveal about trends in the publishing of children's books in Spanish in the next decade?	30 publishers	Survey	Publisher responses varied but most predict a growth in the area. Publishers cite marketing, distribution and effective translation as problem areas.	If children are to learn to read and write in the L1 there is a great need for primary language books.
14. Daily journal writing: How does it improve emergent writing skills and print awareness for bilingual learners?	Six bilingual (Spanish and English) K students	Observations. Examination of three writing samples (for both modeled writings and journal writing) for each student over five weeks	4/5 students improved in directionality, message representation, syntax, message meaning and graphophonics in journal writing but did not show progress in modeled writing.	Journal writing in K facilitates writing growth.
15. The relationship between phonemic awareness level and developmental spelling stage in first-grade students.	Eight first-grade students, four most proficient and four least proficient readers (all native English speakers)	Assessment of phonemic awareness assessment of spelling level	There was a range in phonemic awareness levels between most and least proficient readers (differences on tasks ranged from 35% to 77%).	Teachers can and should help students to develop phonemic awareness.
16. Phonemic awareness and reading development: Is there a relationship?	Six second-grade students, two proficient, two moderately proficient and two non-proficient readers	Used two student assessment tools: running records and phonemic awareness assessment	Proficient readers had little trouble reading texts; moderately proficient readers had more trouble making sense of the texts; the non-proficient readers had most trouble with the text.	There was a relationship between phonemic awareness and reading.

Table II. Summary of inquiry projects for selected participants.

Becoming Teacher Researchers

The most novice participants in terms of research experience initially demonstrated a discomfort with the notion of conducting research, feeling that the role of the researcher did not apply to them. All teachers consistently expressed doubts that they would be able to make generalizations from their own findings, and felt that their research was not as important as that undertaken by 'real researchers.' But after reading several articles related to teacher research (e.g. Cochran-Smith, 1995), papers written by teacher researchers and engaging in many discussions about the important perspectives that teachers bring as 'kid watchers' (Goodman & Goodman, 1990, p. 236) and insiders to the process, most of the teachers began to settle into their own burning questions.

It is interesting to note that the more experienced teachers had an easier time initially coming up with a burning question, while the novice teachers struggled to find questions they deemed important. Some of the novice teachers came up with questions that were so vague as to be almost impossible to explore effectively. For example, Ed stated, 'I wanted to research what I did on a daily basis and see if it actually worked.' Working in a group with others helped him refine his question into a more manageable one related to specific software he used in the classroom. Experienced teachers were generally more certain that the issues they chose were important. This may be a function of a more complete comfort and understanding of the nature of their role as teachers.

The teachers in our sample often questioned the tensions between objectivity and subjectivity. They worried that their insider perspectives would influence their findings, although they also acknowledged the benefits of those perspectives. We continually worked on defining both objectivity and subjectivity and their relationship to 'good research.' The teachers also expressed concern with the small number of subjects they were examining and worried about generalizability. It is important to note that the teachers wanted their papers to resemble published research. They questioned their own biases and even, at times, regarded their own findings as unimportant. One teacher even indicated that her work was flawed within the text of her written paper, even though this particular teacher generated results that directly impacted one of her students. During her inquiry regarding the benefits of a pull-out ESL program she uncovered the fact that one of her students had been misplaced in the program since he was a native English speaker. As a result of her inquiry he was then correctly placed in a reading remediation program, which better met his needs. When we discussed the importance of her findings she was still unconvinced about her own work.

During weekly class meetings the teachers in our sample consistently reflected on the process of research and its impact on practice. One teacher noted, 'I am more aware of watching what and how my students do something in the classroom.' They expressed frustration with the research process, especially the lack of time for both teaching and research. This lack of time was most obvious in relation to data collection duties such as taking and transcribing field notes. They often asked if it was necessary to transcribe all the field notes, as this seemed such a demanding task. One teacher complained, 'the most frustrating aspect has been finding time to clearly write down my thoughts'

The teachers also reflected on their own emerging findings. They voiced a concern with the role of the 'researcher' and the desire to 'correct' or 'fix' problem(s) present in

their classrooms. They used their findings to change their own classrooms, e.g. employing new strategies or intervening with individual students. They began to question their roles as change agents in terms of their schools and/or districts. One teacher continued her work on exposing racism in her school district by expanding her inquiry project into her MA thesis. She began the course as an experienced teacher with limited research experience and quickly became more expert in her research, observing classes, examining test score data as well as district program data and teacher surveys. Her work not only changed her own role as a teacher, but also made others begin to ask questions at a district level. She challenged the notion of teacher as receptacle for other people's knowledge (Cochran-Smith & Lytle, 1999) and began to work toward effecting change within her district.

Along those lines, the teachers in our sample also demonstrated a discomfort with certain aspects of the role of the researcher. Many felt that they were invading their subjects' privacy by asking questions and observing. Fortunately, with the passage of time the teachers began to feel more comfortable with this aspect of research. Others felt that they were discovering too much information about their subjects, schools and/or districts and that this knowledge jeopardized their own comfort levels. This discomfort was clear in the aforementioned example regarding district racism. Table III summarizes the struggles that the participants encountered as well as the sources of those struggles.

