Pre-service teachers' thinking on research: implications for inquiry oriented teacher education

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Abstract

Many teacher educators are championing inquiry oriented approaches that ask pre-service teachers to engage in a variety of activities including becoming critical consumers of research and participating in action research. What is largely missing from the literature is a sense of how preservice teachers think about research. This study attempts to fill in this gap, and by doing so considers how pre-service teachers' thinking on research might inform approaches to inquiry teacher education. Our findings indicate that it may be helpful to investigate with preservice teachers *what is research*, to provide student teaching placements that support research as a form of inquiry, and to utilize action research as a bridge to more traditional forms of research. © 1999 Elsevier Science Ltd. All rights reserved.

A quarter century ago the world of educational research was far simpler and straight forward. Educational research was a process of gathering evidence based on strict rules of science to procure facts that would direct innovation and change. Wittrock (1973) captures this view:

> Research involves methodological safeguards that proscribe untested innovations and ideas. There are strict rules to be followed by researchers who would suggest change or alternatives. The ideas and generalizations of

researchers must be subjected to replicable, empirical tests or studies before they can have scientific credence and respectability. (p. 5)

This particular view of scientific research had the distinctive purpose of "convert[ing] the "right" fantasies into facts and to show the others to be the unsubstantiated fantasies they are" (Suppes, 1973, p. 7). A central problem for educational research at this time was one of communication; how to compete successfully with the often persuasively written non-research based articles and books" (Wittrock, 1973, p. 4).

As educational researchers speed into the next millennium, the nature and purposes of educational research have become muddied. Research in some educational circles still is understood as a scientific approach that helps distinguish subjective

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impressions from facts, but more often today research includes an interpretive process based on observations, interviews, questionnaires, and even journals that enable the researcher to draw some context bound subjective conclusions about education and schooling. The purpose of research has expanded beyond fact finding to include reflective inquiry. The problem of getting research to practitioners no longer dominates the landscape. Instead, there is a growing focus on enabling practitioners to engage in research such that "what is known and worth knowing about teaching is related to the practical knowledge possessed by teachers of how and when to act in actual teaching situations" (Cochran-Smith & Lytle, 1993, p. 41).

The dramatic change in the terrain of educational research has sent ripples throughout the educational community including the field of teacher education. No longer is educational research used only as a way to prescribe pre-service and practicing teachers' actions. Instead, an expanding number of teacher education programs have adopted some form of inquiry orientation. Teacher educators championing inquiry-oriented approaches ask pre-service teachers to engage in a variety of activities including becoming critical consumers of research, participating in action research projects, and generally developing a reflective approach to decision making (Day, 1984; Cochran-Smith, 1991; Eliot, 1990; Zeichner, 1994; Tom, 1985; Stenhouse, 1985). In some ways, the cart seems to have been turned upside down. Historically, getting teachers to read and follow research findings was a major priority of many teacher education programs. Today, assessing research, as well as becoming researchers by participating in some form of action research, is fast becoming a central aspect of many programs. Cochran-Smith and Lytle (1993), two strong advocates of teacher research, describe the change in teacher education this way:

> Beginning, as well as in-service, teacher education programs are typically organized to disseminate a knowledge base constructed almost exclusively by outside experts. This means that throughout their careers, teachers are expected to learn about their own profes-

sion not by studying their own experiences but by studying the findings of those who are not themselves school-based teachers … We argue for a different knowledge base, one that is not designed so that teachers function simply as objects of study but also as architects of study and generators of knowledge (p. 1–2).

A common characteristic of inquiry-oriented teacher education programs is a desire to expand research beyond its traditional fact-finding mission, thereby enabling pre-service teachers to become *critical consumers of research* and/or engage in *practitioner initiated inquiry* (Tom, 1985). If this engagement is successful, pre-service students would be expected to develop certain supportive beliefs about research and the role of teachers in the research process. Yet, to our knowledge there has been little, if any, analysis of the relation between an inquiry-oriented teacher education program and pre-service teachers' thinking about research or their changes in beliefs over time. Such an analysis is significant for understanding and improving inquiry-oriented teacher education programs because, as Corporaal (1987) suggests, one of the limits of teacher education programs is that "there is a lack of integration of the theories presented in teacher education courses with the preconceptions of student teachers" (p. 138).

The purpose of this paper is to begin to fill this gap. In doing so, we have three central aims: (a) understanding the impact of an inquiry-oriented program on pre-service teacher thinking; (b) investigating how culture(s) of teaching, development, and program structures intersect with preservice teachers' thinking about research; and (c) examining what that thinking might tell us in terms of alternative conceptions of the relation between knowledge, decision making, and good teaching.

Before moving to the study itself, however, it is important to clarify how we make our way through the complex task of investigating teacher thinking. Initial studies of teacher thinking have been roundly criticized for their lack of attention to context (Mitchell & Marland, 1989). These studies focused on teacher thinking as if these articulations were

simply psychological entities that had little or nothing to do with the working conditions of teachers, the common structures which enabled and constrained teacher actions, or even the influence of teacher culture. In response to these criticisms, recent studies have paid closer attention to contextual analysis, especially prevalent in studies of action research. For example, Gore and Zeichner (1995), in their examination of the possibilities of using action research in a teacher education program, considered how the program context, including its pedagogy and political orientation, interacted with the types of thinking emerging from the students' action research projects. In developing our study on teacher thinking, we tried to account for context by exploring the relation between teacher thinking on research and certain cultural, developmental, and program factors. Raths-McAninch (1993) emphasized the importance of a cultural perspective when she argued that teacher thinking is linked to a larger process of cultural socialization that occurs because of factors such as teacher isolation, the intensification of work, and work incentives. An alternative explanation, also voiced by Raths-McAninch (1993), is teacher development. In particular, she emphasized the argument made by Belenky, Clinchy, Goldberger and Tarule (1986) that women's ways of knowing often fall along the continuum from silence to constructed knowing. Within this view, teachers' thinking on research is linked not only to a structured set of experiences associated with being a woman, but to women's developmental stage, which influences how they see their role in the construction of knowledge. In this paper, we try to incorporate cultural, developmental, and program factors, such as student teaching socialization and placement, to understand why teachers developed a particular set of views.

