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TEACHERS' CONCEPTIONS OF EDUCATIONAL RESEARCH

(Volume I)

By

John S. Zeuli

A DISSERTATION

Submitted to
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ABSTRACT

TEACHERS' CONCEPTIONS OF EDUCATIONAL RESEARCH

By

John S. Zeuli

Attention to teachers' beliefs has become an essential feature of studies designed to help teachers understand research. The beliefs on which researchers and teacher educators typically focus are teachers' beliefs about teaching and learning. Teachers' beliefs about educational research, however, may also strongly influence their understanding and use of research. This dissertation provides a detailed description and analysis of teachers' conceptions of educational research.

The subjects of the study were two distinct groups of teachers with varying levels of prior involvement with educational research. One group included five former "teacher collaborators" who had worked with researchers on research projects for at least one year. The second group was comprised of eight teachers with considerably less experience with research. All subjects were interviewed using a structured interview protocol. The protocol included a card-sort task to determine (1) what teachers believed constituted educational research. Teachers also responded to vignettes constructed to find out (2) their beliefs about how research should influence their teaching. Also, teachers read and responded to three different types of research articles and two research findings to determine (3) how

they understood research when they read it.

Analysis of the interview data suggests the importance of paying attention to teachers' conceptions of research. Differences between teachers' conceptions of research were associated with the prospect that research serves to educate -- not merely train -- teachers. Drawing on the relevant empirical, historical, and philosophical literature, the dissertation further analyzes what it means for teachers to take a professional -- as opposed to a consumer -- approach to educational research. The study demonstrates also the importance of teacher educators and researchers establishing "a zone of understanding" in work with teachers involving research. Greater attention to teachers' conceptions of research will do much to help teachers break from restricted, taken for granted assumptions that limit their ability to learn from educational inquiry.

This work is dedicated to my father and mother,

John Patrick Zeuli and Edith Sottolano Zeuli

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CHAPTER I

INTRODUCTION AND PURPOSE

The promise and lure of educational research to benefit teachers and teaching has remained constant over the last quarter century. As part of this promise, more sophisticated programs designed to help teachers integrate research into their practice have emerged. Some in-depth staff development programs model for and coach teachers on how to incorporate research-based practices into their teaching. Another unique program helps teachers analyze their beliefs about a subject area before trying to change their teaching using research. Other prominent models involve helping teachers research their own and other teachers' practice, using a variety of methods to accomplish this.

It must be mentioned, if only because of their seeming predominance, that less sophisticated models still flourish in many states and school districts. These programs offer slick and simplistic versions of research findings to teachers. Teachers are expected to glean from the findings useful tips to incorporate into their teaching and too often are also evaluated on their ability to do so.

Simplistic approaches to helping teachers understand and use research are slowly weakening in professional legitimacy. But all the different models share to some degree a common attribute. None is specifically concerned with helping teachers develop a broader, deeper understanding of what educational research is all about and the ways it may be woven properly into their thinking about

teaching.

In the more sophisticated models mentioned above, teachers' understandings of research may change for the better. These models, however, are limited. Programs, for example, emphasizing more in-depth staff development models may excessively focus on skills training and neglect helping teachers read, understand, and draw conclusions from research. Also, it is important to determine teachers' beliefs about an area of interest (e.g., reading or writing) before introducing research on this topic. But, teacher educators and researchers typically overlook the influence that teachers' broader understandings of research may have on how they incorporate any research into their practice.

Specific, sustained, attention to teachers' broader understandings of research is lacking in teacher education. We know relatively little about their views. We know nothing about fundamental issues such as whether teachers believe they understand research when they are able to use strategies drawn from it. We know little about how teachers draw conclusions from research, including whether teachers believe that "good" research compels its use. We know almost nothing about teachers' broader understandings of research and conflicts teachers experience when they recognize the importance of holding richer, more defensible, views of educational research. We do not even know whether teachers have a clear conception of what constitutes research, and if they do, what this conception is.

These gaps have developed for a number of reasons. Researchers

are pressured to demonstrate the usefulness of their research findings for teachers, though getting teachers to use research is not necessarily the same as helping them understand it. Another reason is that educating teachers about research is difficult and time-consuming, and teachers' professional education already requires much in a short time. Still another reason may be teachers' presumed disinterest in conceptual issues.

These reasons, however, do not justify the lack of attention. Several prominent comtemporary scholars argue that the benefits of research are dependent on teachers' understanding of it. No major studies, however, offer teacher educators and researchers a clearer sense of teachers' ways of thinking about and understanding research. This dissertation fills the gap. It offers a broad perspective on teachers' conceptions of educational research. Importantly, the dissertation moves beyond scholars' outlines of teachers' possible views of research by focusing on what teachers actually think about research. In addition, the study moves beyond scholars' interest in the types of influence research knowledge can have on teachers. The dissertation questions not only whether there are any substantial differences in teachers' beliefs about how research can influence their teaching, but it also focuses on what teachers think constitutes research and how they understand research when they read it.

The dissertation overall sets out to answer a broad question: What are teachers' ways of thinking about and understanding research? Teachers' responses extend the sketchy, abbreviated portraits current

in the teacher education literature. Answering this broad question requires breaking it down into several other key questions. To narrate teachers' understandings of research, it is important to find out how teachers see the parameters of educational research. For example, do teachers believe that research only includes statistical studies? What do teachers see research as including and excluding? Do teachers have a clear or consistent understanding of what constitutes research?

It is also crucial to inquire into how, more specifically, teachers think about how research should influence their practice. Do teachers want only teacher strategies drawn from research to impact their teaching directly, or do they think of research's influence more broadly? Do they, for example, believe that research can influence their thinking about the ends of teaching as well as the means to predetermined ends? Do teachers believe that good research evidence for a teaching practice compels its use?

Another set of questions worth investigating concerns how teachers read research. Teachers do not depend only on presenters' descriptions and analyses of research for their understanding of it. Educating teachers about research is, moreover, not fostered when teacher educators have teachers read research simply to change their teaching without helping them understand the research. There have been no studies in the teacher education literature (contemporary or historical) that focus on <u>how</u> teachers read research. The dissertation inquires into this unexplored area. Do teachers read research? If so, what are teachers looking for and how do they

evaluate research? Do teachers fuse understanding research with using it? Following up on this area, emphasis is placed also on how teachers draw conclusions from studies considered to be research. Do teachers refer at all to research assumptions and evidence when drawing conclusions from research, or do they refer only to their teaching experience when drawing research conclusions?

These following questions will be used to answer one main question the dissertation addresses: What are teachers' ways of thinking about and understanding research?

1. What do teachers think constitutes research?
2. How do teachers think about how research can and should influence their teaching?
3. How do teachers understand research when they read it?

The questions are addressed to teachers whose experiences with research differ in important respects. Some teachers who participate in this study had more extensive research experiences. They may hold richer, more sophisticated views of research. Other teachers, whose experiences with research have been less substantive, may not be as reflective about research. The beliefs of this latter group may be representative of the learners researchers and teacher educators often encounter during pre-service, in-service, and graduate education.

In sum, the dissertation provides a description and analysis of teachers' diverse understandings of research. This work furnishes an empirical basis for deliberating on what it means for teachers to

take a professional approach to educational research. This "professional approach" represents a middle ground, or, a zone of understanding, between teachers acquiring a high level of expertise in educational research and holding a consumer approach to research.

As I show throughout the study, it is essential that teacher educators and researchers think seriously about what it means to help teachers move into this zone of research understanding. As the study also makes clear, accomplishing this has powerful contemporary and historical support. In addition, the dissertation suggests that moving teachers into this middle ground can occur in variety of contexts. The dissertation contributes both to thinking about the importance of moving teachers into this middle ground and provides evidence that teachers' understandings of research can be extended and deepened in contexts that do not require teachers to acquire highly specialized, and in some respects irrelevant, knowledge of research.

Thus, the dissertation addresses two broad questions:

1. What are teachers' ways of thinking about and understanding research?

2. What does it mean for teachers to take a professional approach to research?

Given the current emphasis on teachers' understanding of research, both questions deserve the attention of researchers and teacher educators. Answering them provides the educational community with a richer understanding of the diversity of beliefs that exists among teachers. Teachers' responses also provide teacher educators with a better understanding of what conceptual issues are important when helping teachers understand research as well as teachers' common misunderstandings of research. Teacher educators acquire knowledge concerning how teachers can be helped to understand these issues and with what expected results. Thus, teacher educators working at the university and district level may benefit from the study. Teachers may also benefit. Better understanding the potential roles of research knowledge in their practice will provide for their long-term professional development -- an essential feature of any worthwhile teacher education program.

The remaining sections of this chapter place these questions in the context of the teacher education literature. Reviewing this literature suggests that an inadequate knowledge base exists regarding teachers' beliefs about research. Researchers and teacher educators nonetheless continue to stress that teachers acquire the knowledge, skills, and dispositions to analyze research critically. I describe in detail this broad literature, highlighting why some scholars are concerned to help teachers appraise research. I then analyze more prominent and diverse approaches to teacher learning about research in a variety of contexts. Analyzing these approaches is important for two reasons. First, it shows how the approaches are

limited and may be informed by the this study. Second, it illustrates that teachers learn about research across the teacher education continuum. Consequently, when presenting research designed to influence teachers in these various contexts, it is important that teacher educators consider teachers' beliefs about research. The final section of this chapter summarizes the literature review and outlines in more detail the direction of the study.

Contextualizing the Problem

Teachers' Ideas about Research: What Do We Know?

The teacher education literature includes little specific, systematic study of teachers' ideas about research. We do have researchers' and teacher educators' individual impressions, and some information taken from studies of teachers' knowledge-use. Sparse though it is, this work is important because it provides trustworthy signposts for teachers' thinking in this area.

Gleaning this literature, one finds that teachers have three distinct conceptions of research. By far the most common is teachers' view that research is irrelevant and lacking in practicality (see Lucas, 1988; also Broudy, 1985). Teachers feel that it does not answer questions they themselves ask and solves problems they feel are less than critical (see Huling, et al., 1981). Many of these teachers likely find research reports difficult to understand. They are awed by the jargon of research, (see Clark, 1986; also, Griffin, 1983), overpowered by the multiplicity and

fragmentation of research results (Tom, 1985), and find research too theoretical (Bolster, 1983).

Predictably, for these teachers research is not helpful (Howe, 1984) and seems far-removed and contradictory (see Richardson-Koehler, 1987). Teachers see little interaction between the world of educational researchers and the world of teachers (Hopkins, 1985). The lack of relevance dampens their interest in the findings of researchers and the adaptations of teacher educators. Perhaps because teachers see research as irrelevant, they are suspicious and believe researchers are self-serving (see Hosford, 1984). It is no surprise then to find teacher educators concerned that teachers are alienated by research (Fenstermacher, 1983). Summing up this first view, many teachers see research as useless (Griffin, 1983; Hosford, 1984; Bolster, 1983; Clark, 1986).

Though teachers are sometimes resistant to what research can offer (American Federation of Teachers, 1983), they also may look for and find answers in it. In this conception of research, teachers see research as useful, providing techniques and strategies that they can apply immediately. Teachers who share this view appreciate research programs that supply them with a list of "shoulds" that bear some direct relationship to what they are doing (see Shulman, 1986; American Federation of Teachers, 1983). Research offers these teachers standardized practices that "will help to get the lazies (sic) in line," and the scientific authority of research heightens their sense of professionalism (see Garman & Hazi, 1988, p. 671). The uncertainty and complexity of teaching is probably alleviated

somewhat for these teachers. Thus, research findings are worthwhile when they provide usable answers, and are made commonsensical and practical (Huberman, 1983; Louis & Dentler, 1988), even if teachers sometimes distort these findings for their own strategic uses (see Huberman, 1987).

The third conception in the literature is more sophisticated than the first two, but also held by fewer teachers. Rather than seeing research as irrelevant or research findings as authoritative, these teachers view research as illuminating their practice, helping them become more aware of what they are doing. They see research as challenging and interesting (Muir, 1982). Research provokes thought and helps them understand the complexity involved in what they do (Thomas, 1984). It also lets teachers see how others teach, helps them test decisions they have made, and provides principles to negotiate classroom tasks (see Porter & Brophy, 1988). In this view, research doesn't give answers, doesn't make decisions, but can be a helpful source of information (see Thomas, 1984).

An Incomplete Knowledge Base

This categorization of teachers' conceptions is noteworthy in two respects. It shows that teachers may greatly vary in their thinking about research and also reveals how relatively little we know about their views. The most prominent teacher-held conception of research is that research falls into the categories of irrelevant or applicable. We know nothing, however, about the degree and with what variations teachers accept the potentially misguided views that

research knowledge is certain and should be useful (see Buchmann, 1985). It is also well-established that findings from research have no compelling priority over other well-justified considerations teachers may have for a particular practice (see Buchmann, 1984; also, Richardson-Koehler, 1987). Direct instruction research, for instance, suggests that when teachers explain exactly what students are expected to accomplish, students learn more. But teachers may resist overemphasizing direct instruction in their classrooms because they have been studying, for example, Wally's Stories by Paley (1981), and have decided to experiment more with helping students work through their own ideas without explaining to them exactly what they are supposed to learn. Thus, this neglect of research may be legitimized because of other worthwhile goals teachers have decided to emphasize. In what ways do teachers understand this essential point about findings from research having no priority over other well-justified considerations? We do not know the answer to this question, though understanding teachers' responses may influence what researchers and teacher educators say to teachers when educating them about research.

Though there are no studies that focus on these issues directly, one recent survey has looked at how teachers think about some of these questions (see Waxman et al., 1986). Waxman and his colleagues asked 159 teachers in the Southwest about the role teacher education courses had in helping them understand and translate research studies into practice. They found that almost half the teachers felt that research provided practical suggestions for

improved instruction, and a little more than a third felt that professors helped them translate research into classroom applications.

However, finding out teachers' perceptions of teacher education courses as they relate to teachers' ability to understand and translate research studies, once again, only gets at the tip of the varied and differentiated conceptions teachers have. Waxman's study would have been more helpful if it also had provided detailed knowledge of what teachers understand about educational research and how they think about it in relation to their practice. In fact, the underlying premise of the survey is questionable. The position that educational research should simply offer practical suggestions for improving instructions is one that prominent educational scholars reject (see e.g., Zumwalt 1988; Fenstermacher, 1986; Floden, 1985). Waxman and his colleagues (1986) do suggest, as Slavin (see Brandt, 1988a) does, that it is important for teachers to understand research before applying it. But the authors neglect to ask teachers any questions about what it means to understand research, as opposed to simply trying to apply it. Teachers may equate understanding with application, but we do not know the degree and the ways in which teachers share in this misconception. The empirical data reported in the dissertation directly address this important issue.

The Importance of Teachers Learning About Research

Over the last twenty years there has been a surge of activity in research on teaching (Porter & Brophy, 1988). During this time

researchers and teacher educators have debated the merits of research on teaching for teachers. They have considered particularly the value of research knowledge and the manner in which teachers can integrate knowledge derived from diverse research traditions into their classroom practice. While controversy continues about the degree to which research can improve teaching and teacher education (for contrasting views, see Tom, 1985; Berliner, 1987; Phillips, 1989; Tom and Valli, 1990), there has been a convergence of scholarly opinion that research has no direct implications for teachers' practice.

Research Has No Immediate Utility for Teachers

Drawing on Schwab and Dewey, Shulman (1984) argues that to the degree that educational theory grows more powerful and clarifies an area of inquiry, its focus narrows "as a laser-like beam that brilliantly illumines a tiny area" (see Shulman, 1984, p. 45). The benefits of educational research will emerge through the "increasingly central roles played by well-educated teaching professionals" (p. 46), not its immediate influence on classroom practice.

The consensus view that research findings have no straightforward implications for teachers' practice can be broadly documented. Resnick (see Brandt, 1988b), for example, argues that results from the growing research on cognitive learning can not provide prescriptions. Teachers will have to think, to understand the principles of learning involved, their subject matter, and the

context in which they work. And, as Tom explains (1985; p. 148), even the most detailed and insightful ethnographic work can not by itself provide the basis for deciding how to change any teaching practice (see also Cazden, 1983; Zeuli & Floden, 1987; Tom and Valli; 1990).

On the other side of the research on teaching spectrum, Brophy (1988a) also argues that one abuse of the teacher effects research has been the attempt to simply translate findings into rules for teachers to follow and emphasizes that teachers must interpret research findings. Also, Berliner (1987), possibly the strongest advocate of teachers' rapid application of research findings, tempers his enthusiasm by pointing out that research findings are not easily generalizable. He goes so far as to say that telling teachers to follow rules derived from research "makes most researchers angry" (p. 29).

Slavin (see Brandt 1988a) takes Berliner's indignation one step further. Slavin suggests that teachers must have the capacity to understand research evidence before changing their practice.

> Until we have practitioners who say, "I'm not going to use that until I've seen good experimental evidence for it," we're going to continue on the educational pendulum with the "miracle of the month" and will not make much serious progress (p. 28).

These remarks are significant since there is sometimes no relationship between the scientific quality of a study and its degree of use (see Huberman, 1987). Slavin's comments are also noteworthy considering that his work on cooperative learning has been cited as the kind of research that should be taught to all prospective and

practicing teachers (see Berliner, 1987, p. 25). Despite this high praise, Slavin is willing to forego quick and easy applications of his research.

The dissertation addresses Slavin's remarks specifically and in-depth. One need not agree with his strong claims about teachers' need to evaluate fully the evidence base for a research program before adopting aspects of it. On the one hand, a teacher does not need to understand regression equations to consider thoughtfully the effects of changes in their practice based on research. Slavin may have gone further than what most teachers will ever be able to accomplish. If so, does this mean that teachers need not evaluate or raise questions about research evidence? On the other hand, because teachers "have seen good experimental evidence" concerning a research-based practice, this does not mean that they should use the practice in their teaching.

In sum, scholars from diverse research traditions continue to distance themselves from the view that the implications of research programs for teachers' practice are straightforward. They agree, for practical and theoretical reasons, that research-based prescriptions for teachers are inadequate and miseducative. Practically speaking, when teachers are expected to follow mandated practices based on research, they often carry out the mandates perfunctorily, or even ignore them. From a theoretical perspective, research is, to varying degrees, time-bound, theory-dependent and context-specific. Since research findings are context-specific and also partially shaped by researchers' definitions of worthwhile aims, teachers cannot merely be

trained to do certain things in accordance with some findings. If a teacher affirms that a research-based practice is supported by good evidence, the teacher is not compelled to use that practice.

These ideas about research and teachers' practice are important. They may be contrary to teachers' own deeply held beliefs about how research knowledge may or may not influence their teaching. Changing these beliefs will be consequential if, as scholarship in the research on teaching literature suggests, the benefits of research are dependent on teachers' understanding of it.

The pull toward prescription. Progress towards a more informed view has not come easily. Shulman (1986) points out that researchers have sometimes encouraged the over-simplification of their findings and the direct application of research results in teacher evaluation systems and teacher education. There are though a number of reasons for the emphasis on "findings to be implemented."

First, support for research projects, particularly at the federal level, often depends on the promise that research results will provide distinct and immediate improvements (Howe, 1984; Zumwalt, 1982; also Freiberg, 1982). Second, policymakers at the local and state levels frequently are eager to implement research-based findings into staff development and teacher evaluation programs (see Shulman, 1986). Third, the teacher education curriculum has traditionally been molded to certify a transient workforce. For this reason, in part, its content has lacked depth. To assure more rigor and gain professional status, its improvement has been thought to

depend on inserting research findings into the curriculum (see Lanier, 1986; also, Ross & Kyle, 1987; McCaleb et al., 1987).

All these reasons make it likely that prescriptions from research for teachers will continue to be a popular among some legislators, school administrators, and teacher educators. Nonetheless, other researchers and teacher educators have tried to conceptualize ways to help teachers think about research differently and use it willingly. While there is promise in this work, there are notable lacunae. It either neglects the importance of teacher beliefs about research, or pays only lip-service to the importance of teachers' understanding its limitations. And some work inappropriately slips back into an emphasis on research findings.

Diverse Approaches to Teacher Learning About Research

Focusing on Teacher Beliefs

Fenstermacher has presented one thoughtful and frequently cited view of helping teachers integrate research into their teaching practice (for various interpretations of Fenstermacher's work as it applies to teacher education, see American Federation of Teachers, 1983; Buchmann, 1987; Champion, 1984; Confrey, 1987; Eisenhart, et al., 1988; Hoover & Carroll, 1987; McCaleb et al., 1987; Munby, 1987; Shulman, 1984, 1986, 1987; Pendlebury, 1990; Russell, 1987; Sockett, 1987; Tom, 1985; Tom and Valli, 1990; Richardson; 1990; Wilkes, 1991). Fenstermacher (1986, 1987, 1991) argues that research should influence teachers' practice in so far as teachers reason that the research has bearing on their beliefs about teaching and learning.

He claims that teacher educators and researchers need first to observe and talk to teachers about what they do in their classrooms and why. They then can transform teachers' explanations into practical arguments that represent a "rather full description" of the teachers' actions (Fenstermacher, 1987, p. 6).

A teacher's practical argument will include empirical premises that the teacher can compare and contrast to the concepts and findings of selected research. For example, if a teacher believes that discovery learning is the best way to achieve higher level learning objectives in her class, this belief would represent one empirical premise in her practical argument. This empirical premise can be contrasted with another empirical premise from research on teaching that suggests higher level learning requires considerable instruction by a skilled teacher (e.g. see Brophy, 1986). The teacher and researcher can discuss the bases for each empirical claim. Changes in the teacher's practice depend on successful appeals to the teacher's reason why experimentation with another approach is worthwhile.

The strength of Fenstermacher's approach is his suggestion that teacher educators and researchers pay attention to teachers' subjectively held beliefs and help teachers draw their own conclusions about the value of research for their practice. Finding out about how teachers think about teaching and learning when introducing them to research and then reasoning with teachers about its value is sensible educational practice (for empirical studies using this approach, see Richardson-Koehler & Fenstermacher, 1988;

also Morine-Dershimer, 1988).

What Fenstermacher neglects is that how teachers think about research may impact significantly how they understand and use it. Fenstermacher states that research findings have no compelling priority over other well-justified considerations. There is, however, no mention that teachers' understanding of research itself will influence how they understand any research a teacher educator or researcher presents to them, and what, if anything, teachers try to do with it. Teachers' understanding of what research is, what it includes and excludes, its limitations, and how to interpret it in relation to their thinking about teaching in general, and more specifically, their own practice, may affect teachers' responses to any research presented them.

Thus, if knowledge of teacher beliefs is essential for understanding how educational research and policies may be integrated by teachers (see Eisenhart, 1988), then teachers' beliefs about educational research will have to be included too. Without any understanding of the possibilities and limitations of research studies, the authority of research will place these teachers at a disadvantage. Teachers are in the position of comparing their empirical premises with others derived from research. Teachers' premises, drawn from intuitive beliefs and casual empiricism, will not seem as well-grounded as those drawn from scientific studies of teaching. They may not reason well about research without having confronted their own beliefs about what research is, its possible influence on their work, and how they try to understand research.

Finding out teachers' beliefs in these areas may offer researchers and teacher educators new perspectives on teachers' resistance to research and lead to changes in how teachers are educated about research, including how research is presented to them.

Studies of Teachers' Knowledge Use

Another prominent approach to teachers' learning about research comes from descriptive studies of the organizational conditions under which teachers are most likely to use knowledge in general, including knowledge derived from research specifically (Huberman, 1983, 1985, 1987; Louis & Dentler, 1988).

This work can be compared and contrasted to the scholarly works (e.g. Buchmann, 1984; Floden, 1985; Shulman, 1986; Zumwalt, 1982) arguing against the view that research findings have straightforward implications for teachers' practice. These scholars frequently begin with an analysis of the tentativeness of all knowledge-claims, including those from research on teaching. They then develop and argue for a conception of education that excludes the idea that teachers should be merely encouraged and trained to use research findings.

The knowledge-use literature begins with an analysis of school characteristics that drive and constrain teachers' search for knowledge to improve their practice. From this analysis of broad contextual factors (federal, state, local factors, pre-service training, personal characteristics), and within-building factors (teachers' isolation, indeterminate objectives, batch variability,

the classroom press), these researchers describe what orientation teachers will have toward knowledge use. Because of these factors, teachers focus on short-run outcomes, use intuitive judgment, have a craft or artistic perspective and an ethos of personal reinvention (Huberman, 1983, 1987). From teachers' knowledge-use orientation, these researchers draw implications about the kind of knowledge large numbers of teachers in different contexts will likely use. It will have an instrumental focus, tend to be recipe-like, come from personal sources of information as opposed to in-print sources, and be framed in a way that inspires them (Huberman, 1983). Clearly, these characteristics will not only include, but also encourage, an emphasis on research findings.

Distorting the dialogue about research? The two bodies of literature stand in sharp contrast. If, as I mentioned earlier, there is a convergence of scholarly opinion about the miseducative consequences of directly implementing research findings, the knowledge-use literature seems an anomaly. One must recognize, however, that the convergence of scholarly opinion that I have outlined may mean little in relation to what teachers want from research. In general, scholars' analyses of the relationship between research knowledge and teachers' practice are based on a critical appraisal of research knowledge and accompanying reasons why teachers need to be educated about its use. Its strength up to now has not been based on an analysis of what teachers want from research. This is, however, the strength of the knowledge-use literature. It is

founded on what teachers want from research, given the organizational contexts of schooling and assumptions about teachers' knowledge of and interest in research. The lack of intersection between these two bodies of literature is troublesome. This becomes clearer when examining closely a recent study on knowledge-use in United States schools (Louis & Dentler, 1988).

A major assumption of the study is that the strategy for inducing change at the school level is based "in the accumulating dissemination and knowledge-use studies in education" (p. 36). Strategies associated with increased knowledge-use include interacting with colleagues about the information along with external, positive pressures to discuss and use it. Also, their findings support the conclusion that knowledge impacts are highest when the content is shaped "to fit the reality constructs and concerns of practitioners" (p. 57). The properties of the knowledge should be practical, motivating and commonsensical.

The study intends to be both descriptive and prescriptive. Knowing what knowledge use strategies are most effective will purportedly help us determine how change agents in schools ought to go about their business. "State mandated reforms that incorporate these strategies are rare . . . . Researchers seldom collaborate with disseminators in efforts to give new knowledge the properties we have called 'reality'" (p. 59). The implication is that they should do so.

There is a hidden inconsistency in the authors' move from description to prescription. On the one hand, they note the importance of interaction between colleagues so that recipients can

figure out if the knowledge fits the context. For example, research findings about the roles of principals in effective schools led to a discussion of whether the research was applicable to urban school districts (p. 50). This suggests that the limitations of knowledge are important considerations. On the other hand, the authors describe the greater impact of knowledge made usable, geared for action. They describe positively one participant in their study who states that "even if there were no data . . . how can you argue with time on task?" (p. 57).

Few concepts have engaged so many scholars as time on task (e.g. see Egbert & Kluender, 1984; Denham & Lieberman, 1980; Zumwalt, 1982; Confrey, 1982). "Time on task" has no direct implications, it must be understood and interpreted just as the research on effective schools. There is no recognition that making knowledge more action-geared may distort discussion about how participants interpret it. Why emphasize the importance of colleagues discussing research and then recommend shallow renditions of it that distort teachers' interpretative abilities? Also, when research is made usable and geared to action, research that includes a deeper understanding of the subject matter is expunged. It will have too much of a scholarly feel for people to take the time to discuss (see Louis & Dentler, 1988, p. 57).

Fortunately, teacher educators do not have to be saddled with these prescriptions. Teachers are curious about causal and conceptual matters pertaining to research, and not just concerned with "knowing how" (see Huberman, 1985). Further, one aspect of

"knowledge-use" does include teachers' conceptual understanding, if only so that teachers do not readily distort findings (see Huberman, 1987). Thus, there are also grounds within the knowledge-use literature itself for providing teachers with a broader perspective on the relationship of research to their work. This makes it important to look carefully at teachers' beliefs about research. By considering in-depth what teachers think about research, it is possible to show more clearly any limitations of the knowledge-use literature and also to provide some empirical basis for many scholars' proposal that teachers be educated about the role of research knowledge in their practice.

Learning About Research In Teacher Education Programs

Lampert (1988) argues that teachers and prospective teachers can learn to have a more complex view of mathematics, but that teacher education alone can not produce that experience on a large scale. The organization of schooling must also change to support well-educated teachers. Her point is that teacher education must try to provide teachers with a richer view of mathematics but one should not lose sight of more influential factors.

Teacher educators and researchers have tried to develop teacher education programs that provide prospective teachers with a richer, more sophisticated understanding of research, even if teachers well-educated about research are not rewarded at the workplace. This is a key point. Whether or not well-educated teachers are rewarded at the workplace can offer no justification for teacher education programs

that lack quality. Also, the rhetoric of professionalizing teaching has rested, in part, on a credible knowledge-base drawn from research on teaching (see, The Holmes Group Report, 1986). Since teachers will be required to understand this knowledge-base, it becomes urgent that teachers be well-educated about research.

Misconceptions about research are also important. Brophy (1988b) suggests that teacher education make use of "conceptual change teaching" to educate prospective teachers about scientific findings related to classroom management. Conceptual change teaching, as Brophy characterizes it, is based on the recognition that teaching does not involve infusing knowledge into a vacuum. It involves instead extending or changing existing concepts, some of which may be incorrect. This process is often difficult since successful conceptual change teaching sometimes

> requires not merely the correction of a single misconception but the wholesale replacement of an entire network of ideas that has been distorted by one or more key misconceptions with a new network reflecting accurate conceptions and their interrelationships (p. 13).

Brophy's examples of misconceptions include the prospective teacher who identifies classroom management with "disciplinary interventions" or has "overly romanticized notions about human nature."

Brophy claims that the way to change prospective teachers' misconceptions about classroom management is to first label these misconceptions, then underscore key contrasts with correct conceptions, and show how strategies associated with the misconceptions can be self-defeating (Brophy, 1988b, p. 13).

Students will also learn about correct conceptions through reading the research and becoming apprentices under more experienced teachers.

As students read the research, however, they will need to understand the assumptions that guide it and the appropriate ways to interpret it. Students will then be more capable of, for example, contrasting their views on human nature with the view of human nature embedded in the research. Brophy's view of misconceptions may be limited in the sense that he does not see students' conceptions of research in need of confrontation and change as they learn about research-based concepts and programs.

The point that it is important to confront teacher education students' conceptions of research can be made another way. Prospective teachers need to understand that achievement tests may be the only outcomes considered in research studies. Progress toward raising scores through using certain management strategies, for example, may come at the expense of other goals. For this reason, students need to have a strong foundation for evaluating all their information sources, including research studies. It is true, as Cuban (1988) points out, that Brophy acknowledges some of these points. But confronting students' conceptions of research as they learn about its value (normally meaning applications) is not considered.

A few programs address this issue. Helping pre-service teachers become critical about research is a theme in the literature (see Griffin, 1984). Ross and Kyle (1987), for example, describe a

program focused on teaching pre-service teachers about direct reading instruction. They recommend giving teacher effectiveness research early prominence in the program, and then requiring students to read critiques of it. Students also read articles that encourage the use of alternative teaching practices, and "articles that discuss the appropriate use of research in developing implications for practice" (p. 43). The approach is appealing, though we learn little about what articles students read, the kinds of issues they bring up, and how they are dealt with. This information is, however, important for teacher educators to know in order to help prospective teachers confront their beliefs about research. And, given that prospective teachers and continuing education teachers learn about research through teacher education courses, it is important that teacher educators consider the beliefs about research these teachers bring.

Research-into-practice studies. Less explicit teaching that confronts teachers' ideas about research exists in the "research into practice" studies sponsored by the U.S. Department of Education (Office of Educational Research and Instruction, OERI). The Department funded 29 three-year teacher education projects whose primary goal "was to demonstrate that the use of knowledge gained through research and sound practice could significantly improve the preparation of teachers" (see The NETWORK, 1987). Projects frequently focused on helping teachers learn about research while enrolled in teacher education programs. While many projects pertain less directly to this study, several of them focus plainly on

inserting research findings into the teacher education curriculum.

The "research applications for teaching" (RAFT) program for preservice teachers at Mississippi State University includes instructional modules to train teachers across all content areas and levels of schooling. These modules assist students

> to develop competencies in 16 performance areas with over 150 performance indicators specified by the State Department of Education for meeting certification requirements (The NETWORK, p. 18).

The instructional program includes "reading and discussing research," but this work is accomplished to facilitate performance. The project does not raise the question whether teachers felt that they understood the research when they could apply findings drawn from it. Since the project was designed to facilitate performance, narrowly defined, teachers may have entered and completed the project mistaking understanding research for directly applying its findings.

In another project at Iowa State University (Volker, 1988), prospective teachers had difficulty understanding and interpreting teacher behaviors because they relied mainly on their personal likes and dislikes for teaching styles. The project directors felt that students' judgments needed "to stem from an understanding of the research on teaching" (p. 2). But what this ends up meaning is that students simply compare their feelings to findings, and then make efforts to judge teaching behaviors consistent with the findings. Though "personal opinions were shattered" when students found out their ideas were not consistent with the research literature (see p.

11), such discontinuity is worth little when students are inducted into another set of misguided assumptions concerning the role of research findings in their future practice.

Other programs do not focus so nakedly on findings, but nonetheless reveal a chasm between recognizing the limits of research and educating teachers about them. The CITE program at Eastern Michigan University (see Sparks, 1988) includes the issue of how to use research-based concepts to develop prospective and cooperating teachers' reflective interpretations of research (p. 4). The cooperating teachers needed not only "to understand the research on teaching, but also how to coach students' thinking and practice" (p. 6). While it is good to emphasize contextual decision-making using research, it is more important to figure out how to educate teachers about research for making these decisions. There is unfortunately too little discussion about what it meant for cooperating teachers to understand the research on teaching and how the project directors went about helping them do so.

This is the case also with the project located at the University of Maryland (see Arends & Murphy, 1988). The project focused on developing clinical classrooms in which preservice and beginning teachers could learn research-based teaching models (e.g., direct instruction, classroom management, cooperative learning) from teachers trained as clinicians. The clinical teacher is one who is knowledgeable about research-based teaching practices, can demonstrate them, and can assist beginning teachers learn through discussion and reflection. An important aim of the program was "to

emphasize the interaction between research-based practices and teaching thinking and decision-making" (p. 4). The authors note that a key for the successful implementation of clinical classrooms was the teacher clinician training.

> Initial training focused on learning the research-based teaching approaches and practices with an emphasis on:
>
> 1. The Research Based Practice
>
> -the theory and rationale behind the practice
> -the research evidence supporting the practice along with limitations of the research . . . (p. 13).

Clinical teachers reported that as a result of participating in the project they "are no longer 'afraid' of research" (p. 40) and feel more empowered to reflect on their practice. These are encouraging project results, but the authors do not describe how clinical teachers were taught to think about research evidence supporting the practices, or anything about what it meant for clinicians to understand the limits of research. It is important that teachers gain confidence working with research, but the teacher education community lacks information about whether teachers think research evidence is important and the degree to which they are able to analyze it.

Using a different approach, faculty at Ohio State University (see Zimpher & Rieger, 1988) developed a program designed to develop reflectivity and inquiry among beginning and mentor teachers. The program has several features. One relates directly to this study. Action research projects were developed within the context of a graduate course among eighty-eight classroom teachers. Mentors

helped inductees in the design and conduct of the study to further the professional expertise of both and to increase their understanding of teaching and schooling (Zimpher & Rieger, 1988, p. 50).

The project authors do not claim that action research is the only way to introduce teachers to research. They make the more modest and reasonable claim that action research was one way to help teacher inquiry more deeply into their work and provide some survey evidence that teachers felt more positively toward classroom research after completing the action research studies (p. 60). The authors do not address specifically broader issues related to teachers' knowledge of what research is, how it should influence their work, or how they understand research when they read it. Considering action research more broadly, teachers are often encouraged to participate in these studies because more traditional forms of research on teaching do not help teachers (see, e.g., Hopkins, 1985).

It is, however, shortsighted to give teachers the impression that action research is the research most suited to help them improve their practice. Conducting any study usually requires teachers to draw on other research studies to frame their questions, collect data, and interpret their results. Teachers might be able to avoid this process as they are initiated into action research, but eventually they will be required to broaden the context of their thinking to other bodies of research on teaching. They will need the tools to understand this research. Helping teachers accomplish this

may circumvent the common and recurrent charge that much research that goes under the banner of action research is poorly done (see Hodgkinson, 1957; Clifford, 1973; Tickle, 1987). Also, action research projects may help teacher confront their beliefs about research and expand their understanding of it. These projects, however, may also reinforce misconceptions about research (e.g., the belief that research can and should directly impact teachers' work).

In addition, Fenstermacher's work (1986) offers a powerful corrective to the view that only one strand of research on teaching can assist teachers' thinking about their practice. Fenstermacher begins with the assumption that any research study may inform teachers' practice. His use of practical arguments is, among other things, a way to illustrate the manner in which he believes teachers should be educated about any kind of research on teaching. Thus, one can affirm that "action-oriented ethnographic research" can empower teachers to view critically questions concerning research in education (see Kirk, 1986; also Bolster, 1983; Woods, 1985; Hopkins, 1985; Tickle, 1987) without agreeing that no other body of research is suited for the task.

Summary: Problem Statement and the Significance of the Study

Scholars agree that the benefits of educational research depend on having teachers be well educated about research. But educating teachers' about research is difficult. It requires that teachers have a grip on their own views of teaching and learning. It also requires that teachers understand what constitutes research, the ways

in which research can and should influence their work, and the ability to evaluate critically research studies in relation to their own thinking about teaching.

The benefits of research are dependent on teachers' understanding of it, but no major studies broadly describe and analyze how teachers think about research. Scholars know relatively little about their views. They know nothing about basic issues such as whether teachers define understanding research as being able to apply it. They know nearly nothing about teachers' more sophisticated views of research. Conflicts teachers experience when they consider richer and more defensible views of research remain submerged.

Frameworks and programs designed to help teachers understand research frequently reflect the lack of attention to teachers' conceptions of research. Some focus rightly on teachers' beliefs about teaching and learning, but leave out any consideration of teachers' beliefs about research. Others recognize the importance of teachers' understanding the limitations of research, but give no indication of what this specifically means to teachers. Still others continue to confound understanding with use.

Teachers' reasoning about research can be improved through confronting their beliefs about research and its role in their teaching. It is important, however, to first map out the range and depth of teachers' ways of thinking about and understanding research. Finding out teachers' understandings of research would fill a major gap in the literature. The aggregate of data collected will provide

a refined understanding of teachers' explanations of what they think about research. Furthermore, the interview protocol developed for this study to find out teachers' conceptions may offer researchers and teacher educators an instrument to access and understand teachers' thinking about research. There is, at this time, no instrument available to provide this service.

The empirical grounding for teachers' thinking in this area furnishes a basis for deliberating on how to help teachers take a professional approach to research. The research community extols the value of teachers becoming critical of research. Given that research is increasingly touted as providing an authoritative basis for teaching decisions, teachers who understand research are especially valuable. As the study demonstrates, teachers can neither remain passive research consumers nor be expected to acquire highly specialized and often irrelevant knowledge of research. Taking a professional approach to research means that teachers have entered a middle ground, a zone of research understanding, between remaining passive research consumers and developing highly specialized research knowledge. No prior study has considered in depth what it means to help teachers take a professional approach to research.

In summary, there will be two distinct foci of the dissertation. One focus concentrates on teachers' thinking about and understanding of research. Teachers were interviewed to find out their beliefs about what constitutes research, how they think about research's influence on their practice, and how they understand research when they read it. The first focus provides an empirical and conceptual

grounding for the second focus. Based on the interview data, the second focus considers what it means specifically for teachers to take a professional approach to research. Taken together, both foci offer teacher educators and researchers a firmer foundation to confront teachers' misunderstandings of research so that research may serve to educate teachers about their practice. If, as Fenstermacher claims (1986), the manner in which teachers learn about research is more important any mandates thought to follow from it, understanding their beliefs about research seems an essential prerequisite.

Structure of the Dissertation

After describing the methods of data collection and analysis in the next chapter, I undertake a historical analysis of how different conceptions of educational research have driven and strengthened major movements to improve teachers' professional preparation since 1870. This third chapter serves two purposes. It places in a broad historical context contemporary claims that advances in research on teaching offer an unprecedented opportunity to professionalize teaching. As I show, the use of research to upgrade standards in teacher education has been a common strategy of researchers and teacher educators. I show that different types of educational research have been held up to support changes designed to upgrade standards. Contemporary promoters of this and that type of research perhaps differ in degree, certainly not in kind, from their predecessors. Truly unique, unprecedented in the history of teacher education in the United States, would be educating a large proportion

of public school teachers to take a professional approach to research. In addition, the historical chapter serves to help generate abstracts of different types of research studies. These abstracts are part of a card-sort task used to find out what teachers believe constitutes educational research.

The next three chapters (chapters four, five, and six) report thirteen teachers' responses to an interview protocol used to learn about one focus of the dissertation: teachers' ways of thinking about and understanding educational research. Chapter four uses a card-sort task (mentioned above) that includes different types of research studies to help find out what teachers think constitutes research.[1] This chapter reports teachers' responses, categorizing them as representing either a broad, narrow, or unclear conception of what educational research is.

Chapter five considers how teachers think about the influence of research on their practice. Using vignettes devised from scholars' and teachers' views on research's influence, the chapter reports how teachers think research can and should influence their work. The chapter details teachers' responses to the vignettes, uncovering important conflicts teachers experience when considering the broader influences of research on their teaching.

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[1] The next chapter on methods of data collection and analysis details the content of the interview protocol and the composition of teachers participating in the study. Also, each chapter provides additional information on the content and use of the interview protocol. See also Appendix A, which contains the interview protocol.

Chapter six looks at how teachers understand research when they read it. Researchers in this area traditionally have been more interested in what teachers read. This chapter goes beyond this narrow interest and focuses also on how teachers read research. To find out the manner in which teachers read research, teachers read three articles that can be associated with, respectively, quantitative, qualitative and historical research. Teachers were then interviewed to find out how they approached the articles and how well they understood them. Drawing on teachers' beliefs outlined in the preceding two chapters, I show the ways in which teachers read research is associated with their beliefs about its influence and what constitutes research.

Chapter seven, the final chapter, attempts to bring together teachers' and scholars' perspectives in order to approach the second focus of the study: what it means for teachers to take a professional approach to research. The final chapter draws on the wealth of empirical data reported in the preceding three chapters. It also draws on follow-up interviews of four teachers who enrolled in a course designed to introduce classroom teachers to educational research.[2] The final chapter places the empirical data in the context of scholarship on the use of research knowledge in teacher education and teaching. It considers at length both what it means

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[2] The four teachers participating in the follow-up interviews were among the original thirteen teachers interviewed for this study. The next chapter outlines further this component of the study.

for teachers to take a professional approach to research and what it means for teacher educators and researchers to help them do so.

CHAPTER II

METHODS OF DATA COLLECTION AND ANALYSIS

Overview

The empirical part of this study draws on interviews with practicing teachers. I interviewed teachers at various stages in their teaching careers to find out their thinking about and understanding of educational research. My intention was to determine first what teachers thought constituted research and how they thought about its influence on their practice. Based on teachers' responses, I hypothesized that teachers' willingness and ability to read research would be associated with whether they had a clear idea of what research is and whether they perceived its influence on their teaching more broadly.

After analyzing teachers' responses in this light, I set out to consider what these empirical findings meant in relation to the literature on research knowledge and teacher learning about research. Drawing on this literature, I show how teachers in this study took either a professional or consumer approach to research. I conceptualized that this professional approach is located between an extreme consumer approach to research and highly specialized knowledge of research. In this chapter, I describe the methods related to the empirical portion of the dissertation.[1] I delineate

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[1] Reporting of teachers' responses in chapters four, five, and six also provides important information about the interview protocol and methods used to analyze teachers' responses. The interview protocol is included in appendix A.

the sample of teachers who were interviewed, the structure and content of the interviews, and procedures used to analyze the data.