As instructors in the courses we offered a variety of support mechanisms to help the teachers with their struggles. These support mechanisms emerged from the classroom setting and were infused into the data collection. Support was ongoing throughout the semester for each course and included our responses to teacher reflections, both during discussions and in 'mini-lessons' on issues of methodology, validity, reliability, subjectivity, and objectivity. We consistently modeled research procedures in instruction and brought in a variety of articles/studies by teacher researchers to serve as models for the participants. We responded in writing to early drafts of papers and provided time for the teachers to discuss and think about their inquiries during class. These support activities took place weekly, in each of the courses. We further modeled data collection during our peer observations and shared field notes from those observations as well as other data collected in classrooms with the teachers in our courses demonstrate as much questioning in this area.

Struggle	Category		
	About the research	About themselves as researchers	From others
Opposition by other teachers at the school site			X
Being explicitly asked by other teachers to stop worrying about things that 'don't really matter'		X	X
Ideas and/or questions ignored and/or dismissed by site administrator	X		X
Doubting their own ability to conduct an inquiry that matters	X	X	
Encountering difficulty in analyzing what they really wanted to know or investigate in order to develop more specific questions	X	X	
Difficulty in narrowing the focus of questions	X	X	
Not knowing what they really <i>knew</i> or not being able to articulate what they really knew	X	X	
Not trusting that they knew what they knew		X	
Questioning how to analyze and think about their teaching while teaching		X	
Not having enough time to analyze and discuss personal development as well as student development	X	X	
Not having enough time to collect data	X	X	
Not having enough time to analyze data	X	X	
Criticizing their own research as not <i>looking like real research</i> : comparing their work to published studies	X	X	
Issues of subjectivity vs. objectivity: seeing problems through their own perspectives while considering the perspectives of other at their schools and the roles these others played	X	X	X
Infusing reliability and validity	X	X	
Addressing issues within the context of acceptable school practice	X		X
Choosing the right data collection methods	X	X	
Developing research tools (e.g. surveys)	X	X	

Table III. Struggles that the teachers encountered during inquiry.

It is interesting to note that more than 50% (23) of the teachers began this questioning from a very tentative position. A further observation is that the bilingual teachers were more open in their questioning and challenging, perhaps due to political constraints in place during the time they were participating in the inquiries (see Ulanoff & Vega-Castaneda, 2003a, b, for a more complete description of the sociopolitical context of bilingual education in California during this time). These constraints were already causing them to challenge instructional mandates.

The teachers were also concerned with their personal knowledge and context (both in a cultural context and in the context of practicing teachers) and how this is reflected in

the analysis, and, more importantly, what this means for teaching. As they came to view themselves as teacher researchers, they began to ask more questions about policy and practice. For example, some teachers began to 'see' how issues of power in the classroom context can include some students and disengage others. Some also questioned the design and approach to teaching and curriculum development at their own school sites.

Critically, though, as their work neared completion, teachers began to better understand their roles as teacher researchers. One stated, '[I am] starting to view myself as a valid researcher ... I feel the classroom teacher is the person who should be doing the research. It makes sense.' While most teachers ended up with more questions at the end of the project than at the beginning, all reflected on the importance of research in their practice.

Developing an Inquiry Ethic

Examination of data collected from teachers in the three courses suggests that, as teachers engage in inquiry projects as a means of becoming teacher researchers, there are a variety of dimensions that inform the development of an inquiry ethic. Nine dimensions emerged from the data that serve to describe processes that teachers engage in as they come to see connections between course content and their own practice (see Table IV). These dimensions are: questioning, initiation, engagement, reflection, reaction, action, understanding/acceptance, proaction and engaging their own students in research. While our initial intent was to examine these dimensions as part of a taxonomy for developing an inquiry ethic, close examination of the data indicates that these dimensions, while forming a framework that helps to define/describe the inquiry processes, are neither hierarchical nor exclusive in terms of how teachers come to understand the relationship between theory and practice.

As teacher researchers begin to take ownership of the research process and come to understand connections between research and what they do as teachers, they begin to struggle with the tensions that exist between theory and practice. Upon examining the data it became clear that the teachers in this. In each of the courses teachers began to question their own belief systems and uncover 'their implicit assumptions about teaching' (Cochran-Smith & Lytle, 1999, p. 16) based on their own observations. This was more apparent with the experienced teachers who began to question curricular and programmatic choices that they had long accepted. Novice teachers were most likely still developing their own belief systems vis-à-vis teaching and learning and did not study were acting on their own emerging notions of inquiry as they explored the answers to their questions.

Examining the Dimensions of an Inquiry Ethic

In this section we will examine each of the dimensions that emerged from data analysis and give examples of how the teachers in our courses engaged in some or all of the dimensions. Many teachers exhibited more than one dimension at any given time. We will attempt to conceptualize this actualization of an inquiry ethic throughout our discussion by using examples from reflections, inquiry papers and survey responses. Table IV lists and describes the nine dimensions of developing an inquiry ethic that emerged from the data.