Another criticism of the teacher thinking literature is that it has been reductionist, accepting theoretical knowledge as valid while rejecting practical knowledge (Carlgren & Lindblad, 1991). Developments in recent scholarship, however, have begun to challenge this view by incorporating within their analysis the voices of teachers and students who live and work within the corridors of our schools. The emerging traditions of narrative work and autobiography (Bullough, Knowles & Crow, 1991; Connelly & Clandinin, 1990; Butt, 1994; Pinar & Grumet, 1976) have provided a powerful forum for these voices. This study builds on these important works by incorporating the voices of teachers and assesses their thinking in ways not solely determined by a narrow academic view of what is the most desirable form of knowledge (i.e. the priority given to knowledge emerging out of systematic research study over knowledge emerging from practical experience). It is our hope that this more inclusive approach will allow us to understand what teacher thinking tells us about research and to learn from these accounts.

The question of what purposes research should serve also becomes critical if we are to examine what teachers' thinking on research means for inquiry-oriented teacher education programs. Huberman (1993), in his work on research utilization, identified a neo-positivist vein that views the purpose of research as developing a "soft technology for getting knowledge which is produced in centers of research into the hands of practitioners" (p. 35). In contrast to this rather narrow conception of the purposes of research, Grimmett (1988) proposed that formal research "is one source of information whereby teachers apprehend practice as they reconstruct their classroom experience" (p. 12). In this view, research enables teachers to develop new understandings of how to structure their knowledge and cultural world. Because we explicitly reject the positivist notion that research can and should direct practice without consideration of contextual factors, our study views the relation between research and practice as an interactive process where research, conducted either by teachers or others, can be used to pose new questions, examine assumptions, and consider alternative courses of action. As Lucas (1988) states so powerfully, "It is important for teachers to realize that theories offered by researchers in books and articles can be challenged or confirmed by teachers interested in the same problems. Teachers can also produce theories from careful study of what goes on in their own classrooms" (p. 70). Thus, from our perspective teachers need to be critical consumers of research and/or active participants in the research process.

1. Research methods

This study of pre-service teacher thinking on research was part of a larger investigation that examines different groups of teachers at different career points and after experiencing different types of educational programs. The present study employed qualitative methodologies. To begin the study, we developed and administered a questionnaire (see Appendix A) to pre-service teachers at the beginning and end of an elementary (17 students) inquiry-oriented program that emphasized being critical consumers of research, and a secondary (20 students) inquiry-oriented teacher education program that used a balanced approach that included becoming critical consumers of research and the doing of action research. The questionnaire asked these students to describe their thinking about research. Specially, we asked the following questions: What is educational research? What are its goals? Who does it? Does research address your concerns as teachers? How do you decide to make changes in a classroom setting? What do you do when research contradicts/supports your thinking or contradicts itself? How do you find out about research? and, How can research be improved?

Based on an initial coding of the questionnaires we identified dominant themes based on frequency of response. These patterns or themes articulated how these teachers viewed research in a general sense but did not provide an in-depth explanation of their personal views and did not help explain why these views were being endorsed. To address these limitations, we conducted 16 interviews, 8 with pre-service teachers beginning the elementary and secondary programs, and 8 with the same students as they finished the program. In choosing the pre-service teachers, we tried to select a diverse group that represented their cohort in general. Specifically, we considered these criteria: gender, if they viewed themselves as more teacher centered or student centered (a query on the questionnaire), and their previous teaching experience (e.g. church, volunteer, etc. which was also an item on the questionnaire). We conducted in-depth interviews with each of these students using the questionnaire as a guide while adding probe questions that encouraged students to elaborate and clarify their responses. In addition we interviewed the two cohort leaders (elementary and secondary) to obtain a description of their programs and an understanding of how they utilized research in their inquiry-oriented approach. All names used in this paper are fictitious.

To analyze the questionnaires and interviews, each member of the research team read all the questionnaires individually to determine the frequency of response for the four groups of preservice teachers (elementary beginning, ending; secondary beginning, ending). We then met as a research team (which included the two cohort leaders) to see if we agreed on the themes. (See Table 1 for a description of those themes.) With these responses/themes in mind, we examined the interview data. If a dominant theme in the interview data supported a dominant theme in the questionnaires this finding was retained. Atypical interview responses were only used as exemplars of unusual alternatives. For example, we might say *a few* preservice teachers felt this way. In essence, we were looking for emerging patterns that were grounded in the data. (Glazer & Strauss, 1967). The themes that emerged from beginning teacher thinking about research were then compared with their thinking at the conclusion of the teacher education program.

Before presenting these findings, we use the interviews with the two cohort leaders to provide a descriptive account of the elementary and secondary inquiry oriented programs in which the preservice teachers participated.