The Sample

Demographic Characteristics and Selection Procedures

The study was not designed to produce generalizable estimates of the proportion of teachers holding a particular view of research. However, one central purpose was to learn more about the range and diversity of teachers' views. For this reason, it was important to include a variety of subjects. To provide for a rich, diverse data base, teachers with different prior experiences with research were sought to participate in the study. I wanted teachers whose experiences with research were minimal and teachers whose experiences were extensive. I considered research experience as "extensive" if teachers had spent at least one-year involved in an educational research project located at the local or university level. To further extend the diversity of the data base, I also wanted to include at least two beginning teachers. Selection of teachers to participate in the study was based on their prior research experience. It was based also upon teachers' willingness to participate in long interview sessions. All teachers' participation was strictly voluntary.

I recruited 13 teachers to participate in the study. I went directly to local school districts and schools to recruit candidates. One group of four teachers was selected from two local school districts. In one district, a staff development coordinator provided

me with the names of five possible candidates. Three (including one first-year teacher) agreed to participate. Two female teachers worked at the same elementary school, and one other male, first-year teacher worked at another elementary school in the district. One other female first-year middle school teacher participated in the study. She was selected from another local school district. Her name was provided to me from the coordinator of a Michigan State University teacher education program from which she had recently graduated.

Another group of four teachers was selected from a master's level education course designed to introduce practicing teachers to research in education. I received an early enrollment class list, called teachers one month prior to the beginning of the class, explained the study, and invited their participation. I spoke with eight teachers of which four (all females) chose to participate. All four of these teachers worked in different school districts located between 20 and 100 miles away from the Michigan State University campus. Two were elementary school teachers, one was a middle school teacher, and one other taught at the high school level.

In sum, these eight teachers represented one group of teachers whose experiences with research were considerably less than five other teachers who were part of the study. To make sure that teachers with extensive research experience were included in the study, former teacher collaborators at Michigan State University were asked to participate. Collaborators were teachers who taught half-time in their schools and released the other half time to work with

Michigan State researchers on various types of research projects (see Porter, 1986 for a full description of teacher collaborator work at the Institute for Research on Teaching). Teacher collaborators typically worked between one and three years on research projects designed to study teaching and learning in schools. Their activities variously included defining what problems to study in schools, helping to investigate them, sharing responsibility in analyzing data, and presenting research at local, state, and national conferences.

From the Dean's office, I was provided a list of former teacher collaborators that included information about their present employment. Although many collaborators did not return to their local schools after working at the university, those asked to participate in the study were still closely involved in teaching and working with students in public schools. After screening the list, five teacher collaborators (three female and two male) were asked to participate. All five agreed to be interviewed. One collaborator taught high school English, another taught middle school, and two others taught elementary school. One other collaborator had recently become a middle school counselor and still taught mathematics and social studies to middle school students on occasion.

Table 2.1 shows the gender composition and teaching levels of the sample. As the table indicates, there were ten females and three males who participated in the study. Seven teachers taught at the elementary level, and six teachers taught at the secondary level.

Table 2.1

Gender Composition and Teaching Levels of Sample

	Male	Female
Elementary n = 7	1	6
Secondary n = 6	2	4
Total	3	10

Table 2.2 summarizes further the demographic characteristics of the sample. The table includes the pseudonyms of study participants, educational levels, years teaching, and any additional information on their teaching areas.[2] As the table indicates, all teachers, except one first-year teacher, had completed at least 27 hours of graduate work in education or had received a master's degree. With the exceptions of the two first-year teachers, all other teachers had between four and 25 years teaching experience. For the five teacher collaborators, the mean number of years teaching was 19. For the other teachers (excluding beginners), the mean was eight.

Table 2.1 and table 2.2 suggest that a diverse sample was chosen to participate in the study. There was an almost equal split of teachers teaching at the elementary and secondary levels. The number of males included in the sample represented nearly the percentage of males teaching at the national level in 1990. Teachers' educational levels were similar, although teachers differed in terms of their prior experiences with research. There were also differences in the number of years teaching among teachers. Although no general claims are made about the teaching population at large, the sample is broad and diverse. Teachers' responses during the interview is suggestive of what teachers with similar educational backgrounds and experiences with research may believe.

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[2] Table 2.2 may prove especially useful for determining quickly key background characteristics of teachers when they are referred to throughout the text. However, much of the information in the table is summarized in different parts of the dissertation.

Table 2.2

Credential Level and Teaching Experience of Sample

Pseudonym	Credential Level	Teaching Area	Years Teaching (Total)
Jessica	B.A. (education)	Middle School (science)	1
Nick	B.A. + 30 (curriculum)	Elementary	1
Ana Marie	M.A. (reading)	Elementary	10
Nicole	M.A. (curriculum)	Elementary	9
Andrea (MC)	B.S. + 30 (curriculum)	Middle School (mathematics)	5
Karla (MC)	B.A. + 30 (curriculum)	Elementary	4
Leisa (MC)	B.A. + 27 (curriculum)	Elementary	5
Lynda (MC)	B.S. + 30 (curriculum)	High School (remedial math)	12
Bryan (TC)	M.A. (elementary administration)	Middle School (math & social studies)	21
Cheryl (TC)	M.A. (curriculum)	High School (english)	25
Fran (TC)	M.S. (education)	Elementary	20
Geoff (TC)	M.A. (counseling)	Middle School (social studies & math)	11
Kathleen (TC)	M.S. (ed. psych.)	Elementary	18

Note. TC = Teacher Collaborator; MC = Teachers pre-enrolled in a master's level course on classroom research.

Note. Geoff had been a counselor at the middle school level for three years when he was interviewed. Prior to this, he taught math and social studies at the middle school for eleven years. He still teaches these subjects occasionally.

Data Collection and Analysis

I mainly used interviews to learn about sample teachers' views regarding educational research. In some cases, teachers' written responses to questions played an important role in understanding their views. In this section, I describe the structure of the interview, interview procedures, and how teachers' responses were analyzed. It should be mentioned that chapters four, five, six, and seven describe and analyze teachers' responses to the interviews. These chapters, once again, provide additional, important details about the interview structure and procedures. Each separate chapter also furnishes essential information about how data was analyzed. This chapter offers a broad overview of how the interview protocol changed over time and how data was collected and analyzed.

Structure of the Interview

The interview was designed to find out what teachers think about research by giving them a concrete basis for responding to questions about research. The interview protocol was piloted twice over a six-month period before its final form was set. It was first piloted with four practicing elementary school teachers and subsequently revised. Again the protocol was changed after piloting the revised interview with four undergraduate teacher education students enrolled in an introductory teacher education course.

As the literature suggests, these pilot interviews were important (see Goetz & LeCompte, 1984, pp. 128-129; also, Pelto and Pelto, 1978). They helped me determine the strengths and weaknesses

of both the protocol and myself as an interviewer. The pilots primarily served to improve the tasks employed to find out teachers' thinking in different areas. Also, the pilots helped me to become more skilled in eliciting teachers' responses, avoiding leading questions, and minimizing my own talk (see Pelto and Pelto, 1978). In addition, the structure of the interview changed over the course of the pilots. I added to the protocol another section that focused on interviewing teachers after they had read research studies.

The interview protocol itself was divided into six sections. The first section furnished background information about teachers' education and teaching experiences and their prior experiences with research. In the second section I wanted to find out two things. First, what did teachers consider to be their most salient, memorable experience with research, and second, whether and how teachers paid attention to research. The first two sections of the protocol changed little during the pilot interviews.

In the third section, the purpose remained the same, but the means used changed considerably. Section three was designed to find out what teachers believed constituted educational research. In the first pilot interview, the focus was on teachers explaining what their conception of research was and attempting to provide some sort of definition of it. This proved inadequate. Teachers often had an idea of what constituted research, but could not provide formal definitions of it.

A card-sort task was developed in order to better understand teachers' beliefs in this area. Twelve abstracts composed of

different types of research studies as well as prescriptions drawn from teacher manuals and how-to teacher journals were selected carefully to present to teachers. The types of research chosen had historical relevance. Much time and effort was expended to find prominent research studies that represented the type of research prevalent during different eras in the professional preparation of teachers.[3] So, in general, the abstracts represented the kinds of research historically and presently found in the curriculum of teachers' professional preparation. The card-sort task also included prescriptions about what teachers should do in their classrooms.

The abstracts in the card-sort task were piloted before their final form was set. Based on the results of the pilots and committee recommendations, the abstracts were rewritten. In some cases, the author's language was confusing, in other cases, my rendition of the text in abstract form was hard for teachers in the pilot study to understand clearly. As a result, I tried to make the abstracts more "reader friendly." In some cases, more readily understood phrases were substituted for highly specialized prose. The abstracts, however, were still tied as closely as possible to the text's language and were often based mainly on authors' own abstracts that preceded their articles (abstracts are included in chapter four).

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[3] Chapter three reconstructs how different conceptions of educational research drove and strengthened movements to improve the professional preparation of teachers. The types of abstracts included in the card-sort task were influenced by the scholarship carried out to reconstruct this relationship (see also, chapter four).

As in section three, the goal of the next section remained the same. What changed was how to elicit teachers' responses. Section four of the interview protocol considered how teachers thought research influences and should influence their work. Based on descriptions in the literature, I outlined three different views on how teachers think about the influence of research on their practice. For the initial pilot interviews, I developed twenty statements that I asked teachers to rate using a Likert scale. I found this approach less helpful for eliciting teachers' thinking about research's influence. Consequently, I changed the structure of the section. I developed three one-page vignettes, grounded in the literature, that described different teachers' perspectives on the influence of research.[4] After piloting the vignettes, I found teachers more disposed to discuss their vignette choices than their statements rated on a Likert scale. Following further revision, the vignettes served as the tool for understanding teachers' thinking about research's influence.

Section five of the protocol remained basically the same throughout the pilot interviews. The section focused on whether teachers recognized value premises or assumptions about teaching or learning when drawing conclusions from research findings. The literature on teacher learning from research suggests that teachers

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[4] The content of the vignettes is included both in chapter five and in appendix A. The introductory chapter provides the literature review used to furnish the content of the vignettes. Chapter five describes and analyzes teachers' responses to the vignettes.

should be careful about drawing conclusions from research. In this section, I was trying to find out whether teachers were in fact careful about drawing conclusions. I took a research finding from the highly visible U.S. Department of Education publication, What Works. Also, I adapted a research finding that Phillips (1971) uses to argue why no conclusions necessarily follow from any research study. Teachers read the research finding and asked to describe what it prompted them to think about, and what conclusions they would draw from it for their own teaching, and why. In order to find out further what teachers thought about the authority of research, they were also asked whether they should use a teaching practice in their teaching if the practice is supported by good research evidence.

These five sections originally formed the framework of the interview protocol. All five sections were piloted twice. The five sections of the interview provided much useful information, but it was limited. The information was not connected to how teachers actually read and responded to research studies. Consequently, another section was added to the protocol. Section six focuses specifically and at length on how teachers read research. Three short research articles from different research perspectives were selected for teachers to read. Teachers were first asked, in general, whether they looked for when they read research and whether they read research any differently from other texts. Teachers were then asked questions about the articles as a group and specific questions about each article. The articles teachers read and

questions asked teachers about the articles were reviewed by the dissertation committee to determine relevance and appropriateness.[5]

In sum, the instrument used to understand teachers' thinking about research improved over the course of the two sets of pilot interviews. When it reached the final form, the protocol included a card-sort task, a set of vignettes, two research findings, and three research articles. Chapters in the dissertation are devoted to analyzing responses to different sections of the protocol. Chapter four considers teachers' responses to the card-sort task. Chapter five looks at teachers' responses to the vignettes. And, chapter six combines sections five and six of the interview protocol and analyzes how teachers read research.

Interview Procedures

As the previous section indicates, the interview protocol was carefully organized. The interview format itself could be categorized as standard and nonscheduled (see Goetz & LeCompte, 1984). I employed similar tasks and questions for all participants. However, I infrequently varied the order of tasks and/or questions in order to encourage participant response. All interviews began with a brief statement about the purpose of the research, assurances that participant identity would be protected, and an outline of the interview session (see Lofland, 1971 for the importance of these

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[5] Section VI was not piloted. The research articles teachers read are described in chapter six. Questions asked teachers about the articles are included both in appendix A and in chapter six.

preliminaries). Interviews were held at convenient meeting places for teachers. These places included university meeting rooms, public school classrooms, public libraries, and in two instances, teachers' homes.

Each full interview took two sessions with each session lasting one hour. The full interview, including both sessions, was usually completed within a three-week period. Teachers needed to find time in their schedules to read the three articles in order to prepare for the second interview (see below). For one teacher (Geoff), the second interview was delayed three months. During the first session teachers responded to background questions, the card-sort task, and the vignettes (sections I-IV). After providing essential background information in response to the first two sections of the protocol, teachers then responded to the card-sort task. Teachers had not seen the card-sort prior to the interview session. However, in order to reduce the length of the session and to facilitate teachers' thoughtful responses, teachers were given the vignettes prior to the interview along with some of the questions they would be asked about the vignettes.[6]

After completing the first session, teachers were then given the articles they were asked to read for the second session along with the questions they would be asked about the articles. It was made

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[6] The interview protocol indicates which questions teachers could think about prior to the interview. Teachers were encouraged to think about and even jot down their responses prior to the interview, although this was not required. Most teachers, however, did outline their views prior to the interview.

clear that teachers had to read the articles prior to the second interview session. During the second session teachers responded both to questions about the three articles (section VI) and the two research findings (section V).

There was one variation on the conduct of the interview sessions. For teachers taking the master's level course on educational research, the first interview session included sections I-IV (as usual), section V, and three questions from section VI.[7] In the second session, these four teachers wrote out their responses to questions about the articles that form the main part of section VI. The reason for this variation was because these teachers were preparing to enter the master's course, and there was not sufficient time to schedule interviews. Since I continued to interview these teachers over time, I wanted to complete both interview sessions prior to their exposure to ideas about how to read research that may were included in the course. These teachers were also given specific instructions about the importance of reading the articles carefully before writing out their responses to questions about the articles.

I also followed changes in their beliefs as they proceeded through the course, using their responses as another way to help determine whether teachers value taking a professional approach to research. Using a similar interview format, these four teachers were

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7 The three questions from section VI related to how they read research and their ability to distinguish between causality and correlation in reports of research studies.

interviewed during the middle of the course and again two or three weeks after the course ended.[8] By analyzing teachers' responses to the interviews, I could determine whether and how their thinking about research had changed, what course content and activities contributed to any changes, and importantly, which ideas about research teachers continued to struggle with, and why.

Use of probes. The success of face-to-face interviews depends on the use of effective probes. Probing responses allows participants to clarify their thinking, to offer further examples, and to add detail (Patton, 1980; Goetz and LeCompte, 1984). Standard probes were used throughout the interview to validate teacher' responses. For example, during the card-sort task, teachers were asked to categorize each abstract in terms of whether they thought it represented their idea of what constituted research. A standard probe for this task after the respondent placed the abstract was, "what makes this research to you?" or, "why isn't this an example of research?" This probe gave teachers a chance both to articulate and to reflect on their choices. It meant sometimes that teachers changed their response based on criteria that became increasingly clear to them. These probes and others like them helped me understand better teachers' thinking throughout the interview.

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8 Teachers were also interviewed one year after the course ended. They were asked simply what, if anything, from the course had continued to influence them during the school year. Description and analysis of these teachers' changes in their views about research over time are included in chapter seven.

I also inserted non-standard probes during the interview. These probes were offered neutrally within the context of the conversation in order to clarify teachers' meaning. These probes were important. They helped me understand any noticeable inconsistencies in teachers' thinking across the interview. I would typically try to summarize two statements teachers had given that were apparently incongruent, ask them if I had characterized accurately their views, and then ask them to help me understand their meaning.

There were also occasions when teachers asked me questions. They sometimes wanted to know if they were getting the "right answers" to the card-sort task or to the questions about the research articles. In these instances, I said that after all the interviews were completed we could discuss the right answers, but that it was now important to find out how they interpreted the issues. Teachers seemed to feel comfortable with this standard response.

Recording the interviews. Interview sessions were tape-recorded and transcribed verbatim. Much time was spent listening to teachers' responses. Often it was difficult from reading a transcription to determine accurately the reference of a teacher's response. In these cases, I went back to tapes and listened again to the context of the response, the teacher's and my own inflection and tone, and made a judgment about the referent. After rechecking the tape recordings, I inserted handwritten notes on the transcriptions that indicated the proper referent or word meaning.

The tape-recording were done unobtrusively and there were no

mechanical malfunctions. The transcripts averaged roughly 35 pages single-spaced for both sessions (about 17 pages per session for each interview). In total, the data base included over 500 pages of transcribed text.

Data Analysis

General strategies. Most data was collected over a six-month period. At the end of the six-month period, I also collected a small amount of data one-year later from teachers taking the master's level research class.

The standard approach taken to analyzing teachers' responses to the interview protocol was, in general, to identify differences and similarities between teachers that could be placed in some broader framework grounded in the literature. As a preliminary, I read each complete interview twice, taking notes on particular themes that emerged, potential conflicts within individual teachers, and the differences and similarities that existed between teachers. After reading and taking notes, I placed the interview data within a broader literature appropriate for each chapter.

After writing up most of the first four chapters, I also began to work out a hypothesis I had about how teachers read the articles. Teachers' beliefs about what constitutes research and their beliefs about its influence seemed associated with how they read research. I studied how I had categorized teachers' beliefs about what research is and its influence. I then looked at their beliefs in light of the framework I developed (see below) for analyzing how teachers read

the articles. This hypothesis is explored fully in chapter six where I look at teachers' responses to the articles.

Specific analysis of empirical chapters. Portions of the data base, however, were analyzed differently. The data base was large, and teachers' responses to the three articles that they read accounted for roughly 35 percent (about 190 pages) of it. This portion of the data base needed to be reduced and placed in some sort of analytic framework.

There were few relevant models to follow in order to analyze this data. There exist accounts of what it means to read well in general (see Norris and Phillips, 1987) and highly specialized descriptions of how to analyze quantitative research in textbooks on educational research. Neither account in itself provided a suitable analytic framework. Teachers were reading different types of research. They needed some specialized skills appropriate to the different types. Also, their ability to read well in general would likely contribute to their understanding. Importantly, teachers' disposition to read research would also play a role in how well they understood the articles.

I developed an analytic framework that included different skills scholars considered important in order to understand different types of research articles. The framework also included what one would expect anyone who reads well in general to figure out from a text -- some defensible perspective on the text's main idea and the author's support for ideas in the text. After developing the framework, I applied it both to teachers' responses to the articles

and the manner in which teachers drew conclusions from the research findings. The framework was useful in two ways. It seemed a defensible framework to analyze teachers' responses. Also, it helped me to reduce the amount of data to be analyzed and included in the chapter's write up.[9]

The amount of data from teachers' responses to the other sections was more manageable. There were some differences, however, in how I analyzed the different sections that form the basis for the other two empirical chapters in the study (chapters four and five). With the card-sort I wanted to find out what teachers thought constituted research. Teachers' categorization of the abstracts was the primary basis for judging what they thought. However, the probes used to further understand a teacher's placement of an abstract were important. A teacher categorized each abstract as (1) this represents my idea of educational research; (2) this does not represent my idea of educational research; (3) I am not sure whether this abstract represents research. After placing each abstract, the teacher was asked why he or she placed the abstract in that particular category.

This probing was essential. In my analysis of this section, I categorized teachers as holding broad, narrow, or unclear conceptions of what research is. The probes helped me judge whether

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9 Nonetheless, a long appendix (B) includes teachers' statements in accord with the framework used to judge their responses to the articles and research findings. This framework is included in appendix B and chapter six.

my overall categorization of their responses was defensible. Despite the probes' general usefulness, it was difficult in some cases to determine whether teachers, for example, held a broader or narrow view of research. Teachers may include one historical abstract as research and exclude the other historical abstract. Sometimes in these cases and other like them (e.g., excluding one teacher's ethnographic study of their own teaching and including the other one), probes were not decisive in determining the basis for teachers' judgments. In these cases, I made a judgment after considering their responses as a whole and the weight of the evidence.

Teachers' responses to the vignettes were also more bounded. Two important themes emerged in this chapter. One concerned the differences that exist between teachers. Another concerned the conflicts within teachers about how research should influence their work. What was particularly useful for analyzing this section were those parts of the interview where I had asked teachers to respond to opposing statements that they themselves had made about the influence of research. That individual teachers would disagree with themselves was not predicted, but it turned out to be salient and important enough to include in the write-up of the chapter.

In conclusion, the analysis of the interview data provides part of the groundwork and much of the scaffolding for the final chapter. There I look at the sum of teachers' responses in light of what I have conceptualized as consumer and professional approaches to educational research. The power of the final chapter is that it relies greatly on important distinctions teachers advanced about

research over the course of the interviews. It is not only scholars' views but teachers' conceptions about, for example, the limitations of thinking about the influence of research or reading it in certain ways.

One hope for this study is that it will persuade teacher educators and researchers to take much more seriously teachers' beliefs about research. More specifically, they should take seriously helping teachers understand the research that is expected to influence their practice. To start, it may be important to think about some of the issues in a broad historical perspective. The expectation that research can and should influence teachers' professional preparation has long roots in American education. I document in the next chapter how different conceptions of educational research have served to meet this expectation. I also try to show how, despite the rhetoric, contemporary claims about the potential of research to impact teaching conform to this historical pattern.

CHAPTER III

THE INFLUENCE OF RESEARCH ON TEACHERS' PROFESSIONAL PREPARATION

Overview

Prominent researchers recently have claimed that educational research now offers an unprecedented and unique opportunity to impact teachers' professional education. These researchers see themselves as breaking from a tradition in which educational research has had no impact on teachers' preparation. The purpose of this chapter is to reconstruct a richer, more accurate portrait of teacher education and research. Contrary to contemporary opinion, different conceptions of educational research have driven and strengthened major movements involving the professional preparation of teachers. I describe and examine these dominant visions of research intended to influence teachers over the past 120 years of teacher education. To accomplish this, I first place teacher education between 1870 and 1890 within its social and institutional contexts. I then clarify the ways in which different conceptions of research have been employed during sucessive eras to influence teachers' professional preparation.

Research Knowledge and Teachers' Education: A Comtemporary View

Researchers (Brophy, 1986, 1988; Porter & Brophy, 1988; Berliner, 1987) continue to stress the importance of research on teachers' learning to teach. Their claim is that the past twenty five years of research on teaching has finally produced a knowledge

base to inform teachers' professional education. Prior to this, no knowledge base existed. Thorndike's work held promise to offer a knowledge base, but he and his colleagues failed to consider the political and sociological forces that affect teacher education and schools (Berliner, 1984; p. 52). The Great Depression, according to popular misconceptions, was a reversion to a dark age in which there developed "a lack of faith in scientific inquiry in education as a means of improvement" (Berliner, 1984; p. 52).

The lack of a knowledge base is tied closely to educators' shadowed status. Good, for example, states that there was essentially no professional knowledge base in teaching until recently, and this is one reason why educators are not treated professionally (see Good, 1989a). In contrast, the newly emerged knowledge base in teaching provides the foundations for raising teachers' professional stature. These researchers focus on process-product or process-outcome research (see Brophy, 1986), research on teacher planning, thinking and decision-making (see Porter & Brophy, 1988) as well as other "findings, concepts, and technology that educational researchers have developed in the last few years" (Berliner, 1987; p. 18).

These researchers sometimes draw a close analogy between medical and educational research. Brophy (1986), for example, argues that unlike medical practitioners, professional educators never possessed a research knowledge base. Referring to teachers, Brophy claims that "most of their decisions were based on untested theories or extrapolations from personal experience" (p. 1075). He claims that

"research linking teacher behavior to student achievement has finally begun to establish a relevant knowledge base for the teaching profession" (p. 1075). Berliner (1987) also tries to parallel the professional aspirations of teachers with the successful attempts of doctors to professionalize at the turn of the century. Just as the art of medicine gained status as it relied more on its scientific underpinnings, so the art of teaching can gain status by making use of a burgeoning knowledge base "that can transform our profession as well" (Berliner, 1987; p. 6). According to Berliner, a knowledge base consisting of facts, concepts, and a technology will offer the necessary scientific and technological expertise to win the public's confidence that teaching can not be performed by ordinary, untrained persons.

The story now told (see Porter & Brophy, 1988), that research on teaching really did not begin in earnest until twenty years ago in reaction to the Coleman Report (Coleman et al., 1966) and the Jenck's et al. study (1972), seems plausible on the surface. There has been an enormous output of research on teaching during the past twenty years, and this research may be part of a knowledge base that informs the teaching profession. This story, however, represents a popular misconception. Zeichner and Liston (1990) point out that one salient feature of the teacher education reform movement in the United States is "its lack of historical consciousness" (p. 3; see also, Hertzberg, 1976). There is no recognition that historical precedents exist for claiming the scientific foundations for teacher education has finally

been achieved.

In fact, research in education has driven and supported major changes in teachers' professional education. Early educational scholars contended that teachers' professional education should be based on research. They also made the seemingly requisite analogies to medical and legal education and expressed their disdain at teachers' overreliance on personal experience when learning to teach.

Importantly, the professional preparation of teachers has historically been deeply affected by different conceptions of educational research. These conceptions of research influencing teacher preparation differed but were defensible, given the canons of university scholarship then in place. Contemporary supporters of reform in teacher education are not unique in attempting to break with the past using the recently emerged research base in education. As I demonstrate, ever since chairs of pedagogy were established in universities over one hundred years ago, research has shaped and supported major movements in teacher education.

Teacher Education Within Its Social and Institutional Contexts

In his report to William T. Harris, the United States Commissioner of Education in 1889, Addis (1891) stated that future historians of education would show that an educational renaissance occurred in teacher education after 1870. Addis, a specialist at the United States Bureau of Education, characterized the period between 1868-1880 as "the era of discontent" in teacher education (Addis,

1891; p. 295). Historians agree that during this period the morale of the normal schools was alarmingly low. The number of normals was increasing substantially, but there was minimal support for them. Students continued to seek out normal schools for merely post-elementary and post-secondary education. Professional coursework for normal schools' floating student body was subservient to students' need to learn the subjects they eventually would teach others, if indeed they pursued a teaching career. There was real danger and concern that the normal would become, if not remain in some cases, a nondescript school with fourth rate academic standards, despite all the devotion and high hopes of its founders (see Kruse, 1929, p. 53; Borrowman, 1956; p. 70; also, Herbst, 1989).

The concern was warranted. The expectations of Cyrus Peirce and Horace Mann for normal schools would not be realized. The normal schools were never a reliable source of classroom teachers for the country's public elementary schools, even by the century's end. The normals had failed to cultivate a professional corps of teachers who would stabilize and strengthen the common school movement. Though public and private normal schools continued to be widespread at the turn of the century (there were nearly 300 in 1900) their programs still lacked consistency because of the divergent capabilities and aspirations of their students (see Herbst, 1989, p. 231; Williamson, 1936; p. 34; Borrowman, 1956; p. 77).

Educational writers of the period increasingly contrasted the undeveloped state of teacher education with the more established professions of medicine and law (see Gordy, 1891; p. 142; Kruse,

1929; p. 30; also, Powell, 1980; p. 38). They also lamented teachers' overeliance on tricks of the trade, tradition, and personal experience. The normal schools' emphasis on practical experience as providing the foundational knowledge base for teaching was inadequate. It would slowly give way as university scholars contended that a science of education could better direct teachers' work (see Powell, 1971; p. 406; Hinsdale, 1901; p. 1; and Kruse, 1929; pp. 30-31).

Establishing a University Beachhead

Between 1870 and 1895, university departments of education began to play an important role on the educational scene. In colleges and universities a more standardized approach to teachers' professional preparation, based on the legitimating power of science, was slowly developing. In 1870, the University of Iowa offered a bachelor's degree in didactics, and in 1873 established the Chair of Didactics. The University of Michigan established a program and course of study in the science and art of teaching in 1879. The University of Wisconsin followed suit in 1885, as did Indiana and Cornell University in 1886. Teachers' professional preparation, long the object of much obloquy, was now establishing itself within the university (Borrowman, p. 70, also, p. 86; Williamson, 1936; p. 34).

In order to understand this unprecedented transition, it is useful to consider how postbellum colleges and universities were adapting to broader social changes. Scholars have examined the

social upheavals in the United States between 1870 and 1920 as well as university adaptations to them. The United States was rapidly changing from an agrarian to an industrial and urban society. The economic transformation to corporate and industrial capitalism led to a dramatic increase in commerce and service employment opportunities (see Wiebe, 1967; Veysey, 1965; Bledstein, 1976; Haskell, 1977; Church, 1974; Fallows, 1985).

Colleges had to adapt to these social changes in order to survive. In the eighteenth century, colleges had thrived by helping young men confirm their place in respectable society (Veysey, 1965). As the middle of the nineteenth century approached, however, the prestige of the American college graduate was fast sinking. Adolescents were increasingly convinced that it would be more advantageous to skip college and directly enter business or other occupations. Between 1850 and 1870 colleges in New England served a decreasing percentage of the population, and of the 515 colleges started in 16 states before the Civil War, 412 failed (Bledstein, 1976). For many ambitious middle-class students, the college was becoming a marginal social institution.

Colleges and universities, however, would acquire over the next thirty years an tremendous popularity and influence. While traditional sources of social authority waned as Americans adapted to an increasingly urbanized, industrialized, and diversely populated society (Wiebe, 1967), the acquisition of university credentials emerged as a means for achieving social influence and mobility. The middle class began to support the university because it served as a

testing ground for attaining and maintaining social status (Bledstein, 1976). Between 1870 and 1910 student enrollments in higher education almost quintupled (Hofstader, 1963; p. 275).

The increase in enrollments brought about concurrent changes in curricular requirements. The elective system gained ground at the expense of prescribed studies. Diverse occupational training was more and more placed in the university curriculum. The traditional college curriculum of classics and mathematics was threatened and eventually overrun as the university became responsive to the practical and vocational ambitions of its growing student body. And by 1890, specialized training, acquired only through colleges and universities, was essential for any occupation that wished to call itself a profession (Powell, 1980; p. 34).

No new profession felt complete or scientific without a distinct academic curriculum (see Veysey, 1965). Educators too saw the creation of university departments of pedagogy as an opportunity to capture the respect afforded other professions whose specialized training was already established in the university curriculum. Most educators agreed with Gordy, a noted professor of pedagogy at Ohio State University, that public respect for the teaching profession depended on breaking down "the wall of conservatism that surrounds our colleges, to secure from them the same respect to the profession of teaching which they give to the professions of law and medicine" (Gordy, 1891; p. 142).

The chairs of education would symbolize that education had advanced as a science and thus deserved higher public regard (see Addis, 1891; p. 299). Like other fields that had prepared the way for education to find its place in the university (Borrowman, 1956; p. 86), educators had to link the production of scientific knowledge to the social benefits it could eventually provide (Veysey, 1965). Educators were quick to establish this link. The rapid development of public high schools and school systems increased the demand for better prepared high-school teachers, school principals, and superintendents. Educators argued that this "large class of enlightened professional leaders could be nurtured if the universities could establish chairs of pedagogy to train them" (Powell, 1980; pp. 38-39; see also, Frazier, 1933; p. 34; Gordy, 1891; p. 99; Pangburn, 1932; p. 32).

High school teachers, not elementary teachers, were the direct target of upgraded educational requirements. Elementary teachers were at this historical juncture less stable members of the occupation compared with university trained secondary teachers and school administrators (see Powell, 1971; p. 409; also, Borrowman, 1956; p. 103). William H. Payne, the first holder of the education chair at the University of Michigan in 1879, wanted university departments to focus primarily on educating high school teachers and other school leaders, leaving the normal schools to train "the transient members of the teacher's profession" (Payne, 1887; quoted in Borrowman, 1956; p. 103). Payne claimed that programs of study in teacher education were "to fit students for the higher positions in

the public school system", and "promote the transformation of teaching from an occupation to a profession" (Payne, quoted in Addis, 1891; p. 299).

The Science of Education and Its Value for Teachers

By 1890, Payne had convincingly articulated the necessary connections between an established science of education, the importance of educators understanding this science in order to improve education, the role of university training, and the increasing professional status of teachers. As in medicine and law, education would now be based on principles and doctrines from which decisions about practice could be derived.

> It is legal science that the student learns at the law school; and it is out this science, on the occasion of actual experience, that he must evolve his art (Payne, 1898; quoted in Williamson, 1936; p. 24).

As in law, an educational science, derived from more basic sciences such as philosophy, psychology and educational history, would be learned in education schools and used to guide teachers' practice.

Payne's pedagogical curriculum featured courses on the philosophical study of education and the history of education. This program of study, in Payne's view, offered prospective teachers the necessary principles upon which they could base their professional activity. Importantly, Payne's conception of teachers' professional education set the pattern for other university departments of education that were being established during the 1880s and 1890s (Williamson, 1936; 44; also, Addis, 1891; p. 299; Frazier, 1933; p. 34).

The science of education had become by 1890 associated most with the introspective study of mind and history (Powell, 1980; p. 42). Until near the end of the nineteenth century the "introspective study of how learning occurs, combined with some speculative rules to guide teaching method constituted what was considered the science of education" (Borrowman, 1956; p. 103). Payne believed that philosophical study of mental processes led to an understanding of the science undergirding teaching processes. Educators, he contended, who understood the "complex principles" underlying teachers' practice would be freed from the mechanical machine-like exactness that often characterized much teacher training. For Payne, one learned to do, as well as lead, by understanding theory, a theory which encompassed the recognized science of education (see Powell, 1980; p. 41; Addis, 1891; p. 275).

There were different approaches and emphases in the philosophical and historical studies that constituted the teacher education curriculum at this time (see Williamson, 1936; pp. 33-56; also Borrowman, 1956; pp. 103-107; Powell, 1980; p. 42). Beneath these different approaches, however, was the belief that the teachers' duty was to learn the principles of education that constituted the science of education. Although these principles might differ in terms of the philosophy of mind the author held, without understanding them, teachers were "slaves of routine," and therefore, "incapable of emancipating their students" (Williamson, 1936; p. 53; also, Gray, quoted in Gordy, 1891; p. 92). To counter

this possibility, teacher education courses would draw systematically from philosophical and historical scholarship to yield principles of how to teach (see Brauner, 1964; p. 104).

One especially notable variation on the deductive approach to a science of education came from the Herbartians. The Herbartian movement in the United States gained momentum in the 1890s through the support of Charles DeGarmo and the McMurry brothers, Charles and Frank. Though DeGarmo and the McMurrys provided American educators with a select and often incomplete understanding of Herbart's doctrines, Herbart typified the rationalistic, deductive approach to educational science. Herbart constructed a philosophical system from which could be derived a psychology of mind and a system of ethics. Pedagogy was a part of this system. Pedagogical ends could be derived from ethics, and pedagogical means (the five formal steps) derived from psychology (Dunkel, 1970; Robart, 1968).

Herbartian ideas spread quickly in the United States through the efforts of DeGarmo and the McMurry brothers. The scholarly foundations of Herbartian thought enabled it to take hold in university departments of education during the 1890s, providing the content for general methods courses (see Brauer, 1964; p. 63; Kruse, 1929; p. 65). But, the underpinnings of Herbart's educational science were highly complex. Consequently, his popularizers focused mainly if not solely on techniques derived from his principles that were thought to be immediately useful to teachers (Dunkel, 1969; p. 123).

Changing Conceptions of Educational Science

Payne's and the Herbartians' conception of educational science helped legitimate the movement of teachers' professional education to the university setting. One legacy remains in the base they provided for the educational foundations courses which still remain a basic component of teacher education programs (Borrowman, 1956; see p. 103, also, p. 110). Their science was based on a philosophical virtue -- careful logical reasoning -- and this was joined to systematically arranged ideas from which teaching methodologies could be derived. However, their definition of science as "an orderly arrangement of things based on a uniformity of relationships" would soon be discarded as empirically oriented researchers began to dominate university departments of education (Borrowman, 1956; p. 115; Brauner, 1964; p. 105).

Educational science as primarily based on philosophical principles and the psychology of mind derived from them was nearly anachronistic in a university geared increasingly toward experimental research and its practical bearings. Other university departments shared in this early emphasis on discovering "universally valid principles" as a source for a science. Like the classically oriented academic economists (see Church, 1974; p. 587), the speculative educational thinkers would be increasingly attacked and overrun. The renaissance of interest in scientific pedagogy which began in the late 1870s and 1880 and symbolized by Payne and Harris, gave way in the 1890s. There was growing dissatisfaction in the a priori methods and perceived philosophical dogmas of the rationalistic school (see

owell, 1980; p. 43; Kruse 1929; p. 61). Herbartian psychology, hough well worked out, was not easily subject to the new xperimental procedures that were gaining acceptance. As a result, erbart's educational science appeared unscientific, even ntiscientific, according to new conceptions of psychological science Dunkel, 1970; p. 282). The climate of scholarship had changed.

G. Stanley Hall and the child study movement. G. Stanley Hall as an evolutionary psychologist, believing that the concepts of volution could be applied to the study of mind. Hall's fundamental nesis was that psychic life and individual behavior develop through tages that correspond to the stages through which humanity passed in ts advance to civilization (ontogeny recapitulates phylogeny). This nesis was also central to Herbartian thought, though Hall believed nat he could establish his position through examining the natural evelopment of children (Cremin; 1961; p. 102; McDonald; 1964; p. 4).

One major criticism of Payne's and the Herbartians' educational cience was that it was derivative from first principles that had not een, or could not be, experimentally validated. Hall wanted to stablish first principles in education through empirical means. The mpirical study of what children knew, Hall contended, was the key to stablishing what children are like, in general, and thus, a way to uild a unified science of education. Hall believed as well that the esults of child study could influence teacher preparation and the urriculum content of the elementary school (Siegel & White; 1982; 252; Powell, 1971; p. 407; Cremin, 1961).

Hall launched a program of child observation, data collection,

nd data analysis that supported two distinct types of child study. ne type was carried out by Hall's own students trained in xperimental techniques. The other type of child study was carried ut by scores of teachers, parents, and other adults who used rescribed questionnaires to collect data on what children knew. oth types represented the new emphasis on empirical methods of tudying educational phenomena. And, Hall maintained, child study ould "give education what it had long lacked -- a truly scientific asis and help to give teachers a really (sic) professional status" see Robarts, 1968; p. 441).

Hall's attempt to found a science of education based on the bservations and interviews of children attracted a strong following. any normal school leaders and professors of pedagogy supported the ild-study movement, and child study was sometimes incorporated as rt of teacher-training (Kruse, 1929; p. 63). In 1894, the National ducation Association created the Department of Child Study. Also, achers resonated to participating in the scientific enterprise of ild study in order to raise the status of teaching and apparently lt that it was their duty to do so (see James, 1899/1958; p. 26).

But Hall's work was subject to devastating criticism. His pirical methods were considered uncontrolled and unsophisticated. ll's enlistment of masses of untrained research workers to collect search data was thought scientifically unproductive. The ofessionalization of the social sciences was dependent on taking sues out of the realm of public debate and subjecting them to

objective, standardized scientific procedures. Hall's enlistment of amateur data collectors made child study seem as much like a popular reform movement as it did an educational science (see Church, 1974; 398-399; also Powell, 1971; Robarts, 1968; Siegel & White, 1982). As a result, his science of education failed to have a substantive, long term impact on teacher education.

The Scientific Movement in Education

If Hall's empirical methods were uncontrolled, and his data collectors untrained, an educational science founded on controlled observation and experimentation and carried out by university trained experts could provide necessary knowledge for teachers' professional preparation. In fact, from 1900 to 1930, the scientific method in education became dominated by the empirical and the statistical. Rigorous empirical methods used in the established natural sciences were applied to subject matter bearing on education in hopes of developing a true educational science. Thus, the science of education became identified with quantitative and statistical techniques used to analyze controlled laboratory and school studies as well as other newly devised kinds of measuring instruments (Abelson, 1943; p. 681; Cronbach & Suppes, 1969; p. 56).

The period between 1900-1930 was also characterized by expanding school enrollments. The public school population had exploded. Elementary enrollments increased nearly 14 percent each decade. Secondary school enrollments went from 500,000 in 1900 to 4,500,000 in 1930. Students whose ethnic and social class roots often differed

widely stayed in school longer as well --- from an average of 99 days per year in 1900 to 130 days per year in 1930. An urgent demand for teachers coincided with the expanding student population. Standards for certification and hiring were raised as normal schools slowly became teachers colleges. Teachers' pre-service education was expanding and changing, becoming equal in extent to other bachelor degree programs and conforming more and more with the new science of education (Borrowman, 1956; pp. 128-129; Monroe; 1952).

More broadly, society had become increasingly dominated by business ideals. Efficiency and favorable balance sheets were the symbols of successful management. Public schools were deeply influenced by the prevailing zeitgeist. Superintendents became judged by the number of pupils successfully turned out per dollar, and teachers judged by the number of students they could pass on to the next grade (see Cronbach & Suppes, 1969; p. 48; also, Callahan, 1964). Quantitative measures that could determine and promote school efficiency in its various forms became useful for educators. Educational scientists argued that the new science of education, once ushered in, would supply educators with the means to make teaching and learning more efficient (Cremin, 1961; pp. 192-193).

Cubberly (1919) captured well both the content of and hopes for the new science during this period. Instead of philosophical speculations and the sometimes sentimental focus of child study, Cubberly outlined the new educational conceptions that were emerging since 1900. He saw these conceptions as already deeply modifying

ducational thought and practices, providing needed scientific irection to personnel working in the burgeoning and increasingly iverse school system.

> The scientific purpose of the new movements has been to enable us to determine educational results quantitatively, and to make it possible for us to evolve, by the careful measurement of schools and children, a series of standards of measurement (measuring sticks for school work) and units of accomplishment (time and effort evaluations of instruction) which can be applied to schools anywhere to determine, scientifically, the economy or wastefulness and the efficiency or inefficiency of the work being done (Cubberly, 1919; p. 689).

Foundations for the New Science

Cubberly rightly ascribed E.L. Thorndike as the leader of the cientific movement. Educational psychologists at the turn of the entury were trained in university programs that focused on xperimental research done in psychological laboratories. horndike's training fit this pattern. He began his career at arvard performing experiments on animal learning. Later, at olumbia, Thorndike's research led him to publish in 1905 the "laws f learning" --- exercise, effect, and readiness -- that he had been umulatively formulating (Powell, 1971; p. 408; Watson, 1961; p. 224).

Thorndike held firmly that educational procedures should be uantitative and based on the results of appropriately controlled sychological research. He dismissed those research methods that did ot meet strict scientific standards that had become dominant in the hysical sciences. In the preface to the first edition of his book, ducational Psychology, published in 1903, Thorndike stakes out his rview of the new consensus on what constitutes educational science.

> This book attempts to apply to a number of educational problems the methods of exact science. I have therefore paid no attention to speculative opinions and very little attention to the conclusions of students who present data in so rough and incomplete a form that accurate quantitative treatment is impossible (quoted in Watson, 1961; p. 226).

Thorndike's book offered a powerfully influential vision of the connection between experimental psychology and education. It included chapters on the measurement of individual differences, maturity, environmental influences, and retardation and pathology. With the publication of his book, Introduction to the Theory of Mental and Social Measurements a year later, Thorndike considered measures of central tendency, variability, and correlation in order to help students interpret the abundant amount of experimental data becoming available. His demand for a precise study of education also offered educational psychologists esoteric knowledge that separated them from laymen and other educational enthusiasts. This knowledge laid the groundwork for the areas in which psychology would later influence strongly education in the United States (see Siegel & White, 1982; p. 267; Cremin, 1961; p. 110; also, p. 185).

The rapid development of intelligence and aptitude tests for use in schools lent credibility and visibility to the new educational science, grounded in refined experimental and statistical methods as well other forms of measurements. Educational psychologists followed up on various aspects of Thorndike's work, especially his promotion of measuring school children's abilities and developing scales for measuring subject-matter learning. Thorndike and associates

constructed and standardized a number of these scales. Curtis constructed and standardized a arithmetic test for school use in 1908, Hillegas did the same for english composition in 1912, Buckingham developed a test in spelling in 1913, and Thorndike developed his standardized tests for reading in 1914 and 1916. Intelligence testing was also being developed at this time. By 1918, there were over 100 well-regarded standardized tests of student performance (Watson, 1961; p. 223; Cronbach & Suppes, 1969; p. 48).

The new science of education with its emphasis on quantitative studies had enveloped the field by the end of the century's second decade (Borrowman, 1956; p. 167; also Lagemann, 1989; p. 210). Cubberly (1919) compared the introduction of tests and measures into the school to what had been successfully accomplished in agriculture when scientific methods were applied there (p. 698). Russell, the dean of Teachers College, described in powerful language how the new science had besieged traditional education and its obsolete scientific pretensions.