	Description	Struggles	Examples
Questioning	Teachers begin to question their own practice.	Conflict with teaching peers regarding curriculum and instruction.	Critiquing mandated curriculum.
Initiation	Teachers begin to learn the research process and its applicability to understanding and changing classroom practice.	Learning how to narrow the focus of their questions; difficulty in choosing appropriate means to examine questions.	Refining questions. Choosing and developing instruments
Engagement	Teachers begin to engage in the research process within their own classrooms (or those where they observe).	Doubting that they have the skills/tools to conduct their own research.	Examining student artefacts. Selecting appropriate methodology.
Reflection	Teachers reflect on the process and product of their own research.	Not knowing what they really know and how to describe what they know. Learning how to analyze their own development and accept their own knowledge as important.	Informal and formal reflections. Inquiry-specific questions.
Reaction	Teachers react to their findings by initiating change in their own classroom.	Administration and peers ignoring ideas and questions.	Implementing strategies based on findings.
Action	Teachers begin to use their findings to influence decision making at their school sites and districts.	Resistance from other faculty and from administration.	Serving on school-wide committees. Developing curriculum.

Understanding/ Acceptance	Teachers begin to see the role of the processes and products of research in guiding their own practice.	Limited time to analyze their personal development as well as their students' development. Lack of support from peers. Examination of issues and changes from multiple perspectives.	Using findings to generate more questions.
Proaction	Teachers begin to use research as a means of implementing curricular change both in their own classrooms and in the larger school context.	Accepting the validity of their own research and their ability as a researcher	Becoming active at district and state levels.
Engaging their own students in research	Teachers make the connection between their own learning and their teaching.	Resistance from peers and administration. Conflicts with mandated curriculum and instructional methods.	Teachers use inquiry-based instruction.

Table IV. Emerging dimensions for the development of an inquiry ethic.

Learning to Ask Questions

One of the categories that emerged from our data was *questioning*. It was clear that while the teachers in our courses understood the basics of asking questions, they were unsure of how to pose questions that were relevant, important and able to be answered by examining classroom practice in a relatively short period of time. The participants in this study all demonstrated at least the seeds of beginning to question their own practice, but the level of questioning varied from teacher to teacher. The questioning was further influenced by amount of expertise in teaching and researching that each of the teachers possessed.

We asked the teachers to search for burning questions, ones that related to their practice and that would be relevant to their daily classroom life. Many of our teachers told us that they had never been asked to formulate their own questions regarding any aspect of their education, certainly not about their practice. The more novice teachers and novice researchers had the most difficulty posing relevant questions that burned for them and repeatedly asked for more time to finalize questions before moving on. One teacher complained, 'the section I truly need time on is the question. I still wish more time could be devoted to nailing down questions I need research time, thinking and percolating time. *If this doesn't get done early enough a time crunch ensues.*' Within the contexts of our classes, the more expert teachers and researchers were able to share their questions and facilitate the questioning process for the more novice teachers.

An example was Elaine (all names are pseudonyms to protect the confidentiality of the teachers in our sample), who wanted to know whether her kindergarten class could meet the needs of her English learners. Elaine had been teaching for a little more than five

years when she participated in the ESL literacy course. She stated, ‘my intuition told me María was better off staying in my classroom rather than being pulled out each day in the middle of an activity.’ This intuition meant she would have to challenge the current policy and program in her school so she was not willing to make an argument based solely on intuition. After an extensive review of the literature, observations of the ESL program and an analysis of her own program she came to the conclusion that her intuitions were correct.

The teachers in our courses struggled with the questioning process, even questioning about questions, as they began to engage more actively in the inquiry process. This dimension took the teachers from their initial big ideas or broad questions through the refinement of the questions and then to choosing appropriate tools to answer the questions. We supported the teachers with the questions during whole-class and small-group discussions, through minilessons and conferencing and with demonstrations and written comments on their drafts. Table V summarizes elements of questioning and the support we offered teachers in this dimension.

	Description	What it looks like	Support mechanisms
Big ideas	Many ideas related to the area of concern are generated during class and group discussions.	Students are unsure of the questions themselves and consistently look to instructors for the answers.	Written reflections Mini-lessons Modeling Sharing questions Group discussion
Broad questions	Students begin to ask questions that address multiple issues. Multiple questions are generated to address all of their concerns	Students ask questions that are relevant, but huge in terms of research scope. Students ask questions they may not be able to answer in their own classrooms.	Group sharing Reading inquiry papers as models Mini-lessons Conferencing Written response
Probing to clarify	Probing questions for support are needed to help students focus on exactly what it is they want to know, given the multiple questions they have asked	Questions include: If you ask that question, what kind of information will you get? Will you need to know more? How will you get that information? What question will you ask?	Mini-lessons Demonstration Written response Modeling Sharing papers

Refinement of question	Students are asked what they intend to learn about their area of concern, given the questions they are asking.	Students refine questions to one pertinent question after analyzing the type and kind of data received.	Writing groups Modeling Sharing inquiry papers Mini-lessons on data collection procedures
Instrument development	Data collection instrument is developed based on what students want to know; the instrument is refined based on information sought and age of subjects.	Teachers bring their questions to class and discuss how they will answer questions. Teachers try out sample instruments on each other to examine what data will be collected.	Sharing assessments Modeling Conferencing

Table V. Elements of questioning and in-class support.

Initiation

A second dimension of the development of an inquiry ethic that emerged from the data is *initiation*, where teachers begin to learn the research process and its applicability to understanding and improving classroom practice. As the teachers in our courses began to pose their own burning questions, they began to seek out knowledge that would help them answer their questions. Initiation entails understanding how to frame the questions in such a way as to make them reasonable to answer (or attempt to answer). Many teachers initially suggested broad questions that would require their attention and that of a research team full time (e.g. which is the best bilingual methodology?) and as we began to talk about the research process they came to understand that given the time and personnel constraints (since none of them had release time from teaching or a large budget to hire additional personnel) they needed to more narrowly focus on specific issues in their own classrooms and/or school sites. In a sense, we were asking them to focus at a micro-level of analysis.