2. The preservice programs

Over a decade ago the teacher education programs at this western university in the United States developed and continue to use a "cohort" orientation where groups of 15 to 25 students progress through the elementary or secondary programs together. Within this cohort structure, the secondary program focuses on curriculum, instruction, and student teaching. Pre-service teachers coming into the secondary program have already taken the majority of their course work in their major and minor fields. Pre-service teachers in the

Table 1

	Elementary	Secondary
What is research?		
Beginning cohort	Determines effective methods	Determines effective methods
End of cohort	Determines effective methods	Determines effective methods
Limitations of research?		
Beginning cohort	Not accessible	Not accessible
	Cannot be trusted	Cannot be trusted
	Not objective	Not objective
End of cohort	Not accessible	Not accessible
	Cannot be trusted	Cannot be trusted
	Not objective	Not objective
How do you find research?		
Beginning cohort	Research journals, university	Research journals, university
End of cohort	classes, district workshops,	classes, district workshops,
	(However, lack of time)	(However, lack of time)
Who does research?		
Beginning cohort	Professors, graduate students	Professors, graduate students
End of cohort	Professors, graduate students	Professors, graduate students
	and teachers	and teachers
If not research, how to plan to make decisions?		
Beginning cohort	Go to like-minded experienced	Go to like-minded experienced
	teachers, institution intuition	teachers, institution intuition
End of cohort	Experienced teachers over	Experienced teachers over
	research, institution, look for	research, institution, look for
	intuition influences on my students	intuition influences on my students

elementary program, who major in elementary education, complete methods courses in subject areas such as reading, math, science and social studies as part of their undergraduate education. In recent years, reflectivity and action research have become a major theme in the secondary program. Due to the large number of instructors in the elementary program who teach separate courses in the cohort, the elementary program takes a more eclectic approach that in one way or another stresses being critical consumers of research, especially within specific content domains such as reading or science. With this said, individual cohorts differ significantly. Given our focus on one secondary and one elementary cohort, it is important to gain some insight into the particular aims and purposes of the instructional leaders of these cohorts.

2.1. The secondary cohort

Camille, the cohort leader in the secondary program is a clinical faculty member who came through the teacher education program at this university and received undergraduate degrees in the areas of special education and psychology and a master's degree in educational psychology. When she started to teach, she was able to manage students' behavior but was concerned when the behaviors were not internalized. She was also frustrated with the fact that although there was a large body of literature on management, she had not been exposed to the limitations of a behaviorist approach. Through independent reading and interactions with colleagues Camille developed a broader, more cognitive perspective on teaching

that caused her to:

> speed up the process of looking at a broader view of their classrooms so my students don't have to go through what I went through … I hope my students come away with an understanding of the multiple perspectives impacting what goes on in their room and take note of the different elements that contribute to teaching. It is not simply a matter of knowing which management system is best; they have to look at the kids, their own backgrounds, the culture of the school, and curriculum issues (Camille, interview).

Pre-service teachers enrolled in the secondary certification program complete a 20-week teaching experience. Following the completion of what is referred to as "early field experiences", candidates complete a number of investigative assignments. These include examining the roles and responsibilities of teachers through multiple writing assignments, conducting interviews and observing the school context. These interviews and observations focussed on and encouraged students to examine the impact of multiple variables on classrooms (e.g., culture, curriculum, instruction and teacher and student backgrounds). By conducting interviews and observations, preservice teachers have an opportunity to reflect on their teaching, identify problems and solutions, and discuss issues related to teaching. Specific assignments include: a personal autobiography, a teacher and peer interview/observation, an administrator or counselor interview/observation, a student shadow study, an analysis of student metaphors about school and a video tape and analysis of a teaching lesson.

Following an introductory 4-week period in the schools, candidates are asked to identify a problem issue stemming from interviews, observations, shadow studies, and metaphor gathering. Next, preservice teachers engage in a three-phase action research project.

Phase I: During the first phase of the assignment, preservice teachers describe in writing a concern or issue related to their teaching. They are encouraged to examine personally relevant topics with a focus on the relationship between teaching, students, school culture, and curriculum. For example,

students focused on topics such as increasing student performance through relevant curriculum or increasing student engagement through student-centered instruction. Once a general area of analysis is identified, students are encouraged to narrow it to a more definitive topic.

Phase II: During the second phase, preservice teachers write a plan for addressing or ameliorating their problem issue, including an analysis of actual changes to be addressed. Students are encouraged to address multiple variables in their teaching and are asked to determine how they will collect data and evaluate change. Data gathering includes video taping, portfolio reviews, and/or reviewing student feedback from interviews and/or student surveys.

Phase III: Following problem identification and the implementation of a plan of action, students collect data for a period of eight weeks. Although limited in the amount of time to implement changes, preservice teachers are encouraged to attend not only to regarding pupil performance outcomes but also to the educational processes they help construct. With these goals in mind, students complete a final paper with a discussion of their problem issues and the reasons why the issue was chosen. They then present their plan of action, methods of data collection, and findings to the cohort group, explaining how their findings will impact their future teaching.

Besides doing research, Camille also wants students to become critical consumers of research, to know the difference between a magazine and a professional journal and, where possible, to include a literature review in their action research projects. Unfortunately, Camille has not been overly successful in enabling students to include literature in their projects because of the intensity of student teaching, the difficulty in accessing the library, and students' job oriented perception of certification.

2.2. The elementary cohort

Sally, the elementary cohort leader is a clinical faculty member who completed bachelor's and master's work in education and history at an eastern university that had a significant commitment to teacher research and qualitative studies.

Nevertheless, given that Sally's time with students is primarily limited to a course per term devoted to theories of classroom organization and management and integrating content and special methods classes, she has little opportunity to do any sort of extensive action research project. Instead, she focuses on a reflective approach emphasizing pre-service students as critical consumers of research. Specifically, she begins with a discussion of why research on classroom management did not begin to emerge until the 1950s. The students then consider major theories guiding research on various models of classroom management, including Skinner's *Beyond Freedom and Dignity*, Kounin's *Discipline and Group Management in Classrooms*, and Ginott's *Teacher and Child*. This is followed by an extensive analysis of the research guiding various management models. When interacting with this research, students are asked to "examine the data, methods, and assumptions of each of the authors" (Sally, interview). The purpose of this approach is not simply to know the research but to begin to look at research in a critical way. Students are then asked to put theory into practice and to reflect on these experiences in their journals.