> The old education is put on the defensive. Like the Knights of the Round Table, its supporters still do heroic deeds, but clad in armor fitted to each individual and supported by henchman from their own domain, they come badly off in a contest with opponents entrenched with scientific skill and armed with weapons of scientific precision. The outcome is no longer in doubt . . . Our successors will appreciate how great a revolution has been set in motion in this first quarter of the twentieth century (Russell, 1926; p. 721).

The new profession of educational psychology brought prestige to education schools. The link to colleges of education was based primarily on Thorndike's research on mental testing and learning

theory. Educational psychologists now possessed esoteric knowledge based on quantitative techniques and applicable to education. The knowledge was prized in the university and sought among schoolmen. Ambitious schoolmen pursued specialized training at colleges of education in order to prepare themselves for more specialized administrative positions. School districts also needed administrative specialists with training in the new instruments of educational measurement used to judge individual student ability and widescale district achievement. The most influencial professional courses at larger colleges of education became those aimed at preparing career educators for specialized positions. The new science of education supported well the professional interests of educational psychologists and public schoolmen alike (Powell, 1971; p. 410; Siegel & White, 1982; p. 277).

Influences on Teachers' Professional Preparation.

An applied psychology considered useful for professionalizing educational psychology and influencing educational practice had emerged from Thorndike and his colleagues' educational psychology. It also was influencing the professional preparation of teachers.

> Twenty-five years ago the scientific study of education was in its infancy and a teacher had to depend either on tradition or trial-and- error methods. Now he gladly employs many devices developed by research methods which in former years would not have been available (Greene & Raisner, 1939; p. 22).

The hope also was that the new science would enlighten teacher education by offering experimentally based generalizations to

prospective teachers and reducing the number of a priori generalizations in their preparation programs.

In fact, generations of prospective teachers and psychologists came under the sway of the new science. Predictably, teachers' professional education also changed because of the new science's hold on colleges of education (Watson, 1961; p. 222; Brauner, 1964; p. 126; Evenden, 1926; p. 66). E.S. Evenden, professor of teacher education at Columbia University's Teachers College and noted for his national survey of teacher education, claimed that the scientific movement had substantially impacted teachers' professional education. One study Evenden cited demonstrates how training in objective measurement had assumed an important place in the teacher education curricula. Considered essential to teachers' -- and not only measurement specialists' -- preparation was their understanding of the value and limitations of available tests and scales in their field, understanding of test scores, and the ability to construct and use new kinds of tests (Evenden, 1938; p. 39; also Evenden, 1926; p. 66). Teachers' professional preparation was incomplete without acquiring the knowledge that the new science had produced. The prospective teacher becomes assured

> that research workers have found ways of solving many of the problems which formerly baffled teachers. Thru their findings he is acquainted with the intelligence quotient, the importance of individual differences, the laws of learning, and the levels of pupil achievement. He has some understanding of the meaning of averages, correlations, and deviations . . . (Greene & Raisner, 1939; p. 15; see also Buckingham, 1926; Caldwell & Courtis, 1925).

In addition, Charles Judd, professor at the University of Chicago and a central figure in the scientific movement, claimed that the history of education since 1909 was no longer a suitable introductory course at normal schools and colleges of education because of progress in scientific measurement (see Lagemann, 1989; p. 206). According to educational leaders, progress in scientific measurement had significantly altered the content of teachers' professional preparation.

This extensive influence of the new science is substantiated by broader assessments of changes in teachers' professional preparation between 1907 and 1933. One study of professional courses offered at six institutions between 1873-74 to 1923-24 revealed that course offerings in educational psychology and administration and supervision had almost quadrupled between 1908-09 and 1923-24 and were the second and third most frequently offered courses behind methods and practice of teaching (Lee, 1925; p. 114). Also, by 1920, educational measurement had become a standard course in departments, schools, and colleges of education according to a broad survey of 233 institutions of higher learning. The increase in number was so rapid and concentrated that this course "represented a standardized content and product which other areas of professional training could not even approximate" (Sears, 1924; p. 96; quoted in Brauner, 1964; p. 170).

Overall, there was a declining emphasis on prospective teachers studying the philosophy and history of education, and greater emphasis on educational measurements, statistics, and instructional techniques. This trend was reflected specifically in required

education courses proposed for preparing elementary teachers within a four-year college curriculum. Major emphasis was placed upon educational procedures (measurement and statistics) and teaching techniques and a minor, even incidental, role was given to the philosophy and history of education (see Monroe, 1952; p. 236; also, Lee, 1925). Educational psychology based originally on the laboratory experiment method of research and including other quantitative measures applied to education had found a permanent place in teachers' professional preparation.

Subordinated Conceptions of Educational Research

In the scientific movement, educational psychology had attempted to build a scientific pedagogy on laboratory experimental methods of research and other types of quantitative methods. Armed with these techniques, it sought to establish the nature of the student's intellect, measure mental differences between individuals, and establish teaching methods that would respond to individual differences in ability. The belief was that these methods, and these alone would be the content of a science of education (Powell, 1971; Church, 1971; Brauner, 1964; p. 295).

There were other competing conceptions of educational research ignored or neglected as the scientific movement penetrated educational institutions. The most prominent competing conception of educational research is represented by Dewey's view of educational purposes and educational science. At the laboratory school at the University of Chicago, founded in 1896, Dewey sought to bring schools

in closer relation to children's community life, how to introduce history, science, and art to children in ways that had significance to their experiences, and how to help children learn to read, write, and calculate as a by-product of their involvment in other subjects and activities.

Though the school was considered a laboratory of applied psychology, the Laboratory School did not carry out any scientific study of experimentation at the school (Cronbach & Suppes, 1969; p. 50). Nonetheless, Dewey's later writing expanded on the way educational science could promote the type of learning and teaching he encouraged at the Laboratory School (see Dewey, 1911; 1928; 1929). Dewey believed that other disciplines, such as biology, psychology, and sociology were sources for a science of education. Consistent with this view, he thought that educational psychologists had developed a science useful for traditional schools. Dewey saw it as "fitting and proper" that traditional school practices should be influenced by tests and measurements because these make school operations more efficient. However, he argued that the emphasis on quantitative measurements and "the control of conditions demanded by laboratory work" should not blind educators to qualitatively different educational aims and methods.

> They contribute at most to the more efficient working of present practices in some subjects . . . But they do not give any help in larger questions of reconstruction of curriculum and methods. What is worse, they divert attention and energy from the need of reconstructions due to change of social conditions and to the inertia of traditions of the school system (Dewey, 1929; pp. 65-66).

Dewey argued that it was perilous to designate the science of education only those results reached through use of techniques borrowed from established sciences, and specifically those techniques capable of being stated in quantitative formulae. Attaining qualitatively different educational aims would require a different method and content for educational science. Dewey defined his science of education as "a body of verified facts and tested principles which may give intellectual guidance to the practical operating of schools" (Dewey, 1928/1959; p. 116).

Thus, Dewey opted for a broad range of disciplines that could be sources for an educational science, and importantly, included observational reports of children's learning within naturalistic settings. Researchers' and teachers' careful reports on conditions that are favorable and unfavorable to learning in natural settings of schools and school systems would be important sources for the science of education.

> (T)he educator cannot sit down and wait till there are methods by which quality may be reduced to quantity . . . A series of constantly multiplying careful reports on conditions which experience has shown to be favorable and unfavorable to learning would revolutionize the whole subject of method (Dewey, 1928/1959; pp. 118-119).

From research on pupils actually engaged with subject matter, definite and organized bodies of knowledge could be presented to other teachers for trial and criticism (Dewey, 1928/1959; p. 124).

Dewey's and other progressive educators' views of teaching and learning had limited impact on public schools, as did Dewey's conception of educational research on professional training (see

Brauner, 1964; p. 183). Thorndike and his colleagues' view of the science of education dominated the field of practice and professional education. Their conception served to professionalize the field of educational psychology. It also served the needs of school systems more interested in categorizing and placing diverse students than in providing them with rich and meaningful educational experiences. And, despite its limitations, this science of education found its way into teacher education, considerably influencing the structure and content of teachers' professional preparation over a long period of time.

The Foundations of Education Movement

> As Thorndike astutely -- and I thought wistfully -- summed it up in an aside to me one day in the depression years -- "So! Sociology's the thing now!" (Rugg, 1952; p. 723.

The scientific movement eventually generated a negative reaction among many teachers, administrators, and education professors by the late 1920s. The hope was that the new science would discover the best teaching method and curriculum for every field. Educational objectives would be isolated and reached by scientifically validated techniques. Once these had been produced, teachers could follow their outlines to impact directly what they did in their classrooms. However, teachers and administrators were threatened by the growing curriculum standardization based on scientific findings. Sounding much like contemporary critics (see, for example, Erickson, 1984, 1986), it was claimed that the more complex relations between the

child and the social environment were ignored, and there was growing fear that acknowledging only those values which tests measured compromised the quality of students' education. In addition, the results from controlled experimentation for educational decisions about, for example, ability groups or teaching arithmetic did not prove as conclusive as once envisioned (Cronbach & Suppes, 1969; pp. 63-64; Borrowman, 1956; p. 203; Monroe, 1938; pp. 323-327).

Social Changes and Intellectual Shifts

Broader social changes supported and accelerated this shift away from the dominant research mode and its prevailing influence. The stock market crash in 1929 had exposed the structural weaknesses in the economy. Business activity and social services were curtailed severely. While thousands dropped into immediate financial ruin, millions were left unemployed and would remain without work until the depression's end. Those with work saw their wages and hours sharply reduced. With rising unemployment and falling revenues, communities were without adequate means to support local services. Youth unemployment was not exempt from the depression's effects. More than 4 million youths between the ages of 16 and 24 were out of school and unemployed in 1935. Average unemployment for young adults would reach 40 percent in several cities (Church & Sedlak, 1976; p. 371; Bowers, 1969; p. 12).

Labor market changes also lowered the demand for youthful workers. Industry had become more mechanized, and rudimentary factory tasks were less available to the young. Since the young had

neither the understanding nor maturity to work with complex machinery, schools could not focus on training students for specific jobs to enter once leaving school. High school enrollments began to soar. While elementary enrollments were falling because of a declining birthrate, high school enrollments went from 4.8 million in 1929-30 to 7.1 million in 1939-40 (Church & Sedlak, 1976; p. 372; Tyack, Lowe, & Hansot, 1984; p. 148).

With the changing economy and increased secondary enrollments, the purposes of schools changed. Its welfare function expanded significantly. Schools were expected to protect students from the effects of alienation and the temptations of crime the lack of employment opportunities entailed. New school lunch programs focused on minimal nutrition for students. Handicapped and low-ability youngsters all received more attention. Vocational preparation also changed its orientation. Earlier vocational education had focused on training students for specific skills. This type of preparation, however, was obsolete in an economy needing semiskilled laborers. Employers were more willing to instruct job candidates in technical skills. Schools would provide well-adjusted, literate, and fast-learning workers. Educators thus sought to train youths in personality adjustment and work skills useful for a number of different occupations. Students' ability to meet people, to work with them effectively, and to have a broader notion of social and economic systems became more important than training in specific skills (see Borrowman, 1956; p. 187; Brauner, 1964; p. 180; Cremin, 1961; p. 274; Church & Sedlak, 1976; pp. 371-72).

With the onset of the depression, critical analyses of society and school prevalent throughout the 1920s gained greater acceptance. While the influence of the scientific movement had continued to wane among educational leaders, some scholars formulated and introduced an educational foundations program that would help teachers meet the changed circumstances. The new program was most clearly associated with a group of professors at Teachers College interested in the reconstruction of society and the American school. The group included noted faculty at Columbia such as George S. Counts, Harold Rugg, John L. Childs, R. Bruce Raup, William H. Kilpatrick, Harold F. Clark, among others, occasionally including John Dewey (see Cremin, 1961; p. 228; Borrowman, 1952; p. 219).

Meeting regularly between 1927 and 1934 and intermittently for several years later, these scholars possessed strong progressive roots and were deeply reform-minded. In 1933, members of this group along with other well-known educators produced a statement of their view of education appropriate to the socio-economic situation. The book, Educational Frontier (1933), aimed to give new direction to educational efforts. The changing social circumstances, these authors argued, required a change in educational aims. The role of education would be

> to prepare individuals to take part intelligently in the management of conditions under which they will live, to bring them to an understanding of the forces which are moving, (and) to equip them with the intellectual and practical tools by which they can themselves enter into direction of these forces (see Cremin, 1961; p. 229; also, pp. 224-234).

These aims signified that students' education would include both their understanding of broad social forces and their active participation in intelligent and humane social reformation. To accomplish this, the authors recommended a massive adult education program focusing on educating the public on the realities of industrial civilization. This would build support for a substantially revised school curriculum. Also, the authors recommended administrative changes. Teachers and students would play an important role in school management. Finally, the authors proposed a completely reoriented professional education for teachers based on a different conception of educational research (see Cremin, 1961; p. 230).

Restructuring Teacher Preparation

During the scientific movement, the science of education was dependent on quantitative techniques borrowed from already established sciences and applied to educational phenomena. This conception of educational research drove teachers' professional preparation which was dominated by teaching techniques, educational psychology, and practice teaching. Prospective teachers were trained to be technicians making use of the new science's findings. Psychologists involved in teacher education had not given much attention to the social implications of their work. They had neglected educational aims, and this had been reflected in the changing content of teachers' professional preparation (see Monroe, 1952; pp. 236-240; Brogan, 1940; p. 249; Borrowman, 1952; p. 214).

The scientific movement was divorced from larger social issues that the depression made difficult to avoid and about which the group at Teachers College was deeply concerned. Reorienting teacher preparation to focus on larger social issues required these scholars to draw on a different conception of educational research. Educational situations reflect complex social forces and cultural patterns. If teachers were to evaluate and to share in reconstructing social institutions, professional preparation must help teachers develop a keen understanding of these multifaceted social relationships. The reform-minded educators at Teachers College developed and established a educational foundations program that drew on other areas of scientific inquiry to illuminate these relationships.

Systematic studies of society and culture drawn from sociology, anthropology, historical studies of social change, and other relevant fields would offer prospective teachers the broad understandings necessary to participate meaningfully in social and educational change. The economics of Veblen, the sociology of Lynd, the history of Beard and Robinson, the legal analysis of Holmes, and the ethics of Dewey were all representative examples of systematic studies in other fields that could serve as a basis for educational foundations programs. Educational science was not limited to quantitative studies applied to a narrow range of educational phenomena. Newly completed scientific studies from a broad range of relevant fields that shed light on social issues and had bearing on education increasingly represented the dominant view of what constituted

educational science (see, Cronbach & Suppes, 1969; p. 65; Brogan, 1940; p. 255; Rugg, 1947; p. 1952).

These scholars' vision of an educational foundations program and their conception of educational science on which it was based substantively altered the structure and content of teachers' professional preparation. The first systematic, multidisciplinary course and program in the foundations of education was established at Teachers College, Columbia University in 1934. The program was an impetus for the development of foundations programs at other universities and teachers colleges throughout the 1930s and 1940s. Foundations programs eventually provided a powerful model for teacher preparation that was adopted in varying degrees by every state certification agency. Teachers' professional programs were required to include content, drawn from foundational disciplines, to help them understand the relationships between education and society (Borrowman, 1952; pp. 218-219; Tozer, Anderson, & Armbruster, 1990; p. 294; Rugg, 1952; p. 226; Brauner, 1964; p. 211; Monroe, 1952; pp. 246-247).

Foundations scholars had formulated an educational program that they believed would help create better schools and a more just social order. However, the deep-level reforms of school and society that educational leaders at Teachers College hoped to institute did not take place. Schools accepted their growing custodial function and their mission to produce well-adjusted youth. Thinning out the conventional curriculum to make schooling more tolerable to

disinterested adolescents, schools helped preserve the status quo. Also, most teachers did not become educational leaders who assumed positions of responsibility and influence during periods of social disruption and changing educational purposes.

Less ambitiously, colleges and schools of education were expected to help teachers gain a greater understanding of education in a democracy. They were expected also to provide the knowledge and competence to support their meaningful participation in discussions of school policies and programs. Educational foundations programs and courses provided the knowledge in teachers' professional preparation programs to accomplish these aims (Monroe, 1952; p. 246; Borrowman, 1956; pp. 210-213).

The scholars who initiated the educational foundations program have long been accused of engaging as much in polemics and inspirational thinking as systematic scientific study (see Brauner, 1964; pp. 198-226; also, Berliner, 1984; p. 52). It is, however, unfair to characterize their work as not involving systematic, disciplined inquiry because they used new styles and methods of social analysis. Like supporters of chairs of pedagogy in the late 1870s and the scientific movement in the early 1900s, their approach fit the canons of university research acceptable at that time. Noted scholars have recognized the contributions foundations professors made to educational research.

> At its best their dialogue was as scholarly as it was forthright. Moreover, they did substantially broaden the purview of educational research by bringing to bear disciplines that had not generally been considered relevant (Cronbach & Suppes, 1969; p. 66).

As scholars have also noted, foundations leaders created a model for teachers' professional preparation that eventually influenced the structure of teacher certification in every state (Monroe; 1952; pp. 246-147; Borrowman, 1952; pp. 218-219; Tozer, Anderson, & Armbruster, 1990; p. 294).

Action Research in the Late 1940s and 1950s

Educational foundations leaders' approach to educational science built on and was reflective of one aspect of Dewey's conception. Dewey (1929) had argued that other sciences furnished the content for educational science. Foundations' scholars followed up on this approach, eschewing the dominance of quantitiative techniques applied to education, and emphasizing how systematic studies of society and culture could form the foundation for teachers' professional preparation (Cronbach & Suppes, 1969; p. 65; Borrowman, 1952; p. 219).

Dewey included one other source that was not strongly promoted by foundations scholars, but later became more popular. Dewey suggested that teachers' observational reports of classroom experiences favorable or unfavorable to childrens' learning would serve as an essential source for educational science. Guided by some practical goal and acting as close observers of classroom activity, teachers could develop generalizations of how they changed human behavior. Teachers' generalizations would not provide recipes for other teachers to follow, but "would be indications of intellectual possibilities of this and that course of action" (Dewey, 1928/1959; p. 125).

Action research, popular in the late 1940s and 1950s bore resemblance to Dewey's suggestion that teachers' reports of classroom life serve as a source for educational science. Action research, defined as the process by which practitioners systematically study their own classroom problems in order to guide, correct, and evaluate their practice, was considered a direct and logical outcome of progressive education. Just as teachers showed children how to work together to solve problems systematically, teachers could engage together in systematic study of their own practice.

Action research by teachers covered a variety of topics, from studies of children's behavior and values to studies of how to work out numerous kinds of curriculum problems. Action research also had different approaches that blended into each other. One approach, close to Dewey's suggestions for teacher research, had teachers keeping a record of what occurred during classroom instruction and what happened as a result. Another approach focused on an individual or group diagnosis of classroom problems in order to discover courses of action. Much action research also represented relatively simple experimental, controlled research on the effectiveness of various techniques (see Hodgkinson, 1957; Wann, 1953; Corey, 1953).

Action research was popular throughout the 1950s in some colleges of education and innovative schools. But it was also subject to severe criticisms. Criticisms included teachers' lack of familiarity with various research techniques to produce worthwhile findings. As a result, studies easily degenerated into uncritical success stories. There was also an overemphasis on teachers quickly

utilizing the results of their studies, but rarely any follow-up of what happened to teachers after putting their results into practice. In addition, many action research studies attempted to model the statistical approach to research problems and neglected the careful observations of meaningful classroom learning that Dewey hoped would provide a key source for the science of education (Hodgkinson, 1957).

There were exceptions to these criticisms as well as other valuable types of teachers' collaborative study of classroom life (see, e.g. Brandt & Perkins, 1956). However, knowledge gained from action research did not serve as a focus for teachers' professional preparation in colleges and schools of education. Under the weight of these criticisms and the lack of broad support from colleges and schools of education, the action research movement soon collasped (Clifford, 1973; p. 37; Hodgkinson, 1957).

Contemporary Views in Historical Perspective

By the end of the 1950s the progressive movement in education was over. Progressive education had been perceived as too permissive and overly absorbed in the individual, and the movement had failed to generate the cohesion necessary to marshall the political forces that might have supported it (see Cremin, 1961). National priorities also had changed with the Cold War. The threat of Russian technological superiority had returned the school curriculum to its focus on subject matter, particularly math and science. Groups of university professors developed curricula in the late 1950s and early 1960s to

represent more accurately the nature of the disciplines and the processes of subject matter growth. Curriculum revision of this nature occurred in math, physics, biology, chemistry, and social science. Teaching materials were developed along with changes in curriculum. Students' ability to grasp the new curriculum clearly was based on teachers' ability to understand and teach it. Nonetheless, success of the curriculum projects was often characterized as dependent on creating curricula that anyone could impart, that is, "teacher proof" curricula (see Church & Sedlak; 1976; pp. 412-417; also, Hertzberg, 1976).

National priorities changed once again during the 1960s. More so than today, citizens were willing to face the growing gap between the rich and the poor and the widespread poverty that existed in the United States. The Democratic administration launched a number of federal efforts to analyze and to alleviate the poor's condition. Schools, considered the linchpin for most any social ill, were expected to play a major role in reforming society.

There were, however, contraindications about what teachers and schools could do to reduce poverty. In 1966, Professor James Coleman issued his Congressionally commissioned report on the "Equality of Educational Opportunity." Coleman found that changing teacher training, revising curriculum, constructing new schools, or changing other educational inputs would not reduce significantly poor students' achievement relative to other students. Schools, Coleman's study seemed to suggest, could not erase the effects of poverty. A later study, Jencks' and associates' 1972 work, Inequality: A

Reassessment of the Effect of Family and Schooling in America, also supported the conclusion that educational inputs played a insignificant role in determining gaps between income levels. By implication, both Coleman's and Jencks' studies deemphasized the role teachers play in increasing student achievement and their opportunities for social mobility.

Competency/Performance Based Teacher Education

Against this backdrop, a number of classroom researchers began to investigate whether variations in teacher behavior did actually make a difference in student achievement, defined as performance on standardized achievement tests. Researchers studied teacher behaviors including classroom management behaviors (responses to misbehavior, allocation of turns, and establishment of rules) or generic instructional behaviors (wait-time, frequency of praise or criticism, and the use of lower or higher-order questions). Research generally relied on quantitative methods that produced correlational findings. This process-product research was later expanded to study mediating variables (such as, e.g., time on task) between teacher behavior and student response that accounted for instructional success (see Shulman, 1986; also, Brophy & Good, 1986).

Armed with the results of these and similar studies conducted throughout the 1970s, researchers were confident that process-product research had "yielded a substantial collection of replicated correlational findings as well as several experimental studies that documented causal relationships between teacher behaviors and student

achievement" (Brophy, 1986; p. 1069). Because the research utilized an indicator important to policymakers and laypersons in determining school success -- students' performance on standardized achievement tests, the research findings struck a responsive chord. Findings based on the research were incorporated into some teacher education preservice courses on classroom instruction and management. Teacher educators were told that a scientific knowledge base had at last been realized for incorporation into teachers' professional education. Prospective teachers could be trained to produce observable teaching behaviors associated with student gains. Also, practicing teachers' ability to perform also could be evaluated and serve as the basis for staff development (see Shulman, 1986; p. 11).

Founded in part on the early beginnings of this research literature, the competency or performance based teacher education (C/PBTE) movement became increasingly popular in the 1970s.[1] State certification agencies began to encourage or even to mandate CBTE for

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[1] Prior influences on the movement are also traced back to competency-based programs used to teach serviceman to perform tasks during and after World War II and to the U.S. Department of Education's massive support for model competency-based teacher education programs in the 1960s. These programs applied systems analysis used in business and management to teaching (see Hertzberg, 1976; pp. 12-13). Historical origins of the competency movement are also traced to Charters' and Waples' comprehensive study of teachers' traits and duties in the late 1920s. These authors promoted their scientific study of teaching as what was once again needed to help do away with any existing teacher training that still relied on "common practice and tradition" (Charters and Waples, 1929; p. v; quoted in Hertzberg, 1976; p. 4). Charters' and Waples' work, unlike other components of the scientific movement, had little impact on the teacher education curriculum (Zeichner & Liston, 1990; p. 7).

certification purposes (see Hertzberg, 1976). The movement also made some inroads within schools of education. Despite its popularity, the C/PBTE movement apparently did not deeply influence the teacher education curriculum. National surveys conducted in the late 1970s and early 1980s found that relatively few teacher education programs had fully implemented C/PBTE programs (see Zeichner and Liston, 1990; pp. 7-8). In the 1980s, however, the competency-based teacher education movement powerfully reemerged at the state level in required programs for evaluating and certifying beginning and experienced teachers (see Shulman, 1986; p. 11; also, Sykes and Zeuli, in press). The effects on schools of education in states requiring these programs is not currently known.[2]

Breaking from Tradition?: The New Reform of Teachers' Professional Preparation

Contemporary researchers claim that advances in educational research offer scientific foundations for the structure and content of teachers' professional preparation. Only now does there exist a "reliable knowledge base for the inservice and preservice education of teachers" (Berliner, 1984; p. 74). The emergence of the new knowledge base to form the foundation of teachers' professional

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[2] There are no studies which have taken a comprehensive look at how teacher education programs have adapted to new state requirements tied to competency-based evaluations. It is likely, however, that schools of education are under pressure to adapt the curriculum to help prospective and practicing teachers meet performance requirements.

preparation breaks from a tradition in which no knowledge base existed. Previously bound by a reliance on more personalist conceptions of teaching and learning, teacher education can, these researchers claim, for the first time acquire scientific foundations.

> Heretofore, professional educators have not had such a knowledge base, so that most of their decisions have been based on untested theories or extrapolations on personal experiences. Instead of gradual but cumulative development of a profession based on detailed knowledge about particular educational practices, there has been a succession of fads and policy advocacy featuring oversimplified, sweeping generalizations (Brophy, 1986; p. 1075).

These researchers point toward a range of sophisticated correlation and experimental research on classrooms conducted over the past 20 years. The knowledge base for the new scientific foundations of teacher education, however, is not limited to the correlational and experimental process-product studies used to support the competency-based teacher education movement in the 1970s. The research base has expanded to include more recent studies on, for example, classroom management, cooperative learning, student motivation, descriptive studies of classrooms, and teacher thinking research (see Berliner, 1987; Zeichner and Liston, 1990; p. 9). Knowledge derived from this research, they claim, is the first scientific knowledge base that can be legitimately used as a foundation for teachers' professional preparation.

Looked at within the perspective of the 120 years of teachers' professional education, such claims can be understood as conforming to a historical pattern. Educational scholars and researchers have

typically held out various conceptions of educational science as offering the scientific foundations for teachers' professional preparation. Contemporary researchers wholly ignore the influence different conceptions of educational science have had on teacher education.[3]

While educational scholars disagreed during different periods what constituted the science, their ideas nonetheless influenced the structure and content of teacher education. During the foundations movement, a broader conception of what constituted educational science was equally influential in forming the content for teacher education. As this review of the literature suggests, the different conceptions that influenced teachers' professional preparation were consistent with the broader social contexts that existed in each successive era. Their historical acceptance was not a function of their scientific value alone, or, as is now often prescribed, their empirical credentials:

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This makes sense since to do otherwise may undermine contemporary researchers' claims for the unique status of their research. It has its pitfalls though. Other legitimate conceptions of educational inquiry continue to be neglected in teacher education. Jackson (1987a), for example, argues that recent claims about searching for and developing the scientific foundations for teacher education could be abandoned. Abandoning this search and the attendant forms of arguments used to influence the professional preparation of teachers would be beneficial, according to Jackson. One result could be the rejuvenation of historical and philosphical foundations of education, "a portion of the curriculum of teacher education that currently suffers from benign neglect" (Jackson, 1987b; p. 389).

> What was considered "good science" changed, partly because standards of research methodology progressed; but because education remained more than a technical activity, to be acceptable, educational science also needed intangible qualities of philosophical and social significance (Clifford, 1973; p. 26; see also McDonald, 1964; emphasis in original).

A scientific basis for teachers' professional preparation has been present since teacher education moved to the university almost 120 years ago. Educational scholars relied on canons of scholarship accepted within the university at a particular period, and their ideas were consistent with the zeitgeist of the respective era. Their ideas were influential. Contrary to contemporary claims, a study of the historical record clearly documents previous scholars' powerful influence on the professional preparation of teachers.

It is important to recognize contemporary researchers' lack of historical consciousness when they claim to provide the final definition of the scientific foundations for teacher education. Zeichner and Liston (1990) point out that understanding the historical lineage of different perspectives on preparing teachers can help teacher educators examine differences in goals and assumptions underlying various proposals to change teacher education (p. 16). Besides placing contemporary claims in historical perspective, there are also other important issues surrounding research knowledge and teacher education to consider.

A substantial body of literature has developed around (1) understanding the limitations of any knowledge base relevant to teaching, and consequently, (2) what this means for teachers' professional preparation (e.g., Zumwalt, 1982; Fenstermacher, 1986;

see also, Feiman-Nemser, 1990). Fenstermacher's (1986) work has captured the attention of prominent researchers and teacher educators. He has emphasized that decisions about how to apply research should reside "with the individual teacher who thinks about the needs of his/her students (Good, 1989b; p. 21). The expectation that teachers themselves should determine the value of research is significant. We turn now to study teachers' conceptions of research in order to consider in-depth whether the emphasis on teacher autonomy in relation to research findings is sufficient as it stands.

CHAPTER IV

TEACHERS' BELIEFS ABOUT WHAT EDUCATIONAL RESEARCH IS

Overview

Attention to teachers' beliefs has become an essential feature of studies designed to consider ways of helping teachers understand and use research (see, e.g., Shulman, 1986, 1987; Fenstermacher, 1986; Richardson, 1990; Pendlebury, 1990; also, Hoover & Carroll, 1987; Trumball, 1986). These scholars emphasize, for practical and theoretical reasons, that research-based prescriptions for teachers are inadequate and miseducative. Since research findings are context specific and partially shaped by researchers' conceptions of worthwhile aims, teachers cannot merely be trained to do certain things in accordance with some findings (see Buchmann, 1984; Floden, 1985; Zeuli & Buchmann, 1988; Zumwalt, 1982).

The beliefs on which researchers and teacher educators focus are teachers' beliefs about teaching and learning. But teachers' beliefs about educational research also strongly influence their understanding and use of it. Teachers' conceptions about what research is, what it includes and excludes, its limitations, and how to read and interpret it in relation to their thinking about teaching in general, and more specifically, their own practice, has not been the subject of systematic investigation. Inquiry into teachers' beliefs about research is important given that educators hope research can do more than provide findings that teachers can use directly in their practice. If research is also to heighten

teachers' awareness of their own beliefs about teaching and to help them develop justifications for them (see Richardson, 1990; p. 16), understanding teachers' beliefs about research is important.

This chapter reports data that are part of the broad study describing and analyzing respectively, teachers' beliefs about what constitutes educational research, how teachers believe research can and should influence their teaching, and how teachers understand research when they read it. The premise is that understanding different aspects of teachers' beliefs about research will help teacher educators and researchers think about how to work with teachers. Hopefully, they will acquire a firmer basis for educating teachers to appraise research critically.

This chapter considers one part of the broader study -- teachers' beliefs about what constitutes educational research. Thirteen teachers, divided into two groups based on their prior experiences with educational research, were asked to read 12 short (roughly 80 - 110 word) abstracts of articles or texts related to education. Nine abstracts were drawn respectively from historical, philosophical, quantitative and descriptive educational research studies. Three other abstracts were composed from articles or textbooks offering prescriptive advice to teachers about how to teach. Teachers were asked to read and then to categorize whether or not each abstract represented their idea of what educational research is. Before detailing further interview procedures, the content of the abstracts, and teachers' responses to them, I first examine further why teachers' conceptions of research is an important area of

inquiry, and also discuss how noted scholars in education (Dewey, 1928/59; 1929; Cronbach & Suppes, 1969; Cronbach, 1975; 1982; Peters & White, 1973) have tried both to broaden and to limit the range of work considered educational research.

Why Teachers' Understanding of Educational Research is Important

Researchers and teacher educators want teachers to pay attention to research. But if teachers do not know what research is, what meaning will researchers' and teacher educators' exhortations have? Most teachers interviewed for this study stated specifically that they paid attention to educational research. Ten of thirteen teachers interviewed affirmed that they were in one way or another involved with educational research through in-services, personal contacts, or their own reading. Two teachers stated that they did not pay much attention to it except when taking university courses. One teacher said that she did not pay attention to research because she was afraid of it.

What teachers are paying attention to is critical. Teachers with a narrow conception of research may neglect other kinds of inquiries that offer valuable guidance for their work. Historical and philosophical research, for example, can help teachers understand central questions relevant to curriculum content and teaching methods. Unexamined assumptions about teaching and learning are brought to light. Insights that go beyond established educational practice become grounded in these scholarly texts (see Scheffler, 1968). Without sustained engagement in those forms of inquiry,

teacher may remain unreflectively bound to accepted educational goals and practices (see Hogan, 1980).[1] Educational conversations that fail to draw on experimental or other quantitative methods are relegated to the category of unsupported opinion. Teachers are thus saddled with a restricted view of how professional knowledge drawn from research can improve their practice.

Teachers without <u>any</u> clarity about what is educational research is again troublesome. These teachers will not be able to distinguish between, on the one hand, anecdote and prescriptive advice without any research support, and, on the other hand, ideas and procedures supported by research. The authoritative, formal tone of speakers or texts may prompt them to affirm that something represents educational research. These teachers fail to consider the question asked, systematic procedures used to answer it, and evidence in support of conclusions. When attending to educational texts and speakers, these teachers are likely susceptible to speakers' personal charisma or texts' resonance with personal experience. Faced with an array of tips, prescriptions, and other information on teaching, and without meaningful basis to distinguish them, all external sources are

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[1] The desire to exclude forms of inquiry that do not include quantitative and statistical meaasures is prominent in the history of the professional preparation of teachers, especially during the scientific movement in the early 1900s (see chapter three). This narrow focus delegitimized teachers' access to scholarly inquiry examining and understanding educational aims during this period. Some contemporary critics (see Jackson, 1987a) also claim that the educational foundations are currently neglected in teacher education.

lumped together. Trying out the idea in the classroom and seeing how it works becomes the only criterion for judging the value of research. These teachers easily retreat to their classrooms, relying on the sureties of their personal experiences teaching. They remain less able to participate in valuable conversations about teaching that research can help inform, and the idea that research can help them develop justifications for their teaching practices becomes more remote.

Besides understanding what teachers may think educational research is, it is also useful for teacher educators and researchers to understand and to consider different questions teachers have about specific types of research. Thus, finding out what teachers think constitutes educational research is important. Teachers' views of it may constrain the types of research to which teachers attend, and their understanding of it may determine the depth to which they attend. Also, finding out what teachers pay attention to when they recognize something as research will help teacher educators and researchers gain insight into the broad and specific problems teachers have identifying certain types of studies as research.

Expanding and Restricting What Counts as Educational Research

John Dewey's (1928/1959; 1929) idea of educational science broke from narrow definitions associated only with quantitative measures. A dogma popular among Dewey's contemporaries was that "all research involves the use of statistical methods," including historical or legal research. By definition, there could be no such thing as

philosophical research in education (Symonds, 1928; pp. 28-30). This narrow point of view dominated the early 1900s, influencing the structure and content of teachers' professional preparation. But Dewey rejected it, partly because he believed quantitative studies were too closely bound to existing school practices. He believed further that a broad range of educational inquiries could contribute to a better understanding of educational processes, including teachers' observational reports of children learning within naturalistic setting (Dewey, 1928/1959; 125). In addition, Dewey resisted associating only empirical, scientific methods with educational research because he saw no fixed point at which science ends and philosophy begins. In line with Kuhn's (1962) later distinction between normal and revolutionary science, Dewey suggested that philosophical inquiry plays a powerful role in the formation and development of revolutionary science in all fields (see Dewey, 1938; pp. 478-80).

Though Dewey had broadened the concept of educational science, he sought also to distinguish between attempts to try out "any happy thought" that comes to mind and different types of sustained, systematic inquiry (Dewey, 1928/1959; p. 114). Dewey believed that there were a plurality of sources that could provide intellectual guidance for teachers. He cared less whether different types of inquiry used to provide better understanding and control over educational phenomena were contributions to educational "science," educational "research," or even educational "theory." He was,

however, determined that his broad conception of educational research include only careful, systematic, and intellectually responsible studies (see Dewey, 1928/1959; p. 120; also, Dewey, 1929; Borrowman, 1956; p. 218).

Dewey's interest in broadening the conception of educational research while separating it from unsystematic and uncontrolled work has more recent parallels. Cronbach and Suppes (1969) argue that too many writers limit the term research to quantitative studies. Surveys, measurements, and controlled experiments content are useful. Inquiry in education can not, however, be restricted to these quantitative techniques. Naturalistic observations, for example, are an important form of disciplined inquiry. Further, Cronbach and Suppes show how historical studies can provide perspective on current debates, while philosophical studies can add clarity and breadth to educational discussions. It is the joint and sophisticated use of these diverse methods that will better address educational problems in curriculum, instruction, and policy (Cronbach & Suppes, 1969; p. 58; also see, p. 14).

Cronbach and Suppes (1969) also claim that educational research must be separated from anecdotal reports and assertions, or prescriptive advice without clear, supporting evidence. Educational research must be conducted and reported in a way that permits careful examination. Researchers must detail the steps in their study, try to avoid sources of error to which their questions refer, and consider the margin for error in conclusions. Disciplined inquiry in education need not necessarily follow well-established, formal

procedures, and there is no uniform method of educational research as textbooks sometimes suggest. But, the details of the study must be lucid, specific, and pertinent so that colleagues in the field can take the findings seriously (see, Cronbach & Suppes, 1969; pp. 14-19).

Other noted educational scholars (Peters & White; 1973) also show why research can not be restricted to inquiries in which hypotheses are subject to observational tests. This narrow view of research fails to do justice to the more reflective side of scientific work (see, also, Floden & Buchmann, 1990; pp. 48-50). Furthermore, strictly empirical inquiries in education and psychology can not answer questions about aims in education and about the criteria used to decide them. These questions are nonetheless important to teachers, especially those who have greater autonomy in deciding curriculum content. For Peters and White, answering questions related to educational content and procedures makes philosophical inquiry in education necessary (see Peters & White, 1973; pp. 96-100).

Research, however, is not just any search to these authors. Counting grains of sand at the beach is not research. And, teachers who try out "any bright idea" with children are not thereby doing research. Research requires sustained and systematic inquiry by people versed in a form of thought and interested in answering a specific question. To be <u>educational</u> research, this question also must be related to initiating people into desirable states of mind

involving depth and breadth of understanding. Thus, research in education is not merely concerned with anything that goes on in educational institutions. For example, research on the structure and capacity of high school football stadiums is not educational research. This research has nothing to do with initiating students into desirable forms of thought. Consistent with these qualifications, Peters and White define educational research as sustained, systematic inquiry designed to provide new knowledge that is relevant to initiating people into desirable states of mind involving depth and breadth of understanding (Peters & White, 1973; pp. 95-96).

Basic research and action research. Peters and White further break down accepted distinctions between basic research carried out for the development of theory, and action research concerned with on the spot improvement of educational practices. What distinguishes basic research and action research is not that the former is theoretical and the latter practical. Both types of research may be relevant to practice, and both types of empirical research are concerned with the question, "What are the facts and how can we explain them?", rather than primarily with what ought to be done (Peters and White, 1973; p. 103).

Also, action research does not have to be concerned only with the applications of findings for the groups studied. What does distinguish action research from basic research is the "added difficulty of controlling variables faced by any form of 'on the job' research" (Peters and White, 1973; p. 103). Teachers are not engaged

in any form of empirical research if they simply consider whether an idea works and do not look further into the precise reasons why. But, they are engaged in empirical research when they systematically study classroom events, gathering data and trying to understand why these events happen the way they do.

Thus, researchers, including teachers, can use different types of empirical methods other than strictly quantitative methods to study educational phenomena. Other prominent educational researchers also draw this conclusion (Cronbach, 1975; 1982; Shulman, 1986; Zumwalt, 1982). Cronbach (1982), for example, recognizes the intractable problems associated with the social sciences establishing lawful relations comparable to traditional natural sciences. Social phenomena are too complex to establish empirical generalizations. Higher-order interactions, much of which teaching consists, can not be captured by traditional experimental and quantitative methods. From this conclusion, Cronbach suggests that methodological orthodoxies should be reduced and a mixed strategy of research approaches are appropriate and should be encouraged (see Cronbach, 1982; p. 73; also see, Shulman, 1986; p. 29; Erickson, 1986; Zumwalt, 1982; pp. 235-236).

A Broad Based Approach to Educational Research

In summary, educators can and should use a variety of research methods to study educational phenomena. Consistent with Dewey's and other authors' broad based approach, educational research includes historical and philosophical inquiry, descriptive research as well as

various types of experimental and correlational research. Also consistent with this broad approach to educational research are contemporary researchers' textbooks on different types of educational research (see, e.g., Gay, 1987; Wiersma, 1986; Smith & Glass, 1987), and scholarship on particular types of educational inquiry (see, e.g., Floden & Buchmann, 1990, for a discussion of philosophical inquiry in education).

What constitutes educational research can be represented by all these different methods. But, educational research must also meet minimal criteria. It must be undertaken by those with a background in and an understanding of the question investigated. The approach must be systematic, that is, governed by accepted procedural principles and guidelines. Qualified readers must be able to follow the manner in which the study was carried out. Sources of error must be avoided in the various types of questions pursued, and conclusions interpreted in light of the quality of evidence provided. Also, following Peters' and White's (1973) analysis, educational research is germane to initiating people into desirable states of mind involving depth and breadth of understanding.

What Is Educational Research to Teachers?

Two groups of teachers with substantially different research experiences were interviewed to find out what they believed educational research is. One group of teachers (n = 5) was composed of former teachers collaborators who had spent at least a year

working with educational researchers on research projects related to teaching and learning. Besides their experience working on research projects, the five teacher collaborators had all received Master's degrees in education, and each teacher collaborator had at least 12 years experience teaching. Two of the teacher collaborators were male.

Another group of teachers (n = 8) had substantially less prior experience with research. However, seven of these teachers either had their Master's degree in education (n = 2), or had completed at least 27 hours toward a Master's degree (n = 5). Two of the eight teachers in the second group were first-year teachers. One beginning teacher was one course shy of a Master's degree in education, while the other first-year had received a Bachelor's degree in education and had not yet enrolled in any graduate courses. Besides the two beginning teachers, the six other teachers in the second group each had between four and ten years experience teaching. Also, one teacher in the second group was male.[2]

All subjects volunteered to be part of the interview study. A list was provided the researcher of former teacher collaborators. They were then asked if they would be willing to participate in the study. The other practicing teachers who participated in the study were drawn from a pre-enrollment list of master's students taking a

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[2] The chapter on data collection and analysis (chapter two) spells out completely the nature of the sample and interview procedures. These paragraphs provide a brief overview.

classroom research course (n = 4). Another four practicing teachers were chosen based on recommendations from other educators working in the local school districts. Though the sample of teachers interviewed in this study is admittedly unrepresentative, it is important to bear in mind that interviewees' beliefs are suggestive of the beliefs many teachers may hold. As table 4.1 indicates, each teacher in either group was given a pseudonym. The table briefly summarizes the pseudonyms given to all teachers interviewed in the study.

Table 4.1

Teacher Pseudonyms

Group 1	Group 2	
Teacher Collaborators	Teachers With Less Research Experience	
Bryan	Leisa (MC)	Nicole
Cheryl	Karla (MC)	Ana Marie
Geoff	Lynda (MC)	Nick (BT)
Fran	Andrea (MC)	Jessica (BT)
Kathleen		

Note. BT = Beginning Teacher MC = Teachers pre-enrolled in a Master's level course on classroom research

During the interview, each teacher was asked what words they associated with the term, educational research, and if they possessed any working definition of educational research. However, the description and analysis of teachers' views draws primarily on teachers' responses to 12 abstracts of articles and texts related to education (the abstracts used in the interview are fully presented later in this chapter and in Appendix A).