Some teachers initially intended to interview 50 or more students or observe dozens of classrooms. As they became more familiar with a variety of data collection strategies and what they each entailed, they were able to focus on questions such as, ‘Why does student A read better than student B?’ or ‘What reading strategies will help student C to improve on retellings?’ As they learned more about the research process they revised their questions so that they were both manageable and measurable. The teachers also came to understand that they could do purely descriptive research, rather than compare two or more groups, if they so chose.

Susan examined several guided reading strategies in her third-grade classroom to find out if there was any ‘best practice’ for second-language learners. Initially, she wanted to look at the data from her whole class, all second-language learners, as she engaged her students in three different guided reading lessons, each incorporating a different strategy. Given both the variety of reading levels and language proficiency levels in her class, she finally settled on examining data from a group of four students who had recently transitioned (changed over) from Spanish reading instruction to English reading

instruction. When asked what was most difficult about conducting her study, Susan responded, ‘narrowing down my question.’

Engagement

The dimension of *engagement* is where teachers participate in the research process within their own classrooms (or those of their master teachers). As the teachers began to collect data they were able to describe their classroom settings in very specific terms. Furthermore, as they observed, interviewed, surveyed and collected student artifacts including work samples and test scores, they began to question what was taking place. Teachers began to ask more questions and searched for more ways to answer the ones they had already asked. The research projects were constantly undergoing revisions as questions changed, were supplemented or even abandoned and replaced.

Teachers also interacted with their peers during whole-class and smallgroup discussions. They used discussion time to tap into the expertise of their peers and also became more confident about sharing their own knowledge regarding practice (Teitelbaum & Britzman, 1991). It is important to note that both the novices and more expert teachers helped each other. The novice teachers, who graduated recently from the teacher credential program at our institution, learned a variety of strategies and methodologies that were new to some of the more experienced/expert teachers. They also had access to different resources that they were able to share with the more expert teachers. As novice teachers, essentially newcomers to the field, they had different, less ‘insider’ perspectives that they brought to the task of teaching. This may have led them to be able to see/discuss things that the more veteran teachers took for granted. Minerva shared that ‘I am more aware of watching what and how my students do something in the classroom.’ She specifically talked about her own findings related to the relationship between phonemic awareness and success in reading that she noticed with her first-grade students. She also commented, ‘being a teacher gave me the opportunity to conduct research as an insider,’ acknowledging her teacher as researcher status.

Furthermore, those that had engaged in prior research projects were able to facilitate the task of narrowing the questions and selecting appropriate research methodology (see Table V). At the same time, the more expert teachers were able to share both their wisdom and experience in the field in terms of pedagogy and teaching. The teachers took an active role in the discussions and the course instructors served to facilitate and assist where needed.

Reflection

Reflection is the dimension where teachers reflect on the process and products of their own research. Reflection is ongoing throughout the development of an inquiry ethic and often takes place alongside one or more of the other dimensions of an inquiry ethic. The teachers in our courses continually reflected on their work (and on their practice) in a variety of ways. As previously mentioned, weekly whole-class and small-group discussions served as a venue for reflection throughout the semester. Teachers also were asked to complete informal reflections and shared these during whole-class discussions throughout the course of the projects. Teachers completed formal reflections twice during the semester in order to examine the processes that they were going through as they

engaged in research. Furthermore, some classes had access to a listserv and teachers consistently engaged in dialogue with the entire class throughout the semester (one group maintained the listserv even after the class was over) and all teachers had access to the instructors (and each other) through email.

Teachers were continually encouraged to question the process and product(s) of their research. Process questions included: 'What do I do with all this data? How do I decide what is significant and what is not? How can I identify possible patterns? What should this assignment look like?' Teachers also asked questions specific to their own inquiries. Susan, the teacher previously described who conducted the study on guided reading for secondlanguage learners, provides an example. At the end of her study she was able to make suggestions for her own practice, arguing that 'the strategies that work best in a guided reading lesson for second language learners are those that will provide scaffolding needed for comprehension.'

Reaction

During *reaction* teachers react to their findings by changing their own classroom practice. Many teachers in our classes demonstrated this dimension of the development of an inquiry ethic by their attempts to implement curricular change as well as organizational change. For example, Sylvia examined the impact of cooperative groupings on English learners in all English instruction at the fourth-grade level. She found that 'academically each student was challenged to work up to and beyond his ability. Learners were involved in reading, writing, and speaking in the language that they prefer and each made advancements in second language development.' Her findings led her to see the benefits of cooperative groupings for all students and to change her classroom structure some of the time to include such groupings. The previously mentioned teacher who examined the impact of a pull-out ESL program on her English learners had her research supplemented by another teacher who examined what was going on during those pull-out sessions.

Together the two teachers felt that their research demonstrated that the students would be better served by remaining with the classroom teacher instead of attending the ESL sessions. The classroom teacher then worked to end the students' participation in the ESL program. Three teachers worked together to examine the impact of the use of realia in developing sheltered English lessons for their second-graders. They developed a unit on whales and were so impressed with their students' English vocabulary development that they worked together to create similar curricular units and integrate them into their instruction.