Students are also asked to do informal research, shadowing a student and collecting data through interviews and observations. They then present that data to their peers for review and recommendations. As Sally states, students in her cohort know the program is about research, "From the first day of orientation, students have an idea that this program is about research and we talk about that. This is a research institution; we look at research. I want students to become smart consumers of research, I want them to think about the possibility of eventually doing their own research" (Sally, interview).

Because these students interact with many methods instructors, students get differing perspectives on research. Some instructors are strong advocates, whereas others do not emphasize research. Furthermore, most of the schools in which students do their student teaching do not socialize these preservice teachers to see the importance of research. However, one school has provided a model of teachers doing research and has helped

Sally accomplish her goals:

> I would say East Valley is probably the most open to research … because that is the way the school is structured. They basically restructured the school so that it is governed by the faculty. I think students see that teachers are keeping up and using the most current thinking on research (Sally, interview).

In thinking about these conflicting influences Sally feels that students:

> are a little more positive and a little more confident in reading research. However, I would like them to see that they have the possibility to do research … I would really like them to be more active than passive (Sally, interview).

Clearly, the two cohorts differ significantly in terms of their approach to inquiry-oriented teacher education. The secondary cohort structure allows for a balanced approach that includes both the doing of research and critical interaction with research texts, whereas the elementary program focuses more on becoming critical consumers of research. On the other hand, while the secondary cohort found little support for research in the schools where students were placed to do their student teaching, the elementary cohort was able to place students in one school that promoted research. Finally, where secondary cohort students were able to get a consistent view of research because they spent the vast majority of their time with the cohort leader, in the elementary cohort students interacted with various instructors and were exposed to differing views of research.

3. Understanding the impact of inquiry-oriented teacher education programs on pre-service teachers' thinking about research

To understand the impact of inquiry-oriented teacher education programs on preservice teachers' thinking about research we begin with a descriptive account that compares their thinking as they entered the program with their thinking as they exited

the program on five major topics: what is research, what is the relation between research and decision making, who does research, how does one find out about research, and decision making. Table 1 summarizes the major findings. Following this descriptive data of Table 1, we use a number of contextual frames in providing an analysis of this thinking.

3.1. What is research?

Upon entering the cohort, both the elementary and secondary preservice teachers consistently viewed research as a practical and technical matter. In their view, research specifies methods that can improve teaching. Its goals are practical in the sense that research identifies concrete options that immediately strengthen teaching practice. One elementary preservice teacher captured this theme by defining research as "what makes an effective teacher … its goals are to find out what works" (Amy, questionnaire). A secondary preservice teacher echoed this same theme in noting that "research involves the observations done in the classroom, to test new and old methods in order to find out what works best" (Tamara, questionnaire).

3.2. Limitations of research

In describing research, these preservice teachers also identified several limitations. One common criticism was that research is written in an inaccessible way. As one elementary preservice teacher noted, "they should write for the everyday people not just the prominent ones" (Denise, questionnaire). A secondary preservice teacher added, "make it [research] more accessible. I think it needs to show application to the real world context" (Samuel, questionnaire). These teachers also doubted that research could objectively determine what methods were most effective, in part, because research is politically biased. As one elementary teacher noted "I wish research was based less on politics" (Cathy, questionnaire).

These preservice teachers entered the program with a strong preference for research that is practical rather than conceptual or theoretical. Research centered on philosophical and historical concerns, for example, lies outside the bounds of what they considered research. Research in their opinion focuses directly on practice rather than a theory–practice dialectic. Finally, these preservice teachers already have a healthy skepticism about the objectivity of research and suspect it is not written to influence those working in the schools.

In trying to make sense of these findings within a contextual frame, the issue of teacher culture becomes important. On one level these findings lend support to what is referred to in some circles as "clinical consciousness" which prioritizes a reliance on first-hand experience in decision making, a crude pragmatism, a distrust of generalizations, and a trial-and-error approach (Raths-McAninch, 1993). However, the cultural view is a bit too simplistic because pre-service teachers already embody much of their "clinical consciousness" before spending a great deal of time working as teachers. What this may suggest is that prospective teachers begin to develop their cultural views about teaching as students who have spent a great deal of time in schools. They may learn, for example, that schooling involves an intensified environment which leaves little time for reflection. They may also learn that education is often imposed, leaving the "other" silenced (Weiler, 1988). Because teachers are often silenced in terms of educational policy in much the same way, students who become teachers often resent and resist the construction of expertise as residing outside the corridors of schools and therefore point to experience and fellow teachers as primary sources of knowledge.

At the conclusion of the cohort program, the preservice teachers, for the most part, did not change their views about the nature of research. Both groups still viewed research primarily as a way to determine the most effective teaching methods. As one elementary preservice teacher stated at the end of the program,

> As a new teacher a lot of times you don't have a bag of tricks to pull from. You are still trying to develop that little bag of tricks. So a lot of times if you do have a problem you have to search … so as a new teacher I would probably rely on research more because I don't have all the answers (Denise, interview).

Secondary preservice teachers also viewed educational research in terms of answering questions about effectiveness: "Educational research is probably trying to obtain an ultimate goal of how to educate everyone … How you could be the most effective teacher and teach kids in the most effective ways" (Gina, questionnaire).

For these teachers theory was a luxury that had little to do with the demands of practice:

> The kind of educational research I think that bothers me the most are the people that are theorizing for the sake of theorizing. That is lovely but I am never going to read it. If it does have a practical application it is a distant one … theory is not relevant to someone working in the classroom (Dawn, interview).

While this view was prevalent in both the elementary and secondary programs, a few preservice teachers did begin to see theory as part of research. However, even for these teachers, the practical counted most:

> Educational research looks at the best ways for people to learn. It goes out into schools with some practical sides and combines this with theory. I think the practical side is best because it looks at the best ways to teach and what is effective (JoAnn, interview, elementary).