The abstracts included in the interview with teachers were carefully selected. They were carefully adapted and written in order to retain the authors' characterization of the work and so that teachers would likely find them accessible. Abstracts chosen represented certain types of research studies or prescriptions teachers may typically find in libraries, teachers' lounges, or teachers' manuals.

The abstracts also have historical relevance. They include one study considered groundbreaking empirical work in education, Gordon Stanley Hall's (1883) questionnaire study on what children know before entering school. The abstracts also include a prominent historical work frequently used in the preparation of teachers, Ellwood Cubberly's (1919) Public Education in the United States. Also, one abstract represents the type of experimental studies influential during the scientific movement in education, R. Cook's (1924) study on the effects of teaching students in mixed or homogeneous groups. The types of research abstracts chosen also represent the different kinds of research one expects to find included in the curriculum of teachers' professional preparation.

The twelve abstracts all together included three abstracts from two experimental studies and one correlation work. Three more abstracts were based on two historical studies and one philosophical inquiry in education. In addition, there were three descriptive studies that included one questionnaire study and two participant observation studies (see Gay, 1987; pp. 191-213 for a classification of types of descriptive studies). Finally, there were three abstracts from articles or textbooks that prescribe how to teach certain subjects without describing the research support for their claims.

Each abstract was individually placed on a 4 X 6 index card. A teacher read each abstract separately and then was asked to place it into one of the three following categories:

a. This represents my idea of educational research;

b. I am not sure if this is educational research;

c. This is not my idea of educational research.

Index cards were placed on a table with the words, "research," "not research," and "not sure" written on them. A teacher placed the abstract on top of one of these index cards to indicate her response, and she was then probed to find out why the abstract was placed in a particular category.[3] Probing was an important part of the card-sort

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[3] Card-sort tasks are commonly used in cognitive psychology and sociology in order to help understand in-depth how people think about a certain topic (see, e.g., Ball, 1988).

because it was through probing teachers' responses that the reasons for their categorization became apparent.

Teachers' Responses

Thirteen teachers placed each of the abstracts into one of the preceding categories. Given the division of the 12 abstracts into three experimental and correlational research methods, three descriptive methods, three historical and philosophical methods, and three prescriptive statements, there is a total of 39 possible responses for each research method or prescriptive statement (13 teachers X three abstracts for each method or prescription = 39). Table 4.2 below summarizes teachers' overall categorization of the abstracts.

Table 4.2

Teachers' Categorization of Research Abstracts

		Teachers' Responses			
		Research	Not Research	Not Sure	Total
METHODS	Experimental/ Correlational	32 (82%)	1 (2.6%)	6 (15.4%)	= 39
	Descriptive	23 (59%)	5 (13%)	11 (28%)	= 39
	Historical/ Philosophical	15 (38.5%)	20 (51.3%)	4 (10.2%)	= 39
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	Prescriptive Statements	2 (5.2%)	34 (87.1%)	3 (7.7%)	= 39

Teachers' responses to the abstracts suggest that teachers clearly associated educational research with experimental and correlational methods. Of 39 responses to these methods, teachers believed that 82 percent represented their idea of educational research. Teachers, however, were less certain whether abstracts of descriptive as well as historical and philosophical research fit their conceptions of research. Of 39 responses to abstracts of descriptive research, teachers placed 59 percent of them in the category of educational research. Only 38.5 percent of responses to historical and philosophical abstracts were placed into the research category. The table also indicates that some teachers had difficulty determining whether particular abstracts of descriptive or quantitative research were research. Roughly 28 percent of responses to descriptive research abstracts were placed in the "not sure" category, while over 15 percent of teachers' responses to quantitative research abstracts were placed in this category. Finally, roughly 13 percent of the prescriptive statements either represented teachers' idea of research, or teachers were not sure whether the abstracts represented research or not.

The overview, however, needs closer analysis. In this unrepresentative sample, there were substantial differences between teachers in their responses to the abstracts. One group of teachers offered responses that revealed a broader, more developed view of educational research. Another group of teachers possessed a narrow view of research, while a third group of teachers had an unclear and unformed conception of what educational research is. Table 4.3

identifies the teachers by group and pseudonym.

Table 4.3

Differences Between Teachers' Responses to Abstracts

Broader Conception	Narrow Conception	Unclear Conception
Fran (TC)	Bryan (TC)	Nicole
Kathleen (TC)	Cheryl (TC)	Leisa
Nick (BT)	Geoff (TC)	Karla
Ana Marie	Jessica (BT)	Andrea
		Lynda

Note. TC = Teacher Collaborator BT = Beginning Teacher

Teachers with Broader Views of Research

As table 4.3 indicates, most teachers (n = 9) either possessed a relatively narrow or unclear conception of educational research. Four teachers had a broader conception. These teachers categorized more types of research studies as educational research. The reasons why teachers possessed a broader conception were varied. One teacher, for example, worked from a specific definition of research that guided her categorization of the abstracts. To Fran, educational research includes those studies in which a problem is perceived, a researcher sets out "to solve" it, and is ready and able

to use a variety of research methods to do so (see Fran; p. 10) With this definition, descriptive, quantitative, and historical and philosophical abstracts all counted as research. Prescriptive statements offered teaching methods for teachers to solve classroom problems, but they included no basis for the prescriptions, and thus they were not classified as educational research. Teachers with a broader view also tended to associate the term, educational research, with people taking the time to think through issues, to find out more about the issues, and researchers working together with teachers (see Fran; p. 7; Kathleen; p. 6).

Teachers with a Narrow View of Research

In general, teachers who fit in this group excluded important types of research described earlier in the paper. Thus, for many of these teachers, the historical and philosophical research abstracts did not represent educational research. For others, descriptive research did not conform to their narrow view of research. Their conception of research, however, did enable them to exclude all prescriptive statements. And, some of these teachers were able to define education research more openly, stating that it involved a close look at something related to teachers teaching and students learning (see e.g., Geoff; p. 13; Cheryl; p. 7). But, most teachers in this group defined it as the process of gathering and analyzing empirical data -- frequently emphasizing experimental data.

Teachers with a narrow view of research also associated educational research with "journals," "looking at data," and

"figuring out statistics" (see Geoff; p. 7; also Jessica, p. 5). When they thought of educational research, they saw images of teachers and researchers being isolated from one another, and researchers having "time to look and think and write that we're (teachers) not afforded in the classroom" (see Cheryl, p. 4) Some other teachers in this group associated the term with looking at the process of learning (see Bryan; p. 4).

Unclear Conceptions

Two teachers with an unclear conception of educational research could not provide any definition of research. Two other teachers defined it simply in terms the results of research, claiming that research was "what methods can be used to make kids learn" (see Nicole, p. 5; also, Andrea, p. 8). Though defining educational research can be intimidating and seem artificial, teachers with an unclear conception of research also had more difficulty than the other two groups of teachers categorizing prescriptive statements. These teachers were, in addition, less consistent in how they categorized similar types of studies.

Teachers with an unclear view of research also more frequently associated the term, educational research, with negative images and words. One teacher, Karla, thought immediately of "little old man with white hair and it all combed back," who has "big thick glasses just sitting pouring over books" (Karla; p. 5). Another teacher, Lynda, thought of paper, staples, and real long bibliographies, while Leisa associated research with "big long words," and what's boring,

complex, and hard to understand (p. 5). Andrea associated educational research with "achievement tests" and "what works for kids" (p. 3). These teachers without exception offered images and words that represented their discomfort with research.

To analyze more closely the differences between groups as well as individual teachers' questions and problems, teachers' responses to each set of abstracts are presented. The strategy will be to reproduce respectively three abstracts of particular methods or prescriptive statements and then to analyze group and individual responses to them.

We start with the abstracts from two experimental studies and from the one correlational study. The abstracts teachers read are in a similar form as they are presented below. The differences are that the titles, dates, and author(s) on the abstracts were expunged when teachers read them, and the abstracts were double-spaced on the index cards[4]. The number in parentheses before the name of the author(s) indicates the order in which the teacher read the abstract. A teacher did <u>not</u> read all the abstracts drawn from quantitative studies at once. As the numbers before each abstract indicate, a teacher read the first abstract first, the second abstract fifth, and the third abstract was the tenth of the total 12 abstracts each teacher read. The following page provides the three abstracts drawn from quantitative methods a teacher read and were asked to categorize.

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[4] The complete reference to each abstract is in the bibliography.

Abstracts of Quantitative Methods

(1) Good, T., & Grouws, D. (1979). The Missouri mathematics effectiveness project in fourth grade classrooms.

In this piece, the authors looks at the relationship between teaching behaviors and students' performance on math standardized tests. 40 fourth grade teachers are divided into two groups. One group, composed of 21 teachers, receives a 5-page manual describing a procedure for teaching mathematics. The teachers read the manual, receive two 90-minute training sessions, and then implement the key instructional behaviors into their mathematics teaching. The second group does not receive the manual and are told to continue to instruct in their own style. Students are tested before and after with standardized and content tests geared to the actual instructional content students were taught. Based on statistical analysis of the tests, students belonging to the first group of teachers did significantly better than students of the second group of teachers.

(5) Armento, B. (1977). Teacher behaviors related to student achievement on a social science concept test.

This author considers what teaching behaviors are related to student achievement on a social science concept test. She looks at 20 preservice and 2 in-service teachers teaching social studies lessons to students in Grades 3-5. The teaching behaviors that are strongly associated with achievement on the social studies concept test include relevance of teacher behavior to learning objectives, a balance between concrete and abstract terminology, and teachers' expression of interest and enthusiasm. There is no association between teaching behaviors and student achievement for signaling changes in topic, repeating or rephrasing questions, or telling students to stop irrelevant behavior.

(10) Cook, R. (1924). The effects of classification by intelligence tests.

The author looks at the achievement of high-school students grouped into different classes according to their performance on intelligence tests. Some students with the same test scores are taught in separate classes. Other students with the same tests scores are placed in mixed classrooms (with students of all ability levels). Student achievement of these two groups in algebra and Latin is compared. Achievement is measured primarily by standardized tests, secondarily by teachers' marks. The author finds that superior and medium students achieve more in separate classes; however, lower ability students do not achieve more when placed in separate classes with students of lower ability.

Quantitative Abstracts: Group Differences and Individual Questions

As indicated in table 4.2, teachers predominantly (82%) classified these abstracts as representing their idea of educational research. No teacher in any of the three groups placed the abstracts from experimental studies (numbers 1 and 10) in either the "not research" or "not sure" categories. When teachers identified "two groups" and "a comparison between groups" in the abstracts, they immediately associated these terms as representing their idea of what educational research is.

One teacher, Bryan, classified these two studies as "traditional research" and "classic research interventions." Fran stated that the two studies with the comparison and control groups were "easier than the others" to categorize because they represented their predominate view of what educational research is all about. Another teacher, Nicole, said that she simply focused on "catch words" to make her judgment. Terms like "compared" and "statistical analysis of tests" gave her confidence that the abstract represented research.

Many teachers, however, did have difficulty classifying the abstract drawn from a correlational research study (abstract number 5). Three (Nicole, Karla, and Lynda) of four teachers with an unclear view of research said they were not sure if this abstract was research. Also, two (Cheryl, Bryan) out of four teachers with a narrow research view were unsure about whether this abstract was research. While two teachers (Fran and Kathleen) with a broad view of educational research classified this abstract as research, two other teachers in this group (Nick and Ana Marie) had trouble

categorizing this abstract. One stated specifically that it did not fit her idea of research because the abstract described "just someone making some observations (Ana Marie; p. 16).

Teachers may not understand what correlation means. It is important to find out why teachers had trouble with the abstract. Probing their responses, one finds that teachers had difficulty understanding that if teacher behaviors are strongly associated with students' achievement on tests, this indicates a certain kind of relationship between the variables. Teachers with an unclear conception of research who placed this abstract in the "not sure" category stated that they had no idea what the abstract was trying to relate. Nicole's statements typified the reaction of this group.

> It doesn't really state anything . . . I don't know.
> In someone's eyes, it might be. There's not enough meat.
> I don't understand it (p. 4).

Other teachers stated their problem more specifically. Bryan stated that research should have conclusions, but this abstract did not say much about conclusions (p. 5). To Bryan, the abstract was just reporting. Nick stated that the abstract was an assertion, and it "doesn't tell the relationship between variables" (p. 5). Cheryl could not tell what the hypothesis was, and felt that the reference to teachers' enthusiasm and interest was very subjective. She claimed that the abstract "might be an observational piece," but she could not tell (p. 5).

These teachers' responses to this abstract suggest that they need to understand more about the relationship between variables correlational research establishes. This conclusion is supported by

interviewees' responses to a later interview question dealing with this same issue. Teachers were told that "educational researchers often warn readers not to mistake correlation with causality," and then asked if they know what researchers mean by this statement. Nine of the interviewees did not grasp what researchers meant. While some of these teachers looked at the statement as "jargon," other teachers were interested in understanding the statement's meaning.

Four teachers did offer explanations and examples that revealed some understanding of the difference between causality and correlation. Most of these teachers' explanations assumed a positive correlation between variables. All recognized that a close coincidence between two variables does not mean that one variable causes the other. Two teachers, Geoff and Jessica, saw teachers' understanding of this difference important. Geoff, for example, talked about how this understanding was a turning point in his undergraduate education. Teachers must "not jump in and make decisions based on things that might happen to coincide" (p. 32). His point reflects Zumwalt's (1982) cautionary note.

> Process product research yields information on what teacher behaviors correlate with student outcomes. . . . The correlational nature of the relationship is a constant reminder that contextual and extraneous variables may account for a significant finding. A causative link is an interpretive jump (Zumwalt, 1982; p. 219).

It should be noted, however, that interviewees' responses to the abstract drawn from a correlational study could be related to their inability to recognize that the term "strongly associated" indicates

a correlation between two variables. Two teachers who said that the abstract either was not research (Ana Marie), or they could not tell if it was (Nick), were able to demonstrate some understanding of the difference between correlational and causal relationships between variables. But they did not transfer this knowledge to their categorization of the abstract, stating specifically that it failed to mention any relationship between variables (see, Nick, p. 5; Ana Marie, p. 16).

Overall, teachers did experience some problems and questions about the correlational study abstract, but their responses to the abstracts drawn from quantitative studies were relatively homogeneous. Experimental studies clearly represented interviewees' idea of what educational research is. One finds even greater homogeneity in teachers' reactions to abstracts drawn from prescriptive statements. Some teachers, however, did experience problems. We turn now to a description of the prescriptive statements to which teachers responded, and, following this, a description and an analysis of their reactions.

Abstracts of Prescriptive Statements

(2) Watkins, P, et al. (1989). General Science, Teacher's Edition.

This piece presents a method to introduce social issues into a general science classroom. Students bring in articles on science and technology from newspapers and magazines. Class time is set aside on a regular basis for teachers and students to analyze and discuss the articles. The teacher's role is considered vital in these discussions. Students will integrate social issues in science when the teacher does not make judgments on students' responses, but rather accepts all possible answers, ideas, and positions.

(7) Shaw, B, Kane, R., & Merseth, K. (1982). Fundamentals of Mathematics: Skills and Applications, Teacher's Edition.

The authors write about how teachers can assist students with problems multiplying and dividing fractions. Even though multiplication of fractions is a relatively simple skill, there are many steps in the process that confuse some students. Students believe that they need a common denominator before they can multiply fractions. Teachers can remind students that this is not necessary; fractions with unlike denominators can be multiplied. Some of the students also multiply fractions diagonally. Those students who do this do it consistently. Teachers who catch this error early can avoid later student misconceptions. In addition, students sometimes forget to convert answers to their simplest form. Teachers must help students change improper fractions to mixed numbers and encourage them to reduce all fractions to lowest terms.

(9) Wassernan, S. (1983). How to turn your class into a think tank.

The author writes about teaching students thinking skills. She reviews different kinds of thinking skills. These include comparing, classifying, hypothesizing, looking for assumptions, organizing data, interpreting, and decision-making. To develop and improve these skills, teachers should involve students in activities that require them to analyze and discuss situations through with others. There are two steps to this process. Teachers' first step is to set up an atmosphere that invites and welcomes original thinking. The second step is to provide students with exercises in all the different kinds of thinking skills.

Prescriptive Abstracts: Group Differences and Individual Questions

Roughly 87 percent of teachers' responses to these abstracts were categorized as not representing their idea of educational research. Teachers with either a broad or narrow conception of research responded similarly. The eight teachers in these two groups all identified the three abstracts as "not representing their idea of what educational research is." These abstracts to them seemed more like "instructional techniques," "teaching hints," or "teaching strategies."

Advice differs from research. Fran accurately proposed that the abstracts were "like the beginning pages of a teacher's manual" (p. 9). Nick distinguished between strategies and techniques drawn from research and those not based on research. He did not find enough in the abstracts to claim that they were based on a research study. In response to the prescriptive statement describing how to introduce social studies issues into a general science classroom, he states:

> It may have been spawned by research, but in itself, I don't see it (Nick, p. 4).

Teachers with broad and narrow views of educational research agreed with Nick. The abstracts represented assertions and advice about how to teach. No explicit basis was provided for the techniques. They therefore felt comfortable categorizing them as not representing educational research.

Looking for key words. Four of the five teachers who had an unclear conception of educational research were less certain how to categorize these abstracts. Four of the teachers (Nicole, Leisa,

Karla, and Andrea) accounted for 13 percent of responses categorizing the prescriptive abstract as either "research" or "unsure if it is research." Their problems were related to their tendency to try to figure out whether the abstracts were from research based solely on key words they associated with research.

Nicole classified as research the abstract on how teachers can help students multiply and divide fractions. She assumed that someone who drew this conclusion "had to talk to them, work with them" (p. 4). She was uncertain whether the abstract on teaching students thinking skills was research because "there's no statistics." Andrea was uncertain whether to categorize as research the first prescriptive statement because it was missing "testing" (p. 4). Leisa thought that the first prescriptive abstract was research, even though "there's not two groups." Her reason was because someone is nonetheless studying teacher's impact on the students (p. 5).

Karla's response to the abstract on teaching thinking skills suggest that her uncertainty was tied to a securer conception of educational research. She states that the author's review of "the different kinds of thinking skills" may mean the abstract is from a research study. It would depend on whether the author actually read about and reviewed what thinking skills there are (Karla; p. 8). Karla, however, places other abstracts that emphasize literature reviews in the "not research" category, and she admits that she focused on key words to make her judgments (p. 9). Like the other

teachers in this group, Karla has no adequate basis for distinguishing between teaching strategies and prescriptions based on research, and those not based on research. Looking for key words in order to categorize the abstracts misled and confused Karla and teachers like her. They needed a firmer basis on which to ground their judgments. Teachers' responses to the remaining abstracts also revealed this problem. To understand teachers' responses, we turn to those abstracts drawn from historical and philosophical studies in education.

Abstracts of Historical and Philosophical Methods

(4) Cubberly, E.L. (1919). Public Education in the United States.

This author examines and synthesizes previous work on the history of public schools in the United States. He shows how the evolution of public schools was closely tied up with forces that shaped the nineteenth century, such as immigration, industrialization, and the disappearance of apprentice training. The author also describes how educational theory (for example, theories of how students learn) and practice (for example, how students were actually taught) evolved and adapted to these forces in society. Present and future educational problems are placed in a historical context so that teachers can understand the broader social and political significance of their work.

(6) Scheffler, I. (1982). Of Human Potential.

In this work, the author analyzes different interpretations and definitions of the concept of human potential. He argues that traditional ways of interpreting the idea of students' potential perpetuate the false beliefs that potentials are unchangeable, uniformly good, and consistent with one another. In contrast to this view, he argues that potentials are variable outcomes that depend on social contexts. Applying his analysis to ongoing school practices (for example, how the curriculum or instruction is typically organized), he shows that using the traditional language of human potential can prevent some students from having certain worthwhile learning experiences.

(12) Powell, A.G. (1971). Speculations on the early impact of schools of education on educational psychology.

In this piece, the author first describes how American teacher educators viewed education as a subject matter in 1890. He then analyzes what factors contributed to changes in teacher educators' views between 1890 - 1920. One factor contributing to these changes was the new profession of educational psychology, with its reliance on laboratory experiments and its virtual neglect of classroom life. The author claims that this change led to narrow view of human learning within educational psychology. A second factor was the increasing specialization within the education field itself. This specialization led to greater fragmentation in education courses and journals as well as an overemphasis on education credentials within the profession.

Group Responses to Historical and Philosophical Abstracts

To gain a sense of the diversity of teachers' responses, consider how teachers' with a broader, narrow, and unclear views of research categorized the three abstracts. Table 4.4 presents these differences.

Table 4.4

Group Responses to Historical and Philosophical Abstracts

		Categorization of Abstracts			
		Research	Not Research	Not sure	
TEACHER GROUP					Total
Narrow View -		0	11	1	12
Unclear View -		5	9	1	15
Broader View -		9	2	1	12
					39

As table 4.4 shows, teachers' (n = 4) with a narrow view of research overwhelmingly categorized these abstracts as not representing their view of research. These abstracts had failed to meet what they perceived as research's defining characteristics. Their responses to Scheffler's book on human potential (abstract # 6) reflect this point. Jessica states that the author is analyzing things, "but I don't see it as being an analysis of a given control group" (p. 7). Geoff states that the author fails to "talk about how

he was going to set up his design" (p. 11). Cheryl suggested that the abstract was "maybe a hypothesis," and it could become research if students were grouped and data gathered (pp. 5-6). Bryan believed that the author was "just adding thoughts" to someone else's research (p. 5).

The abstracts drawn from historical studies in education (# 4 and #12) were considered "opinion papers," "just reporting what is going on," "some theories." Cheryl claimed that the abstract represents history, and "history is not research" (p. 5). Geoff states that the author (Powell) of abstract number 12

> is not researching. He's just saying this effected this and this effected this. (He's saying) this is what happened back there, rather than saying that we compared this to something and set up a way to analyze it (p. 11).

In sum, teachers with a narrow view of research believed these abstracts did not appear enough like traditional empirical, quantitative research to be identified as research.

Interviewees with an unclear conception of research had a similar view. Leisa suggests that Scheffler is not looking at a defined group and "needs data to back him up" (p. 6). Andrea believed that the abstracts were "just opinion," while Karla saw one historical abstract as more "informational" than research. These teachers once again looked for catch words to determine how to categorize the abstracts. Lynda looks for guidance from what she learned from statistics, while Andrea looks for some kind of testing in the abstracts. Also, Karla placed the abstract from Powell's work in the research category because it included the words, "laboratory

experiments" (p. 9). Nicole does the same thing because the abstracts use key words such as "analyzes" (p. 5). Overall, these teachers had little confidence about how to categorize these abstracts.

Teachers with a broader view of research did share in some of the views already mentioned, though they did so much less frequently. Nick and Kathleen, for example, both believed that the abstract drawn from Scheffler's work was "just opinion." Nick, however, explains in his responses to the historical abstracts that these abstracts deal with events in the past that cannot be "controlled." These abstracts are nonetheless research (p. 4). Ana Marie states that authors who use other people's research to draw their own conclusions are engaged in some form of research, though it is not the same as other kind of (quantitative) studies (p. 16).

Kathleen also identifies the historical abstracts as research because the authors are doing a lot of reading and research to make sure that their assertions are correct (p. 14). Fran at first claims that a historical abstract is not research because

> I really don't see where this person has done anything other than bring together information on the evolution of public schools and how it shaped the 19th century (p. 8).

After further thought, she does place it in the research category because "this person has a problem and pulls together information that would bring about a conclusion." Like Fran, teachers in this group had a more flexible approach to what counted as research, and they did not simply rely on catch words to make

their judgments.

These teachers' broader view of research is reflected further in their responses to abstracts drawn from descriptive studies. Teachers in this group also raised important questions about the abstracts that parallel the questions and difficulties of other interviewees. We turn now to the final abstracts teachers were asked to categorize.

Abstracts of Descriptive Methods

(3) Hall, G.S. (1883). The contents of children's minds.

The author in this work considers what city children know and have seen when they enter school. 300 students are interviewed in groups of three by teachers. Teachers give the children the name of an object and children respond to questions about the object. Responses are examined in terms of types of responses, and the children's age, sex, ethnic background, and prior kindergarten training. In 34 questions out of 49, the boys surpass the girls. The girls excel in knowledge of the parts of the body home and family life, rainbows, and in conceptions of square, circle, and triangle. Irish children tested are behind others on nearly all topics. Kindergarten children, regardless of nationality, do better than children without kindergarten experience.

(8) Paley, V. (1986). On listening to what the children say.

In this piece, a teacher writes about her attempts to reflect on the way she responds to students' talk during class. The teacher feels like she did not listen closely to students' ideas, and fears that she harbors hidden prejudices toward certain children. To learn more about how she responds to students, she tape-records many of her classes. She replays and transcribes the tapes at a later time and finds out what topics and subjects inspire the best classroom discussions. She also finds out that the way she controls the discussions influences the quality of students' responses, and her own interest in their ideas.

(11) Armstrong, M. (1980). Closely Observed Children.

This work explores the intellectual experiences of a class of 32 eight to nine year old children in an English Primary School. The author co-teaches and observes a class over a school year, keeping a diary and notes on students' growth. The diary and notes focus on the most significant events of the day. A co-teacher and another teacher comment on and correct the notes. The work also includes students' writings and other samples of their schoolwork. Through observing children engrossed in various subjects, the author suggests that these "moments of absorption" are of critical importance in understanding children's intellectual growth.

Responses to Descriptive Abstracts

Teachers with a broader view of research categorized the abstracts drawn from descriptive studies exactly the same as they did for abstracts drawn from historical and philosophical studies. Nine of 12 possible responses were placed in the "research" category, two responses were placed in the "not research" category, and one response in the "not sure" category.

Ana Marie and Nick were the teachers in this group who placed abstracts in the "not research" and "not sure" categories. Nick was unsure whether Paley's (abstract #8) work was research.

> It loses some validity in terms of a scientific outlook because the person is experimenting on herself. . . The validity suffers more than it would here in abstract 11 because here (# 11) there is at least a team of teachers (p. 5).

Questions about objectivity. Nick is concerned about the a lack of objectivity in one teacher's study of her own classroom. He is more convinced that Armstrong's (abstract # 11) study is research because other teachers help secure a greater degree of internal validity. Ana Marie has the same concern as Nick. She understands that Paley "researched" her own behavior through tape recording her teaching and then analyzing the tapes. But, Ana Marie categorizes Paley's work as "just how she reflected on her teaching style." She is not convinced that Paley was careful and systematic enough in her self-study in order to draw any conclusions. Paley would need to replay all the tapes and convince readers that she carefully analyzed them.

> I think what might have been helpful is, once she identified those (ways to control discussions), to continue using those to make sure that was indeed what was happening. Cause it might have also been that she had bad headaches on some days. There are too many other variables that really might have influenced why she had good and bad discussions (p. 17).

Ana Marie's comments make it difficult to say whether she believes Paley is engaged in bad research that lacks internal and external validity or is not engaged in research at all.

Kathleen and Fran believed that all the descriptive abstracts were research. Fran, however, was in some ways unsure about her categorization of the abstracts. She asks whether

> when you're thinking about research, is research something that can be, should be able to repeat (sic) in other situations, and it should hold true? (p. 8)

Fran wants to know if replicability is another criterion that research must meet besides the criteria she had outlined (see above). What clinches her decision to place these abstracts in the research category is her recollection of working on an ethnographic research project. The goal of this research, she recalls, was not replicability, but rather understanding how a particular group of teachers changed their views of teaching.

Kathleen felt strongly that Paley's work was research because "she's listening to herself and getting an objective view of the quality of the discussions" (p. 11). Kathleen suggests that Paley's careful, systematic analysis of her own teaching is research, but this research is limited in its external validity. She states that it is not generalizable to other classrooms, though "teachers certainly could relate to it if she wrote it up well" (p. 13).

Though Kathleen also places Armstrong's work in the research category, she states that it seems "anecdotal" because she can not tell how the author was measuring child's learning, and what was meant exactly by "understanding children's intellectual growth" (p. 12).

Other interviewees' responses. The problems and questions teachers with a broader view of research had were also reflected in the responses of the remaining interviewees. Teachers with a narrow view of research had particular difficulty categorizing the descriptive abstracts. Seven of their 12 total responses were categorized as "not sure," while 5 responses were categorized as "research." Jessica, Cheryl, and Geoff were unsure whether the Paley and Armstrong abstracts were research because the authors' studies seemed too subjective. Cheryl felt that the Paley was more a "personal comment" from which a hypothesis could develop and a collaborative research project perhaps undertaken (p. 6).

To Geoff, the authors were engaged in "researchy behaviors, but it doesn't really continue to do the things you need to do to be considered formal research" (p. 12). If these abstracts were research, they were research in a "soft, soft way."

> Kind of like the Yugo and Lincoln Continental are both cars. Or the Yugo and the Honda. There's a big difference. But the term is research, not pure and legal (that) journals would accept. It just says research on the card. It may help to know that's how I'm thinking about this (p. 9).

Jessica categorizes Paley as "just self-analysis" that lacks "real objectivity." Research is "someone from the outside coming in a lot

of times -- not individually done" (p. 7). She begins to wonder whether her judgment is correct when she places the work by Armstrong (abstract # 11) in the "not sure" category.

> Because I'm sitting here and I'm thinking, a teacher can analyze her students and through the means of diaries and notes and the collection of writing can form a sort of research data bank I guess, if you want to look at it that way (p. 11).

But, Jessica and the other teachers with narrow views of research did not want to look at the descriptive abstracts this way. In general, these teachers hesitated to place them in the research category because they did not seem enough like formal, quantitative research.

Teachers with an unclear view of research placed nine of their 15 possible responses in the research category, and three each in the other two categories. Their categorization revealed their misconceptions about what research is. Leisa, for example, states that the Armstrong study is not research because

> she can't see where there's any change that's going to take place based on what she did (p. 8).

Leisa places Hall's (abstract # 3) in the research category because she confuses it with a kind of experimental study.

> It's kinda like that dentist commercial on TV. Dentists have proven that 29 out of 50 kids, and the kids were given some-thing and are being examined by people to see how they respond (p. 6).

Andrea places two of the abstracts in the research category because she perceives the authors as "taking a sample and testing them" (p. 6). Further, Andrea says that the Armstrong abstract is "bad research" because she can not be sure if the sample of 32 students is representative of students from different geographical areas and

income brackets (p. 6).

Teachers with unclear views of research also shared the questions and problems described in the responses of other interviewees. Karla placed the Armstrong abstract in the research category, "but it does not sound like well-documented research," and seems "anecdotal" (p. 9). To Nicole, the Paley abstracts seemed as much like "one person's opinion" than research, and Armstrong seemed to be only "highlighting significant events of the day" (p. 5). Like many other interviewees, these teachers had difficulty deciding whether to categorize the descriptive abstracts, particularly the Paley and Armstrong works, as representing research or anecdotal reports and personal opinions.

Summary and Conclusions

Important differences existed in what teachers believed counted as educational research. Teachers' conceptions of research ranged from fairly expanded to relatively restricted views of what research is. The data also suggest that some interviewees mainly played a guessing game with the abstracts. Lacking a more principled conception of what research is, teachers with unclear and unformed research conceptions relied on isolated words commonly associated with research such as "testing" and "statistics." Key words, in general, prompted these teachers to categorize an abstract as research. They said that they paid attention to research. But, if they valued external information sources about teaching, they seem especially vulnerable to the authoritative tone of texts or speakers.

All teachers face a variety of prescriptions, personal advice, and research-based opinions about teaching from external sources. Teachers with unclear views do not have enough knowledge about what research is to distinguish between the different sources. They can not raise the right questions in order to distinguish between, for example, anecdotal advice and sound opinion based on research. It is likely that they are less able to participate meaningfully in conversations about teaching research helps inform. Evidence for teaching practices or ideas about teaching may become highly personalized and dependent only on what works in the classroom. This approach to judging external sources of information about teaching will limit both teachers' ability to raise questions about research and their ability to think about research in relation to their teaching.

Interviewees with a narrow view of research were able to distinguish between prescriptive statements and research. But, they excluded all historical and philosophical studies of education. Because their view of research primarily included quantitative studies, they also had trouble deciding whether descriptive studies should be considered educational research. If the study did not mention formal control groups and statistical analysis of data, the work was immediately suspected as too subjective to be research. Consequently, their view of research was limited. Their view is also limiting. These teachers claim that they pay attention to educational research. They are, however, neglecting and devaluing

other types of educational inquiry that offer rich and unique understandings of teaching.

Several interviewees did categorize more types of studies as educational research. Teachers with a broader conception of research were better able to discriminate between personal opinion and historical and philosophical studies of education. They did not confuse prescriptive statements with various types of research studies. Some of these teachers raised important questions about descriptive studies, and did not reject them only because they did not include statistical analyses of differences between groups. Nonetheless, some teachers who thought of research more broadly had problems, like other study teachers, recognizing correlational research because they did not understand what correlation means.

Researchers and teacher educators have focused on teachers' beliefs when helping teachers understand and use research. Teachers' beliefs about research have been neglected. One component of teachers' beliefs -- what constitutes educational research -- is worth their attention. Based on teachers' views in this study, teachers hold a variety of beliefs about the sources of research findings. Some teachers assume the findings can be only the product of experimental studies establishing cause and effect relationships. Other teachers have little idea about what the sources of research findings are. Either belief about what constitutes educational research has negative consequences. Believing all research findings are the product of quantitative experimental studies, teachers may overestimate the certainty of research findings. And, being unclear

about the possible sources of research findings, teachers may further focus only on whether the findings can be translated into strategies that work. These beliefs need to be confronted and changed. If research serves to educate teachers when teachers are engaged in a process of trying to understand the concepts and claims that compose a study (see Floden, 1985), helping teachers understand what constitutes research is an important part of this process.

Finally, implicit also in the data was that teachers with a broader conception of research were not always teacher collaborators. Two teacher collaborators were placed in this group, but three collaborators held narrow views of research. This suggests that working extensively on one particular research project does not necessarily broaden a teacher's conception of different types of educational inquiry. Working on a collaborative project with researchers, however, may change other conceptions a teacher has about research. While teachers' beliefs about what constitutes educational research are important, teachers' thinking about how research can and should influence their teaching is also important. The literature suggests that teachers do, in fact, hold different ideas on the influence of research on their teaching. Teacher collaborators, because of their intense work on research projects, may have substantially different ideas about the influence of research than teachers with less experience with research. How teachers think about the influence of research is also worth the attention of researchers and teacher educators and is the subject of

the next chapter.

CHAPTER V

TEACHERS' BELIEFS ON THE INFLUENCE OF RESEARCH

Overview

Expectations for educational research can seem like the ancient moral equation Nietzsche criticizes in his Twilight of the Idols. There Nietzsche (1889/1968; pp. 29-34) derides the Socratic/Platonic equation of reason, virtue, and happiness. Reason leads to truth. Truth leads to virtue, and virtue leads to happiness. Clifford (1973) notes a similar equation in her work on the history of the impact of research on teaching. Underlying the enduring optimism and hope for educational research is the belief that "to know the right is to do the right" (pp. 1-2). Educational research provides the knowledge that will influence teachers. Teachers thereby acquire the pedagogical excellence (virtue) necessary to promote some educational good.

This chapter does not question the equation's basic structure, except to deny any necessary connection between parts. Knowledge derived from research may lead to pedagogical excellence. But, important differences appear in how teachers, teacher educators, or researchers conceptualize "knowing the right." Among teachers, Dewey (1929) laid out broad possibilities. Prospective teachers, he claims, want to know how to do things in order to be successful teachers. Research knowledge becomes mainly a source of procedural advice for good performance, and knowing the right means using the right "recipes" (see Dewey, p. 15). For Dewey, knowing the right may

also mean understanding a system of scientific thought. This sense of "knowing the right" held promise.

> Because the range of understanding is deepened and widened, he can take into account remote consequences which were originally hidden from view and hence were ignored in his actions . . . Seeing more relations he sees more possibilities, more opportunities. He is emancipated from the need of following tradition . . . and has a wide range of alternatives to select from in dealing with individual situations (Dewey, 1929; p. 21).

Knowing the right here means understanding the principles of and warrants for knowledge derived from research in order to enrich teacher judgement.

With Dewey's possibilities in mind, this chapter focuses on what contemporary teachers believe about the influence of research. Consistent with the dissertation structure, two groups of teachers with substantively different research experiences were interviewed. Three vignettes, based on a review of current literature, were constructed to elicit teachers' beliefs on the influence of research. The body of this chapter describes and analyzes teachers' responses. Several important findings emerge. In contrast to teachers' views on what constitutes research, teachers' work as teacher collaborators was closely related to broader, more flexible views about the influence of research. Other important findings are related to conflicts individual teachers revealed when responding to the vignettes. These findings as well as other significant themes are highlighted when describing teachers' responses. In a concluding section, I place these empirical findings into a broader perspective concerning the ways research can influence teachers.

Teachers' Contemporary Beliefs on the Influence of Research

Research Directly Impacts Teaching

A review of current literature (see chapter one for a complete review) suggests that teachers often believe research should provide them with techniques and strategies that they can apply immediately in their classrooms. They want research to be prescriptive, but they want to use prescriptions from research as they see fit. They do not want external agents, administrators, teacher educators, or even other teachers, telling them that research says they should teach in a certain way. They want to decide what will work for their classrooms. Nonetheless, these teachers believe that research should provide answers that are down to earth and are of direct use to them. This belief about the influence of research parallels Dewey's claim that many teachers want recipes. Teachers expect research mainly to provide proven instructional techniques, and they look for recommendations from research about what to do in their classrooms. These teachers seem to focus exclusively on procedural conclusions that seem to follow from the research than in the propositional claims that guide and support it. Whether this is true or not will be considered when teachers' responses to the vignettes are described and analyzed.

Research Expands Understanding.

Teachers, however, sometimes believe that research can influence them by illuminating their practice. They believe that research's influence goes beyond offering techniques and strategies to change classroom practice. They want research to broaden their thinking about some area of interest in teaching. Research helps them clarify and raise questions, thus deepening their understanding of teaching. These beliefs may be consequential. Teaching holding them might place more importance on studying the research. Though research may eventually influence their teaching practices, they may be less interested in research translations that allow them to use its findings efficiently. This also will be considered when analyzing teachers' responses.

These two possibilities roughly parallel Dewey's outline of how research can influence teachers. However, teachers' beliefs about the influence of research are not exhausted by these two types. These two types, however, do seem to exhaust what one mainly finds in literature on teachers' views of research. To round out this literature, one need only include that teachers often fail to have their most common expectation for research fulfilled. They want research to have a direct impact on their teaching in the form of strategies and techniques that they can use to improve their teaching. They typically fail, however, to receive them.

Structure and Content of the Vignettes

Drawing from the relevant literature, these two beliefs about the influence of research, and the one concerning research's lack of influence, formed the basis for vignettes designed to elicit teachers' beliefs about how research should and does influence them. Each of the three vignettes represents a way teachers can think about research's influence, or its lack of influence. Each vignette also included some basis for the particular view the teacher held. Overall, the vignettes were designed to fill in each divergent profile in the current literature more clearly and vividly.

Vignette Number One: Neal

Research can be strained through and may sometimes be in conflict or even beyond a teacher's net of personal experiences. With Neal, research does not in any way intermingle with his experiences teaching. Neal represents a teacher who eschews research and emphasizes teaching experience as the primary, if not sole, guide to learning about teaching. While not totally negative toward research, this teacher wants answers from research, but has not found them. The complete vignette on Neal that interviewees' responded to read as follows.

Neal: No Answers from Research

Educational research has never been relevant or practical for me. I am a certified teacher and have taken all the required teacher education courses (that invariably included some research). But research has not provided me with the instructional techniques and know-how I believe it should provide. The information I use to guide my teaching comes mainly from my own experience. I have not found research evidence from research important to guide or change my teaching.

Why do I feel this way about research? It may be because the kinds of questions that I ask about my teaching are rarely answered by researchers. Researchers might have solved what they consider important problems, but those problems seem less critical to me in my work. I have not seen a lot of interaction between researchers who live in the "ivory-tower," and teachers who live in classrooms. Because research seems irrelevant to classrooms, I'm not very interested in following what researchers are writing about. Research is also hard to understand because it has a lot of jargon and tables only specialists can figure out. It's far too theoretical for what teachers need in their classrooms.

I am not saying that research has no value for teachers, or that I am wholly against it, even though I am critical. I am saying, however, that I do not think about educational research when I teach. If I hear of a good idea about teaching that happens to come from research, I'll try it out. And if someone could present to me recommendations from research that are supposed to work for teachers, I would listen. But before I accept such recommendations, I want to find out if it works in my classroom. To this point, research has not done this.

Vignette Number Two: Deryl

Deryl also perceives research as mainly providing strategies and techniques. But unlike in Neal's case, teachers educators and researchers have supplied Deryl with these teaching strategies. Deryl is thus enthusiastic about the potential of research to influence teaching, though is not interested in becoming involved with research texts. Deryl wants from research-based strategies to try out and has received prescriptions drawn from research that have worked in the classroom. Deryl believes strongly that research can help teachers work more efficiently. The complete vignette reads as follows.

Deryl: Research Should Directly Impact Teaching

While I understand teachers' frustrations with research, my experiences with educational research have been positive, and these experiences have influenced my perspective.

Educational research can definitely be useful. At any rate, it has been useful to me and should be useful in the following way. Research should give teachers information that has a direct impact on what they are doing and needing in their classrooms. It's true that research can be too theoretical. Fortunately, the research that I learned about was not written up in the normal academic jargon that only researchers can understand. I did not have to study the in and outs of the study on which the research findings were based. The findings were made understandable and I was able to learn how to apply them in my class.

Making research clear and ready for me to use is important because teaching is fast-paced work. The large number of students and the need to look after all of them creates many problems. Research can help. Sometimes when I have had a problem in my classroom, research that I encountered through in-service, a university course, or my own reading provided an answer. For example, I was having problems with discipline in my class, and through an in-service on classroom management, I learned instructional techniques about how to handle the situation. Also I've learned about different ways to manage my time more efficiently when I teach. This research is worthwhile to me because it provides information and ideas that work directly in my classroom.

This is what reseach can and should do, provide teachers with missing information and skills useful to solving their concrete classroom problems.

Vignette Number Three: Sarah.

Sarah's vignette was designed to differ substantively from the other two. Sarah sees research as complicating her ideas about teaching, but also sees this as being its strongest attraction. She wants research to help her understand what she does, and is disposed to take time to read and think about research texts. Her views on research seem at times almost unrealistic. For example, she approaches reading research like she approaches reading good literature. Her enthusiasm for research comes not from the potential of research to help her do things more efficiently, but its potential to help her understand more deeply what she does and what she might want to do (see description below).

Sarah: Research Expands Understanding

Research has rarely given me answers or made my decisions about what to do in my classroom much easier. Research can help me raise new questions and provide different ways of seeing the difficulties involved in teaching. In fact, I would prefer that research do this for me rather than help me with information and strategies that are supposed to change what I do directly. I don't think that research can do much to have a direct impact on my teaching.

Research is especially valuable when it helps teachers think about a point of view or raise a question that they never thought about before. For example, I had students last year who just did not understand fractions. In this case and others like it, studying research helped me see what's happening here more clearly, perhaps differently. I read research in a class that introduced us to a whole different way of thinking about what it meant for students to understand math, including fractions. The research changed my view of teaching fractions more than it told me what to do.

The purpose of research is not to provide techniques to help solve classroom problems. Teachers should read it somewhat like they try to read good literature. Good literature prompts people to see and examine things in a new light. Through reading, say, a novel, you gain a deeper and broader perspective on your own experiences, thoughts and actions. Educational research can do the same thing, though researchers rely on more explicit methods of analysis which provide the reader ways of seeing and assessing what was done and what that means.

Teachers have to study research closely. They can not rely on others to make research clear and easy to use when they think about how research can influence their teaching.

Teachers were given these vignettes (double-spaced) to read prior to the interview session. They were also given four questions before the interview session. They were asked to think about these questions and "jot down" their ideas prior to being interviewed. Table 5.1 reproduces these four questions.

Table 5.1

Questions Asked to Teachers About the Vignettes

1. Which vignette is most like you?
2. Which individual statements in the vignette you chose are closest to your feelings and beliefs about research? (It may be helpful to underline the teachers' statements that are closest to your beliefs.)
3. Why did you eliminate the other two teachers? Were there any statements or attitudes that you disagreed with strongly? (It may be helpful to underline these statements as well.)
4. Were there some statements teachers made in the vignettes that left questions in your mind? If yes, what were the statements? What questions did you have?