Action

In *action* teachers begin to use their own findings to influence decision making at their school sites and districts. Several of our teachers began to take leadership roles in their schools/districts, notably the teacher who moved into the bilingual specialist position and the former school board member who became quite a presence at both her school and at the district level. Others demonstrated leadership by leading curriculum development teams, becoming bilingual lead teachers and serving on district committees. One

bilingual teacher worked on his administrative credential concurrent with his MA and during the course of his studies served as acting vice-principal at his school.

While it is not possible to ascertain the direct link between their research and such decisions, relationships can be seen. In the aforementioned example of Rebecca, the teacher who in her inquiry project and thesis attempted to expose racism in her district, the link was obvious. In fact, in her reflection on the process of inquiry she stated, 'I am concerned about the inequities I see as a classroom teacher as they pertain to second language learners and poor children in general [I want to know] how to change a system that is controlled by the more affluent white population that resists change at all costs' In addition to her thesis she presented her findings to her district and also at national conferences.

Joan studied absenteeism among middle-school students at her own school and became involved in creating a school-wide solution to the problem. Sarah explored the impact of three state-adopted ESL programs and was instrumental at the school site level in the decision of which program was chosen, arguing that 'all teachers need to experiment with different methods.' Her findings were also considered at the district level. Four teachers worked together to examine characteristics of successful bilingual education in one district. Their findings were considered during the writing of the district-wide plan for the instruction of English learners.

Understanding/Acceptance

As they engage in this dimension, teachers begin to see the role of the process/product(s) of research in guiding their own practice. This is a critical element in the development of an inquiry ethic. It is within this dimension that teachers begin to use research for their own benefits and choose to ask questions regarding their practice. It is important to note that we tell our teachers from the beginning that reflective practice necessitates the constant use of inquiries into practice in the classroom, but that teachers are often unaware that they are even posing questions. The development of an inquiry ethic presupposes the active knowledge that one is inquiring/posing questions as well as the active engagement in some form of the research process. What is usually missing from this reflective process, though, is the formalization of the question, methodology and examination of findings.

While not all teachers that we worked with in our courses demonstrated understanding/acceptance, there were several who were beginning to ask challenging questions. For example, Roberta chose to question the benefits of class size reduction in California, asking difficult questions related to implementation and impact on student achievement. Three teachers worked together to explore the implementation of Proposition 227 (California legislation passed in 1998 that restricted bilingual education in California) at one school site. It is interesting to note that engagement in understanding/ acceptance often became obvious much later during the students' thesis proposal writing course. More than half of the participants (27) came to that class with preliminary findings related to questions they had already been asking in their classrooms as a result of the three courses examined in this article, and developed these questions into thesis topics.

Proaction

In *proaction* teachers begin to use research as a means of implementing curricular change both in their own classrooms and in the larger school context. Within this dimension teachers often become curricular leaders, engaging and working on task forces, curriculum development teams and staff development teams. Many of the teachers in our classes presented workshops in their districts or at the county level. Four teachers developed classroom presentations that were used in our teacher education classes at the university. Many of the teachers in the group either were or became district mentors and used their research findings to share their expertise and guide curriculum and staff development. Others like Cathy, who announced, 'I will become more active and less passive in political issues re: Bilingual education,' sought different ways to become proactive.

Teachers in our classes also began to see the importance of their work as researchers and the significance of teacher research in general. Alex commented, '[I am] starting to view myself as a valid researcher *We are* the experts. I'll be returning to the classroom with more confidence in my knowledge.' This supports the notion that as teachers become teacher researchers and engage in reflective practice, they begin to take ownership of the research process (Teitelbaum & Britzman, 1991) and thus engage in their practice in a more informed manner. While several of the teachers devalued their own findings (for example, Jeanette stated, 'although superficially this study would seem to be somewhat valid, it is the researcher's opinion that it holds little educational value'), this attitude came most often from the concern that their research was not scientific in nature. Alex, who stated above that she would have more confidence, also questioned, 'Will other people feel the same way I do after they read my inquiry?'

Engaging their Own Students in Research

In this dimension teachers make the connection between their own learning and their teaching. In other words, they use inquiry-based instruction in their own classrooms. As teachers become teacher researchers they come to see the benefit of having burning questions guide learning. It has long been said that teachers teach the way they themselves have been taught. Part of the perhaps hidden agenda of guiding teachers to become teacher researchers is changing the way we are teaching teachers, so that they might make that classroom connection. We consistently encouraged our teachers to attempt inquirybased instruction in their own classrooms and shared examples of such instruction throughout our courses (Cochran-Smith, 1995). James, a high school teacher with about six years of experience at the time that he took the research methods course, reflected, 'the inquiry project *is* what I do in class. This is a micro look at what happens in my class.'

Several of the teachers in our courses began to see the connections between their inquiry projects and their own teaching in ways that looked beyond the contents of their studies. Noel reflected, 'one connection I see is that sometimes when I give out assignments I expect everyone to get started right away because I already have an idea in my mind of what I want them to do, *but* they may not.' While this is not indicative of engaging her own students in inquiry-based instruction, it does demonstrate how she started to look at her own inquiry process in relation to the learning of her students.

Other teachers we worked with talked about giving students choices during instruction, but also complained about district constraints on their teaching.