A significant difference did occur between secondary and elementary teachers in terms of their attitudes toward research at the end of the cohort program. Elementary preservice teachers continued to focus on the issue of accessibility:

> A lot of what has been presented here at the U. is very hard to read and very hard for us to understand just because of the level that we are right now. I find most educational research that is helpful to me I find in bookstores that is not presented as research but maybe a 'how to' manual (Linda, interview).

Secondary preservice teachers, by contrast, concluded that the central problem with research was no longer accessibility but the lack of time to engage with the research.

> I have a lot of things I would like to do. I think with the class load it just doesn't allow people to engage with research. Your time is so limited that when I pick up research a lot of times I just want a kind of synopsis of it (Ted, interview).

This finding supports McGlaughlin's (1993) claim that it may be more appropriate to talk about cultures of teaching rather than a culture of teaching. While there are large areas of common ground among the elementary and secondary preservice students, there are also significant areas of difference. This suggests that if we are to accommodate the thinking that pre-service teachers bring to inquiry-oriented teacher education program, it will require a careful analysis, taking into account differences between groups that represent the varying cultures of teaching.

Even though the elementary cohort focused on being critical consumers of research and the secondary cohort used a balanced approach that stressed both becoming a critical consumer of research and the doing of action research, both programs had little influence on teachers' thinking about the fundamental nature of research. Preservice teachers entered the program believing that research should be pragmatic, and focus on effective methods. It had little application to their lives as teachers, was not really written for them, and failed to clarify effective methods because of its subjective or "political" nature. When elementary preservice teachers left the program they critiqued research for its lack of accessibility while the secondary teachers criticized the lack of time to engage with research. Despite these differences both groups' thinking about research remained, for the most part, unchallenged and unchanged.

3.3. How do you find out about research?

Nevertheless, it is possible that future experiences may encourage teachers to either do research and/or become active critical consumers of research. However, if these future teachers are to engage in research, they need to find diverse ways to find out about research, and more importantly, to view teachers as potential researchers. We

wanted to know, therefore, how these preservice teachers felt about these issues and if the cohort program influenced their thinking.

Before entering the program, preservice teachers overwhelmingly felt that one finds out about research through journals, university classes, and school or district workshops. After the conclusion of the cohort, they mentioned these same sources, with a particular emphasis on the university library. However, several of these pre-service teachers, especially those in the elementary program, felt uncomfortable using the university library: "I hate the library. I never find anything I need" (Lynn, questionnaire) or "It [the library] is huge. Maybe I am just intimidated" (Donna, questionnaire).

If these teachers were not going to use the university library, we wondered where they would find journals. Most of the pre-service teachers interviewed mentioned the teachers' lounge. However, when pressed on the topic, they noted that journals in the teachers' lounge at the schools in which they did their student teaching provided practical hints rather than research on a particular topic. The question of how teachers are going to find out about research, when and if they feel a need, remains largely problematic. This problem is exacerbated by intensified schedules that leave these pre-service teachers with little or no time to do anything more than plan for the next day:

> I have left Meadow High (fictitious name) at seven p.m. since I started student teaching. I don't have the time to really figure out what I am doing. I am trying to get the next day planned, I just don't have the energy to go look up research. I have to be prepared first before I do anything else. I just don't have the time (JoAnn, interview).

Even if these teachers were given more time and felt comfortable searching the university library for research journals, they already viewed research with a large measure of distrust. One preservice teacher put it this way:

> A lot of the time I don't see new things happening in education. They just name and rename terms. I mean something that was

called this so many years ago is back and now it is called something else with a new buzz word (Debbie, interview).

3.4. Who does research?

Conversely, these inquiry oriented programs did make a difference in who these preservice teachers felt could and should be involved in research. At the beginning of the program they primarily mentioned professors and graduate students; at the end of the program both groups also mentioned teachers: "Hopefully every teacher and anyone going into education should do research. But in actuality, it is probably a minimum, unfortunately" (Allison, questionnaire). This positive view of teacher research appears to contradict these preservice teachers' views about research in general. This apparent contradiction, however, begins to make sense when it becomes clear that teacher research allows for a linkage of research with experience, whereas traditional forms of research appear less likely to do so. As one preservice teacher stated:

> I can see the benefits of devoting all your time just to research but I think you really need to have teaching experience. So, if you are a researcher I think it is important to have teaching experience so you know what to look for (Amy, interview).

For elementary preservice teachers, supportive views of teacher research were linked with their placement at a school where the teachers were actively engaged with research. As one elementary student noted, "Not only are there researchers devoting all of their time to research but also classroom teachers who are finding new ways to do research" (Joelle, interview). Secondary preservice teachers seemed to develop supportive views toward teacher research from the action research projects they worked on as part of the cohort program.

> I think when I did my action research project it really helped me look at my ideals about teaching … why I went into teaching, and how I was actually implementing those ideals. I had to tailor my curriculum to meet the

students' needs without dummying it down. It is something I will take with me. It has helped me to rethink and realize that education is flexible and I can do with it what I want and my outcome will reflect my practice (Gina, interview).

These pre-service teachers did not feel that searching for current research studies was a priority. Given intensified work schedules, their distrust of research generally, and the lack of ready access to research at their schools, it is unlikely that locating and reading research will become a regular part of their teaching practice. However, these preservice teachers did develop a commitment to teacher research. While their busy schedules may limit such activity, the connection of research with classroom experience seemed to make them *more likely* to engage in this type of research if the opportunity presented itself. Seeing teachers engaged in research and the doing of the action research projects appeared to be key factors in developing their views on teacher research. While both programs differed in their approach to an inquiry oriented form of teacher education, what made a difference in terms of teacher thinking about who does research was either the experience of seeing teachers engaged in research or the doing of action research projects themselves.