Teachers were also asked to talk about any questions the vignettes left in their minds and were given the option to state another way in which teachers could view research. In addition, teachers were asked specifically, if these issues were not already addressed, whether they thought research mainly should provide them with teaching strategies to apply directly in their classroom, and

whether a central role for teacher educators and researchers is to make these finding clear and ready for them to use (see Appendix A, Section IV for a full description of the questions asked teachers).

Teachers' Responses to the Vignettes

I now turn to teachers' responses to the vignettes. The analysis draws primarily on teachers' responses to the direct questions about the vignettes described in the preceding paragraph. It also draws on other pertinent sections of the interview protocol such as interviewees' descriptions of what research experiences or encounters have made the most impression on them (see Appendix A, Section II, Question 1), and teachers' beliefs about what type of research articles succeed most for them (see Appendix A, Section VI, Question 4). These other sections are included in the analysis because they either were relevant to understanding teachers' responses, or teachers drew in some way on these other sections when they elaborated on their responses.

Vignette Choices

Before embarking on a close and thorough analysis of teachers' responses, I present a general breakdown of teachers' vignette choices[1] as shown in table 5.2 (see below).

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[1] Once again, readers are reminded that this sample of 13 teachers is unrepresentative of any given population of teachers, though the results are suggestive of what teachers with more or less experience with research may think about its influence (see chapter two).

Table 5.2

Distribution of Vignette Choices

Vignette Choice	Number of Teachers	Percent
Neal - Lack of Research Influence	2	15.5 %
Deryl - Direct Impact View of Research	6	46.0 %
Sarah - Research Expands Understanding	5	38.5 %
Totals =	13	100.0 %

As table 5.2 indicates, teachers' most frequent response was the direct impact view of research. Six teachers identified most with Deryl. Closely following this choice were five teachers' identification with the vignette that represented research as a way to expand their understanding of teaching. Few teachers, only two, claimed that they wanted research to have a direct impact on their teaching, though this had not been their experience.

This aggregate of choices can be broken down further by considering teachers' choices of vignettes 1) by educational credential level and 2) by contrasting teacher collaborators' choices with the choices of teachers who had no experience as teacher collaborators. Table 5.3 breaks down teachers' choices by credential level.

Table 5.3

Distribution of Vignette Choices by Credential Level

Vignette Choice	No Graduate Work N = 1	%	Master's Degree or B.A. + 27 N = 12	%
Neal - Lack of Influence	0		2	17%
Deryl - Direct Impact View	1	100%	5	41.5%
Sarah - Expands Understanding	0		5	41.5%
Totals =	1	100%	12	100%

Progress through and successful completion of a master's program was not associated with particular beliefs about research's influence. In table 5.3, seven teachers had completed their Master's degree, three had more than 30 hours toward their master's degree, and one other was 27 hours into their master's program. These teachers were as likely to chose the Deryl vignette as the Sarah one. Beginning teachers, Dewey (1929) thought, were most interested in classroom techniques drawn from research. One beginning teacher in the sample, Jessica, chose the direct impact view of research, but so did five other teachers who had or nearly completed their master's degrees. Two other teachers completing their master's identified most with Neal.

What was closely associated with vignette choice was teachers' work as teacher collaborators. Four out of five teacher collaborators chose Sarah, the vignette emphasizing how research's role is to expand teachers' understanding (the other interviewee who chose Sarah was a beginning male teacher, Nick). So, the reasoning behind including teacher collaborators in the study is borne out by table 5.4 (see below). Collaborators' more frequent selection of the Sarah vignette demonstrated a broader range of views. They had, in general, a more flexible view of research's influence.

Table 5.4

Distribution of Vignette Choices by Teacher Collaborator Experience

Vignette Choice	No Collaborator Experience		Former Teacher Collaborators	
	N = 8	%	N = 5	%
Neal - Lack of Influence	2	25%	0	
Deryl - Direct Impact View	5	62.5%	1	20%
Sarah - Expands Understanding	1	12.5%	4	80%
Totals =	8	100%	5	100%

To summarize, one beginning teacher (Nick) chose Sarah, the expands understanding vignette, and one (Jessica) chose Deryl, the direct impact view of research influence. Two teachers with extensive work in Master's degree programs and without teacher collaborator experience chose Neal, the vignette describing research's lack of influence on them. Four other teachers with master's degrees or near master's, but without teacher collaborator experience, chose the direct impact view of research influence. One teacher collaborator chose the Deryl vignette as well, while four other collaborators chose Sarah. Also, all male interviewees (n = 3) chose the Sarah vignette. Importantly, considering all responses, teachers' educational credentials, in general, were less associated with broader, more flexible beliefs about research's influence. What was closely associated with these beliefs was teachers' in-depth involvement with research as teacher collaborators. For ease of reference, I provide in table 5.5 a summary of teachers' pseudonyms and the vignette each teacher chose.

Table 5.5

Vignette Choices and Interviewees' Pseudonyms

	Vignette		
	Neal	Deryl	Sarah
N	Andrea (MC)	Ana Marie	Bryan (TC)
A	Lynda (MC)	Jessica (BT)	Cheryl (TC)
M		Karla (MC)	Fran (TC)
E		Leisa (MC)	Geoff (TC)
		Kathleen (TC)	Nick (BT)
		Nicole	

Note. BT = Beginning Teacher; TC = Teacher Collaborator
MC = Teachers pre-enrolled in a master's level course on classroom research

Analyzing Individual Responses to the Vignettes

Teachers' reactions to and reflections on the vignettes were often passionate, digressive, and, at times, deeply conflicted. These conflicts existed both between teachers and within individual teachers. The strategy for analyzing their responses will be to select and to highlight teachers' most notable responses to each individual vignette. Conflicting ideas about research's influence between teachers and within individuals also will be displayed prominently.

Teachers Identifying with Neal

Neal's vignette drew some of the strongest responses among interviewees, especially among those did not chose him. These interviewees characterized Neal as inflexible, narrow, indolent, and extreme (see Fran, p. 14; Nick, p. 10; Jessica, p. 12; and Nicole, p. 6). While two teachers (Karla, p. 12; also, Ana Marie, p. 5) agreed with Neal's focus on learning about teaching primarily from teaching experience, another teacher saw this as alarming:

> I think that's so dangerous an idea because teachers are in lock-up for their whole career. So, if you only use your own experience . . . it just seems that it would be so limited and so limiting (Cheryl, p. 14).

These characterizations of Neal, however, did not match with the two teachers (Andrea and Lynda) who chose him as the vignette they most identified with. Their beliefs seemed as vague as they did narrow.

One teacher (Lynda) chose Neal because she had never found research relevant and practical. Lynda also emphasized experience as the way she learned about teaching and found research language inaccessible. She also believed that "you need research so that you can use it" (Lynda, p. 8). Research use was bound up with teaching techniques and strategies, though at one point she questions this:

> I mean I do want strategies and techniques, but there's more than that, isn't there? There's ways to think about things and ideas. I don't know (Lynda, p. 9).

Andrea, the other study teacher who chose Neal, feared research and felt that researchers have not spent time in the classroom to understand teachers' work. She also viewed the language of research as inaccesible. "They really don't know how it is, and alot of research is just alot of tables and jargon and things like that I can't figure out" (Andrea, p. 8).

Andrea was three steps removed from research texts. There were colleagues' opinions about what to do in the classroom. And then there were research findings. And then there was research. Andrea associated research mainly with research findings. She described herself as neither reading research findings nor delving further into research. She wanted research findings related to instructional techniques because "I don't always know that I'm doing it the right way" (Andrea, p. 11). Andrea, however, wishes that her approach to research was broader.

> Sarah is really into the research, and I guess that's more the way I wish I could be (p. 11).

Andrea and Lynda held many beliefs about research that were

shared by other interviewees, especially those who chose Daryl. These included (1) the belief that research is much too full of jargon, (2) experience is the best way to learn about teaching, and (3) research should mainly provide techniques and strategies. But Andrea and Lynda were not as explicit about their beliefs. Any tensions that underlied their relatively unformed views had to be wrested out. I turn now to teachers who were more certain about what they wanted from research, and had also secured it, to find out specifically what these beliefs were.

Teachers Identifying with Deryl

Six study teachers identified most with the Deryl vignette. Five of these teachers agreed strongly with "research should give teachers information that has a direct impact on what they are doing and needing in their classroom." One teacher referred primarily to "research should provide teachers with missing information and skills useful to solving their classroom problems." There was basic agreement among these teachers about what they wanted from research. But, there was also significant ambivalence within teachers about research's influence. I first describe the beliefs of two teachers who may typify many teachers' attitudes towards research before examining closely the types of conflicts that erupted among two other teachers who chose the Deryl vignette. I also describe one other teacher whose beliefs about research's influence are narrow partly because of workplace conditions.

Only Research That Works

Two teachers, Nicole and Karla, adamantly denied that they wanted anything from research other than directly useful tools to deal with classroom problems. Nicole said that cooperative learning research and the research from Madeline Hunter influenced her teaching. She offers some understanding of her relationship to these research programs and what she wants from them.

> They give me methods and things in the hand, instantly. I could never tell you what research that was cited from, or who did the research, or who they researched . . . .
>
> It's more like give me, just tell what it is that works. A quick fix. Don't tell me that you researched 100 kids and 98 got it. Just here's a good method. It works. It appears to work in most classrooms. Try it (Nicole, pp. 1-2).

Nicole says that she feels this way towards research because teaching is fast-paced work, there are discipline problems and sick students and so she needs something that she can use right away, "the hard facts, the results" (Nicole, p. 6).

Nicole does state that research has at times influenced her "awareness." She had not thought about how a student could misunderstand the word "of" in multiplication and perhaps not know its different uses within and outside the math world (p. 2). But, she does not believe teachers need become involved with the research.

> I don't think they (teachers) have to study it closely either. I think that they or me or whomever can take research, and maybe it does work for some people, maybe it doesn't work for everyone, but I don't think I need to study it closely. I basically know when something works by using a technique or a result . . . If it works, you don't need to go back and find out why they say it was working. I don't have time for that. I let the researchers research and the teachers teach (p. 7).

Karla's attitude toward research's influence is similar to Nicole's. Karla wants research to tell her what is wrong, what information she needs, or where to go find it. "Give me a technique, okay" (Karla, p. 10). She also wants research to be "direct, short, and outlined" (p. 11). She says that she does not mind studying research,

> but if I'm going to study it, then I want to be able to pull out of there, something practical, something concrete. . . I don't want to waste my time reading a bunch of research unless it's clear cut. I know that I have to make my own association with that, but for right now, tell me, this is what I need to do (p. 12).

Karla states that she wants to study research if it tells her what she needs to <u>do</u>. Consistent with this approach, she believes that teacher educators and researchers should make research clear and ready for her to use. This would be more convenient, reducing the amount of time she would have to spend studying it. "Why have 200 people studying the same thing, when 20 people can do it and make it clear and precise for other people" (Karla, p. 16)?

<u>Evaluating research is not discovering its use</u>. Karla's beliefs about research's influence suggest that she confuses analyzing and evaluating research with finding out how she can use it. She had been involved with an in-service on cooperative learning, and also had studied it through a class project. She states that when she read this research, she would

> sort through, pick out the things that were important, the things that I understood. Put it together. In other words, analyze, synthesis. Is that the right word? And also evaluate it. You know, what would work for me (p. 2).

Evaluation of research has come to mean looking at how she can use it in the classroom. This is consistent with Karla's beliefs about how research should influence her. But, it may reduce her ability and willingness to understand the concepts and claims that constitute the research.

Conflicts About Research Answers

Like Nicole and Karla, Ana Marie and Kathleen were confident supporters of the direct impact view of research influence. Their responses also revealed ambivalence about this view of research influence. I turn now to describe and to examine their beliefs.

Ana Marie describes herself as someone who initially accepted all research uncritically, but now states "that 98 percent of the research that's done is garbage" (p. 3). She sees herself as someone who has read a lot of research, and is critical of it, which is why she even partly identifies with Neal's vignette (p. 6). She firmly believes "that research should have a direct impact on teaching," and that "teachers do not have to study the ins and outs of the study on which the research findings were based" (Ana Marie, pp. 3-4). She gives high praise to research that helps teachers in "practical areas" such as time management and discipline. She denies that teachers would want to read research articles, and also claims that if she had

> five minutes to sit down and read, I'm not going to read educational research. I want to read my mail. It's just not very reasonable. But to present it in a package and run in-services on it, that's worthwhile. I think that's an effective way to get research across to teachers (p. 5).

So, Ana Marie is deeply skeptical of the value of research for her own professional development except in so far as it can directly impact her work. She also sees herself as someone who has read alot of research, but is not disposed to do so.

> You know what it does? It disillusions me. Why go back and read all that stuff? Part of it is to find out that alot of it is B.S. That's what it comes down to. And you think, gosh, you know, whole schools of philosophy have been based around this. What is this? That's where I get back to I'm kinda critical (p. 7).

Answers without explanations are inadequate. Ana Marie asserts that research should have a direct impact and that neither herself nor other teachers need to read and study it. Her beliefs about reading research are qualified when she discusses how the influence of research is harmful when it is misinterpreted. She describes her interest in Piaget's theories, and says she had planned to write a thesis drawing on his research describing the transition in children from concrete to operational thinking. She believed this transitional period was connected to children's increased math anxiety. Ana Marie further describes her thinking about Piaget's research.

> . . (A)lso when I read more and more about Piaget, he never wanted his work to become what it became. To him, it was just an understanding of child development. But you weren't supposed to develop curricula around it. Because for him you couldn't do anything to change a child from going from sensory to concrete and concrete to operational. It just happened naturally anyway. There was nothing you could do. So what do we in America do? We develop all these developmental programs. We're going to get those kids ready. We're going to provide all of this material for them and kind of help them along to get them into this next stage. We took it and perverted it (p.7).

Ana Marie's point suggests that the problem is not with research. The problem is that teachers are told what to do based on research and do not have the opportunity to read and understand it. This is apparently in conflict with her claim that the influence of research can be direct and straightforward without teachers' sustained involvement with research texts. She recognizes this tension and responds.

> Well, what you're saying is that I've said two different things now. Yeh. And I meant both of them (laughing). . . . I'm thinking about it. I'm thinking about teacher responsibility, individual responsibility for knowing what you're doing and why. Do you just accept everything that people tell you (pp. 7-8)?

She elaborates on this response, noting that the direct impact of research can have different meanings for herself and other teachers. She distinguishes between research that she is "comfortable and familiar with" (p. 9) and has a direct impact on her work, and research that she is not familiar and comfortable with and will have a major, direct impact on her work (pp. 9-10). In the latter case, she wants and needs to study it. Ana Marie mentions an in-service on reading instruction. The presenter stated that reading specialists should do more consulting with teachers and "try to keep the kids in the classroom as much as possible" (p. 8). Ana Marie questioned the presenter who kept emphasizing the authority of the research. After persuading the presenter to give her a copy of the research to read herself, Ana Marie found that all the research was done on

> children in special education classes, children in EMI rooms, children who are emotionally, mentally impaired. None of it was done in a regular education setting. And I couldn't believe it. This is a major transition for the public schools, and they're basing all of this change on research done in a completely different setting. To me, that's an abuse of research (p. 8).

Later in the interview, Ana Marie summarizes her view on research's influence:

> If it's going to have little impact on me, or an impact that I'm comfortable with --- it might be a big impact, but it's something that I'm comfortable with like Madeline Hunter --- then I'm not concerned about knowing all the details about the research. But when it has a big impact on me and I'm not comfortable with --- and the example I gave was the consultant model --- then I want to know more about it. I want to know where they're coming from and why I'm being asked to make the changes I'm being asked to make. Why I'm being asked to implement what I'm being asked to implement (p. 12).

Ana Marie defines comfortable as something that she is already familiar with, that already fits her schema that she says is based on "intuition" or "classroom experience" (p. 12). Ana Marie sees value in reading research texts, but only if she is being asked to accommodate in the Piagetian sense a new practice she does not feel comfortable with. "If it already fits into my schema, then I can accept it easier"[2] (p. 12).

Ana Marie consistently holds that research should have a direct impact. Conflicts erupt when she claims that teachers need not study it. She recognizes that she has a professional need and responsibility to understand explanations for "answers" based on

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[2] Jessica, a beginning teacher who identified with Deryl also states that she does not want to study research. But, like Ana Marie, says that she would "go into the research data" if she "felt strongly either for or against it (see Jessica, p. 4; also, Geoff, p. 17).

Ana Marie's beliefs about research are defensible if she is able to evaluate well research used to support major teaching changes that she is not comfortable with. Her defense also depends on whether research should only serve the purpose of directly impacting teachers' work. This issue emerges in an interview with a former teacher collaborator, Kathleen.

Should Research Only Offer Answers for Classroom Practice?

Before becoming a teacher collaborator Kathleen identified most with Neal. She states that she

> really had no use for research at all. I would read some of the results of studies and found it sometimes so simplistic it was laughable, the conclusions they would come to. Where are they, do they ever go any place? That wasn't the way real life was (p. 15).

The process of working with researchers and writing about her teaching changed her belief that research lacks relevance for teachers. Her work as a collaborator involved describing how she responded to students with different classroom behavior problems. Through her work and through reading research summaries provided by the Institute for Research on Teaching, Kathleen became convinced that research could influence teaching. She mentions work specifically connected to the institute such as studies examining the relationship between the mathmematics curriculum and the standardized tests student must take, and she highlights other research not carried out by the institute such as "time on task" (p. 6). These studies and studies like them she considered very useful. Describing her response to the

curriculum study, she says,

> it changed the way I did it. I switched my curriculum and make sure my kids know decimals by the time they take that test. It's not fair to give a test standardized against the other fifth graders in the country and you haven't taught them decimals, and it's 30 percent of the test (p. 6).

Kathleen's teacher collaborator work changed her views about research's influence from it should have a direct impact, but does not, to, it should have a direct impact, and does (i.e., from Neal to Deryl). She argues that the "whole heart of research" is to have a direct impact on what teachers are doing and needing in their classrooms. Kathleen's response to the Sarah vignette is similar to Ana Marie's characterization. Kathleen states that Sarah's point of view is interesting, but

> it's purely like a theoretical, academic kind of thing. No, if research can't give you something that's practical and makes a difference in the effectiveness of teaching and learning, then it wouldn't interest me at all. I'd rather read a good novel anyday (p. 17).

Research should influence teachers by coming up "with information that helps teacher very quickly improve their technique or change a strategy, or do things in such a way that students learn better" (p. 18). Since teachers, however, are not "robots," she prefers "a good, sound principle" that the teacher can use "to work out the specifics" (p. 16).

Joined with these beliefs is Kathleen's unyielding stand that teachers do not have to study research closely. "That is a monumental job! No teacher has time to do that. Implicit here is a total lack of trust" (p. 17). Kathleen places her trust in researchers, namely Institute for Research on Teaching researchers. She states that she

does not need to know where the "good, sound principle" comes from "if it comes from the institute" (p. 16). Kathleen suggests that Sarah's need to study research closely is connected to a justifiable lack of trust in researchers.

> Yes, I don't blame her, if people aren't familiar with what the institute has been doing. I guess I couldn't blame them because I had no use for researchers at all before I went over there (p. 17).

Conflict: Broader influence blurs established roles. Kathleen retreats from her position that research should only directly impact teachers. Kathleen is asked to read three articles associated with research (see chapter five), and finds most interesting and stimulating the article that has the least to do with directly impacting teachers' work. The article she read was Larry Cuban's work on school reform. It provides no directives or principles for what teachers should do in the classroom. Kathleen, however, sees this article as important for teachers to read.

> This isn't what I think of basically as the kind of research that would make a direct impact in my classroom . . . . But it's nice to be able to read something that really gives you a much broader view of what you're doing. When as a teacher you serve on curriculum committees or other committees where the objective is to think about what is needed --- what kind of things should these kids have in the next ten years to fit into the real world --- this kind of thing can be very helpful (pp. 24-25).

Kathleen clearly recognizes the importance of research influencing her thinking in ways which have little direct connection to classroom techniques. Looking at the broad view of things is

important for teachers "because otherwise we get very narrow in our viewpoint" (p. 25). Kathleen responds to the comment that this type of research might not be offered to teachers because it does not directly impact their practice.

> Yeh, you know, that's a real kind of tension that does exist and you learn to live with it a bit. The year I was a teacher collaborator was enormously stimulating. . . I was writing about my teaching and thinking about my teaching for the first time because nobody had ever asked me why I did anything. So it was an interesting challenge to talk to adults about all these interesting questions in education. . I remember thinking to myself, if I stay here (at the institute) for another year, I may never go back to the classroom because I would just outgrow it. The classroom has many challenges, but intellectually it was nowhere as stimulating as the institute. . . But you feel like a fish out of water after you have done that. You're sorta in-between the practicing teacher and the research group, and you're just wandering around the middle there for awhile. But this kind of thing (the Cuban article), I don't seek this out (p. 26).

Kathleen's teacher collaborator work separated her from what she identified as the teacher's traditional role. But, she also associates research that broadens her perspective with inner conflict. The reason is that this type of research influence symbolizes that teachers have assumed a role divorced from classroom practice. Though Kathleen sees the value of how research can break teachers from narrow viewpoints, her clear preference is for research that provides information to directly impact classroom life. She has not integrated comfortably these two views about research's potential influence. One view does not fit her beliefs about what teaching is primarily about.

Workplace Inhibitors

Like other teachers, Leisa chose Deryl as the vignette she identified with most, though she had her doubts. Leisa says that she "probably" identified with the Deryl vignette, though she disagreed with "alot" of what he said. She claimed that she did use research to provide information that worked, and that research should have a direct impact on what she is doing in her classroom (p. 9). Leisa also emphasized that research can be too full of jargon and theoretical.

Leisa, however, claimed that "Deryl needs to know what's going on outside too" and "that a teacher needs to be aware of what's happening in education" (p.9). She was not sure that all research can and should do is to give "instructional techniques on how to handle situations" (p. 9). Consistent with these caveats, she argues against Neal's statement that researchers live in the ivory tower and do not interact with teachers.

> I think they are studying what's going on in the classroom. They don't have to be actually going through the pace, but they're analyzing what's occurring there. So, in a way, I think they are in the classroom (p. 10).

Asked directly whether research should mainly provide her with strategies and techniques she can immediately apply in her classroom, Leisa responds by saying that she did before reading Sarah's vignette (p. 11). Leisa says that she really liked Sarah's approach of taking research and using it

> just to get her thinking and to question what she is doing. She's not looking for instructional techniques to problem-solve or to help her out with a situation. . . There's larger words, you really have to think. And she's saying that you should go through more of a reflection process, become involved (p. 10).

Leisa wishes she could do this with research, but the broader context in which she teaches does not support this. Her experiences with research have been negative because administrators use research to legitimate policies and practices with which she does not see as beneficial.

> They'll say, research has shown. That's the most familiar quote I hear from administrators. . . And that's real frustrating to me (p. 1).

School district's staff development programs also have not helped her learn about "what research is or how to use research" (p. 2). Research presented is "one-sided." There is no comparison with other research that offers different perspectives (p. 2). Leisa has doubts about her identification with Daryl's view of how research should influence her teaching. Though she has some idea of how research could influence her thinking differently, the context in which she works inhibits its development.[3]

In summary, the teachers who chose the Deryl vignette emphasized findings from research that were "concrete" and could impact their teaching immediately. They wanted research findings that gave them

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[3] Other teachers also mentioned workplace inhibitors in relation to teachers' further involvement with research -- most notably -- time constraints (see Jessica, p. 13), the organization of teachers' work (see Nick, p. 9), and the public's perception of teachers' role (see Bryan, p. 2).

classroom guidelines they could trust. Often connected with this interest was teachers' desire for research to deliver these findings without teachers trying to understand the basis for them. Another was teachers' skepticism toward research. This skepticism seemed to be a result of the different language researchers use, the different world they seem to inhabit, and the perceived faddishness of research (see Karla, pp. 5-6; Nicole, p. 7).

Teachers' skepticism toward research and their desire for it to provide authoritative guidelines to impact their teaching form an odd juxtaposition. If you are deeply skeptical that something can help you, why would you want it to provide authoritative prescriptions to guide what you are doing? The answer is that these teachers felt that they could test research prescriptions against their own teaching experience (Ana Marie, p. 8; Nicole, p. 7; also, Kathleen, p. 5), and thus discard them or accept them at their discretion. These teachers want research prescriptions; they do not want others telling them what research prescriptions to include in their teaching.

Kathleen and Ana Marie acknowledged the limitations of focusing only on research answers. Ana Marie perceived the need to evaluate research, and Kathleen recognized that research can influence her thinking more broadly. One teacher, Leisa, doubted whether she wanted research only to provide answers about instructional techniques, but she described the context in which she worked as inhibiting her development. I turn now to those teachers who chose the Sarah vignette and claimed that they wanted research to serve

wider purposes beyond offering research findings that prescribe what they should do to solve problems.

Teachers Identifying with Sarah

All five teachers who choose Sarah emphasized that the most important thing they wanted research to do was to help them raise questions and look at classroom practice differently. The idea that research should provide usable strategies and techniques was not wholly rejected, but clearly subordinated to other ends. Skepticism about research or its "faddishness" did not mean these teachers wanted research techniques for immediate use and validation. Geoff, for example, acknowledged cyclic research topics, but this did not lead him to focus on techniques drawn from research. Geoff believed

> that research is ongoing like life. You know, you keep learning more. You become clearer about some things, and some things get discarded (Geoff, p. 20).

Other teachers (e.g., Fran) focused on the value of learning the language of research. Some teachers' responses to the vignettes also shows how their work as teacher collaborators helped them understand how research can influence their thinking more broadly.

Research Ideas -- Not Answers -- Are Valuable

Cheryl, a former teacher collaborator, did not understand how research could have a direct impact on her teaching. She claimed that she had "yet to see a classroom problem that was concrete" (p. 12). Hers were "complicated, abstract problems" (p. 13). To Cheryl,

Deryl's view of research implies a specificity that research can not offer. "I used to believe there were answers and I hunted for them, and got really ticked when I couldn't find them" (p. 8). She admits that research can offer possible answers (p. 12), but the value of research to her is something different.

Cheryl emphasized the relevance of research ideas. She is not content to look only for research strategies, test them against her experience, and use or discard them accordingly. "Using" research has connotations she rejects.

> (U)seable somehow has an attached connotation of disposable connected to it. And I think there's a real interesting question in that. Do you use research for awhile and when it's all used up, do we dispose of it like a dirty diaper, you know? Or, do you store and then reuse it again twenty years later? I don't know. It's just an oddity when you talk about using research. A strange term, a comical term (p. 17).

Cheryl's approach to research is working through the ideas associated with the research, thinking about them, and perhaps trying to put them into practice over time, as she does with cooperative learning. Research can address neither all the particulars of her practice, nor can research-based strategies simply become part of her teaching repertoire. Research ideas and research-based strategies are integrated slowly into her system of ideas about teaching and learning. Conclusions from research were all-important to teachers who chose the Daryl vignette, but Cheryl does not reject research if conclusions drawn from it do not impact her directly. She is more interested in something else.

> The conclusions are less important to me than the idea the researcher was trying to explore. The conclusions may or may not match what I believe the conclusions might look like in the particular setting I'm in. So although I would look at them (the conclusions), I think I'm more likely to think hard about the idea of the research (p. 10).

Attending to research evidence. Cheryl worked with data when she was a teacher collaborator. Her role was to write a narrative account of student teachers' prideful experiences from observers' notes and interviews. She recognized how much could be lost translating from voice to words on paper, and feared that she might not be working with the notes and interviews appropriately. She also was not sure that she was working with research evidence.

> And I kept thinking, boy I hope I'm hearing this right as I read. I'm not sure you could ever call that evidence because I wasn't there when any of that original material was collected or those people were observed. So, I never met any of those people I was writing about. I was just writing from these copious observation notes and interviews (p. 15).

Cheryl admits that one aspect of research that she does not understand is evidence. To her, evidence has a ring of concreteness to it, and something clearly identifiable. Also, she says,

> I don't know if researchers believe they have evidence. I really don't understand data very well if we get right down to it. I am not sure I have a real clear feel for how that word data bank works in educational research (p. 14).

Cheryl's confusion about evidence or data is more apparent when she discusses her own competence reading research.

> For one thing I'm not trained enough to be able, even if I read it closely and thought hard about it, my background wouldn't show me probably where the deficiencies are in that particular set of research anyway, even if I have some hunches about it. How the data is recorded, for instance, is something you never see unless you go back to all the raw material in a research project, and it becomes almost an impossibility to look at that (p. 9).

Though Cheryl may not be competent to appraise the research, she seems to believe that she has to study all the original material collected to judge the evidence used to support it. This would mean that no one except those who conducted the research would be able to do this.

Cheryl's statement that "it is impossible to study research closely" (p. 9) is understandable considering her doubts about her competence to judge the evidence that supports it. She considers it "more honest" to say that she will look at the ideas that are part of the research and "try to think hard." Nonetheless, Cheryl implicitly sees a need to go beyond her focus on ideas only, and dig further into the research's supporting evidence. She describes an experience she had at a recent convention where the practice of reading Romeo and Juliet and other traditional literary texts was being questioned.

> The question came out of research that was being done on the lack of minority literature in modern day textbooks and curriculum. And then the following question is, who decided this stuff that we have been living for our whole career? But the original research had been done on the impact of minority literature --- the disfranchisement of minority students when there is nothing in the curriculum that dealt with their particular group -- Black, Native American Indian, Mexican American, Asian American, whatever. That had been the original research. But it led to another question that is a real startling one once teachers look at it. Who did decide this (the traditional texts), and why in the world do we feel so attached to it? And then the whole minority literature question can really be dealt with. And I think that was certainly one thing Sarah said --- making us think (p. 11).

The idea drawn from research that traditional literary texts can disfranchise minority students is worth teachers thinking about. Teachers, however, need to be able to assess the different types of evidence and assumptions that support the idea, especially in such a

contentious area. Cheryl recognizes the importance of the question, and she wants to know the answers to it. She looks to research to help her, and is implicitly committed to grapple with the evidence and assumptions that support its claims.

Breaking from Conventional Modes of Thought

As a teacher collaborator, Geoff benefitted from the close attention to detail the project demanded. The struggle to "stay factual" and to support explanations with evidence he considered helpful (p. 5). The research project Geoff worked on studied how teachers responded to students' incorrect answers. His project work did not force him to reject the intuitive basis of many teacher decisions. He remained certain that

> it doesn't mean it's wrong to be hunchful when you're a teacher. You have to be. You have no choice (p. 5).

His experience did place in sharp relief the two different perspectives teachers and researchers possess, and helped him see that each perspective has its own value. He found that working on the research project started to intertwine with the way he thought about his own teaching.

> I think it made me a little more investigative and pursue further hunches sometimes. Why am I doing it this way? . . Is this working great because it's easy for me, or because it gets a ditto in their hand, or is it working because of what I know about learning styles for kids? Not that I learned about learning styles in research, but what I learned was to think about what I was doing and ask myself, what are you basing your fact on why you want to do this approach? Is it because you've doing it for the last five years, or is it because somebody down the hall does it? Is this really a good way for kids to understand fraction for instance. So that sort of investigative thinking (p. 5).

Studying research helped Geoff break from traditional modes of thinking and acting. Before becoming part of the project, Geoff felt threatened to use research to raise new questions about his teaching. After working on the project, research is

> more valuable to me now and maybe (it is) less threatening to raise new questions. It's less likely for me to go, wait a minute, I don't want to know what all the implications of this are, just tell me how I can do this in my classroom. I think I'm different from that. Some of these other guys in here (the vignettes) are not . . . Being in a research atmosphere has an impact. That was one, that raising new questions helps teachers think about a point of view or ways they have never thought about before. You know, that kind of being open and listening and seeing other points of view (pp. 15-16).

Research provides analytic frameworks. For Geoff, he does not anymore come away from research thinking it will tell him the right thing to do. His approach now is that involvement with research provides an opportunity for him to be more analytic about his teaching. He states that he was not coming away from the research project thinking that now he knows what to say to students' incorrect responses to his questions. He was not just finding "the right way to respond."

> But rather, what is the nature of responding to kids, and how does that affect kids, and why might it be a different sort of response based on the kid, the teacher, the class, the subject (p. 16)?

Geoff believes, however, that research "can not be untied" to solving some of the classroom problems teachers have. But this can not be its sole purpose. He did draw some "prescriptions" from the research project he worked on. There were some things in the project that helped him interact with students and supported notions that he

already had about how things work.

> But I thought of the broader picture there for me --- broader thinking about the nature of interaction between teacher and kid, and what are the reasons that interaction is --- what affects it (p. 16)?

Because Geoff places importance on seeing the broader picture, he sees Daryl's vignette as presenting "too narrow a determination about why we should be doing research" (p. 14). Some research is not done to be made clear for teachers to use. It's there to raise new questions. He says that if research does turn out to provide helpful techniques, that's good. He does not see anything wrong with research translations "that help people to do one little thing" (p. 21). But, "it is isn't the primary function of. I'd be awful disappointed if that's all I went to look for" (p. 22).

Like teachers who confused prescriptions about teaching with what research is (see chapter 3), Geoff claims that Deryl may be confusing the translations of research with research.

> My guess is what he read was somebody else's interpretation or somebody else's summary of some research that was in fact fairly formal -- we would hope -- in its constructions and it ongoing process. I don't know if he's misstating himself to say he found research when in fact he found some useful aids that can help him that were research based (p. 17).

Geoff feels that he wants to look at the research itself. He wants to read the research study and find out what and how it was carried out. He states he does not "need to see forever alot of statistics and kinds of analyses that can be used" (p. 17). But he wants see how the study was set up, "some basic numbers," and "find out if maybe there's anything that's too pat" (p. 17).

Must Research Change Teachers' Practice To Be Valuable?

As a veteran teacher, Bryan believed that the function of research was to change teacher action. He maintained this view until he assumed a teacher collaborator role. Working on a project in which researchers studied how teachers taught reading, Bryan looked at how teachers allocated their time during instruction. His role, in part, was to interview teachers about their decision-making processes as they helped students comprehend texts.

Bryan details his prior view of how research influences teaching before becoming a teacher collaborator.

> You decided as a researcher you would change something -- you go in and make that change -- do research and collect data on the change you have made and see if it was better now than it was before. Like running an experiment, more scientific (p. 4).

He states further that "my views definitely got restructured by working at the institute" (p. 4). His idea that research changes practice was transformed into research makes sensible classroom practice. He says that now "my model of research is a whole lot more going in, seeing what's going on, and trying to make sense out of what's going on" (p. 4).

Bryan's transformed view is consistent with his assessment of the Deryl vignette. Bryan says that at first reading Daryl sounded like him, but after thinking about it more he identified with Sarah. He states that the Deryl vignette focused on techniques, "the how of teaching," while Bryan thought research's influence was "more discovering why and the how will grow out of the why" (p. 8). Bryan's identification with Sarah is understandable based on his

association of research with sense-making. Sarah's vignette is more flexible. It portrays research helping teachers make sense (discovering the why) of classroom life. Deryl's vignette is more rigid. It focuses on research products to change classroom methods.

Downplaying teachers' need to read research. Bryan's emphasis on research making sensible classroom practice did not mean that he was interested in studying research closely. Since sense-making is bound up with explanations about why events take place, one might reasonably predict that Bryan is interested in research texts that offer evidenced-based hypotheses and perspectives about classroom life. This was not the case. Bryan states that

> I don't think teachers have to study research closely. And in fact when they do, most teachers I don't think really understand what's going on (p. 8).

He explains further,

> I guess instead of study I would change it to maybe experience the research in some way or other. You gotta be close to it (p. 13).

Bryan mentions also that he is not currently involved with studying research, but relies more on his "personal contacts" to learn about research (p. 13).

Through his research involvement, Bryan's thinking about research's influence and his teaching practice changed. He admits that it was painful to realize his teaching of comprehension was inadequate. Most teachers, like himself, do not want to listen to research because "it says things they don't want to hear" (p. 11). He stresses, however, that teachers have to understand what

researchers are saying in order for meaningful change in their teaching to occur (p. 12). Understanding research is difficult for Bryan because of the language of research. This is why personal contact with researchers is paramount for Bryan. The language of research can be mediated through conversations with researchers. He also hints at a middle ground between how-to teacher-oriented magazines and arcane research journals. The former provide

> alot of how tos without explaining the whys. And with alot of research journals, it's hard to understand the whys the way they're presented. It's too bad there isn't a middle ground, somewhere along the line. But I know why they do it --- the teachers, most teachers want ---- give me the techniques, let me go do them in my classroom and see if they work or not, and they want them in short fast versions (pp. 12-13).

Because of what teachers want from research and because the language of research is inaccessible, Bryan downplays the value of reading research.[4] He nonetheless has an expanded view of how research can influence him. He claims that most teachers' view of

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[4] In contrast to Bryan, Nick took a strong stand against all research tranlations, arguing that teachers read closely research texts. Simplifying research for teachers presents a danger. "When you are simplifying or reducing information, I don't think you're adding something to it generally -- you're losing something from it. So, I think it's important that each teacher get as close to the original source as possible" (p. 9). Nick, a beginning teacher, identified with the Sarah vignette. He wanted research to "load his armor," give him "bullets" with which he is able "to defend" himself (p. 6). These bullets, however, were not instructional techniques. They were research ideas that fit (and defended) his teaching philosophy. He also wanted research to raise questions for him (p. 7). Nick found that the workplace offerd him or his colleagues no support to read and think about research. According to Nick, teachers do not want to read research because of the fast-paced work of teaching. "The school year should be set up differently" (p. 9).

the influence of research is one-dimensional and narrow. They want research to provide the "how-tos" and not "the whys" of teaching. Bryan values his personal relationships and conversations with researchers, trusting these experiences alone will help him understand research he finds interesting.

Learning the Language of Research

As a teacher collaborator, Fran worked on a research project looking at how teachers' conceptions of their work changed over time. She initially felt threatened by the two worlds teachers and researchers inhabit. Teachers and researchers ask questions, approach problems, and seek solutions differently. The language of research was her greatest stumbling block.

> When I first came to research the most difficult thing was sitting there trying to understand the vocabulary. You'd sit there and say, what are they talking about (Fran, p. 5)?

Familiarity with the language slowly began to change her views about research and researchers.

> But after you are there for awhile it grows on you, and I think that helped me more than anything, that over time and with more exposure I could learn more about research, and research became much more helpful. I changed my opinion about alot of things. It wasn't that these people knew more, these people have all these words. It's just that they had more exposure, had learned different ways of saying things. And if I sat there long enough and read long enough I could too.

A surprising shift in understanding. Fran asserts that one of the changes she experienced was the kind of skepticism she had toward research. She became tired of friends using research

> to prove, to support their own small beliefs. And so I became very skeptical about research. Plus, when you're in school, in order to get you to do anything, they always say, --- and research says. The moment you say, research says, I want to say, what research (p. 7)?

Fran's original skepticism toward research was based on genuine misuses of research she perceived. But it was also based on her lack of understanding of it. She states that she was "surprised" when she started working on the research project and discovered that many research questions came out of what she as a teacher considered very small parts of classroom life. Fran had to restrain her usual desire to look at the research in terms of what it should do for her as a teacher.

> With research, the part you might be trying to figure out is, what's happening in that child's life or some small part of what's going on there. Or, if this is an ongoing thing, what led up to it? All I wanted to do as a teacher is get it done (p. 6).

Fran learned that researchers often try to understand a small part of classroom life that a teacher may overlook. This helped her see research more positively. It also prompted her to look at research more in terms of "what this person is trying to prove," and less in terms of what she needs immediately accomplished as a teacher.

Fran identified with Sarah's vignette, but she disagreed with Sarah that research can not have a direct impact on her teaching.

> Whether I agreed with the research or not, sometimes I set out to prove the research wrong. I wasn't always successful, but occasionally I was. And I would test it in different ways. Just because of my hardheadedness, I'd think, well, this person really doesn't understand what's going on in the classroom. And certainly that impacts my teaching because I'm looking for something. And I really don't see how she (Sarah) can use research at all and say it doesn't have a direct impact on her teaching (p. 13).

Fran has broadened the definition of research's direct impact to mean any use of it, and this accounts for some of her difficulty in understanding Sarah's viewpoint. She ultimately chooses Sarah as the vignette with which she most identifies because Fran believes that research should move teachers beyond a focus on classroom techniques (p. 13). Moreover, she views Deryl as "eliminating the decision-making by the teacher" (p. 14), and too passive in relation to the authority of research.

But Fran also believed that Sarah's emphasis on reading research closely was too strong. Obtaining clarification from someone involved with the research could be helpful. Also, Fran had read research syntheses that cut down the amount of time she had to go sifting through the research, and gave her guidance on whether she wanted to go deeper into the research. Fran, however, felt uncomfortable with making it ready to use.

> . . . a teacher educator has a particular bias, a researcher has a particular bias. And when they give me ready to use research, I think they have narrowed my perspective. . . They've guided how I'm thinking about this particular issue (p. 16).

Fran wanted to read research and consider the evidence on which the research is based. She would accept and appreciate summaries of various approaches to a problem that were based on research because these would help her reflect on it. But, she was cautious about translations of research findings geared to encouraging her to do something. Fran did not want her thinking about the problem to be narrowed inappropriately.

Teachers' Perspectives on the Influences of Research

All teachers in this study shared the belief that research could lead to some form of pedagogical excellence. Even the two teachers who identified with the Neal vignette believed that research could benefit their practice, though it had not done so. How they wanted research to influence them and how much they wanted to understand research differed greatly among interviewees. Their responses roughly matched the broad parameters Dewey laid out. Some teachers' responses suggested that they wanted recipes derived from research findings. Other teachers saw less value in this. They wanted research to raise questions and to help them understand their classroom practice. These teachers also seemed more willing to study research.

These findings can be placed in broader perspective. Dewey's hope that teachers' understanding of educational research would offer them systems of thought with which to interpret classroom practice was not a prevailing view (see chapter three). Dominant expectations of research's influence during this period focused on changing teachers' practice, more specifically, offering products (techniques and strategies) that would improve instruction (see Clifford, 1973; p. 6, also, p. 36). Importantly, changing teachers' instruction was frequently separate from their understanding of research assumptions, goals, and evidence that produced the techniques. This predominant view has contemporary lineage, particularly in the knowledge-use literature as well as the use of research in teacher-testing systems

(see Louis & Dentler, 1988; Shulman, 1987; also, American Federation of Teachers, 1983).[5]

Teachers who chose the Deryl or Neal vignettes accepted these often popular and prevailing expectations for how research should influence teachers. They wanted research-based answers that they could use to change instructional practice, and they wanted these answers without acknowledging any concomitant value in discussing research goals, methods, and assumptions. They would test the efficacy of the techniques against their own classroom experiences. Taking this approach can benefit teachers but is limited.[6]

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[5] Dewey's hopes for the way educational research would influence teachers also has contemporary support, with important variations (see Scheffler, 1968; Fenstermacher, 1980; Zumwalt, 1982; Buchmann, 1985; Floden, 1985).

[6] Floden and Klinzing (1990), for example, strongly support the value of teachers discussing and understanding research results; i.e., what methods, assumptions, and goals were used or assumed by the researchers. They claim, however, that "(k)nowledge of general tendencies is better than no knowledge" (p. 17), even if teachers do not discuss and understand the research. As long as they contrast knowledge of general tendencies derived from research with prejudice, misconception, chance, or no knowledge at all, the authors are on strong ground. More tenuous is knowledge of general tendencies without discussing the research contrasted with individual experience (p. 18). Personal experience teaching can be limited. But, contrast general knowledge derived from research about how to improve students' standardized test scores or classifying students according to ability (as during the scientific movement) -- without discussing and understanding the research -- with a beginning teachers' knowledge derived from individual experience working with a good teacher (or more starkly -- working at the Dewey school). This point suggests that (1) knowledge of general tendencies is not always better than individual experience, and (2) disassociating the benefit of knowledge of general tendencies from greater understanding of research goals, assumptions, and evidence may be more difficult than these authors presume.