Pondering the Dimensions

The dimensions that emerged from our data are one way to describe the process through which teachers go as they become teacher researchers and develop an inquiry ethic. In this section of the article we reflect on our work with teacher researchers as they develop an inquiry ethic. Too often teachers are not exposed to the possibility of becoming researchers or of developing an inquiry ethic. They think of research as something foreign to their practice. We wanted to engage our teachers physically as well as cognitively in their learning. We wanted them to conduct research in their own classrooms in order to look at practice with different lenses, to see the possibilities in examining and reexamining student work from the stance of a burning question.

Within the framework of the dimensions of developing an inquiry ethic, we describe *understanding/acceptance* as the dimension where teachers begin to see the role of research in their own practice. We wanted the teachers in our courses to reflect on and verbalize concerns that they had in their heads about teaching and learning in order to help them make such connections. We wanted them to ask questions based on the knowledge that they had and to begin to have trust in that knowledge. Understanding/acceptance is also used to support interaction between teachers to clarify what they know so that they begin to have a sense of ownership in terms of their own knowledge (Shulman, 2002).

As they moved toward developing an inquiry ethic, we wanted the teachers in our classes to commit to research as a habit of mind. That is, we wanted them to move beyond talking about what was wrong with students and what went wrong with lessons to asking why what they did as teachers did not always work as well as they had expected. We felt that once teachers had the time to question, discuss and reflect they would act as a result of what they learned in their inquiries. We also hoped they would become committed to inquiry as a way to learn about themselves and their teaching as well as how to involve their own students in inquiry as a learning process. As they engaged in their inquiry projects they would come to an understanding of their own work: whether they asked the right question, whether the data they gathered really informed them as teachers, what they should have done instead.

One theme that consistently emerged from our data and is a cornerstone of both our work with teachers and of the development of an inquiry ethic is reflection (Schön, 1983; Zeichner & Tabachnick, 1991; Patterson & Shannon, 1993). For us reflection entails looking back on what one does, analyzing why one does what one does and critically thinking about the results in light of what is being explored. The consequence of actions taken is central to reflection. Reflection leads to reexamination and eventually to what Shulman (2002) calls 'judgment and design' (p. 8). Critical reflection is a necessary component to help teachers move and engage in the various dimensions of their inquiry ethic. In the reflection process, it is important to help teachers pause, think about and see their work differently – to ask questions about their work and the context in which they practice.

While our study does not focus on judgment or commitment (Shulman, 2002), these factors are deeply embedded in our notion of an inquiry ethic. We wanted the teachers involved in inquiry to exercise judgment about the questions they generate and apply that understanding to the design of their inquiries. And finally, we want teachers to develop commitment to an ethic of constant inquiry about their practice and student learning. We hope they internalize the values associated with asking questions and develop the character to become teachers who can change the face of teaching in ethical and responsible ways. We believe that the dimensions of developing an inquiry ethic support teachers in seeking new questions and finding new understandings. And that is what we want for our teachers, for all teachers, and for their students.

Developing an Inquiry Ethic and Its Relevance to Practice

As we continue to work with teachers, we feel it is important to formalize some of the practices that we use in our teaching to support the development of an inquiry ethic. Table VI describes some of the challenges that we face as instructors and the activities we use to guide our students through their development as teacher researchers. These activities are used throughout the semester and often in more than one class, so that students in any one class have varied experiences as researchers. For example, in one seminar course in reading research the students are engaging in collaborative research projects in order to share expertise.

Challenge	Dimension	Course and school activities	Products
Examining burning question	Question	Use of reading/ writing	1. List of research
	Initiation	workshop to:	questions
	Engagement Reflection	– examine existing teacher research – brainstorm burning questions – read ongoing projects. Read and discuss published research. Discuss elements of research. Mini-lessons on research methods in the context of teachers' burning questions.	2. Article analyses 3. Written reflections and/or journal entries
Designing and conducting inquiry projects	Initiation	Mini-lessons on research	1. Article analyses
	Engagement	methods.	2. Methodology
	Reflection	Use of reading/ writing	worksheets
	Reaction	workshop to: 1. examine components of existing research and teacher research including literature review, methodology, data analysis, findings and conclusions; 2. complete methodology worksheet, which lists setting/ sample, data collection and analysis procedures; 3. share in-progress work for feedback.	3. Feedback comments from peers 4. Written reflections and/or journal entries

Examining results and initiating change	Engagement Reflection Reaction Action	Mini-lessons on critiquing existing research. Use of reading/writing workshop to: – share in-progress work for feedback and suggestions; – examine findings; – revise and edit; – discuss classroom applications.	1. Article analyses 2. Feedback comments from peers 3. Student drafts
Becoming a teacher researcher	Reflection Reaction Action Understanding/ Acceptance Proaction Engaging their own students in research Questioning	Classroom discussion on existing research. Sharing of inquiry projects. Teachers begin to engage in research ‘acts’ by: – critiquing published research; – attending and/or submitting proposals for conference presentations; – developing thesis proposals; – using inquiry-based instruction in their classrooms.	1. Article analyses 2. Draft and/or final papers 3. Feedback comments from peers 4. Conference proposals 5. Thesis proposals
Embracing an inquiry ethic	Understanding/ Acceptance Proaction Engaging their own students in research Questioning	Teachers present their work at conferences. Teachers write grant proposals to continue their research in order to: – challenge existing constraints; – question existing practice; – make changes based on their own research; – view inquiry as a mode of instruction.	1. Conference proposals and/or presentations 2. District workshop presentations 3. Grant proposals

Table VI. Addressing the development of an inquiry ethic during instruction.