This finding suggests that student teaching is one program structure that has the potential to significantly influence students' thinking. Interview data indicate that most preservice teachers did not see their "cooperating" teachers involved with reading or producing research. Instead, these teachers made teaching decisions based primarily on experience. When cooperating teachers provided advice to these preservice teachers, they made their recommendations based on their experience. Furthermore, when these preservice teachers went into the teachers' lounge in the school they observed "how to" magazines and noted pragmatic conversations on what to do with "Sam". Put simply, most preservice teachers did not see their more experienced colleagues using research or doing research as part of their everyday teaching practice. Significantly, in the one elementary school where teachers were actively engaged in research and were utilizing this

approach to shape curriculum decisions, pre-service teachers placed at this school more frequently mentioned that teachers could do research and that research could play a role in their decision making.

At the secondary level, conducting action research projects seemed to influence these preservice teachers' thinking about research. Those involved in action research consistently mentioned that teachers could and should be involved in producing knowledge about schooling. With this said, it should be noted that the sharing of traditional forms of research in the cohort context had little or no influence on teachers' thinking about research. Preservice teachers entered the program with significant skepticism about research and entered their first year of teaching thinking much the same way. In this sense, action research was not viewed so much as a type of research, but rather something unique and different from well established forms of research.

3.5. If not research, how do you plan to make decisions?

If these teachers are unlikely to use "outsider" research in their classrooms, and only use action research when time permits, we wondered how they would make their everyday decisions and what influence, if any, the inquiry-oriented programs would have on the sources of knowledge they draw upon. Before entering the teacher education program, both elementary and secondary preservice teachers anticipated that they would rely primarily on experienced teachers to help them make decisions. "I would ask another Spanish teacher for suggestions" or "I probably will ask colleagues what they have done and try to integrate some of the ideas" (Rachel, questionnaire). What these colleagues offer is experience. Experience was the root of their knowledge and provided a common ground between these preservice teachers and experienced teachers. As one preservice teacher noted, "I would find other teachers who have been through the same sort of thing I will go through and I will ask them what they did" (Zandy, questionnaire). Although some of these preservice teachers occasionally mentioned journals, trade books, and even

teacher educators, these alternative sources of knowledge were not based on formal research.

After the cohort more of these preservice teachers felt they would rely on sources other than teachers in making their decisions. In particular, they mentioned university professors, trade books, and journals. When asked what journals and trade books they would rely on, it became clear that these sources of knowledge would only be used if they provided specific teaching strategies rather than research findings. Furthermore, the majority of preservice teachers still mentioned that they would rely on other teachers, and not just any teacher, but one who held views of teaching they supported: "I will tend to go to the teachers that I know and I know their teaching methods and when I agree with their teaching methods, I seek out their advice" (Amy, interview). This suggests that where experience is valued, teachers are likely to pay particular attention to those teachers who support their own beliefs about teaching. These preservice teachers preferred experience, as an epistemological root, to research because they felt that "a lot of times it looks like researchers have something they want to prove and no matter what they find, they find a way to prove it instead of really objectively looking at both sides" (Debbie, interview).

In choosing teachers over researchers as sources of information, preservice teachers emphasized both familiarity and context. "I think I go to teachers because I know them as people ... Some Dr. Jane Smith that I don't know who they are or if their ideas worked for them I am less likely to follow" (Denise, interview). The advantage of using experience as a source of knowledge was that it provides a first-hand look at the influence of teaching practices on a *particular* group of students.

> I am not saying that I am not open to new ideas but what I am saying is that what matters is that the students are excited about learning, that they want to come to class, that they are involved in what is going on. That is what counts for me (Linda, interview).

It wasn't research that provided a frame to analyze teaching but instead, their intuition on what was working with their students. "I don't even know if this makes sense, but as far as teaching goes I've learned to trust my intuition. If someone gives me an idea, or from educational research that doesn't fit my teaching style I wouldn't use it because that is not the person I am. I would just go with what I thought was best" (JoAnn, interview).

Preservice teachers, after going through these differing inquiry programs, did not dramatically change their views on decision making. Experience, rather than research, continued to be the most important source of knowledge. Given the numerous ways to interpret experience, these preservice teachers used two screens: first, they would rely on other teachers who taught in a manner similar to the one they endorsed and second, regardless of what the research said, if students were happy, coming to class, and active, they would stay the course.

A developmental perspective may contextualize these findings. Several important caveats, however, are needed before making such an analysis. First, we do not assume, as is true in most developmental theories, that individuals or groups progress in a linear manner from one stage to another. To challenge this aspect of developmental theory we refer to the developmental location of a person or group within a developmental scheme as a "place" not a stage. Second, we reject the essentialism (i.e. the view that an entire group is assumed to share a set of similar perspectives) assumed in some developmental schemes. To avoid an essentialist view, we only talk about the relation between a developmental place and the specific group of preservice teachers in this study.

This perspective on research – that teachers depended primarily on experience, intuition, and other familiar teachers in making their decisions – is supported by Rath-McAninch's (1986) finding that teachers' thinking is related to types of developmental schemes that focus on women. An analysis of women has led some developmental psychologists to suggest that they value subjective ways of knowing. Within subjective knowing, the source of knowledge is the individual's feelings, personal experience, and intuition (Belenky et al., 1986). Rath-McAninch (1986) goes on to say that

> The findings of experts or scholars are simply other opinions based on different

experience. This prizing of first hand experience and intuition is accompanied by a distrust of books as a source of knowledge … These women often drew sharp distinctions between their own way of knowing, which was largely intuitive and the logic and abstraction of the scientist. (p. 27)

While we unequivocally reject the notion that all women can be lumped together in a group, this description of subjective knowers seems to echo much of the thinking of the preservice teachers (women and men) as they entered the preservice programs. They rejected the supposed superiority or objectivity of research, instead prizing first-hand experience and their intuitive feelings. This suggests that part of what inquiry approaches must take account of is the developmental place of the preservice teachers who enter the program, especially as it concerns their views on subjective ways of knowing.