Teachers themselves described the limitations. Two teachers who chose the Deryl vignette questioned some of these traditional expectations. Ana Marie wanted research to provide instructional strategies to change her teaching, but recognized that teachers need to examine carefully research evidence and assumptions. Kathleen acknowledged a tension related to the expectation that research focus only on changing teachers' instructional techniques. To Kathleen, this emphasis was narrowing. She valued research that offered broad perspectives in areas other than instruction. Her conflict was that research used to broaden teachers' thinking threatened and challenged conventional expectations of the teacher's role.

Teachers who chose the Sarah vignette subordinated, if not rejected, many of these traditional expectations. They did not want research only to change instructional strategies, and, in general, valued studying research. This was particularly true with teachers who worked as teacher collaborators. Geoff, for example, describes his involvement with researchers who valued clarity of expression and searched for explanations of classroom events. The result was that he began to realize that research could do more than change practice. He valued research because it helped him explain why classroom events occur. Bryan is another example. Unaware that research could influence him in any other way, he expected research to change his practice. After working on a research project, he saw this view as narrow. Like Geoff, he wants research to help him make sense of what goes on in classrooms. Fran initially expected research to impact her teaching directly. Talking about and studying research broadened

her view of research's influence. She did not simply want research to help her "get things done," but valued trying to understand what the researcher is trying to learn or to prove. Cheryl also did not want from research products to use, but ideas to consider over time. And, in sum, teachers choosing the Sarah vignette were less oriented toward research changing their practice. Their focus was not exclusively or primarily instructional strategies and techniques that work, and they were more interested in working through and understanding research.

Teachers who chose the Sarah vignette seemed to have made an important shift in their professional thinking. Clifford (1973; p. 36) argues that creating a liberal or learned profession out of a mass, amateur occupation requires that teachers reject certain traditional expectations of educational research. According to Clifford, the expectation that research offer teachers products (strategies) for classroom use must shift to research enlarging their understanding of teaching and learning. Teachers who chose the Sarah vignette have made this shift. Kathleen and Ana Marie also recognized its importance. Other teachers, for example, Leisa, demonstrate interest in making this shift, but workplace expectations and time constraints make this transition even more difficult.

The importance of Clifford's point can be illustrated further and tied once again to teachers' responses to the vignettes. Jackson (1990) recounts Cronbach and Suppes's (1969) description of how research influences widely held beliefs systems (prevailing views) existing in institutions.

> As investigators discuss their results with colleagues, a restlessness emerges. Findings from different studies seem to conflict. Phenomena are noticed that cannot well be summarized in available language. Similarities are observed among findings on what were previously considered to be distict topic. As investigators puzzle over these irregularities, they find themselves assembling what they know in a new way. Some of the concepts so created will influence thought throughout the educational world. Some especially stimulating or clarifying concepts will influence even the views of the public, especially when the researchers come forth to argue their views in public (pp. 127-128).

Jackson finds the language addressed to nonspecialists, including practitioners, especially revealing. Nonspecialists "will find the new concepts stimulating and clarifying, not simply informative or corrective, as might be the case if such alterations of view were looked upon as mere additionals to or subtractions from what is already known" (emphasis in original, see Jackson, 1990; p. 5).

Teachers who chose Sarah are more open to research that attempts to influence them in the manner Jackson describes. They are more interested in research that helps them conceptualize or redefine issues. As research ideas are culturally diffused, research can become part of a dialogue in the these practitioners' search for understanding (see Nisbet and Broadfoot, 1980; p. 22; also Weiss, 1977; pp. 15-16). But teachers who chose the Neal and Deryl vignettes are not open to this type of influence. They are less interested in new concepts drawn from research that stimulate their thinking and clarify their practice. They want information about what to do next in their teaching. Altering their beliefs about, for example, teaching higher-order and basic skills to disadvantaged students, may be seen as simply attempts to add new teaching

strategies. They may not recognize that a major shift in understanding the relationship between learning higher-order and basic skills is required (see Lanier & Sedlak, 1989). And, they are less diposed to value close attention to and analysis of research concepts, evidence, and assumptions that would help them evaluate their own beliefs.[7]

Teachers chosing the Sarah vignette indicated that research expanded their understanding. Research, however, "may raise a question" or "provide food for thought" without expanding teachers' understanding. Research on teaching higher-order cognitive skills along with basic skills may raise a question and offer food for thought. But, this does not mean that research expanded teachers' understanding. The question or object of thought may not, for example, be relevant to the research's main ideas. We need to know more about the question raised, and what in the research raised the question or offered food for thought. Even more specifically, we need to know more about the ways in which teachers consider research concepts, evidence, and assumptions.

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[7] These points are relevant to those working in professional development schools. Teachers in these schools are not simply adding new techniques to their teaching repertoires. They are being asked to alter substantially their beliefs about teaching and learning. Workplace expectations and time constraints may prevent teachers' discussion and evaluation of research pertinent to these beliefs, and teachers' prior beliefs about research's influence may hinder their willingness to do so. They may reject opportunities to discuss and to understand research because they look to research to provide new instructional strategies.

If this is correct, it will be helpful to consider teachers' attempts to study research closely. We have already found that studying research closely has meant different things to different interviewees. Bryan, for example, wanted to study research closely mainly through his personal contact with researchers. Other teachers, like Geoff and Fran, thought it important to read research carefully and to talk with researchers. In addition, teachers chosing Deryl's or Neal's vignette were not interested in studying research. Does that mean that when they are asked to study it, they do not evaluate and understand research? To consider these important issues more carefully, I look at teachers' attempts to study research closely when reading it.

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TEACHERS' CONCEPTIONS OF EDUCATIONAL RESEARCH

(Volume II)

By

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CHAPTER VI

HOW DO TEACHERS UNDERSTAND RESEARCH WHEN THEY READ IT?

Overview

Reading research is closely interwoven with teachers' and prospective teachers' learning about teaching. Good, for example, argues that professionals or teachers who are too busy to read are simply not professionals (see Good, 1989a). While Good's conception of a professional may seem idiosyncratic or tautological, the relevance of teachers' reading research makes sense. All prospective teachers read research in their foundations and methods courses. Teachers read research in their graduate education courses, and sometimes read it for in-services and professional meetings. Based on the amount of research teachers read and are expected to read throughout their preparation as teachers and their continuing education, reading research is one important way teachers learn about teaching.

Teachers, of course, learn about teaching from sources unconnected to educational research -- most notably, their own teaching experiences. Teachers also can learn from research without reading it. Researchers, for example, may discuss research with teachers, and teachers learn from these discussions without reading the research. These points suggest that educational research is one, among other, sources for learning about teaching, and reading research is not necessary in order for teachers to learn about teaching from research.

These points notwithstanding, teachers reading research remains

strongly linked to their professional development. Research of various types forms the bulwark of teachers' professional preparation, and teachers are expected to learn about teaching from research throughout their careers. This learning from research commonly entails that teachers read it. And, professional norms exist that encourage teachers to study research closely and discuss what they have read with colleagues. Thus, reading research is an important component of teachers' professional education and worthy of researchers' attention.

There have been, however, few studies of how teachers read research. What teachers read, as opposed to how they read it, has long been an object of inquiry. In 1903, studies of public school teachers in New York City found William James' Talks to Teachers and Charles Eliot's Educational Reform on some teachers' reading lists. Most teachers, however, read mostly contemporary fiction, and new teachers' interest in reading research was found to wane quickly as their teaching experienced increased (Wilde, 1903; p. 348; Pretlow, 1903; p. 341).

Frazier's 1933 national survey of teachers included a section on the reading interests of teachers. Consistent with the changing focus of educational research at the Depression's onset, the survey's purpose was to determine teachers' interest in social change based on what they read. Frazier and his associates found that teachers' social concerns, based on their reading interests, were "not much more enlightened" than those of the population at large (see Frazier, et al, 1933; p. 256). Over 30 years later, a study of 270 teachers

in the United Kingdom found that teachers could not be relied on "to read just one serious book on Education or Psychology" each year, and a small proportion of them read educational journals (see Johnson, 1966; p. 78; also Johnson, 1963; p. 296).

This chapter goes beyond traditional studies looking at what teachers read. Consistent with the study's outline as described earlier, thirteen teachers were asked questions about how they read research. Teachers were first asked open-ended questions about whether they read research, and what they looked for when they read it. They were then asked to read three articles and respond to questions about the authors' main points, how the authors' attempted to convince them of these points, and the different types of evidence presented in the articles. In addition, teachers responded to two short research findings and asked what conclusions they would draw from the findings for their teaching, and why (see Appendix A, Section V & VI).

Interpreting teachers' responses draws on a hypothesis generated by findings in the preceding chapters. How and whether teachers read research will be related to their ideas about (1) their beliefs about how research can and should influence their teaching and (2) what research is. Since teachers' ideas in these areas differed substantially, I hypothesize that how they read research will differ accordingly. If, for example, teachers believe research should have a direct impact on their teaching and they do not know what research is, then these teachers will be less interested in

reading research, pay less attention to the researchers' claims when they read it, and neglect underlying assumptions that researchers make when drawing conclusions from their research. Conversely, teachers who believe that research's influence should be to expand their understanding of teaching (indirect influence) and who include a wide range of research studies in their conception of research will be more interested in reading research, pay more attention to researchers' claims, and note more carefully these underlying assumptions.

Whether and to what degree this hypothesis serves to explain teachers' responses guides the analysis. The degree to which the hypothesis accurately frames how teachers read research is consequential. As I later discuss, how teachers read research determines whether research serves to educate them. Using this hypothesis to frame teachers' responses has other spinoffs. Teachers' ability to evaluate research articles will be described and analyzed. Also, what types of evidence teachers cite as credible to them will be described. I turn now to consider teachers' responses, starting first with a more traditional focus -- what research teachers read.

Did Teachers in This Study Read Research?

Like the teachers' in Johnson's (1963) study, few teachers interviewed for this study described themselves as reading educational research. Eight teachers stated that they did not read any research. Nicole stated that she received memos in her mailbox each week and

> in our memos every Monday there is some research, Madeline Hunter, cooperative learning -- not long articles -- because the principal knows we would not read it. . . . It will say mostly what research is saying, and it is mostly a description of what research is saying to classroom teachers in a page or two summary (Nicole, p. 1).

With time only to read teaching manuals (see Nick, p. 2), neither beginning teacher said they read any research.

Two teachers (Bryan and Leisa) said that they read research very little or sporadically. Bryan claimed also that he read little research. In public schools reading research is not valued. "The idea of take a day off to read is crazy" (Bryan, p. 2). Three other teachers (Cheryl, Geoff, and Fran) described themselves as readers of research and, unlike most other teachers, named prominent educational journals in their field. Fran described herself as someone who read research journals to find out what evidence supported the idea (Fran, p. 3). Geoff said that he reads more teacher-oriented journals than professional journals, but feels that the teacher-oriented journals are limited because

> sometimes I need to look deeper to find out what really seems to be factual reasons why some of the outcomes are being cited . . . (Geoff; p. 2).

Table 6.1 summarizes teachers' prior beliefs about research and

Table 6.1

Teachers' Prior Beliefs and Amount of Research Reading

			Regular Reading	Very Little Reading	No Reading
P R I O R	B E L I E F S	Direct Impact Unclear Definition	--	Leisa	Andrea Karla Lynda Nicole
		Direct Impact Narrow Definition	--	--	(BT) Jessica
		Direct Impact Broad Definition	--	--	(TC) Kathleen Ana Marie
		Indirect Influence Narrow Definition	(TC) Geoff (TC) Cheryl	TC) Bryan	--
		Indirect Influence Broad Defintion	(TC) Fran	--	(TC) Nick

Note. TC) = Teacher Collaborator (BT) = Beginning Teacher

whether they read it. With the exception of Nick, teachers who claimed research's influence should be to expand their understanding of teaching (indirect influence) described themselves as reading research. With the exception of Leisa whose infrequent reading was limited to more popular teacher oriented journals such as Learning or Instructor (Leisa, p. 2), all other teachers with a direct impact view of research stated that they did not read research at all. Table 6.1 suggests also that teachers' beliefs about what constitutes research have little connection to whether they read it.

How Did Teachers Read Research?

Analyzing how teachers read research proceeds in two ways. First, I look at teachers' self-descriptions of how they read it. Second, I analyze what teachers did when they actually read three articles pertaining to research and responded to two research findings. Teachers' responses are important for several reasons. They will indicate whether teachers' prior beliefs about research are in some way associated with their manner of reading research. Also, their responses will provide the teacher education and research community a better sense of what sorts of evidence teachers initially find credible (see Floden, 1985). Teachers' responses will also indicate the degree to which research serves to educate them. This last point needs further elaboration.

When reading particular types of research, teachers can seek ideas or steps to take in order to improve a component of their

teaching. If the focus is on doing without teachers seeking any additional justification for why they should do it, reading research may help teachers improve their performance, but it does not serve to educate them. When reading research furthers the education of teachers, teachers are engaged in a process of trying to understand and to evaluate the concepts and claims that compose the study. If teachers are unable to raise questions about research concepts, evidence, or assumptions, or do not pay any attention to them, research does not educate them (see Floden, 1985; Phillips, 1971; 1980; also Cherryholmes, 1990). So, the manner in which teachers read research is inextricably linked to whether research will educate them.

Teachers' Self-Descriptions of How They Read Research

> You know what I usually do is skip the research because I figure they're right anyway. They've done the research. I don't need to know about the research. I go for the steps that I need to know. What are the things that I can take back to the classroom that are going to work for me (Karla; p. 18)?

Karla's view of how to read research assumes that research results are certain, learning about research assumptions and methods serves no purpose, what procedures to follow is the most important conclusion to draw from research, and judging and interpreting the study's merit is based primarily on whether the procedures work when she tries them in her classroom. Another teacher offered a contrasting response based on different criteria for reading research. Cheryl said she focused on the study's

coherence, and whether the study is "organized enough so that you can follow it." Cheryl wants to understand research on its own terms.

> Does it come up with some kind of sensible conclusion that you can process and do something with in your head? Can you take it in and do something with it, then apply it in some way to your own existence, or discount it on the basis of some set of criteria. . . . You don't have to agree with it, but you have to be able to understand what it is that the original author was trying to make clear (Cheryl; p. 18).

Research must be understood in its own terms to Cheryl. "Processing" research does not only mean finding what procedures to use. Agreement or disagreement with a study is based more on understanding it and less on whether applicable findings drawn from the study work in her classroom.

The stark contrast between Karla and Cheryl is mirrored in other teachers' responses. Lynda stated that although she had been told that the "conclusions sometimes are not validated by the statistics," she "always go(es) to the conclusions; what are they really trying to tell me" (Lynda; p. 11). While Jessica mentioned that she looks for how the study was conducted and how that affected the findings, her focus was on research findings. She stated that that she looked first at research findings, because "the findings are ultimately what either asks you to evaluate the way you do things or think about things" (Jessica; p. 15). Nicole also focused primarily on research findings. She says that she read it to determine primarily whether there is

> anything I can use and if it applies to me. More realistic things than idealistic things. I guess I don't look at how many people they researched. It's just a reaction I have, oh, that's a neat idea (Nicole p. 19).

Like Cheryl, some teachers said that they did not focus on findings when reading research. Geoff said that he read research searching for how researchers support their claims. He needs more than "somebody that says this is true because I know I did it in my classroom and it really works" (Geoff, p. 24). He does not "pour over" the graphs and tests of significance because he figures researchers know how to do that. Nevertheless, he states,

> I look for the care that was put into making sure that what they try to tell me they think is going on can be validated by some sort of experimenting (Geoff, p. 23).

Geoff's statement is consistent with his narrow view of what research is. Quantitative studies represented his view of what research is, and he consequently discusses reading these types of studies. He wants to know about sample selection and whether treatment effects can be validated. His strategy when reading is to find out first what researchers claim they are after, and then what they found. He then goes back to study how researchers came to their conclusions (Geoff, p. 23).

Fran said that she focused first on the study's "premise -- what are they setting out to say." The study has to be interesting, but she does not have to agree with it. She reads the research, "stores the knowledge away in long term memory" and then thinks about the ideas in her teaching practice" (Fran, p. 19). Fran refers more to grasping the idea in the research, thinking about it, and then

over a long period of time trying to integrate that idea into her thinking about teaching. Teaching strategies drawn from the research are secondary, but, if appropriate, classroom experimentation based on a research idea will influence her thinking about it. Kathleen said that she looks for what precisely researchers are attempting, which variables they concentrate on, and how researchers choose their sample. She wants to find out research procedures "seem logical" to her (Kathleen, p. 21).

Some study teachers were unsure what to look for, or it was unclear what their responses meant. For both Andrea and Leisa there was an explicit or implicit uncertainty about to look for. Andrea said at first, reliability, but then admitted that "I was trying to come up with some response; I wasn't really sure" (Andrea, p. 14). Leisa said that she looked for what they study involved, but was not very clear what this entailed.

> If there was a study that took place, what the study involved, were they both the same or if they were different (sic), and I'd like to look at what date this took place (Leisa, p. 13).

Ana Marie stated simply that looks for relevance to what she is doing in her classroom first, and whether the research is believable second.

Andrea and Leisa were uncertain about how to read research. With Ana Marie, it is uncertain what she means by "believable." It could mean whether she thinks research findings could be translated to work in her classroom, or it could mean whether she thinks the conclusions are believable based on the merits of the study itself. This is a point to bear in mind when interpreting table 6.2 below.

Table 6.2

Teachers' Prior Beliefs About Research and Self-Descriptions of How They Read It

		Reading Focus		
		Findings & Applications	Uncertain Focus	Concepts, Claims & Evidence
PRIOR BELIEFS	Direct Impact	Karla, Nicole	Andrea	--
	Unclear Definition	Lynda	Leisa	--
	Direct Impact, Narrow Definition	(BT) Jessica	--	--
	Direct Impact, Broad Definition	--	Ana Marie	(TC) Kathleen
	Indirect Influence, Broad Definition	--	--	(TC) Fran; (BT) Nick
	Indirect Influence, Narrow Definition	--	--	(TC) Cheryl; (TC) Geoff; (TC) Bryan

Note. (TC) = Teacher Collaborator (BT) = Beginning Teacher

Consistency of Teachers' Self-Descriptions

As table 6.2 suggests, teachers' self descriptions of how they read research is consistent with their beliefs about how research should influence their teaching. If teachers believe research should have a direct impact, they describe themselves as interested in research findings, and they judge the study's merit by whether the findings can be translated into procedures that work in their classrooms. If teachers believed research should expand their understanding of teaching (indirect influence), they are concerned with the concepts and claims the author proposes, and how the study's conclusions are supported by evidence in the study. Kathleen is the one clear exception to this. She believes research should have a direct impact, but she is interested in understanding the study apart from its immediate use.

Teachers with either a narrow or broad definition of research (i.e., teachers with clear ideas about research) said that they were interested in analyzing a study's concepts, claims, and evidence. Teachers with unclear ideas about what research is focused on research findings apart from the body of the research or were uncertain about how to read research. Thus, judging from teachers' self-descriptions, the manner in which teachers read research is related to having a firm idea of what it is and believing that reading it will expand their understanding of teaching. It is necessary, however, to probe further, moving beyond self-descriptions of how teachers read research and looking carefully at how they actually do read it.

Teachers Reading Research

Teachers read and responded to three articles and two research findings during a one hour interview session. Teachers were required to read the articles prior to the interview session, and they were asked whether they indeed had read them before or during the interview.[1]

The articles were chosen to represent different types of research studies as well as for their brevity and potential interest to teachers. One article, Teaching critical thinking in elementary social studies (Hunkins and Shapiro, 1967), is a quasi-experimental study of 54 fifth-graders. The study investigated whether a "case-method" approach to teaching critical thinking was superior to a "traditional lecture-textbook" approach. Another article, On listening to what the children say (Paley, 1986), is one teacher's descriptive study of how she responds and listens to children in her own classroom. A third article, Cuban's (1988) A fundamental puzzle of school reform, takes a different approach. Cuban, drawing on his historical studies, introduces conceptual distinctions in order to

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[1] Four teachers (Andrea, Lynda, Karla, and Leisa) who enrolled in the master's level course on classroom research wrote out their responses to the questions (see below) about the three articles. Because I followed these teachers over time, I wanted to find out how they read research before their participation in the course started to influence their thinking. There was not enough time to interview them face-to-face before class began. Consequently, they wrote out their responses. These teachers also were required and given instructions to read the articles before answering the questions. The relevance of this different approach is discussed later.

sort out the types of changes that have occurred in schools' organizational structure over the past century.

Teachers were asked to read the articles and were given the questions they would respond to before being interviewed. For each article they were asked:

1. What is the main thing the author seems to be trying to say, and how does he or she try to convince the reader? I mean, what does the author(s) do to make you to believe the article?

2. Is there anything in the article that you have trouble understanding?

3. What conclusions, if any, would you draw from the article for your teaching, and why these conclusions?

For all the articles together, study teachers were asked:

4. Did you enjoy any article more than the others? Why or why not?

5. In light of how you think research should help teachers, does any article succeed more than any other? Why or why not?

6. Did the authors use similar kinds of evidence in each article to support their views? Was any evidence more or less convincing?

Teachers also read research findings during the interview session. The research findings included one finding on direct instruction from What Works, the 1986 U.S. Department of Education publication.

> When teachers explain exactly what students are expected to learn, and demonstrate the steps needed to accomplish a particular learning task, students learn more (p. 35).

Teachers also read the one-half page comments and reference list that followed the finding (see Appendix A, Section V).

The other finding was an adaptation of Phillips' example of how someone can draw different conclusions from a research finding depending on the values they hold or their assumptions about learning (linking premises; see Phillips 1971; also, 1980).[2] The finding is that children under eleven can not understand the national anthem. Study teachers were asked what they would say to an educational psychologist who observed their class and informed them of the finding (see Appendix A, Section V). Finally, teachers were also asked: if there is good research evidence for a teaching practice, should you use the practice in their teaching? And, under what conditions can you ignore "good research"?

Analyzing Teachers' Responses

Substantive, important differences existed between teachers' responses to these questions. If research serves to educate teachers, teachers need to go beyond focusing only on research findings. They need to be able at least to render a (defensible) sense of authors' main ideas and how authors' supported them. Teachers also may further analyze research in relevant ways that demonstrate greater ability to understand what they read.

To find out how teachers read the articles, a system was devised to analyze their responses. The system included elements

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[2] All teachers' read and responded to the research findings during the interview session. No teacher read the findings prior to the session.

linked to teachers' ability to provide defensible versions of the articles' main ideas and evidence. It also included elements linked to teachers' dispositions and abilities to analyze the articles' merits and to recognize underlying assumptions when reading research findings.

Numbers were assigned teachers based on how much their responses and reading processes matched those shown in table 6.3 below. For items one through three (see table 6.3) teachers could receive up to nine points. These items referred to direct questions that teachers should have thought about or even written down prior to the interview. The remaining items (four through seven) went beyond simply responding to the questions and focused more on analyzing the articles. These items were worth two points each. A good judge or critic of research could realistically score 40 points for the second set of items. So, the higher a teacher's score, the more willing and able they were to analyze the articles and findings.

Table 6.3

System for Analyzing Teachers' Responses

Reading Processes

Articles (responses worth one point for each article)

1) Recognizing main ideas in each article.

2) Recognizing (broadly) how the author(s) tries to convince readers in each article.

3) Labeling different types of evidence for each article.

Additional Analysis of Articles and Research Findings
(responses worth two points each)

4) Drawing conclusions for one's own teaching based on recognition of the main idea and evidence in the article.

5) Judging further the merits of an article (two points each for any response related to a - f);

   a) recognizing and analyzing conceptual distinctions;
   b) creating and explaining distinctions based on the article;
   c) questioning further the data's consistency (apart from drawing conclusions as stated in four above).
   d) considering, if appropriate, the article's internal validity;
   e) external validity;
   f) construct validity;

6) Referring to or positing different conceptions of learning or educational aims when responding to and drawing conclusions from research findings or when talking about "ignoring good research."

7) Noting relevance of reading the studies on which a research finding is based in order to further evaluate that finding.

The reading processes listed above in Table 6.3 (6 a - f) were tied to reading different types of research. The inclusion of internal, external, and construct validity is based on Smith and Glass' (1987; pp. 2-6; see also, Gay, 1987) broad criteria for judging the merit of research studies. Teachers' ability to judge the merit of studies is considered important for both quantitative and descriptive studies (see Goetz & LeCompte, 1984; pp. 208-245; Hopkins, 1985, pp. 105-115; also, Smith & Glass, 1987; p. 278). Recognizing conceptual distinctions, creating them, and questioning further the data's consistency is related more to analyzing philosophical and historical studies, though these processes may be appropriate for all types of studies (Floden & Buchmann, 1990; also see Gay; 1984; pp. 184-185 for analyzing historical data).[3]

As the following table indicates, how teachers read and responded to the articles and findings varied substantially. Table 6.4 presents overall scores which indicate the degree to which teachers' responses matched those included in table 6.3 or focused more on the products of research. The higher the score, the more teachers responses were related to the reading processes described in table 6.3.

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[3] I have tried to exclude highly technical analytic skills related to different types of research studies that would be mainly the province of experts in the fields. One should not expect teachers, for example, to be experts in statistical analysis or in determining the authenticity or accuracy of historical data. If research, however, educates teachers, they need the ability to go beyond focusing on the products of research (see above). The province of this "middle ground" will be further developed in the concluding chapter.

Table 6.4

Teachers' Manner of Reading Research

			Processing Research Focus	Score	Research Products Focus
T	Cheryl	(TC)	27		
	Fran	(TC)		20	
E	Ana Marie			20	
	Kathleen	(TC)		18.5	
A	Nick	(BT)		18	
	Geoff	(TC)		18	
C	Bryan	(TC)			13
	Nicole				12
H	Jessica	(BT)			11
	Leisa	(MC)			10
E	Karla	(MC)			10
	Lynda	(MC)			8
R	Andrea	(MC)			6

Note. (TC) = Teacher collaborator (BT) = Beginning teacher
(MC) = Teachers taking a master's level course

Note. Appendix B includes all responses for each teacher that counted toward the total reported in table 6.4. In some instances, especially for teachers' responses to questions about an article's main idea and evidence, responses that did not count in a teacher's score are also included in Appendix B.

Each of the six teachers at the scale's bottom (with scores between 6 -11) believed that research should have a direct impact on their teaching and either had a narrow or unclear conception of what research is. Teachers scored higher (between 13 -27) when they had an indirect view of research's influence or a broad conception of what constitutes research. Teachers' responses, however, are not so clear cut. Some teachers with a direct view of research's influence or a narrow conception of research scored as high or higher than teachers with an indirect view and a broad definition. So even though table 6.4 provides evidence for differences between teachers based on their prior beliefs about research, it is necessary to probe more deeply into how teachers made sense out of the articles and findings.

Reading Research with Less Understanding

The six teachers at the scale's bottom end shared common problems in reading articles and findings. They had greater difficulty identifying main points and evidence in the articles and/or were unable to further analyze the articles and findings.[4]

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[4] As mentioned earlier, four of these teachers (those in the master's course: Lynda, Andrea, Karla, and Leisa) wrote out their responses. One criticism of their relative lack of focus on processing research when reading it is that the context of writing out responses did not lend itself to open-ended analyses of the articles as happened with other teachers who were interviewed face-to-face. This is a fair criticism. However, note that these teachers nonetheless had serious problems identifying main ideas and evidence in the articles. In addition, two teachers (Jessica and Nicole) who were interviewed about the articles and who shared similar prior beliefs about research had scores similar to these other four teachers. Finally, many teachers' scores were increased when positing different educational aims when reading the findings. The four teachers in the master's course had the same opportunities to do this as other interviewees.

Their problems were associated with a focus on what research products -- teaching strategies or methods -- that they could take back with them into their classrooms after reading the articles and findings (see appendix B). Articles were judged less by their tie to evidence and more by whether it "shows you" what skills to use to improve your classroom (see Jessica, p. 24). Articles are difficult to read when they do not give suggestions of "what might work, or what we need to try to do" (see Leisa, p. 15).

In addition, teachers at the lower end of the scale were more apt to claim that the only way to respond to research findings is to try out recommended practices drawn from them. Ignoring teaching practices drawn from research is legitimate only if those practices do not work in your class. There was less recognition that research incorporates different conceptions of learning or educational aims that teachers need to consider (see Andrea, pp. 12-13; Jessica, pp. 25-27; also Lynda; pp. 11-13).

Credible evidence and additional analysis of articles. One dominant theme with teachers at the lower end of the scale was thus their over-identification of credible evidence in the articles and findings with what they themselves can try out and see work in their classrooms. This identification was consistent with these teachers' relative lack of additional analysis of the articles and findings or their inability to pursue further any criticisms of the research articles.

Nicole, for example, liked best the Hunkins and Shapiro article

on teaching critical thinking because it offered her something "concrete." Her distinction between evidence in the articles was that they all relied on "personal experience," but the Hunkins and Shapiro was most convincing because it proves that "there's a method there" she can use. Nicole did offer some further analysis of the articles and realized that she tends to jump to conclusions. Referring once again to the Hunkins & Shapiro quasi-experimental study, Nicole recognizes that the authors said nearly nothing about the instruction of the control group and realizes that this may weaken their case. Self-conscious about prematurely embracing the teaching methods the authors promote, Nicole wonders whether the authors may have been

> biased toward the experimental treatment. And that's how they convinced me (Nicole, p. 13)?

Nicole, however, does not pursue her rhetorical question. The importance of research evidence for a teaching practice should be taken with "a grain of salt."

> And when I start reading this over more carefully, there's nothing real concrete. I'm talking out of both sides of my mouth because I first said it was a concrete concept that I could use, which there is. . But if they were really trying to prove their case, there's a lot of unknowns that they didn't include. So to say this is true I don't think you can really prove it by this article. And I think research is swayed -- that you can find whatever it is you're looking for (Nicole, p. 16).

Instead of being more careful about drawing conclusions from research when reading it, Nicole takes refuge in the view that research can prove anything, and so reading research closely is worth little. The only credible evidence for a teaching practice to Nicole remains what is immediate and tangible -- what she can see work in

her classroom.

Key themes identified in the previous chapter are also manifested when teachers read the articles. Karla believed that analyzing and evaluating research meant finding out how she can use it (see chapter five, pp. 176-177). Consequently when reading the research articles she focuses on what the articles mean for her classroom teaching while misunderstanding or neglecting the articles' main ideas and evidence. This is most apparent when she responds to the Cuban piece.

> Cuban suggests that second-order changes need to be made. That is, instead of throwing all of education out, keep those things that are already in place and are working, and change and improve those that are not working . . . I did not understand how Cuban gathered his information and came to his conclusions. . . After reading the Cuban article, I have to ask myself what changes I need to make as a teacher. . . Once I have identified the type of changes, I then need to decide the best way to go about making changes in the classroom or in education (Karla; p. 20).

Unable to understand the Cuban article, Karla focuses nonetheless on what it means for her teaching. Specifically, she misses Cuban's point that significant change in the organization of education is dependent on broader social and political changes, and thereby draws faulty conclusions for her teaching from the article.

Jessica identified research with quantitative studies, wanting it to impact her teaching without reading it, and described herself as a "reader's digest type of person" (p. 11; also, pp. 15-16). She liked the Hunkins and Shapiro article because of its direct use and furthermore suggested that the data in the article "spoke for itself."

Consistent with this view, after reading the Cuban article Jessica stated that it had "no findings," because there were no data to support it. For these reasons,

> it's not something that you could tangibly sit down and say, this is going to be the basis for our new school reform. No one is going to take that. Our school has got a policy now of not making decisions unless they are research-based (Jessica, p. 17).

Despite their misunderstandings of the articles, these teachers often were able to determine articles' main ideas and the ways in which authors tried to convince them. And, they sometimes displayed more sophisticated views of research. Karla, for example, states that none of the evidence in the articles is more convincing because the author(s) of each article set out to answer their own question and gathered their data to answer that particular question (Karla, p. 22; also Leisa, p. 18). But Karla, like other teachers with similar prior beliefs about research, was generally less able and willing to judge the authors' conclusions in light of the evidence the authors provided and analyze further the articles' merits.

Table 6.5 below indicates the total amount of additional analysis (see table 6.3 # 4-7) these teachers did with the articles and findings contrasted with that done by teachers with broader views of research's influence and/or broader views of what constitutes research. On only three occasions did teachers with narrower views judge further the articles' merits or draw conclusions based on the articles' main ideas and evidence. Teachers with broader views responded to the articles in these ways on 23 different occasions (see table 6.5 below).

Table 6.5

Teachers' Additional Analysis of Articles

	Occasions teachers judged further articles' merits or drew conclusions based on articles' main ideas and evidence (see table 6.3 # 4-7)	Average per teacher
Teachers with direct impact view of research and either narrow or unclear view of what constitutes research (n = 6)	3	.5
Teachers with a broader view of research's influence (expands understanding) and /or a broader view of what constitutes research (n = 7)	23	3.3

Is it important to value reading research? Having broader views of research's influence did not mean that a teacher reads the articles with more understanding. Bryan, for example, was closer to teachers who focused more on research products than on processing research. Though Bryan had stated that he valued the "sense-making" influence of research, he had dismissed the need to read research (see chapter five, pp. 195-198). Predictably, Bryan does not read the articles closely. One result is that he has problems understanding the Cuban article. Another result is that he interprets Paley's article idiosyncratically. He understands the piece to mean that a teacher does not have to worry if they spend school time discussing students' personal problems or engaged in non-instructional activities.

> Some of the best days I have had teaching is (sic) when we did not really teach or learn anything; we just talked. Ice-skating was great today (He took his students to ice skate during the school day.) You get out of school and kids aren't as guarded about what they talk about, and they'll say all kinds of things. And it's just like hanging out with your friends for a while (Bryan; p. 20).

Bryan later admits that Paley helped feel him "less guilty" about wasting school time (p. 28). Personal interpretations of research such as this one must be guarded against, except in so far as the interpretation is defended in relation to the text. Without inclination to read texts closely, it is likely that Bryan will settle on incomplete, less supported, idiosyncratic interpretations of research studies.

Reading Research Articles and Findings With More Understanding

Six teachers scored relatively high on the scale used to analyze teachers' responses to the articles and findings. Cheryl scored the highest. She posited a different and well-formed conception of learning when responding to research findings and was in no way intimidated by the authority of research findings.

> I do not know what good research evidence is for a teaching practice. I mean if there's good evidence that screaming at kids and being abusive to them makes them more obedient and score higher on tests -- I'm not interested and I don't care how good the research is . . I think it would be irresponsible and unprofessional for a teacher to join the bandwagon every time a good piece of research came out (p. 34).

Cheryl's responses to the articles were consistent with her beliefs about the influence of research. She had described herself as someone who focused on research ideas rather than research products. When reading the articles, she concentrated on how important terms were defined by researchers, offered counterexamples, demonstrated an understanding of the authors' main points and then questioned their consistency, and, in general, played with the ideas that she encountered, especially in the Cuban article (see Appendix B). Cheryl had also described herself as someone who did not understand research evidence (see chapter five, pp. 188-192). Responding to the statistics in the Hunkins and Shapiro article she states:

> I think that they are basically irrelevant to the importance of the article. But my hunch is that the writers felt that they needed to be taken seriously, to have this be looked at as more than a methods project in a methods book. That they needed numbers to make their piece look more serious (p. 30).

Part of the reason Cheryl says this is because she does not understand the statistics. But another reason is that she already agrees with the theoretical framework the researchers propose, and statistically significant results from one article can not shake her beliefs about how students learn.

> It would not have made any difference to me if they would have said that the students who had the case methods to develop their critical thinking scored lower on the post testing. I still would have had the same question about the test itself, how it was scored, and if they're really testing critical thinking . . . I would have been surprised if that had happened. It would defy everything I think about kids and subject matter -- if they invest in what their learning, they understand it (pp. 30-31).

Cheryl does not understand the article's statistical analysis and its results can not change her beliefs about learning. But, she raises pertinent questions about it because she wants to understand the ideas presented in the research and how those ideas fit into her way of thinking.[5] In addition, Cheryl raises good questions about the evidence in the articles despite her doubts about what evidence is. She recognizes, for example, that the conclusions Paley or Hunkins and Shapiro draw are open to question. And, she looks to

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[5] Nick also argued, like Cheryl, that the statistical evidence in Hunkins and Shapiro was superfluous because he already believed in learning by discovery. Unlike Cheryl, Nick did not ask good questions about other parts of this study. Nick was, however, critical of Paley's study because he felt like she may have found only what she was looking for during her discussions with students. Therefore, he wanted to read her whole transcript and draw his own conclusions about students' responses (see appendix B). As a first-year teacher, he also saw the Cuban article "a bit ivory tower," but found it the most interesting reading because Cuban offered a broader framework in which to understand teaching innovations (p. 26).

verify Cuban's conclusions by further reading in the area -- not only by reference to her own experiences (p. 32).

Noting the political contexts and the rhetoric of research. Teachers with broader views recognized more that research is shaped by the political context in which it is carried out and researchers' conceptions of worthwhile aims. Unlike Nicole, these teachers did not become cynical about in research when recognizing these points. After reading the finding on direct instruction and combing through the reference list, Fran says:

> I also think that you have to be aware of who the researchers were and what their perspectives were in order that they would do that kind of thing (research). . And I read one article by Berliner, and I kinda know his perspective -- which I sometimes agree with and I sometimes don't (Fran; p. 35; also p. 16).

When asked whether he should use a teaching practice for which good research evidence exists, Geoff states that teachers need to be open to new teaching practices. But, he also believes that research projects are sometimes carried out within a political context in which the search is not simply for truth. This realization does not mean that he does not read and understand the research from which any teaching practice is derived.

> I can't say, oh yeh, that research is just politically done and they're just making sure they get the grant next year. But instead, I need to look at the research critically and think, is there something there (Geoff, p. 34)?

Nick also touches on an important point recognized in the literature -- the rhetoric of research. To persuade readers, researchers' often present their theories and conclusions as more

certain than they actually are. Nick states that research often follows a formal structure that makes it seem as if the theory and conclusions "ironclad." Though the research may appear ironclad, Nick denies that it is.

> But they have to say it is, otherwise, why would anyone read it? It reminds me of this famous meeting of psychologists, Maslov, Rodgers, and Skinner. And Maslow and Rodgers were getting on Skinner -- (an environmental determinist). So they asked him, you're saying that you had no choice in being here -- you're here because events occurred in your life forced you here? And Skinner replied tongue in cheek -- yes -- realizing that it was kind of a ludicrous position, though he had to hold it to be consistent (Nick, pp. 13-14).

These three teachers -- Fran, Geoff, and Nick (see above) -- combined more sophisticated views about the contexts and rhetoric of research with greater ability to judge the articles and findings (see appendix B). Fran, for example, was mainly concerned with articles' and findings' external validity. She believed that research should raise questions for teachers, and bristled at in-services where research findings are presented as answers. Fran's remarks concentrated on whether the research samples were similar to students in her school district or school.

> School systems seem to jump on the bandwagon too quickly without laying down the groundwork for it, without looking critically, carefully at their population (p. 24; also p. 36).

Fran also mentions that teachers need to raise questions not only in relation to the school's population, but also the research's consistency "with the on-going philosophy of the school district" (p. 25). So, when Fran read the articles and findings she thought about

how (1) she can try out recommended practices drawn from the research in her classroom; (2) the sample and its generalizability; and (3) its consistency with the school district's philosophy, and presumably, her own. Fran's responses were consistent with her belief that research studies should move teachers beyond a narrow focus on classroom techniques and her interest in experimenting with new practices draw from research and raising questions about what happens (see chapter five, pp. 198-200). But, one problem with Fran's responses is that she does not mention other criteria for judging the articles, and so she may overemphasize external validity as the only criterion for judging the merits of empirical studies.

Geoff used criteria to judge the articles consistent with his prior views of research. Geoff criticizes the Paley article because "she seemed predisposed to believing her hunches anyway at times" (p. 25). Geoff's wants to put distance between claims from teachers who say "I've just done the neatest thing in my class" (p. 30) and research studies. Paley reminds him of teachers with neat ideas, and Geoff does raise a criticism about her article worth thinking about.

He also says that the Paley article is not research, though it could be turned into a research project (p. 25). Geoff had associated only quantitative studies with what constituted research (see chapter three, pp. 125-126). An important question for him is whether the only way the Paley article could be improved is if it were some type of experimental study. Geoff is, however, also critical of Hunkins and Shapiro's quasi-experimental study (he wants

to know more about how the control group was taught), and he say that this article is most convincing because the authors used a control group. It is not that he disregards the Cuban and Paley articles because he does not think that they are research. These articles reminded him of ideas he considers worth thinking about (pp. 29-31). Geoff, however, is willing to take more seriously those studies that are supported by experimental evidence.

Two teachers, Ana Marie and Kathleen, wanted research to impact their teaching directly and included a broad range of research studies in their conception of what constitutes research.[6] Neither teacher focused primarily on research products when reading the articles and findings. Ana Marie had stated earlier that she did not feel teachers need to read research closely (see chapter five, pp. 177). She admitted, however, that reading research was in fact important to her when she was told or encouraged to include practices derived from research in her teaching, and she was not familiar and comfortable with these practices. Her defense of this way of looking at research's influence was dependent on her ability to evaluate

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When Kathleen responded to the Cuban article, her view of research's influence was broader than her initial identification with the "direct impact" view of research influence indicated (see chapter 4). Ana Marie also responds favorably to the Cuban article. This suggests her direct impact view is less firm than she signifies. However, Ana Marie likes Cuban because she is now being asked to change her teaching practices, and the article helped clarify the conflicts she is experiencing over making these changes. Kathleen sees the benefits of the Cuban article though it has no immediate bearing; Ana Marie sees the benefits because it currently and directly relates to her teaching. So, Ana Marie seems more firmly tied to the direct impact view.

research used to bring about changes in her teaching (see chapter five, pp. 179-181). When Ana Marie read the articles, she was, in fact, able to analyze them well, offering the most thorough criticisms among the study teachers of the Hunkins and Shapiro quasi-experimental study. Also, though she felt the Paley article contained good ideas, Ana Marie was circumspect about drawing conclusions from it because there was not enough information in the article about the teacher and her students.

Though Ana Marie's beliefs about research's influence are narrow, she nonetheless includes a broad range of research studies in her conception of what research is and she is able to read research better than most teachers included in the study. As a result, the possibility that different types of research will serve to educate her is far greater than teachers who can not process research. These latter teachers may need other entry points in order to involve them in trying to understand research studies.

Teachers' Varied Conceptions of Credible Evidence

> Until we have practitioners who say, "I'm not going to use that until I've seen good experimental evidence for it," we're going to continue on the educational pendulum with the "miracle of the month" and will not make much serious progress (Slavin, quoted in Brandt, 1988; p. 28).

Kathleen was one practitioner who agreed with Slavin, stating that "there must be statistical evidence if someone is going to change something' (Kathleen, p. 32). No teacher, however, read the Hunkins and Shapiro quasi-experimental study and understood the

authors' statistical analysis of students' pre and post tests even though five teachers saw this evidence as "most convincing" compared with the other articles. Teachers accepted the statistical analysis based on trust (e.g., Geoff, p. 26; Nick, p. 18). In addition, nine teachers (including Kathleen) had no understanding of what researchers meant when they warn readers not to mistake correlational with causal relationships. Besides the error of focusing only on experimental studies as a basis for change in teaching, Slavin's comment goes beyond what any teacher in the study was able to do.

Teachers nonetheless raised substantive questions about all the articles and were interested in different types of credible evidence when reading both articles and findings. The analysis of teachers' responses has established the poles. Teachers who believed that research should have a direct impact on their teaching and who had either narrow or unclear views of what constitutes research were grouped around one form of credible evidence. They read research with an eye mainly to what strategies they could try out in their classroom in order to determine how they worked with their students. They wanted research products without more consideration of the study's concepts, claims, and supporting evidence. Teachers who believed research should expand their understanding of teaching (indirect influence) and/or had a broad view of what constitutes research were grouped around another pole. Credible evidence was substantially wider for these teachers. They were more willing and able to process the concepts, claims and evidence presented them.

So, teachers in this latter group responded to the articles and findings more flexibly. This is not to say that these teachers focused only on, for example, figuring out what evidence supported a study. For all teachers, the articles and findings triggered their intuitive beliefs about what constitutes good teaching. Teachers were disposed to compare and to contrast these intuitive beliefs without extensive consideration of the concepts and supporting claims in the articles and findings. Almost every teacher, for example, drew conclusions from the articles for their teaching whether or not they believed supporting evidence existed.