Notice that there is not one specific activity to address each dimension; rather, the activities span a variety of dimensions and address challenges that the teachers face when engaging in research. For example, at the beginning of each course, the teachers work in groups to both examine existing teacher research and decide on their own burning questions. They meet in groups in a reading/writing workshop format. In these groups they read, discuss and brainstorm possible questions to explore as well as discover how to go about collecting data to answer their questions. Since students bring different experiences to the groups, they can share both previous inquiry projects and their insider knowledge as teachers. As the instructors we teach mini-lessons on different aspects of research, in the beginning broad lessons on kinds of research. Later on in the semester, as students are further along in their projects, the mini-lessons consist of ‘nuts and bolts’ topics that help students with the intricacies of data collection and analysis.

Throughout the project we ask the teachers to share their ongoing work within their reading and writing workshop groups. This sharing generally happens on a weekly basis along with the mini-lessons and the examination of different components of completed papers. Our mission is often twofold, that of nurturing the evolving inquiry ethics of our students, while also facilitating their writing. By the end of the course we naturally expect

the teachers to produce research papers. We also hope that as they inquire, explore, discuss and share their work they are beginning to engage in ‘research acts’ outside of the framework of the course assignments. We also hope that they move toward implementing an inquiry-based curriculum with their own students.

Therefore, it is important that we continue to explore the relationship between theory and practice and its application to teacher education as well as the processes our teachers employ and the products they generate in terms of their own examination of practice. We, too, engage in inquiry as we look at such relationships. As we examine our own practice of exploring the development of an inquiry ethic, the thing that is most certain is that the dimensions of an inquiry ethic are themselves dynamic and evolving. As we examine the connections between theory and practice as well as the continual struggle the teachers in our courses go through, we come to better understand the complex relationships that develop when teachers become active researchers and inquirers.

As we reflect on the work we did with the teachers in our courses, we have questions about both the practices that encourage and support teachers’ inquiry and also the struggles they will continue to encounter as their inquiry ethics evolve. Fecho (2003) suggests that there exists a ‘double jeopardy of practitioner research’ and argues that practitioner researchers, and in this case the teachers in our courses, often have both their practice and their research examined critically by those to whom they are held accountable (p. 284). Given the diversity in terms of years of teaching experience, this scrutiny could lead to adverse consequences, especially for those teachers who were untenured at the time of the study.

Within the context of our courses and our teacher inquiries, we encouraged the teachers to take a sociopolitical stance in terms of questioning practice. But we have learned from experience that teachers are often expected to be submissive to their superiors. Typically, districts employ a top/down model; that is, those in authority (superintendents, assistant superintendents, directors, site principals, mentor teachers) are thought to have the knowledge of the recent research that is disseminated many times by the State Department of Education and/or by publishers of state-adopted texts. Teachers are treated as consumers of information and not typically as initiators of action unless told to do so by someone in authority. Thus, teachers often find themselves in a culture that does not look kindly on questioning procedures, curriculum or the system itself and are often victims of silencing (see Collaborative Action Researchers for Democratic Communities, 1997, for discussion on one district’s attempt to control teacher talk and actions).

Many times experienced teachers respond to those who ask questions in the same way that those in authority respond to them. Those who ask questions can find themselves without support for their ideas – isolated, ignored or chastised many times. For example, one teacher, Ellen, who examined the impact of early transitioning from Spanish to English instruction and found that her students had ‘lost’ their ability to read and write in Spanish, was asked *not* to present her findings at a state conference. Another teacher, Jessica, who became openly hostile to the effects of her district’s elimination of primary language support for students in her kindergarten class, was suddenly told she would be teaching at the middle-school level during the next school year.

Conversely, there are also positive personal consequences for teachers when they realize what they have learned about their students and their own practice. Teachers may find themselves either isolated or surrounded by a small group of others who believe in what they are doing or who are also engaged in conducting inquiries in their classrooms, but they are rewarded by the successes in their classrooms. Over time, students' positive responses to teacher practices are spread by word of mouth, especially in secondary settings. Others may inquire about what is different in the practice of the teacher who has developed an inquiry ethic. In our own practice, we need to think of ways to support teachers who practice inquiry so that they continue to ask questions. Fecho (2003) asserts that 'for the practitioner researcher the practice of one's pedagogy and the practice of one's research transact in complicated and powerful ways' (p. 284).

This transaction between research and pedagogy guides us as we continue on the path of inquiry-based instruction for the teachers with whom we work. If we truly believe that there is a connection between theory and practice, it is critical that teachers in the field understand that connection and also understand the role that they have in terms of examining their own practice in order to impact education. Teacher researchers have the obvious advantage of having practice unfold before their eyes on a daily basis. As they begin to develop an inquiry ethic they come to take a more active role in understanding what constitutes good practice and why. Teacher researchers truly examine practice through multiple lenses. Their research can only facilitate their growth as practitioners and the way they themselves engage the students they teach. As they begin to perceive themselves as teacher researchers, they have the potential to make an even greater impact on the field of education.

Correspondence

Sharon H. Ulanoff, Division of Curriculum and Instruction, Charter College of Education, California State University, Los Angeles, 5151 State University Drive, Los Angeles, CA 90032-8142, USA (sulanof@calstatela.edu; sulanoff@speakeasy.net).