For the most part, when these preservice teachers left the program they remained in a subjective "place". However, a few seemed to have moved to a new place that mirrored what Belenky et al. (1986) refer to as constructed knowing: "Within constructed knowing emotion and intuition are integrated with reason. It is distinguished by a view of knowledge as constructed, tentative, and contextual" (p. 30). This form of knowing stresses the connection between their own experiences and the issues they are trying to understand. Importantly, constructed knowers develop a passion for learning and are reflective about their own views and positions. Some of the secondary preservice teachers who talked about their action research experience seemed to reflect this passion for learning (e.g. the teacher who talked about the importance of reflecting on her ideals, why she went into teaching, and her expectations for students). While these same teachers are still likely to go to the teacher down the hall as a way to learn about teaching, they also felt comfortable combining this approach with a reflective learning process, "where [they] would step back in action and analyze what was happening and what went wrong" (Ted, interview). It should be stated, however, that given the lack of time to do action research and the lack of support for such activities within the everyday structure of schools, these views may reflect more what these teachers want rather than what they will do in finding sources of knowledge to inform their decision making in the future.

4. Reconceptualizing the aims of inquiry-oriented programs

In reviewing our analysis to this point, one overriding point needs to be made about the relation between teachers' thinking on research and cohort programs: this thinking needs to be considered if programs are to influence how preservice teachers approach research. Given the twin aims of most inquiry-oriented teacher education programs, that of becoming critical consumers of research and engaging in research, it would be easy to interpret these preservice teachers' developing thoughts about research as reflecting a narrow view of the legitimate sources of knowledge. However, it is also possible to see aspects of this thinking as both creative and innovative in that what may be emerging is not a rejection of research or even theory, per se, but rather a modified view of both theory and research. These teachers doubt research can make good on its claim to provide unbiased accounts of effective teaching methods because the researcher is trying to "prove" something and because research varies over time, taking one view and then often contradicting that view at a later date. These preservice teachers also distrust research because it appears to embody a set of interests or goals which frequently diverge from their own. Where most research attempts to produce new knowledge that in one way or another can improve student learning, socialization, and development, teachers appear to prioritize a different set of goals that center on the more immediate goals of involvement, making students happy, and actively engaging them in the teaching process.

A number of scholars support these teachers' thoughts about research. For example, many feminists have stressed the importance of putting the researcher back into the research (Harding, 1991; Lather, 1991) thereby exposing the biases that go into the formation of the research questions.

Critical theorists have also waged a long battle against the supposed neutrality of scientific methods asserting that science, or at least the popularized view of science, is itself an ideological construction (Apple, 1979). Clearly, these teachers do not base their views on feminist or critical theories, but they do seem to have a sense that research is not superior to other forms of knowing, at least in terms of its ability to provide objective accounts of a situation. If one accepts this view as a starting point to think about research and then considers the fact that a great deal of educational research is written in a particular style unique to the cultural world of academics, that teachers have little time to find research, and no easy access, it becomes more apparent why teachers reject many well-established forms of research as a way to inform their everyday decision making.

Rejecting traditional forms of research, however, is different from rejecting research altogether. Some of the students going through these inquiry oriented programs did begin to develop a commitment to teacher research. Some also were more receptive to theory that emerged from the analysis of practical experience (Carr & Kemmis, 1986). Research that linked theory with experience and was contextual, and applied to their students, was seen as having value at the conclusion of the programs. This was especially true for students who directly experienced research, either through their own action research or observing it in others. In this sense, teachers may be suggesting a slight modification of the twin aims of inquiry programs such that these programs focus more directly on forms of teacher research as a bridge to more well-established types of research reports.

Emphasizing teacher research has several advantages as a starting point over the reading of research reports. First, preservice teachers can begin to understand what it means to do research through their participation in a research project. This insider view is more in line with their experiential approach to knowledge production. Second, because preservice teachers rely on experience as a form of knowledge, but do not necessarily reflect on the assumptions underpinning this approach to knowledge, their implicit theories are often hidden. Action research is uniquely positioned to expose and examine these theories because the person doing the research is studying their own educational context. Third, action research can provide knowledge that is context specific, allowing the teacher researcher to not only focus on questions they feel are critical to the success of their classroom, but also to examine the implications of the research for a particular group of students. If teachers see value in this type of action research, it may encourage them to at least utilize other forms of research as a way to compare their emerging theories with the ones embedded in the formal research literature.

The possibilities of using action research as a knowledge base, however, are limited by conflicting views about research that these pre-service teachers still held quite firmly at the end of the teacher education experience. For example, these students seemed to rely on other teachers who they felt approached teaching in ways similar to their approach. This suggests that theories emerging from an analysis of practice might be skewed to supportive situations, thereby curtailing a more critical look at their teaching. These preservice teachers also seemed to view research itself as an activity limited to the determination of effective methods. If they continue to hold this view, then even action research projects are likely to de-emphasize philosophical and historical work that can provide important insights on schooling.

4.1. Having students examine what is research and research goals

To challenge the bounded nature of this thinking, it may be helpful to begin the teacher education experience with a critical examination of *what is research* and *the scope of goals* that it can achieve. The introduction of autobiographical or personal history texts (Gitlin, Bringhurst, Burns, Cooley, Myers, Price, Russell & Tiess, 1992) that can account for how past experiences and developmental place may have shaped preservice teachers' thinking on research might facilitate this discussion. Where successful, this type of conversation would, at the least, allow preservice teachers' thinking on research to be exposed and examined, including its relation to contextual factors. It would also avoid

an essentialist position where all teachers are assumed to fit within a singular culture of teaching. To avoid a reductionist view of teacher thinking, however, requires teacher educators to also consider and examine their thinking on research. Because many teacher educators have been socialized to accept the legitimacy and authority of well-established forms of research as part of their advancement in graduate studies, it is also important for teacher educators to consider how their own personal views limit and create possibilities for working with preservice teachers who may think quite differently.