That teachers think about how something will work in their classroom without trying to understand further the articles makes sense. Sometimes teachers have trouble figuring out what researchers are doing, and why. Important also is that teachers are accustomed to judging teaching ideas or strategies in which their main source of validation is their perception of what happens with their students. All teachers were disposed to treat the ideas or strategies in the articles and findings in this same way. The article or finding presented an idea or a strategy, and teachers drew a conclusion without caring about supporting evidence. Supporting evidence would be found by what happens in their classroom. But only teachers who thought of research more broadly went back and forth between thinking what the articles and findings meant for their teaching and considering supporting evidence.

Between these poles, teachers referred to other kinds of credible evidence that interested them. Table 6.6 describes the

different types of evidence teachers mentioned as credible when responding to the articles and findings. Numbers one and ten on the table refer to the poles that have already been described. Number one refers to teachers' claim that what makes an article or finding credible is when it meshes with their personal experience. Numbers two through nine (see table 6.6) represent credible evidence that is successively removed from teachers' direct classroom experience (number one) and involves teachers more in trying to understand what an article is trying to communicate, and why (number ten).

Table 6.6

Credible Evidence to Teachers

1. Idea or strategy meshes with their experience. Or, using a strategy in their own teaching and seeing whether it works for them (all teachers, but teachers with direct impact view of research and/or narrow or unclear views of what constitutes research identify mainly or exclusively with this).

2. Someone coming in and working with my students in which I have the opportunity to observe the teacher and see my students' response to this other person's teaching (Ana Marie, p. 29).

3. Checking with other teachers to find out how a new teaching innovation is working in their classrooms (Fran, p. 23).

4. Reading research that begins with a concrete case that illustrates the type of learning and teaching that went on in classrooms (Jessica, p. 17).

---- "walking through" descriptions of teacher-student interactions like in Paley. This provided concrete examples of her experiences which are helpful to teachers (Leisa, p. 17).

5. Transcripts of students' thinking and student interviews -- test scores are not sufficient evidence (Bryan, p. 22).

6. Knowing specifically what students learn or were to learn in a study -- examples of tests, questions asked students, materials to which students responded (Cheryl, p. 32).

7. Trying out an innovation, seeing how it works, and referring back to researchers to determine why things turned out the way they did (Fran, p. 22).

8. If claims can be verified through further reading to determine their accuracy (Cheryl; p. 32 -- referring to Cuban's claims).

9. First struggling with the broader framework in which the authors have asked their questions, starting a dialogue within this framework, and then I can understand how the evidence in the article fits into this framework (Nick, p. 27).

10. Judging further articles' merits in line with those described in table 6.3 # 5 a-g. (Mainly teachers wanting research to expand their understanding of teaching and/or with broad views of what constitutes research).

Table 6.6 indicates that teachers find persuasive their own observations of other teachers and teachers' descriptions of the results of implementing classroom innovations (items 2 & 3). At the other end, teachers included as credible evidence activities, if successful, would deepen their understanding of research -- finding out why strategies drawn from research work, further reading in a broader body of literature that supports an article's claims, and finding more about the theoretical framework that informs a study.

Notable also as credible evidence is teachers' interest in what specifically students are learning (see items 4, 5, & 6). Teachers wanted to read about tests and methods used with students and students' responses to these -- not just test scores. Teachers were also interested in transcriptions of student and teacher interactions, and other types of descriptive cases. Materials such as these have a special importance. They could serve as a bridge to encourage teachers to go beyond focusing mainly on what works in their classrooms and to read research carefully and to think about the concepts, claims, and supporting evidence that form research studies.

Other teacher responses may be instrumental in motivating teachers to read research carefully. Teachers were interested in trying to further understand concepts and evidence when a study's conclusion did not match their own beliefs about teaching and learning (e.g., Jessica; p. 19; Ana Marie; p.20). Furthermore, when teachers reflected on an article and recognized their interpretation was in conflict with evidence in the study, they were interested in

thinking more about whether their interpretation was warranted (see Bryan, p. 28).

Summary and Conclusions

Common problems in reading articles and findings were most associated with teachers who focused on research products. They had greater difficulty identifying authors' main ideas and evidence in support of these ideas. Consistent with this problem, these teachers relied more on personal interpretations of the articles as opposed to defensible interpretations based more firmly on the text. In addition, these teachers were less likely to draw on different conceptions of learning or educational aims when responding to research findings and when offering reasons for ignoring good research.

So, one answer to the question, how do teachers understand research when they read it, is that many teachers don't. When reading research, they were more interested in research products and were unwilling and/or unable to process it in ways described earlier in the chapter. These teachers were like consumers interested in making decisions about what goods to procure without understanding further why the decision is warranted. Consequently, their relationship to the text begins and ends with the question, what should I do? The questions -- what is the author saying? -- and -- why should I believe this? -- are not meaningfully raised and pursued in reference to the text.

This conclusion goes beyond Frazier's (1933) concern that what teachers read about social issues was provincial, conventional, and sensational -- much like the population at large (p. 284). The data in this chapter suggest that how many teachers read research may be no more enlightened than any consumer's approach to and interest in information that provides answers for areas in which they have little or no specialized knowledge. The problem is two-fold. It is not simply what teachers read -- as Frazier and his colleagues pointed out for their time -- but more importantly, the manner in which they read it.

One response to this latter point may be that teachers do have specialized knowledge of teaching and no specialized knowledge of research, therefore they have a defensible consumer approach to research which provides answers for their specialization -- teaching. This assumes what has already been questioned in the preceding chapter, looking for research to provide teachers answers is one limited way research can influence teachers.[7] Other teachers in the study did not share in this more restricted view of research's

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[7] It assumes that if teachers have specialized knowledge of teaching, then they should look to research for answers like a mechanic who reads a trouble-shooting guide to figure out a car's sputtering or like a doctor who reads a manual to determine the cause of a patient's symptoms. But education is not an applied science as, for example, medicine or engine repair are. Judgements of aims play a prominent role in education and causal relationships for the attainment of these aims are rarely obtained (see Phillips, 1971; Tom, 1984). Also, insofar as teachers' specialized knowledge is not limited to teachers' knowledge of classroom particulars and other contextual information, there is less reason to believe that teachers' understanding of research could not inform and enhance their specialized knowledge of teaching.

influence, and these teachers made more attempts to understand the articles and findings. This consumer approach to reading research was more characteristic of teachers with narrow beliefs about the influence of research, and these beliefs are not shared by all teachers.[8]

Two teachers, however, who wanted research to directly impact their practice also did not focus on research products (e.g., Ana Marie and Kathleen). These two teachers' view of what constituted research was broader, but it is unlikely that this was chiefly responsible for helping them read research with more understanding. More likely, Kathleen's reading of research while working as a teacher collaborator, or opportunities to read research during courses on educational research, or the acquired ability to read well in general (see Norris & Phillips, 1987) accounts for these teachers' ability to respond more substantively to the articles and findings -- despite their beliefs that research should directly impact their teaching and that they do not need to read research closely.

Earlier in the chapter it was suggested that the manner in which teachers read research determines whether research serves to educate them. Teachers who read research to find out what to do have fastened upon research products (e.g. teaching strategies) as guides

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[8] The notion of a consumer approach to research is further developed in the final chapter.

for action. Other teachers expanded their focus when reading research. These teachers considered more fully the concepts, claims, and evidence in the texts. They did not sever the connection to prospective acts but engaged in reading processes that furthered their understanding of the text. The tie to action was delayed, and the possibility that research served to educate these teachers emerged.

Helping teachers read research does not mean that teachers must understand research studies in the manner Slavin strongly recommends. If Slavin's suggestions are taken seriously, the situation seems nearly hopeless. Teachers can not judge whether good experimental evidence supports a practice. No teacher was able or willing to analyze sophisticated statistical studies.

Teachers nonetheless can benefit from reading research closely. Teachers who understand the importance of research studies are willing and able to grasp authors' main ideas and discern generally the manner in which these ideas are supported. Importantly, they are able and willing to discuss research drawing on their analysis of a study's merits and their knowledge of teaching. They neither drew conclusions from research without reading it nor tried to understand research in isolation from their ideas about teaching.

Supporting teachers' efforts to benefit from research in this way is realistic. Teachers, however, need less technical though substantive explanations of how sophisticated forms of evidence support authors' ideas. Teachers also need encouragement to note salient, underlying assumptions about teaching and learning that

guide research studies. Accessible, explicit descriptions of these assumptions would be relevant and useful as would accessible descriptions of theoretical frameworks underlying research paradigms (see Confrey, 1987). Importantly, teachers also need sustained opportunities to conjoin their understanding of studies with their knowledge of teaching. Consequently, they need time and encouragement to work through research studies.

Finally, Good's statement that teachers who are too busy to read are not professionals misses the point. More aptly, reading research may be important, but how they read it is more consequential. Teacher educators and researchers will need to pay attention both to teachers' beliefs about research and how they read research if research -- broadly conceived -- is to play a role in educating them.

CHAPTER VII

PROFESSIONAL AND CONSUMER APPROACHES TO EDUCATIONAL RESEARCH

Establishing a Zone of Understanding

Teachers who develop a professional approach to research reach a middle ground between acquiring a high level of expertise in educational research and taking a consumer approach to it. A zone of research understanding is achieved. Teachers do not need to understand the ins and outs of theoretical sampling, Dewey's metaphysics, complicated statistical tests, or how to judge the authenticity of historical documents to move beyond the consumer approach. Pursuing this arcane, specialized knowledge makes teachers more like researchers than teachers. This expertise may improve teachers' understanding of research but is legitimately beyond their concern. When teachers ask questions whose answers require highly specialized research knowledge, it is researchers' and teacher educators' responsibility to address these questions meaningfully.

Teachers in this study who developed a professional approach affirmed that their new research understandings -- apart from arcane, highly specialized research knowledge -- were far superior to the consumer approach they formerly took. Narrow and confining conceptions of educational research had been overcome. Dispositions and abilities related to reading and to understanding research had been fostered and learned. They valued understanding the processes of inquiry that lead to research conclusions. Having reached this middle ground, they were more skeptical about traditional beliefs

that research directly improves their practice. They wanted from research conceptual frameworks to deepen and to expand their thinking about teaching. Highly specialized research knowledge was, however, beyond these teachers' ken. Such an elevated level of expertise was unnecessary to move teachers into a zone of understanding.

What it means for teachers to take either a consumer or a professional approach to research needs elaboration. In this chapter, I conceptualize these two approaches more fully and then categorize study teachers' overall responses as corresponding to one or the other approach. I then consider <u>how</u> teachers move into this middle ground, including ways in which a consumer approach to research can be confronted, and with what success. In the final section, I place the study's findings in the context of contemporary scholarship on the use of research knowledge in teacher education and teaching.

What Is a Consumer Approach to Research?

> The hearers experience no struggle to understand. Hence, they do not know that they do not fully know. A new practice may ensue, but it is unlikely to be the testing practice which discloses that the policy it rested on was an imperfect shadow of what it seemed to be (Schwab, 1978; p. 171).

Casting teachers as consumers of research often demonstrates the stark limitations of this approach. Katz and Krasnow (1973), for example, criticize different types of dissemination styles, claiming that a corollary to disseminators as sellers is teachers as consumers. Dissemination styles which exaggerate the utility of

educational information have the effect of turning teachers into consumers. When teachers are consumers of research, they see solutions to problems as outside themselves. They learn to need prepackaged materials and other extraneous props to be effective. In contrast, Katz and Krasnow praise styles of dissemination which do less selling and treat teachers less as consumers. Teachers are thus informed in ways that help them make critical judgments and analyze the validity or usefulness of materials and methods (Katz & Krasnow, 1973; p. 41).

More recently, Kilbourn (1987) criticizes Fenstermacher's use of practical arguments to help teachers use research, claiming that it may "too easily allow the teacher to be perceived as a passive consumer of research" (pp. 380-81). In Kilbourn's view, teachers as consumers are given research knowledge with the intent that they act and think in certain ways. Disregarded in the consumer approach is that teachers can and should be given a detailed account of research and be responsibly critical of it.

Extracted from these authors' conception of teachers as research consumers is that teachers' relationship to research knowledge is fragmentary, or incomplete and partial. Teachers do not get inside the research in order to evaluate it. They follow suggestions drawn from research excerpts and often learn to mistrust research when suggestions fail to work. Teachers as consumers of research are more subject to manipulation, depending on disseminators' style. In sum, the consumer approach to research means that teachers have a partial or fragmented knowledge of the

research study or program. Consequently, they do not follow the steps that lead to research conclusions. In addition, they are disposed to or expected to follow ways of acting or thinking derived from research findings. A consumer approach to research is not dependent on whether teachers are compelled to follow prescriptions drawn from research. It is no less likely to exist where teacher autonomy is highly valued.[1]

A Consumer Approach to Research Among Study Teachers

Five study teachers accepted a consumer approach to research. Without needing to first focus on how these teachers thought about research's influence, this categorization can be based on their dispositions and abilities to read research and their thinking about what constitutes it. These teachers (Andrea, Karla, Leisa, Lynda, and Nicole) all had difficulty marking off "opinion and assent from authorized conviction" during the card sort task and so

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[1] In the literature, teachers as research consumers is also used simply as a descriptive term (see Clifford, 1973; p. 35) or placed in a positive light (see Finn, 1988). Teachers as thoughtful consumers of research is also mentioned in the literature (see Sparks, 1991). In addition, the obverse of Kilbourn's passive consumer is an active consumer of research, which presumably is a less negative characterization. Two points are relevant to these usages. First, I argue that if teachers as consumers of research is truly to be placed in a positive light, teachers' approach to research must go beyond the way study teachers are characterized as research consumers. Second, the metaphor of teachers as even thoughtful consumers is ill-fitting. It connotes a tailoring of knowledge to a general population who may not have or even need specialized knowledge of teaching. It reinforces the idea that anyone (i.e., any consumer) could use research knowledge in teaching thoughtfully.

were denied one important benefit research offers teachers -- the opportunity for more effectively directed reflection on their practice (see Dewey, 1916; p. 189).

Dewey speculatively associated the inability to mark off mere opinion from authorized conviction with less effective use of research knowledge to reflect on practice. This association was, in fact, characteristic of teachers with a consumer approach to research. Besides having trouble determining what constituted research, these teachers did not focus on processing research studies. There is no necessary connection here. These teachers might have analyzed the research studies nonetheless. Neglecting analysis, however, they focused primarily on research conclusions they could put to use or offered personal interpretations difficult to ground in the readings. Based on the responses of teachers in this study, the inability to distinguish between opinion and research was associated with a focus on research products and may contribute to this focus.

Action and the Consumer Approach

Chapter five discussed how teachers believed research can and should influence their teaching. There was a clear division among teachers. One group of teachers (Andrea, Karla, Leisa, Lynda, Nicole, and Jessica) wanted to follow and be provided teaching techniques derived from research findings.[2] They did not want to

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[2] Other teachers (Kathleen, and Ana Marie) shared this view of how research can and should influence them. As I later explain, the two teachers also differed in important ways from the other six teachers.

read research. Progression from teaching techniques derived from research was linear. Teachers looked to their own experience to test these techniques' worth without further reference to research. If teachers returned to the research, it meant returning to research findings for further specification on what should have been done or what to do next. Without needing to understand the research these teachers wanted it to help them master certain ways of acting in specific situations, or, given altered circumstances, flexible guidelines to meet these changed conditions (see Schwab, 1978; pp. 175-176; also, Buchmann, 1987).

Serious problems with this approach have already been raised in earlier chapters. First, this is neither the only nor the most important influence research can have on teachers. Second, because teachers who held these beliefs did not want to study research, they may learn new ways of acting, but research does not educate them. To be educated by research means that teachers spend time and are able to process research in ways already described (see chapter six).

In summary, teachers who take a consumer approach to research want it to influence their actions, but they do not want research to help them understand why certain actions were effective and others not. In addition, they do not want research to help them to compare and to contrast educational aims. These teachers may consult other sources, such as their own teaching experiences, to explain why actions are effective. They may consider educational aims because of, for example, changes in state testing requirements for students. But teachers with a consumer approach to research do not look to

research to go beyond offering strategies whose viability is tested against whether they directly work in their classrooms.

What Is a Professional Approach to Research?

> Since scientific knowledge is couched in terms corresponding neither to "reality" nor to immediate human needs, we need to reflect on the relations of its conclusions to its forms and evidence in order even to know what it is about. And the use of the conclusions presupposes reflection which transforms both the forms of scientific thought and the requirements of felt problems so that the two can be brought together (Schwab, 1978; p. 178).

Schwab (1978) criticizes educators who take fragments of educational studies and present them as the whole. Dewey is seen, for example, as focusing exclusively on learners' concrete doing. The inactive, abstract, and verbal is consequently devalued. The problem with attacking abstractions, words, and logic in this manner is that it leaves unwary readers believing that

> these are alternatives to action, to doing and making, rather than their aids and correctives. . . To "learn by doing" was neither to learn only by doing nor to learn only how to do. Doing was to go hand in hand with reading, reflecting, and remembering (Schwab, 1978; p. 182).

Understanding Dewey is dependent on struggling to comprehend the problems Dewey faced, how he attempted to solve them, and evaluating his relative success.

Parallels exist between how Schwab would like teachers to understand Dewey and a professional approach to research. Teachers who take a professional approach focus more on the research study as a whole and less on research fragments or findings drawn from it. They find meaning trying to comprehend theories which inform the research, the ways evidence is gathered and analyzed, and how research findings

or conclusions are warranted in relation both to the whole study and to their own classroom practice. Research findings apart from knowledge of the study or research program are perceived as inadequate (Confrey, 1987; p. 390). Research thinned out or easily digested by any interested consumer does not lead to greater understanding. Teachers with a professional approach to research are more concerned with research ideas that inform their perceptions than with simply following ways of acting and thinking based on it.

When learning from research, these teachers draw on intellectual dispositions and abilities acquired during a good liberal education, but also possess more specialized knowledge pertaining to research. They are disposed to read research well, that is, with regard for context and with caution about drawing conclusions. They have, in addition, acquired greater ability to judge the merits of different kinds of educational inquiry (see Chapter VI, table 6.3 # 5-6, p. 225). Their ability to distinguish between "opinion and authorized conviction" is not limited to one narrow type of research. They are able to recognize and willing to take seriously a broad range of research studies that potentially contribute to what they think and do.

For these teachers, a focus on how is augmented, though not supplanted, by a focus on why in two respects: (1) looking to research for broader explanations and understandings about teaching and learning, and (2) looking at research to judge why they should believe particular research claims. The focus on why relates to both means and ends. Taking a professional approach to research means that teachers understand that research may help them understand and

deliberate about valued ends as well as means to accepted ends.

Consistent with these points, teachers taking a professional approach to research regard the connections to action from research as indirect and not linear. They have greater sensitivity to the far-from-straightforward connections between the particulars of classroom practice and the findings of research studies (see Buchmann, 1984). Time must be taken to read, to reflect, and to experiment based on one's understandings. They also understand why the findings of researchers may sometimes rightly be ignored. Nonetheless, they are open to change based on their attempts to understand the research study. In addition, teachers taking a professional approach do not reject knowledge of teaching derived from sources other than research. Teachers' knowledge developed in the course of practice and unconnected to research knowledge is valued. What is worthwhile in research knowledge and teachers' knowledge may sometimes conflict, but the potential influences are reciprocal. Teachers with a professional approach recognize that teachers' knowledge may inform the inquiry of researchers just as research knowledge may inform the everyday practice of teachers.

A Professional Approach to Research Among Study Teachers

Responses to this description of a professional approach to research could include the comment Aristotle makes after he outlines the activity of the contemplative person -- it is impossible for anyone to achieve (Nicomachean Ethics 1177 b25-27). Though the full scope of the professional approach was not in fact characteristic of

any teacher in this study, there were teachers who shared in it.

One important way teachers shared in the professional approach was related to their willingness and ability to read research. Teachers often are encouraged or required to read research in order to learn from it. Their ability to process it is necessary for those taking a professional approach to research. Six teachers (Fran, Nick, Cheryl, Geoff, Ana Marie, and Kathleen) focused on processing research when reading research texts (see Chapter VI, table 6.4). They were not content to consider the research in order to find out procedural recommendations for classroom practice. These teachers more frequently looked for a study's underlying assumptions, were concerned about supporting evidence, and in other important ways were able to appraise research studies. Based on their understanding of the research, they tried to judge whether to believe particular claims included in the study.

In addition, all six teachers of these teachers were able to distinguish between "opinion and authorized conviction" during the card-sort task, another characteristic of teachers taking a professional approach. However, only two of them (Fran and Nick) recognized a broad range of studies as constituting educational research. The other teachers identified only quantitative studies.

Four (Fran, Nick, Cheryl, and Geoff) of the six teachers also thought about the influence of research in a professional way. They wanted research to help them explain and understand aspects of their work. They were interested in using research to understand why

things happened in their classroom as well as wanting to understand and to deliberate about valued ends. They did not only want findings from research that informed them of the right techniques to use. This was too limited.

Action and the Professional Approach

Also limited was the expectation that research is valuable only insofar as it changes their classroom actions in some measurable and conclusive way. Research helped them overcome a reliance on conventional modes of thought and helped them see the value of raising questions and, based on evidence and reason, of trying to answer them. Broader pictures emerged that they had never considered, such as the nature of teacher and student interaction, or the importance of considering reasons why classroom events occur as they do.

A fundamental transition from a consumer to a professional approach to research had been made for these four teachers. They were interested in and using ways of thinking based on research knowledge to understand their practice instead of only wanting research strategies about what to do in various situations. These teachers believed research could change their classroom practice in worthwhile ways, and they were interested in thinking about this possibility.

The value of research, however, was not necessarily connected to changing classroom actions. One teacher, for example, described an experience in which research raised questions about the exclusion of

minority literature in textbooks (Cheryl, p. 11). Research elevated her thinking. It raised an important question which was an impetus to pursue it further through additional study and reflection. For this teacher, the value of research was not undercut whether she reformulated her curriculum, tinkered with it, or did not change it at all. She valued using research to understand an area of inquiry she considered important. The occasion to think about these issues more deeply and to be provided a broader understanding of them was what she valued. In light of this understanding, her classroom actions may change in some way, but classroom practice need not change for research to be valuable.

In the widest sense of term, teachers' actions, including those of the teacher mentioned above, were in fact changed. As James (1899/1958) writes in his Talks to Teachers,

> When I talk of action here, I mean speech, I mean writing, I mean yeses and noes, and tendencies 'from' things and tendencies 'toward' things, and emotional determinations; and I mean them in the future as well as in the immediate present. . . . If not today, then on some far future day, you will answer some question differently by reason of what you are thinking now. Some of you will be led by my words into new veins of inquiry, into reading special books (p. 35).

In James' sense of the term, teachers found research to be valuable because it did change their actions. Its value, however, was not connected to whether it changed classroom actions, narrowly defined. The value of research was not necessarily associated with observable and quantifiable differences in their teaching performance the next day, the next week, or even the next year.

Toward a Professional Approach to Research

Table 7.1 below summarizes how teachers in this study shared in either the consumer or the professional approach to research. This categorization is based on teachers' beliefs about what constituted research, their beliefs about its influence, and their disposition and ability to read it. The overlay for this categorization is the conceptual distinction between the two approaches already outlined.

Among the study teachers, two teachers (Fran and Nick) shared most in the strong and vigorous conception of a professional approach to research. They possessed an expanded conception of what research is, were more willing and able to appraise it, and wanted research to influence broadly their thought and action related to teaching. Two other teachers (Geoff and Cheryl) had similar beliefs. They also took a strong professional approach to research, although they had a narrower view of what constitutes research.

There were teachers (Ana Marie and Kathleen) who were less tied to the professional approach. More capable of understanding research when reading it, they did not want to study research. Instead, they wanted useful techniques that would influence their teaching directly. They seemed to hold a potentially limiting mix of beliefs, dispositions, and abilities related to professional and consumer approaches to research. These teachers acknowledged the tensions and limitations inherent to their view (see Chapter V) and were able to evaluate research, suggesting a closer affinity to the professional approach. Another teacher (Bryan) also wavered between a consumer

and professional approach. Unlike the two other teachers with some affinity to the professional approach, this teacher valued research because it offered him conceptual frameworks with which to help him understand his classroom practice. But he both downplayed the need to read research and did not read it well. Combined with his narrow conception of research, Bryan had notable characteristics associated with the consumer approach.

Two teachers (Jessica and Leisa) were clearly associated with the consumer approach. Though one teacher (Jessica) had the ability to mark off authorized conviction from opinion, her conception of research was narrow. In addition, she neither processed research well nor perceived its influence more broadly. Another teacher (Leisa) also took a consumer approach. She had some idea of how research could influence her thinking more broadly, but the context in which she worked inhibited her development (see Leisa, Chapter V, p. 186). These two teachers (Jessica and Leisa) were more like the remaining teachers (Karla, Lynda, Nicole, and Andrea) who took an extreme consumer to research. These four teachers had no conception of what constituted research, wanted research to impact their teaching directly, and were uninterested in reading it. As table 7.1 indicates, the four teachers were most opposite to teachers holding a strong professional approach to research.

Table 7.1

Professional and Consumer Approaches to Research
Among Teachers in the Study

Professional Approach			Consumer Approach	
Strong				Extreme
Fran (TC) Nick (BT)				
	Cheryl (TC) Geoff (TC)			
		Ana Marie Kathleen (TC) Bryan (TC)		
			Jessica (BT) Leisa (MC)	
				Karla (MC) Lynda (MC) Nicole Andrea (MC)

Note. Categorization is based on a teacher's (1) disposition and ability to read research, (2) beliefs about the influence of research; and (3) beliefs about what constitutes research.

Note. BT = Beginning Teacher; TC = Teacher Collaborator;
MC = Teachers pre-enrolled in a master's course on classroom research.

How Did Teachers Reach the Middle Ground?

The importance and relevance of developing a zone of research understanding is demonstrated among teachers who had a professional approach to research (Fran, Nick, Cheryl, and Geoff), and to a lesser degree, among teachers who had a limited professional approach (Ana Marie, Kathleen, Bryan). How teachers moved into this middle ground varied. Some had been teacher collaborators (Fran, Cheryl, Geoff, Kathleen, and Bryan). Their structured experiences working through the processes of research along with researchers and other teachers helped them understand more what research is, how it can influence their practice broadly, and how to analyze it.

Every teacher collaborator had moved beyond a consumer approach to research, but they had invested at least one year working with researchers. This extensive investment of time on the teacher collaborators' part and money on the university's end (see Porter, 1986) might indicate that teachers' movement into this middle ground is prohibitive for school districts and universities to support. The important question of cost is explored by (1) considering teachers' ideas about how they moved into the middle ground and (2) examining more thoroughly one attempt to help teachers move beyond the consumer approach to research.

Teacher collaborators offered other explanations besides their work on projects with researchers that could explain their professional approach to research. One teacher described her experiences as a pre-service teacher in which she was expected to

read and to analyze research related to a teaching problem (Fran, pp. 1-2). Another collaborator mentioned his undergraduate work during which he learned the difference between correlation and cause. He thought about research findings in this light when reading research (Geoff, p. 32). A teacher collaborator who taught English stated that she approached research with the same kind of care and attention that she gave to works of literature (Cheryl, p. 18).

Teachers with a professional approach who were not teacher collaborators offered other ideas, perhaps accounting for the transition from a consumer approach. One beginning teacher referred to a graduate course in educational research, though he found it too slanted toward quantitative research. He mentioned also a long-term and sustained interest in literature and ideas as influencing his views (Nick, pp. 1-3; also p. 8). Another veteran teacher, frustrated with a graduate course she had taken on educational research, turned to a friend.

> And one of the things that I learned in class was how to read it (research) critically. Actually no, I didn't learn it in a class. I was given an unclear assignment by my instructor who gave us research articles to read and to evaluate. And a friend came over to the house and I showed him what I had done all day. And he said, I don't think this is what she wants. And he then sat down and showed me how to read research in a way to critically evaluate it (Ana Marie, p. 3).

This teacher had taught ten years. She had a master's degree in education and had participated in scores of in-services that include research in some way. The most notable experience to her for developing a professional (albeit limited) approach is a chance,

somewhat embarrassing, situation in which a friend helped her analyze research studies.

Confronting the Consumer Approach

Working as a collaborator helped teachers confront various misconceptions about research (for example, see Chapter V, p. 195). Nonetheless, formal and informal experiences in a variety of contexts may help and support teachers in making a transition from a consumer to a professional approach to research. Teachers' undergraduate and graduate education as well as in-school staff development may include components that move teachers toward a professional approach. Different contexts may even mutually influence each other to help teachers make the transition.

One formal experience teachers often undergo is a graduate course on educational research. Few studies address teachers' experiences in these courses. One suspects, however, that they reinforce rather than change teachers' views of research. Graduate course taking in teacher education is often considered desultory (see Sykes, 1990; pp. 88-89). And, in general, graduate courses are subject to the same criticisms as the teacher education curriculum in general (see Lanier, 1986). Teacher education is substantively and organizationally in the early stages of helping teachers understand more fully the knowledge base for teaching. In addition, the few comments teachers in this study made about research courses suggest that such courses often confirm teachers' fears and suspicions of research and researchers.

Teachers in the Study Taking a Master's Course

Four teachers who were part of this study enrolled in and successfully completed a master's level course designed specifically to introduce classroom teachers to research in education.[3] Despite traditional problems associated with graduate courses in teacher education, this context seemed appropriate to confront teachers' beliefs about research. It provided an opportunity to judge whether a less time-consuming and intense experience than, for example, becoming a teacher collaborator, could influence teachers' thinking about research in important ways.

The course itself differed from customary educational research courses. It did not focus on introducing teachers to quantitative research. The course was also not about teaching teachers how to do research. Rather, the course focused on helping teachers (1) to read and to understand a broad range of research studies, and (2) to think critically about how research can inform their practice. Although

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[3] The full course description, its goals, readings, activities, and requirements are included in appendix C. My role in the course was limited to selecting different types of research studies to include in the readings, such as philosophical and historical studies. I also helped develop teachers' final project in which they were expected to read and to analyze different types of research studies. I did not attend any classes, discuss with the instructor teachers' responses, evaluate any work produced by teachers which was reflected in their final grade, or have any other formal affiliation with the course. Teachers were selected to be interviewed based on calling teachers on the course list and asking them to participate in the study (see Chapter II). I also had no idea whether teachers in the master's class who participated in the study would initially have a professional or consumer approach to research.

these terminological distinctions were not introduced to teachers, one important aim of the master's course was to help teachers make the transition from a consumer to a more professional approach.

The four teachers (Andrea, Karla, Leisa, and Lynda) were all in the final phases of completing their master's degree requirements in education. They were interviewed prior to entering the course, once during it, and again between two and three weeks after the course ended. The same interview format and content was used during each interview, except that teachers were also asked after the course ended how, if at all, their ideas about research had changed during the course. Changes in teachers' ability to read research was judged by teachers' responses on a final project for which they analyzed three articles. One article was a chapter on motivation from Carol Cummings' (1980) book, Teaching Makes a Difference, in which teachers are provided practical techniques on how to motivate learners. Other articles included different types of research studies (see Appendix C for the project's full description). In addition, all four teachers were interviewed one full year after taking the course to determine what, if anything, from the course contributed to experiences with research they may have had during the school year.

Teachers' responses from the first interview are included in the previous three chapters. As table 7.1 shows, all four teachers were identified as taking a consumer approach prior to entering the master's course. Three teachers (Andrea, Karla, and Lynda) initially took an extreme consumer approach to research. For this chapter's purposes, two questions were asked of the data drawn from subsequent

teacher interviews and work (1) did teachers themselves describe important changes in their thinking when their prior ideas about research were confronted? And, (2) was there evidence other than teachers' self-descriptions that any changes in thinking about research occurred?

Teachers' responses, of course, must be treated cautiously. Responses were provided within the context of taking and completing a course whose direction is likely clear to them at some point. Teachers' thinking may change briefly but not become part of them. Likewise, teachers' receptiveness to different ideas about research may reflect more the instructor's personality and teaching style and have less to do with teachers' genuine acceptance of these ideas. Also, teachers' responses during a final project may reflect their interest in getting a good grade and not reflect changes in their thinking. To balance these points, practitioners may resist course content that is more conceptually oriented and less tied to immediate concerns. There was no incentive for teachers to hide this resistance during interview sessions. Also, teachers' responses to their final project were indicative of changes in their ability to evaluate research critically. Whether they accomplished this for a good grade is beside the point. It is significant nonetheless if teachers provide evidence that they have improved their ability to understand research. With these points in mind, I return to the questions about whether teachers described important changes in their thinking about research and any evidence for these changes.

Changes in teachers' beliefs. Analysis of teachers' responses confirmed their initial categorization as research consumers and also showed the ways in which the teachers found the course liberating. However, two teachers with extreme consumer approaches (Andrea and Lynda, see table 7.1) continued to have problems analyzing research when the course ended, judging by their work on the course's final project. One teacher (Andrea) also continued to struggle with distinguishing between authorized conviction and opinion. While her view of research broadened to include historical and philosophical studies, she also now included prescriptive statements as research. Her conception of research had become too broad, and thus, it was still unclear to her what constituted research (Andrea, pp. 31-35).

This claim is supported when Andrea analyzed Cummings' highly prescriptive chapter on motivation. She categorized this article as research even though "it did not list background issues, a central question, or specific variables, instrumentation, or analysis" (p. 51). Furthermore, she judged whether the Cummings' piece is convincing without regard to evidence in the article, but based solely on personal experience.

> Cummings' article is convincing because we all are more motivated to do a task if we know we may be successful at it (Andrea, p. 50).

She also neglected to analyze evidence in Anyon's (1981) article on social class and school knowledge, judging (or misjudging) it only on her observations as a teacher and student (p. 50).

These responses suggest that this teacher made little transition to a professional approach to research. One area of progress was

the realization that it is sometimes useful to read research well. Discussions with colleagues about research also started to become increasingly valuable.

> I was just thinking about an article we read in class. And I looked at it and I thought that's the way it should be and kids really perform well in that structure. . And we started discussing it in class and a lot of people said it was awful and I'm thinking -- I teach like that, quite structured. . . I guess I didn't read that article so in depth. I just read it as, yeh, this is what I do in my classroom. . . . But when listening to other people talk about it, criticizing it, it made me see that there were a lot of points I had missed in it, that I hadn't really looked into. So, research (sic) should provide the findings and make them useful, but in another sense, it depends on how you internalize them -- what meaning did you get from the research (Andrea, p. 39)?

The comments suggest that she recognizes her approach to research can be limited and sees some value in discussing research. But, the transition to a professional approach is not internalized. She does not understand what it is, how to read it well, and still wants research to impact her teaching directly by providing teaching techniques (Andrea, p. 40; also, p. 45).

Another teacher offered a stark contrast. Reflecting on her thinking prior to taking the master's course, Leisa states that before the course she looked mainly for research prescriptions and wanted a "quick-fix" (Leisa, p. 44). These views were attributed partly to time constraints and partly to administrators' presentations of research. During the interview immediately following the course, she realizes how her approach to research may have been improved.

> I had enough to read on my own and didn't have time to go figure out all the terminology . . . . I got so sick and tired of hearing, "research has shown. . ." Maybe if I was shown what research they were using, instead of being given a small reference to their research or their bibliography sheet at the end of the research that they read. It wasn't enough information. It was like it didn't matter what you're saying -- "research has shown," and that was the end of the discussion (pp. 35-37).

The comments indicate some transition from a consumer to a professional approach to research. Focusing only on research findings is limited. It is increasingly important to take time to read research and to reflect on how researchers came to conclusions (see Leisa, p. 41 and p. 43). The pre-class emphasis on using strategies drawn from research remains constant, but the focus is now extended. Teachers could use research "to reflect on their practices in the past or in the future, or on maybe an issue that's not dealing with just their classroom, but in a broader aspect like staff relations or curriculum design" (Leisa, p. 40).

Leisa also left the class with greater ability to distinguish between warranted conviction and opinion. Based on the responses to abstracts on the card-sort task, she now recognized a broad conception of what constitutes research (pp. 33-36). This is also shown on the class' final project when she analyzed two research articles and Cummings' motivation chapter.

> The methodologies selected by the other writers seem appropriate and useful to study the initial concerns of each study. Cummings does not systematically collect data regarding her concern nor does she share the basis for her recommendations. She provides no evidence that is convincing to the reader (Leisa, p. 53).

Her analysis of the articles indicates movement toward the professional approach, but not without remaining problems. She hints that researchers should translate research results into implications for teachers, and she still feels uncomfortable with quantitative research (Leisa, p. 49; also, p. 55).

There was marked improvement in the ability to recognize and to evaluate authors' research assumptions, methods, and evidence (Leisa pp. 50-54). Describing improvements in the ability to evaluate research, she states that

> my first analysis (of articles) was written in a fragmented and more tentative style. I was not confident that my viewpoints were valid and I was not sure what was important to notice. I was not used to reading between the lines of an article to try to see what the author was trying to get me to believe. I was also not used to criticizing an article even though I often did not accept what was written (p. 55).

Leisa values changes in her thinking about research since the beginning of the course. Based on project work and interview responses, she has begun to take a more professional approach to research.

Another teacher (Karla) confirms an initial consumer approach to research when, after the course ends, she reflects on her beliefs prior to taking it. She recalls that, before the course, researchers were "dictators" who offered foolproof "remedies" like one finds on "Rolaids" packets (Karla, p. 40). Reading was done in order to be told what to do. Research

> was meant only for prescription. And at that time, I really didn't want to think how it would fit in (sic). Just tell me what to do, and I'll do it, and it will work (p. 43).

This teacher wanted and still wants strategies derived from research. Her focus has expanded, though. Research can also provide broader "perspectives" on teaching. Consequently, reading research studies now takes on greater importance.

> The teacher needs to read it (research) first in order to be aware of what the research says and formulate her own opinions about the research. I don't think that a teacher needs to depend on another person because something is lost in the translation, and the research takes on a whole new meaning (Karla, p. 45).

The belief that teachers need to read research is joined with a greater ability to read it. While able to analyze research studies with greater acuity (pp. 51-54), she also feels able to identify why teaching prescriptions are not research.

> Cummings does not examine relationships or variables in the article. Nor is there any mention of research design or data collection. She does not identify the context, so is the reader to assume that the context is anywhere/all places? . . . . . Even though she throws in a quote from Glaser, the article reads like a remedy on a package of Rolaids (Karla, p. 51; also, p. 53).

Prescriptions formerly seen as authoritative are now disparaged when richer research descriptions are expunged.[4] She refers to research findings on school retention found in the school mailbox. Before, she says, whatever position it took, I would have believed it. Now, she intends to read and to study the findings (Karla, p. 49). Because she now understands research more, it no longer seems

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[4] Though Karla expanded her zone of research understanding, she did, like Andrea, have problems excluding prescriptive studies as research during the card-sort task (pp. 35-39). Unlike Andrea, Karla was able to explain why Cummings' chapter on motivation was not research.

like "gospel." There now exists both less apprehension to raise questions about research and more confidence to think about its influence on practice in diverse ways (p. 49).

One final teacher's (Lynda) transition during the course focused mainly on her feeling greater autonomy in relation to research findings. Having a negative view of research prior to taking the course, her views took an unexpected change.

> I read this article by Ann Marie Palincsar, and she just said: here's what I looked at, you look at it, and see what you think. And I kinda liked that freedom. You see, I didn't understand that before -- that I wanted this freedom (Lynda, p. 43).

The freedom this teacher wants is related to making decisions for herself about research answers. Before answers alone were wanted. Now, she wants to study the research in order to make her own decisions (p. 43). The value of reading research has taken on greater importance, though she is primarily interested in research influencing teaching techniques. Besides acquiring a disposition to read research, the ability to read it has also improved somewhat. She recognized that Cummings' article is "one person's opinion with little evidence" (p. 51), and that Cummings tries to convince readers through appealing to readers' "common sense or shared identity as an educational practitioner" (Lynda, p. 53). However, she also analyzed a philosophical study in a similar way (Lynda, p. 53), suggesting a more limited ability to evaluate research studies.

In summary, movement into a zone of research understanding had clearly been reached for two teachers who took the master's course (Karla and Leisa). One other teacher (Lynda) had made some movement

into this middle ground, but had primarily emphasized her new found freedom to reflect on research findings.

These teachers, in general, described the new understandings as valuable and provided some evidence that they had in fact acquired them. In varying degrees, they have begun to make a transition from a consumer to a professional approach to research. Prior to entering the course, their questions about research revolved around whether strategies drawn from research findings worked in their classroom. Only the most rudimentary and expedient questions about research were possible. Research findings were often seen as certain and applicable in every context. They did not want to read research and did not read it well. Now, they are more willing to consider different types of research studies. They think strategies derived from research may be helpful, but they want research also to offer new perspectives and help them understand their practice. They now find it important to read research and to raise questions about the study's context, assumptions, and evidence. Good research is not necessarily tied to changes in teaching practices. As one teacher stated,

> I think there's a lot of good research out there that can be used, but I don't think that we necessarily need to change what we're doing just because it's good research or a good research practice (Karla, p. 49).

As this teacher also stated, research also needs to be read. And when these teachers looked at research, they were able to read it more critically. A middle ground between arcane, specialized research knowledge and a simplistic consumer view of research

knowledge had been established.

It seems important, however, that teachers' continuing work reading and discussing research pertinent to their own interests is reinforced at the workplace. One year after completing the master's course, all four teachers were interviewed to find out what, if anything, from the course contributed to their experiences with research during the school year. Only one teacher (Karla) had any experience with research over a year's period. She read research independently with two other teachers interested in introducing a whole language approach to reading for first graders. Karla stated that she "appreciated reading the research and the rationale for practical ideas, and how any practical ideas were related to the research" (p. 50). She stated that before the course she would not have wanted to read the research and now valued reading research and then discussing it with other teachers.

Three other teachers (Andrea, Lynda, and Leisa) described themselves as having no experiences with research over a year's period. One teacher (Andrea) was mainly relieved the course had ended and did not mention any other value to the course. Another teacher (Lynda) appreciated that she no longer had a negative view of research but could not identify specific knowledge and skills still valuable to her. One other teacher (Leisa) still found valuable the idea that research is not only useful for tackling a problem directly, but can help her "broaden her understanding of what's happening and help check out preconceptions" (Leisa; p. 46). Leisa

also recalled that she had "a bad attitude" toward research and now has more confidence in dealing with it. She still emphasized that her school district did not encourage more involvement with research.

Overall, the course data strengthens the case that teachers can benefit from reaching a middle ground associated with the professional approach to research. Significantly, teachers are not required to participate in extensive long-term research projects (as with teacher collaborators) that may have prohibitive costs to teachers and school districts. Nonetheless, teachers' less intensive experiences with research (as with the master's course) must be supported in diverse contexts -- both in teachers' continuing education and in staff development efforts that include research in some way. The benefits can be significant. When a zone of understanding is achieved, teachers are more willing to raise questions about research. They develop the background knowledge necessary to know what questions to ask, understand why it is important to ask them, and have greater capability to evaluate responses. Insofar as these characteristics are associated with research helping to educate teachers, their conversations that refer to and draw on research serve to educate them. Because they occupy a different kind of middle ground, they are less subject to the extremes one teacher in the master's course articulated.

> Teachers are right in the middle between two extremes. They are usually not sophisticated enough to read the research and interpret it for themselves (but) are often at the mercy of people who may have a profit motive for encouraging teachers to do what they say (Leisa, p. 49).

The Professional Approach and Research Communication

Researchers and teacher educators can, in a reasonable amount of time, help teachers take a professional approach. Teachers do not need to work for years on research projects to move away from a consumer approach to research. Researchers and teacher educators, however, may -- and often do -- promote and reinforce among teachers a consumer rather than a professional approach. There are many reasons for this. One contributing factor is that teachers who take a consumer approach will expect researchers to present findings in a way that seems to have a direct impact on their teaching and will not expect to study and to discuss research at length.