References

- Cochran-Smith, M. (1995) Color Blindness and Basket Making are Not the Answers: confronting the dilemmas of race, culture and language diversity in teacher education, *American Educational Research Journal*, 32(3), pp. 493-522.
- Cochran-Smith, M. & Lytle, S.L. (1990) Research on Teaching and Teacher Research: the issues that divide, *Educational Researcher*, 19(2), pp. 2-11.
- Cochran-Smith, M. & Lytle, S.L. (1993) *Inside Outside: teacher research and knowledge*. New York: Teachers College Press.
- Cochran-Smith, M. & Lytle, S.L. (1999) The Teacher Research Movement: a decade later, *Educational Researcher*, 28(7), pp. 15-25.
- Collaborative Action Researchers for Democratic Communities (1997) A Fairy Tale about Teacher Research in Conservative Times, *Language Arts*, 74(7), pp. 515-517.
- Fecho, B. (2003) Yeki bood/Yeki na bood: writing and publishing as a teacher researcher, *Research in the Teaching of English*, 37, pp. 281-294.

- Goodman, Y.M. & Goodman, K.S. (1990) Vygotsky in a Whole-language Perspective, in L.C. Moll (Ed.) *Vygotsky and Education: instructional implications and applications of sociohistorical psychology*. New York: Cambridge University Press.
- Hammersley, M. (1994) On Practitioner Ethnography, in M. Hammersley (Ed.) *Controversies in Classroom Research*, 2nd edn. Philadelphia: Open University Press.
- Harste, J. (1993) Inquiry-based Instruction, *Primary Voices K-6*, 1, pp. 2-5.
- Harste, J. (2001) What Education as Inquiry is and isn't, in S. Boran & B. Comber (Eds) *Critiquing Whole Language and Classroom Inquiry*. Urbana: National Council of Teachers of English.
- Huberman, M. (1996) Moving Mainstream: taking a closer look at teacher research, *Language Arts*, 73, pp. 124-140.
- McFarland, K.P. & Stansell, J.C. (1993) Historical Perspectives, in L. Patterson, C.M. Santa, K.G. Short & K. Smith (Eds) *Teachers are Researchers: reflection and action*. Portsmouth: Heinemann.
- Patterson, L. & Shannon, P. (1993) Reflection, Inquiry, Action, in L. Patterson, C.M. Santa, K.G. Short & K. Smith (Eds) *Teachers are Researchers: reflection and action*. Portsmouth: Heinemann.
- Pérez, B., with McCarty, T.L., Watahomigie, L.J., Torres-Guzmán, M.E. et al (1998) *Sociocultural Contexts of Language and Literacy*. Mahwah: Erlbaum.
- Prado-Olmos, P., Dome, N. & Ulanoff, S.H. (2003) Contexts for Teaching in Diverse Classrooms: examining the reflective narratives of preservice teachers, in *Proceedings of the Hawaii International Conference on Education*, Honolulu, 7-10 January. Available at: www.hiceducation.org/Edu_Proceedings/Patricia%20L.%20Prado-Olmos.pdf
- Rosebery, A.S., Warren, B. & Conant, F.R. (1992) *Appropriating Scientific Discourse: findings from language minority classrooms*. Santa Cruz: National Center for Research on Cultural Diversity and Second Language Learning.
- Schön, D.A. (1983) *The Reflective Practitioner: how professionals think in action*. New York: Basic Books.
- Shulman, L. (2002) Making Differences: a table of learning, *Change*, 34(6). Available at: www.carnegiefoundation.org/elibrary/docs/printable/making_differences.htm
- Stenhouse, L. (1994) The Teacher as Researcher, in M. Hammersley (Ed.) *Controversies in Classroom Research*, 2nd edn. Philadelphia: Open University Press.
- Teitelbaum, K. & Britzman, D.P. (1991) Reading and Doing Ethnography: teacher education and reflective practice, in B.R.
- Tabachnick & K. Zeichner (Eds) *Issues and Practices in Inquiry-oriented Teacher Education*. New York: Falmer Press.
- Ulanoff, S.H. & Vega-Castaneda, L. (2003a) Four Years After 227: what about reading instruction for English language learners? Paper presented at the annual meeting of the American Educational Research Association, Chicago, 21-25 April.
- Ulanoff, S.H. & Vega-Castaneda, L. (2003b) The Sociopolitical Context of Bilingual Instruction in 21st Century California: examining the impact of Proposition 27, in *Proceedings of the Hawaii International Conference on Education*, Honolulu, 7-10 January. Available at: www.hiceducation.org/Edu_Proceedings/Sharon%20H.%20Ulanoff.pdf

Ulanoff, S.H., Quiocho, A., Yaegle, M. & Roche, J. (2000) A Classroom Inquiry into Elementary Students' Notions about Reading, *Teacher Education Quarterly*, 27, pp. 59-68.

Zeichner, K.M. & Liston, D.P. (1996) *Reflective Teaching: an introduction*. Mahwah: Erlbaum.

Zeichner, K.M. & Tabachnick, B.R. (1991) Reflections on Reflective Teaching, in B.R. Tabachnick & K.M. Zeichner (Eds) *Issues and Practices in Inquiry-oriented Teacher Education*. New York: Falmer Press.