4.2. Accessibility

This study of preservice teacher thinking also suggests that accessibility is an important issue. In their view, accessibility is a complex process involving the issues of time, point of view, physical proximity, and language. These preservice teachers expressed a need for time to engage with research, that research needs to have specific implications for their classroom, that physical and temporal space needs be created in schools to enable teachers to read research reports, and that the language of the research report needs to avoid specific academic "codes". For example, terms such as ideology and essentialism may be common place for certain groups of academics, but may make the reading of the report more difficult for teachers. Clarifying the meanings of such words is a step in the right direction. Making such a change, however, does not suggest that academics should dummy down their reports or simplify their theories (Lather, 1991; Giroux, 1995). Rather, it suggests the need for a type of cultural "border crossing" where academics articulate their views in a way more accessible to those outside the academic community. If this border crossing is to have a significant influence, however, the other issues associated with accessibility (time, point of view, and physical and temporal space) also need to be addressed. One possibility would be to produce more journals that publish reports linking experience with emergent theories. In addition, ways need to be found to support the placement of these journals in teachers' lounges and schools more generally, and the work

of teachers needs to be restructured so that time to read and discuss these types of research reports becomes an established part of the teaching day.

4.3. Student teaching

Our analysis of program factors also suggests that teacher education programs need to begin a socialization process (Zeichner, 1993) that values a reflective approach to decision making based on a variety of knowledge forms. For example, creating a student teaching experience that is not solely about survival would be an important corrective. Seriously considering research of any kind, never mind doing research, takes a great deal of time. If preservice teachers see their work life in terms of surviving the day, then it is unlikely they will focus on reading or doing research, regardless of how accessible it is. Student teaching, as typically structured, appears to reinforce this survival orientation. An alternative model would provide time within the student teaching experience to engage in the study of teaching and the reading of research. It would also be helpful to develop more collaborative research projects that produce research linking contextual realities and teaching experience with theory building and empirical investigations. This type of collaborative research would begin to break down barriers between academics and teachers such that they are working together to [re]search questions of schooling that allow the implicit theories of all participants to be exposed and examined. The key to this collaborative approach is dialogue across differences between academics and teachers such that the conversation represents a two-way learning process where both groups gain from the learning experience (Gitlin, 1990).

Student teacher placement is also critical in determining program influences on preservice teachers' thinking about research. It is clear from these preservice teachers' comments that many experienced teachers place little value on and rarely refer to research findings. This suggests that as preservice teachers move away from the educational experiences found at the university, there is likely to be little support for the doing of research, including action research studies. This is especially

problematic given that many preservice teachers in this study depended heavily on experienced teachers to answer their educational questions. Typically, novice teachers will have to work against the tide of teacher culture if they are to persist in finding ways to engage in action research projects as they gain teaching experience. Conversely, where preservice teachers see experienced colleagues using research to inform decision making, they can begin to critically look at their well-established views of research. As Cochran-Smith (1991) notes in her discussion of teaching against the grain:

> Struggling along with experienced teachers is an enterprise that is less glamorous … but as I will argue throughout this article, it may be that it is the only way to help students generate and then sustain over the long haul [their] critical perspectives on schooling and [their] commitment to teach against the grain. (p. 280)

Her analysis suggests that much of what may be accomplished within the university classroom is washed out if student teachers are not able to take part in an alternative socialization process in the schools that places value on an inclusive, broad-based approach to knowledge production and decision making. Making every effort possible to place preservice students in schools or with teachers that have some engagement with research is essential to developing a more inclusive view of knowledge production.

In closing, it is clear that the two programs studied had at best only a modest influence on preservice teachers' thinking about research. If these programs are to be more influential, our study suggests it is important to modify the goals of inquiry programs such that they build upon and extend preservice teachers' thinking without imposing a view of knowledge production that is contradictory to that thinking. To do so requires a close examination of preservice teachers' (and teacher educators') thinking about research, including its link to program components, the developmental place of the students, and the types of cultural socialization that shape their views. However, if this thinking is to be taken seriously, changes in the outlets for journals, the way research is written, the time teachers have to engage with research, and its physical accessibility in schools must also be scrutinized. By examining preservice teachers' thinking on research (and teacher educators') and making requisite changes in the nature of research initially introduced in cohort programs, as well as the articulation, and access of research more generally, we are confident that programs like the ones we have described can begin to develop a more inclusive view of knowledge production that enables teachers to take advantage of a broader array of resources in shaping their educational decisions.

Appendix A. Inservice teacher research questionnaire

1. What is educational research?
2. What are the goals of educational research?
3. How does educational research impact your classroom teaching?
4. How do teachers use educational research in your school? Do you think your school looks like other schools in terms of how educational research is used? Why/Why not? How do you know?
5. Complete this statement – Educational research would be better if … If teachers respond with "It should be made more practical" then we will follow- up with, Is there a place for theory in research?
6. How would you describe and evaluate the professional development opportunities you have experienced during your career? Explain.
7. Are your decisions about how to find information shaped by the educational context? If so, how? Follow-up: Is time a consideration?
8. Do you think there are differences between how elementary and secondary teachers approach their work? If so, what are the differences?
9. In your opinion, who are the experts in terms of knowing how to think about school? Does the production and use of research reinforce or conflict with that view and why?
10. When you are conflicted about a teaching approach, how do you decide which way to go? How do you determine if your decision was correct? Follow-up: Are there any problems

with teachers depending on colleagues or in-service presentations as a means of gaining information for decision making?

11. Do you think years of experience will influence how you respond to research?

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