Various possibilities exist between how researchers and teacher educators present research, and what approach teachers can take to it. The analytic distinctions are both useful and crucial. The limitations associated with the consumer approach and strengths associated with the professional approach have been thoroughly outlined. Table 7.2 (see p. 285) shows that either approach can be reinforced across the teaching and learning continuum. The table indicates further that the master's course was one context in which teachers in this study took a consumer approach, although the instructor emphasized a professional approach to research. By emphasize I mean that the instructor attempted to present research in ways that helped teachers understand and evaluate it. In this case, the course was specifically designed to accomplish this. The instructor assumed rightly that teachers' beliefs about research may

need to be confronted directly in order to change their thinking about its use and their willingness and ability to understand it.

Confronting teachers' beliefs explicitly (as occurred in the master's course) may in fact be necessary to help teachers break from a consumer approach. If so, it is necessary for teacher educators and researchers to keep teachers' beliefs in mind, focusing less on getting teachers to use research and more on helping them understand it. Teachers must be encouraged and helped to read research carefully and engage in activities that help them work through and understand what a study is trying to say, and why.

A graduate course is not the only context in which teachers can be helped to take a professional approach to research. Assistance may be provided in contexts as different as two-day teacher in-services or long-term teacher research projects. When it is done well, some understanding of theories and methods guiding the research is considered important for teachers. Research evidence is presented in a clear and responsible way (or teachers understand the evidence when working on their own research projects) in relation to conclusions drawn. In addition, teachers are given the opportunity to raise questions about the research (including questions concerning research assumptions about teaching and learning), and conflicting interpretations of research are given voice. These activities must take place if researchers or teacher educators take a professional approach in work with teachers involving research.

Based on the interview data, table 7.2 suggests that some collaborators (e.g. Fran, Geoff, and Cheryl) began their work at the

institute holding essential beliefs consistent with the professional approach. These beliefs were often reinforced through working on research projects, though sometimes certain beliefs associated with the consumer approach were not changed.[5] Teacher collaborators' beliefs about research were not explicitly confronted as they worked on research projects. Researchers nonetheless often emphasized a professional approach to research, judging by collaborators' comments. Teachers were expected to make sense of and to evaluate research studies through discussions with researchers and other teachers.

Table 7.2 below suggests further that researchers or teacher educators may emphasize a consumer approach with teachers who themselves take that approach to research. Such matching occurs with the knowledge-use literature (see Chapter I, pp. 20-24). The knowledge-use literature (see, e.g., Louis & Dentler, 1988) attempts to legitimize the consumer approach while ignoring the problems associated with it. Its strength is that it is founded on what most teachers want from research (given the organizational contexts of schooling and teachers' beliefs about research) and assumes the irrelevance of teachers reaching the middle ground between a consumer approach and highly specialized research knowledge. It does not

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[5] Kathleen did not relinquish her belief that research should directly impact her teaching (it threatened her conception of the teacher's role), though she acknowledged some tension in her view. Also Bryan did not place a high value on reading research, though he considered it important to understand research. More explicit attempts to confront and to change these views would have been necessary for these teachers, assuming that researchers on these projects considered these changes in belief important.

Table 7.2

Teachers' Approach to Research and Research Communication

TEACHERS' APPROACH TO RESEARCH	RESEARCH COMMUNICATORS' EMPHASIS: Consumer Approach	RESEARCH COMMUNICATORS' EMPHASIS: Professional Approach
Consumer Approach	Knowledge-use literature	Master's course on classroom research
Professional Approach	Same as above -- presented to teachers who have already reached the middle ground	Teacher collaborator work at the Institute for Research on Teaching

matter whether teachers understand research as long as they soon act in ways consistent with it. This strategy of research communication neglects the educational import of a fragmentary approach to research knowledge and how teachers themselves who have reached a zone of research understanding are critical of the consumer approach.

Teachers reaching the middle ground were skeptical of this dissemination approach, not simply because it limits their personal autonomy in relation to research findings (personal autonomy may not be limited) or because it is useless (the knowledge may in some way be useful). Rather their criticism rests on the lack of depth associated with this approach to research knowledge -- what teachers say they miss when it dominates, i.e., gaining a broader understanding of their work, understanding and questioning why instead of focusing on how, and having professionally responsible conversations about research which do not have foregone conclusions. They may quickly become frustrated and alienated when researchers or teacher educators do not encourage a professional approach when communicating research.

One must recognize that the consumer approach -- both from researcher disseminators' and teachers' perspectives -- almost completely dominates how teachers learn about research in the United States. Besides the prevalence of the knowledge-use approach in many staff development efforts throughout the United States, many states still require prospective and practicing teachers to meet performance requirements derived from contemporary research findings (Sykes & Zeuli, in press; Shulman, 1986). The primary focus of states'

efforts is getting teachers to act in accordance with findings from research. These states often extensively fund staff development programs designed to help a large portion of teachers acquire the repertoires derived from findings. There is no evidence that teachers are encouraged to understand and to discuss findings apart from their immediate need to exhibit a passable performance for initial and continuing certification purposes. In many states and most school districts few, if any, organizational resources are devoted to help teachers take a professional approach to research, despite the fact that encouraging this approach has long roots in United States teacher education.

Encouraging a Professional Approach

William James and John Dewey both supported teachers taking a professional approach to research. In his Talks to Teachers, James (1899/1958) did not expect teachers to become experts in psychology, but he also did not reinforce a consumer approach to it. Psychology could offer help to teachers, but teachers need not become experts in psychology or feel compelled to do psychological research.

> Least of all need you, merely as teachers, deem it part of your duty to become contributors to psychological science or to make psychological observations in a methodical or responsible manner . . . . The worst thing that can happen to a good teacher is to get a bad conscience about her profession because she feels hopeless as a psychologist (pp. 26-27; emphasis in original).

Expertise at child study, the new empirical science of education emerging during the late 1800s, was superfluous for teachers to

benefit from research.

James also did not present research to teachers in ways reinforcing and promoting a consumer approach to it. Teachers should not expect to deduce from psychology instructional methods for immediate use (James, 1899/1958; p. 23). Taking a broad view of how research influenced teachers' actions, James hoped that teachers would over time understand students in light of the perspective he develops (see p. 35; also p. 131). Consequently, when presenting his views to teachers, he does so within a broad conceptional framework in which competing views are introduced. Sophisticated descriptions and explanations are offered to help teachers understand main points. James offers teaching strategies, but this is done within an already established broader context.

Dewey recognized that both teachers and research disseminators will likely assume a consumer approach to research. Prospective and practicing teachers, Dewey knew, want research results that they can directly put into action (see Dewey, 1929; p. 15; also p. 18). Dewey acknowledged too that researchers are under pressure to demonstrate the immediate usefulness of scientific findings. Within the parameters of his broad view of educational science (see chapter three), Dewey maintained the value of teachers taking a professional approach to research. He would have rejected compelling teachers to accept teaching repertoires supported by research because this would undermine their judgment and reduce their ability to become students of teaching. As he did with the quantitative studies representing educational science in the 1920s, Dewey likely would have cautioned

against accepting a narrow conception of learning that underlies some contemporary research studies and programs. Dewey was far less interested that teachers acquire research findings from various types of educational inquiry than conceptual frameworks supporting these findings. Teachers gain most from research for their everyday practice when going beyond a focus on findings.

> The practitioner who knows the system and its laws is evidently in possession of a powerful instrument for observing and interpreting what goes on before him. This intellectual tool affects his attitudes and modes of response in what he does. . . Greater continuity is introduced; he does not isolate situations and deal with them in separation as he was compelled to do when ignorant of connecting principles (Dewey, 1929; pp. 20-21).

Teachers must acquire a firm understanding of principles in psychology and the history of education. Acquiring "separate scraps" of knowledge does not help teachers gain greater control and understanding of their practice (see Dewey, 1904/1965; p. 160).[6]

As outlined earlier (see Chapter I, pp. 13-24), there are

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6 Dewey (1904/1965) in this essay distinguishes between laboratory and apprenticeship models of teachers' professional preparation and carefully reconstructs the manner in which prospective teachers can apply their knowledge of theory as they learn to teach. The apprenticeship model of teacher education is analogous to having prospective teachers take a consumer approach to research. In the apprenticeship model the object is also to get prospective teachers proficient in as short a time as possible without much or any understanding of the knowledge which undergirds the skills they are expected to acquire. Dewey's laboratory model is premised on the value of teachers' thorough understanding of knowledge pertaining to their professional practice. He also recognizes the value of teachers engaging in various forms of scholarship apart from any immediate impact on their teaching (pp. 158-159). Helping teachers take a professional approach to research is consistent with what Dewey emphasizes.

contemporary supporters of the professional approach to research who are opposed to popular and miseducative efforts to erode the need for it. Some researchers seem to want it both ways -- accentuate the direct value of certain types of empirical research but point out that teachers should not be asked to behave in ways suggested by research findings. Berliner (1987), for example, claims that the educational research community has provided findings, concepts, and technology so that "it no longer requires a great leap of faith to do what James said was impossible" (p. 31).

James' claim, however, about deducing instructional methods from research for immediate use is not related to the research community's level of sophistication at the turn of the century. As Phillips' (1971, 1980) suggests, James' claim relates more to the prominent role selection of aims -- including conceptions of learning and teaching -- plays in education and other related fields.[7] From this perspective, James' point is impregnable.[8] Berliner suggests that

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7 This is basis for Dewey's rejection of the scientific movement in education. Dewey was not opposed to quantification per se, but the fact that supporters of the movement were too closely tied to advocating prevailing and limited conceptions of teaching and learning in public schools (see Chapter III, pp. 84-87). In like manner, Phillips (1989) criticizes, by implication, certain research findings and concepts Berliner (1987) advocates because he finds the conception of learning and learning underlying these studies limited.

8 From another perspective, the fact that findings in education are rarely causal and thus less compelling (see Phillips, 1971; pp. 22-23; also see Chapter VI, p. 248) has come under attack (see Gage, 1985; Floden & Klinzing, 1990; p. 16). Berliner (1987) uses Gage's work to support his position on the potential of research to influence teaching directly.

research results cannot simply be used to tell teachers what to do. Drawing on Fenstermacher's (1980) work, he states that teachers must be able to consider and to discuss research findings.

> There is another way to communicate knowledge, however, and that is through serious discussion of evidence. A good use of evidence occurs when the results of research are used to test the beliefs that teachers hold about their work (Berliner, 1987; p. 27).

Fenstermacher (1986; 1987; 1991) has in fact presented one thoughtful and frequently cited view of helping teachers integrate research into teaching. Consistent with the professional approach to research, he argues that research should influence teachers' practice in so far as <u>teachers</u> reason that a research study or program has bearing on their beliefs about teaching and learning. To accomplish this, researchers and teacher educators are encouraged to find out teachers' beliefs about teaching and learning. Teachers contrast these beliefs with empirical findings from research on teaching and draw their own conclusions about the value of research for their work (see Chapter I, pp. 17-20; Liston & Zeichner, 1991; pp. 68-75).

This work reflects and supports an important shift in the research community from a focus on changing teachers' behaviors to changing teachers' cognitions and practical knowledge (Richardson, 1990; p. 13; also, Pendlebury, 1991). It highlights the educational value of helping teachers make autonomous judgments about altering their classroom practice based on research. Good (1989b), drawing also on this work, suggests that teachers must reflect on and form their own ideas about the value of research knowledge and its relevance to their work.

> . . (T)he key question is whether teachers will discover what research reveals or whether they will simply accept someone else's (administrators') opinion of the implications of research (Good, 1989b; p. 21).

The attempt, however, to change "the truth value of the practical arguments in the minds of teachers" using research may fail because the conceptions of research teachers hold are markedly limited. Despite the value of teacher autonomy in relation to findings from research and of delineating teachers' beliefs about teaching and learning when introducing them to research, teachers taking a consumer approach need additional help. Because they have not reached a zone of research understanding, these teachers also will not be disposed or be able to grapple responsibly with the literature from which findings are drawn. They will consequently expect that research should change immediately what they presently do, or they will think it worthless. Research does little to stabilize their teaching practice because this depends both on teachers' understanding of research as well as experimenting with what it means for their teaching (Dewey, 1904/1965).[9] Contemporary scholars do encourage that teachers read research (e.g., Berliner, 1987; p. 31),

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[9] It should be mentioned that Dewey also does not consider the importance of confronting teachers' conceptions of research. While Dewey emphasized the value of teachers understanding research, he assumed, perhaps wrongly, that the laboratory experience would be sufficient to help prospective teachers overcome their desire for research to tell them what to do. The potential educational significance of confronting teachers' conceptions of research is also applicable to other prominent models of reflective inquiry using research (see Liston and Zeicher, 1991 for a review of these models).

develop dispositions needed to use it carefully (e.g., Good, 1989b; p. 21), and focus on its broader value (see Richardson, 1990; p. 16). Confronting teachers' conceptions of research has not been seen as important to accomplish these goals. This study documents that teachers cannot reason well about research without having learned how to read it, the different ways to consider its influence on their teaching, and what constitutes it. In sum, the educational value of research is related to teachers' ability to take a professional approach to it and all that this entails.

Conclusion: Moving Beyond the Focus on Teachers' Practical Reasoning

Educators have conceptualized different ways to bring together teachers' actions and research. Researchers and teacher educators have more often tried to accommodate teachers taking a consumer approach to research. More galvanized now, however, is the scholarly community's consensus that teachers' reasoning about research must be both improved and respected, and that different types of educational inquiry can be valuable to teachers. Both realms of theory and practice (or knowledge production and knowledge use) are seen as legitimate in their own right, and the benefit of different types of educational inquiry will be found in the improvement of teachers' cognitions -- not simply changes in what they do. Drawing on Aristotle's philosophy of practice, the emphasis has been specifically on using research to improve teachers' practical arguments or, more broadly, their practical reasoning (see

Fenstermacher, 1986; p. 43).

In this study, research and action were differently constituted for teachers taking a consumer or a professional approach to research. Teachers with a consumer approach focused on research findings for immediate use. Teachers taking a professional approach valued working through the processes of inquiry that form a research study. Connections to classroom actions were neither quickly merged nor completely dichotomized. Before making judgments about what follows for their teaching, they valued understanding what was claimed and why.

Judging by the responses of teachers taking a professional approach, the claim that research should improve teachers' practical reasoning or practical wisdom is misguided in an important sense. This error can be explanined by reference, once again, to Aristotle's philosophy of practice. Aristotle (1979; p. 124; McKeon, 1947; p. 436) includes understanding (sunesis) as an element of practical wisdom (phronesis) that also may be distinguished from it.

> It (understanding) is about the same objects as practical wisdom; but understanding and practical wisdom are not the same. For practical wisdom issues commands, since its end is what ought to be done or not to be done; but understanding pertains to judging only (Book VI, chapter 10, 1143a 5-10).

Practical wisdom is tied closely with determining what to do next.[10] But the distinguishing activities of understanding are

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[10] This does not mean that the reasoning of the practically wise person can not be extensive (in time or complexity), sensitive to competing claims, or does not include deliberation about ends (see Nussbaum, 1986; also Wiggins, 1980).

differently focused. These activities include (1) listening to the reasoning of others about issues concerning practical wisdom; and (2) seeing that understanding does not end in the command, "I must do this."

Engaging in activities associated with understanding means that a person first comprehends the meaning of others' deliberations and then tries to form a judgment about them. The person acting with understanding goes through the steps of others' deliberation in order to judge their worth. Comprehending what others say may be an eventual guide to forming one's own conclusions about what to do next, but understanding in itself focuses on the important activity of judgment (see Greenwood, 1909; pp. 68-69; also Grant, 1885). Thus, the activity of understanding may support the development of practical wisdom. Understanding and practical wisdom complement each other in the following way:

> Understanding (sunesis) is the ability to make judgments about practical problems in human life. Practical wisdom adds commands to the judgments of sunesis. Furthermore, understanding of the practical problems of conduct adds to practical wisdom the quality of correctly judging others' actions and learning from what they say (Eterovich, 19980; p. 122).

Teachers taking a professional approach were similar to the person of understanding. They sought to determine what researchers were saying about an area that had bearing on teachers' practical activity. They valued working through the processes of inquiry that led to particular conclusions. They had suspended the belief that they were seeking only to determine what to do next in their teaching.

They wanted to comprehend what researchers were saying, though later judgments about their own work might draw on both their knowledge of teaching and their understanding of research.

Aristotle reminds us that a person of understanding is not necessarily practically wise. Similarly, a teacher who takes a professional approach to research is not necessarily a good teacher. In addition, classroom experimentation, based on one's understanding of research, often improves teachers' understanding of research and their own teaching. Figuring out "what to do next" can be indispensible for teachers as they learn from research.

This study documents, however, both that teachers see value in working through the processes of inquiry apart from its direct use, and that the educational value of research is dependent on whether teachers are willing and able to understand it. The study demonstrates also the viability of helping teachers take a professional approach to research. Consequently, those working with teachers need to establish a zone of research understanding. Establishing this zone must occur in diverse contexts. It can occur in relatively brief in-services for teachers that involve research, in graduate education courses, as well as in intense, long-term work in professional development schools where teachers are expected to change their practice based on research.

As argued throughout the study, those who communicate research to teachers chiefly encourage and reinforce a consumer approach to it. State departments of education rarely devote organizational

resources to help teachers take a professional approach, though all teachers are expected to act in accordance with findings from research. Enterpreneurs operate in school districts packaging research in ways conforming to the consumer approach. This kind of packaging saturates the market in which research is purveyed at the district level. A whole industry exists that neglects the value of teachers taking a professional approach to research. Furthermore, teacher education faculty often succumb to practicing (and prospective) teachers' insistence that research be presented in ways conforming to the consumer approach.

While teachers must be willing to think about research more broadly and study it closely, those who communicate research to teachers must be responsible for presenting research in ways consistent with the professional approach. Greater attention to teachers' conceptions of research will do much to help teachers break from restricted, taken for granted assumptions that limit their ability to learn from -- and be educated by -- educational inquiry.

APPENDICES

APPENDIX A

INTERVIEW PROTOCOL

INTERVIEW PROTOCOL

Introduction

Thanks for taking time to participate in the study. It's not easy to find people willing to take time out of their busy schedules to sit down and talk about their ideas in-depth. Your ideas in this area are important to find out about. For a long time ed researchers did not pay much attention to how teachers thought about research. I am conducting this study to address this gap. There's growing interest in teachers' views of research, and I believe strongly this study can help researchers and teacher educators think differently, and better, about how to communicate with teachers about research. So, your participation not only helps me; it will also make a real contribution to the field.

This interview is divided into 2 one-hour sessions (Each session will last a bit more than an hour). Today, after you give me some background information, I'll ask you about your experiences with and opinions of research. And then, before we discuss the three descriptions I gave you, I'm going to have you read brief summaries of 12 articles and ask you if you would consider them examples of research.

I will be taping the sessions, so you need to read and sign an informed consent form. The form states that your name will not be used in any reporting of the study without your written permission. Please read the form, and if you have any questions about it, or anything else, feel free to ask me. (After interviewee reads and

signs the informed consent form, ask if there are any other questions. If not, begin the interview.)

Section I. TEACHERS' BACKGROUND INFORMATION

Let's start off this session with some questions about your background, and experiences with research.

1. Where are you from, and where did you go to undergraduate school?

2. What did you major in at college, and in what areas were you certified?

3. Have you done any graduate work since receiving your bachelor's? If so, in what areas?

4. Do you now teach and at what grade level?

5. How many years have you taught in total?

Let me now ask you some more specific questions about your experiences with research.

6. Did you have any undergraduate or graduate courses that focused specifically on educational research? If so, what were they?

7. What journals do you read? Do you get a chance to read much research?

8. Have you had in-services that focused on research? If so, what research did you learn about?

9. Have you worked on a long-term research project? If so, what was the project about, and what was your role?

SECTION II. WHAT DO TEACHERS SAY WHEN THEY DESCRIBE MEMORABLE, SIGNIFICANT EXPERIENCES WITH EDUCATIONAL RESEARCH?

1. When you think about your experiences with research, can you think of one experience or encounter that really made an big impression on you? What was it like?

2. Do you pay much attention to what ed. researchers have to say about teaching?

PROBE: a) If yes, how do you go about paying attention to what they say, for example, mainly through reading research reports?

b) Do you pay the same amount of attention to research now than you did before? Why the change? (if any)

SECTION III. HOW DO TEACHERS DEFINE EDUCATIONAL RESEARCH?

1. When you think of the words, "educational research," what comes to mind? What images, ideas, words do you associate with educational research?

2. I have on these cards (show the cards to the teacher) summaries of various kinds of work. I'd like you to read the summaries and sort them into one of three categories.

a. This represents my idea of educational research.

b. I am not sure if this is educational research.

c. This isn't my idea of what educational research should be.

Tell me what's going through your mind as you decide which pile to put each card in, but don't worry about explaining what you say.

PROBES: a) During the task after the respondent places each abstract:

What makes this research to you?

Why isn't this an example of research?

b) Follow up all inconsistencies in respondents' categorizations with the question,

What makes this piece research and this one not research?

THE ABSTRACTS

(in order and appearence interviewees read them, except each abstract was placed separatedly on a 4 X 6 index card)

(1) In this piece, the author looks at the relationship between teaching behaviors and students' performance on math standardized tests. 40 fourth grade teachers are divided into two groups. One group, of 21 teachers, receives a 5-page manual describing a procedure for teaching mathematics. The teachers read the manual, receive two 90-minute training sessions, and then implement the key instructional behaviors into their mathematics teaching. The second group does not receive the manual and are told to continue to instruct in their own style. Students are tested before and after with standardized and content tests geared to the actual instructional content students were taught. Based on statistical analysis of the tests, students belonging to the first group of teachers did significantly better than students of the second group of teachers.

(2) This piece presents a method to introduce social issues into a general-science classroom. Students bring in articles on science and technology from newspapers and magazines. Class time is set aside on a regular basis for teachers and students to analyze and discuss the articles. The teacher's role is considered vital in these discussions. Students will integrate social issues in science when the teacher does not make judgments on students' responses, but rather accepts all possible answers, ideas, and positions.

(3) The author in this work considers what city children know and have seen when they enter school. 300 students are interviewed in groups of three by teachers. Teachers give the children the name of an object and children respond to questions about the object. Responses are examined in terms of the types of responses, and the childrens' age, sex, ethnic background and prior kindergarten training. In 34 questions out of 49, the boys surpass the girls. The girls excel in knowledge of the parts of the body, home and family life, rainbows, and in conception of square, circle, and triangle. Irish children tested are behind others on nearly all topics. Kindergarten children, regardless of nationality, do better than children without kindgarten experience.

(4) This author examines and synthesizes previous work on the history of public schools in the United States. He shows how the evolution of public schools was closely tied up with forces that shaped the nineteenth century, such as immigration, industrialization, and the disappearance of apprentice training. The author also describes how educational theory (for example, theories of how students learn) and practice (for example, how students were actually taught) evolved and adapted to these forces in society. Present and future educational problems are placed in a historical context so that teachers can understand the broader social and political significance of their daily work.

(5) This author considers what teaching behaviors are related to student achievement on a social science concept test. She looks at 20 preservice and 2 in-service teachers teaching social studies lessons to students in Grades 3-5. The teaching behaviors that are strongly associated with achievement on the social studies concept test include relevance of teacher behavior to learning objectives, a balance between concrete and abstract terminology, and teachers' expression of interest and enthusiasm. There is no association between teach-ing behaviors and student achievement for signaling changes in topic, repeating or rephrasing questions, or telling students to stop irrelevant behavior.

(6) In this work, the author analyzes different interpretations and definitions of the concept of human potential. He argues that traditional ways of interpreting the idea of students' potential perpetuate the false beliefs that potentials are unchangeable, uniformly good, and consistent with one another. In contrast to this view, he argues that potentials are variable outcomes that depend on social contexts. Applying his analysis to ongoing school practices (for example, how the curriculum or instruction is typically organized), he shows that using the traditional language of human potential can prevent some students from having certain worthwhile learning experiences.

(7) The author writes about how teachers can assist students with problems multiplying and dividing fractions. Even though multiplication of fractions is a relatively simple skill, there are many steps in the process that confuse some students. Students believe that they need a common denominator before they can multiply fractions. Teachers can remind students that this is not necessary; fractions with unlike denominators can be multiplied. Some of the students also multiply fractions diagonally. Those students who do this do it consistently. Teachers who catch this error early can avoid later student misconceptions. In addition, students sometimes forget to convert answers to their simplest form. Teachers must help students change improper fractions to mixed numbers and encourage them to reduce all fractions to lowest terms.

(8) In this piece, a teacher writes about her attempts to reflect on the way she responds to students' talk during class. The teacher feels like she did not listen closely to students' ideas, and fears that she harbors hidden prejudices toward certain children. To learn more about how she responds to students, she tape-records many of her classes. She replays and transcribes the tapes at a later time and finds out what topics and subjects inspire the best classroom discussions. She also finds out that the way she controls the discussions influences the quality of students' responses, and her own interest in their ideas.

(9) The author writes about teaching students thinking skills. She reviews different kinds of thinking skills. These include comparing, classifying, hypothesizing, looking for assumptions, organizing data, interpreting, and decision-making. To develop and improve these skills, teachers should involve students in activities that require them to analyze and discuss situations through with others. There are two steps to this process. Teachers' first step is to set up an atmosphere that invites and welcomes original thinking. The second step is to provide students with exercises in all the different kinds of thinking skills.

(10) This author looks at the achievement of high-school students grouped into different classes according to their performance on intelligence tests. Some students with the same test scores are taught in separate classes. Other students with the same test scores are placed in mixed classrooms (with students of all ability levels). Student achievement of these two groups in algebra and Latin is compared. Achievement is measured primarily by standardized tests, secondarily by teachers' marks. The author finds that superior and medium students achieve more in separate classes; however, lower ability students do not achieve more when placed in separate classes with students of lower ability.

(11) This work explores the intellectual experiences of a class of 32 eight to nine year old children in an English primary school. The author co-teaches and observes a class over a school year, keeping a diary and notes on students' growth. The diary and notes focus on the most significant events of the day. A co-teacher and another teacher comment on and correct the notes. The work also includes students' writings and other samples of their schoolwork. Through observing children engrossed in various subjects, the author suggests that these "moments of absorption" are of critical importance in understanding children's intellectual growth.

(12) In this piece, the author first describes how American teacher educators viewed education as a subject matter in 1890. He then analyses what factors contributed to changes in teacher educators' views between 1890 - 1920. One factor contributing to these changes was the new profession of educational psychology, with its reliance on laboratory experiments and its virtual neglect of classroom life. The author claims that this change led to a narrow view of human learning within educational psychology. A second factor was the increasing specialization within the education field itself. This specialization led to greater fragmentation in education courses and journals as well as an overemphasis on education credentials within the profession.

(After interviewees respond to all the abstracts)

I have a couple more questions before we finish up this section.

3. How do you distinguish between research that you think is good and research that you feel is bad? For example, some of the studies you placed in category a might not be very good research. How would you tell the difference between good and bad research?

4. Could you, and if you can't that's okay, provide me with a definition of educational research? What is your definition of educational research?

SECTIOM IV. HOW DO TEACHERS THINK RESEARCH DOES AND SHOULD INFLUENCE THEIR WORK?

Now I would like to talk about the three vignettes I gave you before this session. These vignettes reflect different ways teachers can think about research and its influence on their teaching.

(Teachers had the starred* questions to focus on prior to the session. Teachers were also given the following directions:)

I would like you to read each of the vignettes carefully and choose the one that best fits with your beliefs and experiences. After you have chosen the vignette which best reflects your views, read it again and underline the sentences that are closest to your beliefs and experiences.

Neal

Educational research has never been relevant or practical for me. I am a certified teacher and have taken all the required teacher education courses (that invariably included some research). But research has not provided me with the instructional techniques and know-how I believe it should provide. The information I use to guide my teaching comes mainly from my own experience. I have not found evidence from research important to guide or change my teaching.

Why do I feel this way about research? It may be because the kinds of questions that I ask about my teaching are rarely answered by researchers. Researchers might have solved what they consider important problems, but those problems seem less critical to me in my work. I have not seen a lot of interaction between researchers who live in the "ivory-tower," and teachers who live in classrooms. Because research seems irrelevant to classrooms, I'm not very interested in following what researchers are writing about. Research is also hard to understand because it has a lot of jargon and tables only specialists can figure out. It's far too theoretical for what teachers need in their classrooms.

I am not saying that research has no value for teachers, or that I am wholly against it, even though I am critical. I am saying, however, that I do not think about educational research when I teach. If I hear of a good idea about teaching that happens to come from research, I'll try it out. And if someone could present to me recommendations from research that are supposed to work for teachers, I would listen. But before I accept such recommendations, I want to find out if it works in my classroom. To this point, research has not done this.

Deryl

While I understand teachers' frustrations with research, my experiences with educational research have been positive, and these experiences have influenced my perspectives.

Educational research can definitely be useful. At any rate, it has been useful to me and should be useful in the following way. Research should give teachers information that has a direct impact on what they are doing and needing in their classrooms. It's true that research can be too theoretical. Fortunately, the research that I learned about was not written up in the normal academic jargon that only researchers can understand. I did not have to study the ins and outs of the study on which the research findings were based. The findings were made understandable and I was able to learn how to apply them in my class.

Making research clear and ready for me to us is important because teaching is fast-paced work. The numbers of students and the need to look after all of them creates many problems. Research can help. Sometimes when I have had a problem in my classroom, research that I encountered through in-service, a university course, or my own reading provided an answer. For example, I was having problems with discipline in my class, and through an in-service on classroom management, I learned instructional techniques about how to handle the situation. Also I've learned about different ways to manage my time more efficiently when I teach. This research is worthwhile to me because it provides information and ideas that work directly in my classroom.

This is what research can and should do, provide teachers with missing information and skills useful to solving their concrete classroom problems.

Sarah

Research has rarely given me answers or made my decisions about what to do in my classroom much easier. Research can help me raise new questions and provide different ways of seeing the difficulties involved in teaching. In fact, I would prefer that research do this for me rather than help me with information and strategies that are supposed to change what I do directly. I don't think that research can do much to have a direct impact on my teaching.

Research is especially valuable when it helps teachers think about a point of view or raise a question that they never thought about before. For example, I had students last year who just did not understand fractions. In this case and others like it, studying research helped me see what's happening here more clearly, perhaps differently. I read research in a class that introduced us to a whole different way of thinking about what it meant for students to understand math, including fractions. The research changed my view of teaching fractions more than it told me what to do.

The purpose of research is not to provide techniques to help solve classroom problems. Teachers should read it somewhat like they try to read good literature. Good literature prompts people to see and examine things in a new light. Through reading, say, a novel, you gain a deeper and broader perspective on your own experiences, thoughts, and actions. Educational research can do the same thing, though researchers rely on more explicit methods of analysis which provide the reader ways of seeing and assessing what was done and what that means.

Teachers have to study research closely. They can not rely on others to make research clear and easy to use when they think about how research can influence their teaching.

*1. Which vignette is most like you?

*2. Which individual statements of the teacher represented your feelings and beliefs about research? Would you please underline those statements?

(Look at what the teacher underlined.)

PROBES (on particular sentences underlined):

a. You believe (read back what was underlined), would you like to say anything more about that? Why do you feel that way?

*3. Why did you eliminate (Daryl, Neal, or Sarah)? Were there statements or attitudes that you disagreed with strongly?

*4. You also eliminated (Sarah, Daryl, or Neal), What statements did you disagree with?

*5. Were there some statements teachers made in the vignettes that left questions in your mind? If so, what where they, and what questions did you have? Could we consider them together?

6. You can state still another way in which teachers could view research.

(Ask the following two questions if they have not already been addressed)

7. Do you think that research should mainly provide you with strategies and techniques that you can apply directly in your classroom?

8. Is a central role for teacher educators and researchers to make these research findings clear and ready for you to use? Why or why not?

(Before ending session one, thank the teacher for her time and responses. Explain to her that if there is anything to clear up from the first interview session, I will take a few minutes at the beginning of session two to do so. Make sure to provide her with the three articles and the questions I'll ask during the second session. EMPHASIZE THE IMPORTANCE OF READING THE ARTICLES AND THAT THE READING WILL TAKE NO LONGER THAN AN HOUR. Set-up or recheck the appointment time for the second session).

END SESSION ONE

Go over notes and check for any short follow-up questions I'll need to ask to clear up any important issues at the start of session two.

BEGIN SESSION TWO

Introduction

Thank you very much for coming in again today. Our last session was informative and helpful to me. I hope that the reading has not been too much of a burden for you. Today I want to clear up any questions from the first session (if necessary), and then have you respond to brief research findings that I've selected from the research literature. We'll also discuss the articles and questions I gave you prior this session. Did you have the chance to read the articles carefully?

(If no, reschedule the appointment; If yes, ask);

Do you have any questions before we start? If so, feel free to ask. If not, why don't we begin?

(If there are issues to clear up from the first session, explain that you have a few things to clear up from the first session and ask these questions before going on to section V).

V. DO TEACHERS RECOGNIZE VALUE PREMISES OR ASSUMPTIONS WHEN THEY DRAW CONCLUSIONS FROM RESEARCH FINDINGS?

I have here three research findings drawn from the scholarship on teaching and learning. I'm interested in conclusions you would draw for your teaching from these research findings and why?

The first research finding comes from What Works (1987; p. 35), a U.S. Department of Education report about certain things about teaching and learning which the authors say we now know work. Below is the finding on direct instruction.

1. Tell me what are you thinking about as you read the research finding. What questions or comments does it raise in your minds?

(Teacher reads finding on direct instruction).

Direct Instruction

Research Finding: When teachers explain exactly what students are expected to learn, and demonstrate the steps needed to accomplish a particular academic task, students learn more.

Comment: The procedure stated above is called "direct instruction." It is based on the assumption that knowing how to learn may not come naturally to all students, especially to beginning and low-ability learners. Direct instruction takes children through learning steps systematically, helping them see both the purpose and the result of each step. In this way, children learn not only a lesson's content but also a method for learning that content.

The basic components of direct instruction are:

* setting clear goals for students and making sure they understand those goals,
* presenting a sequence of well-organized assignments,
* giving students clear, concise explanations and illustrations of the subject mattter,
* asking frequent questions to see if children understand the work, and
* giving students frequent opportunities to practice what they have learned.

Direct instruction does not mean repitition. It does mean leading students through a process and teaching them to use that process as a skill to master other academic tasks. Direct instruction has been particularly effective in teaching basic skills to young and disadvantaged children, as well as in helping older and higher ability students to master more complex materials and to develop independent study skills.

References:

Berliner, D. & Rosenshine, B. (1976). The Acquisition of Knowledge in the Classroom. San Francisco: Far West Laboratory for Educational Research and Development.

Doyle, W. (1985). "Effective Secondary Classroom Practices." In R.M.J. Kyle (Ed.), Reaching for Excellence: An Effective Schools Sourcebook. Washington D.C.: U.S. Government Printing Office.

Good, T. & Grouws, D. (1981). Experimental Research in Secondary Mathematics Classrooms: Working with Teachers. Columbia MO: University of Missouri.

Hansen, J. (1981). "The Effects of Inference Training on Young Children's Reading Comprehension." Reading Research Quarterly, Vol. 16, No. 3, pp. 391-417.

Rosenshine, B. (1983). "Teaching Functions in Instructional Programs." Elementary School Journal, Vol. 83, No. 4, pp. 335-351.

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2. What conclusions, if any, would you draw for your teaching from this finding?

PROBE: Can you help me understand why you would draw those conclusions (or no conclusion)?

Let's move on to the last finding, which I will read to you.

Suppose that an elementary teacher has been singing the National Athem with his students for a couple of years. An educational psychologist, who is also the teacher's friend, visits the school. After observing children in third grade singing the National Anthem, he talks to the classroom teacher and says:

"You know, third-graders really can't understand what the words of the National Anthem mean. That's one sure thing that research in cognitive development tells us. Kids of that age just have no sense of what these ideas and concepts mean."

5. If you were the teacher, what might you say to the educational psychologist?

6. If there is good research evidence for a teaching practice, should you use that practice in your teaching?

PROBE: Under what conditions can you ignore good research?

SECTION VI. HOW DO TEACHERS UNDERSTAND RESEARCH WHEN THEY READ IT?

Let's move to the last section of the interview which focuses on the research articles you have read. Before we go over the articles, let me ask you a couple of general questions about reading research.

1. What things do you think are important to look for when you read a report of research?

2. Do you read research differently than you read other things?

(After responding to these two questions, teachers were asked to respond to the following articles that they read prior to the second interview session. The three articles were:

--- Cuban, L. (1988). A fundamental puzzle of school reform. Phi Delta Kappan, 69, 341-344.

--- Hunkins, F.P. & Shapiro (1967). Teaching critical thinking in elementary social studies. Education, 88, (September-October), 68-72.

--- Paley, V. (1986). On listening to what children say. Harvard Educational Review, 56, 122-131.

For each article teachers were asked the following questions:

(Teachers had the starred * questions to focus on prior to the session. General questions about the articles were asked first, and then questions for each article.)

Let's start by going over the general questions about the articles first, and then will talk more specifically about each article

*3. Did you like any article more than another? Why?

*4. In light of how you think research should help teachers, does any article succeed more than any other? Why or why not?

*5. Did the authors use similar kinds of evidence in each article to support their views?

PROBE: Was any of the evidence more or less convincing to you?

Let's now turn to each particular article, and work at each one using the questions I gave you as a frame of reference. Can we begin with the Hunkins and Shapiro piece?

(Ask the following three questions for <u>each</u> article).

*6. Does this article seem like research to you? Why or why not?

*7. What is the main thing the author seems to be trying to say, and how does he or she try to convince the reader? I mean, what does the author(s) do to make you to believe the article?

*8. Is there anything in the article that you have trouble understanding?

9. What conclusions, if any, would you draw from the article for your teaching? Why these conclusions?

When we discuss the Hunkins and Shapiro article on teaching thinking skills in elementary social studies through the case method, this question will be asked at some appropriate point.

10. Educational researchers often warn readers not to mistake correlation with causality? Do you know what these researchers mean by this statement?

CLOSING THE INTERVIEW

Thanks again for all the time and trouble you put into these sessions. They've been very valuable to me, and I think that your efforts are going to be helpful to the teacher education community. I'll send you a letter to let you know when the report is finally completed and tell you how you can get hold of it, if you'd like to. If you have the chance to read the report, and you want to talk about it, let me know. I can be reached here or at home. Thanks again so much.

(Be sure that I have interviewee's address, and that I provide her with my phone number and address).

APPENDIX B

CLASSIFICATION OF TEACHERS' RESPONSES TO ARTICLES AND FINDINGS

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CLASSIFICATION OF TEACHERS' RESPONSES TO ARTICLES AND FINDINGS

The questions asked teachers about the findings and articles are reported in chapter six and in the interview protocol (see Appendix A, sections V and VI). All teachers' responses that counted toward their total score are reported below. The higher a teacher's total score, the more likely they understood the authors' main points and use of evidence. Importantly, teachers with higher scores spent more time analyzing the articles and findings using the criteria developed in table 6.3. In short, they focused more on processing research than on research products (see chapter six).

A clear sense of the author(s) main idea(s) and how that author tried to convince readers was worth one point each. Teachers were also asked in the interview whether authors used similar types of evidence in each article to support their views (see interview protocol, section VI, question # 5). Teachers' ability to label or to identify different types of evidence was worth one point for each article. All other additional analysis of articles and findings that fit the criteria developed in table 6.3 (4-7) were worth a possible two points each (teachers receiving less than two points for any additional analysis is noted).

What follows is a reproduction of table 6.3 that describes the overall system for analyzing teachers' responses. Next is the key used to determine what teacher responses counted toward receiving a point for (1) recognizing main ideas in each article, (2) recognizing

how the author tried to convince readers, and (3) labeling different types of evidence for each article. The key used to determine teachers' additional analysis of articles is, once again, described in table 6.3 (# 4-7). Following the key is a complete description of what teacher responses counted toward his or her total score. The description of each teacher's responses begins with those teachers who scored lowest in the analysis and proceeds with those teachers scoring progressively higher.

Table 6.3

System for Analyzing Teaches' Responses

Reading Processes

Articles (responses worth one point for each article)

1) Recognizing main ideas in each articles.

2) Recognizing (broadly) how the author(s) tries to convince readers in each article.

3) Labeling different types of evidence for each article.

Additional Analysis of Articles and Research Findings
(responses worth two points each)

4) Drawing conclusions for one's own teaching based on recognition of the main idea and evidence in the article.

5) Judging further the merits of an article (two point each for any responses related to a - f);

   a) recognizing and analyzing conceptual distinctions;
   b) creating and explaining distinctions based on the article;
   c) questioning further the data's consistency (apart from drawing conclusions as stated in four above);
   d) considering, if appropriate, the article's internal validity;
   e) external validity;
   f) construct validity.

6) Referring to or positing different conceptions of learning or educational aims when responding to and drawing conclusions from research findings or when talking about "ignoring good research."

7) Noting relevance of reading the studies on which a research finding is based in order to further evaluate that finding.

Key Used to Judge Teachers' Recognition or Labeling of Main Ideas and Evidence in Articles

** Teachers received a point if their responses were (defensibly) similar to those described below. In some cases, teachers may receive partial credit for their responses.

1) Recognizing main ideas in each article:

-- Hunkins and Shapiro article: Teaching elementary students to think critically is an important educational aim. The authors highlight this and then proceed to investigate and to identify a teaching method related to helping fifth-grade students think critically during social studies instruction.

-- Paley article: Teachers need to listen to what students say in order to understand how students make sense of their world. This is difficult since teachers are not accustomed to listening carefully to students' talk. Teachers, however, can discover through studying their own teaching different ways to access the knowledge students bring to class.

-- Cuban article: The author questions why school reform has been prevalent over the last one hundred years, but there has been little fundamental change in the organization of schooling. He identifies two types of reform (first order and second order changes) and looks at school reform over the last century using this framework. He suggests that most school reform has been first-order changes which do not change the organization's basic structure. Second-order changes alter an organization's fundamental structure. Those interested in school change will benefit from understanding the different types of reform and thinking about school change in this light.

2) Recognizing evidence in each article:

-- Hunkins and Shapiro: The authors try to convince readers by setting up an experimental study in which two different groups of fifth graders are taught using two different teaching methods. One group is taught using "case study" methods materials and another group is taught using "lecture-textbook" methods and materials. The authors show that a statistically significant difference in critical thinking occurred for the "case method" group.

-- Paley: The author tape-recorded her classes and listened to her conversations with students. Paley describes the dialogues between herself and her students. She uses these dialogues and descriptions of classroom life to support her views.

-- Cuban: The author offers an analytic distinction between two different types of organizational change. He shows how it is important to define problem in light of this distinction and gives contemporary examples in non-school institutions (e.g. NASA). Drawing on historical examples of school change, he shows how his analytic distinction between types of change is applicable to school reform. His distinctions and historical examples support his point that it is important to raise the right questions about school reform.

3) Labeling specifically differences in the types of evidence authors used to support their main points (three points possible; one point for labeling each type of evidence).

-- Hunkins & Shapiro: Controlled experiment and statistical analysis of test data.

-- Paley: Classroom dialogue and descriptions.

-- Cuban: Analytic distinctions and historical evidence.

Key for Judging Teachers' Additional Analysis of Articles and Findings

4 - 7 : See table 6.3 (# 4-7). Teachers' responses had to defensible match those outlined in the table. If they matched, their responses were worth two points for each instance of additional analysis. Teachers may receive partial credit for their responses. When this happened it is noted in the descriptions below.

Scoring Teachers' Responses

Andrea

Main ideas and how the author tried to convince the reader:

Hunkins & Shapiro article - (main idea; 1 point) The author is trying to convince us that children in elementary grades can be taught to think critically. (manner of convincing; 1 point) He tried to convince with a controlled experiment.

Paley article - (main idea; 1 point) The article is trying to convince readers that they should ask students to express their thoughts and not have so many right or wrong answers. Children at young ages are able to express themselves through open-ended questions. (manner of convincing; 0 points) none.

Cuban article - (main idea; 0 points) The author is trying to get us to reflect on what the reasons are for us to change -- what is the need for the change of education (sic). What has happened to education over the last century to evaluate the change as good or bad. What has worked in the past, what changes are needed to refine our programs. (manner of convincing; 0 points) There is no evidence because it does not take a sampling of what to test.

Labeling types of evidence:

Hunkins & Shapiro - (1 point) examples of what they were studying and how testing.
Paley - (0 points) examples of what they were studying and how testing.
Cuban - (0 points) just stated findings from other articles he read.

Additional analysis of articles or research findings: (possible 2 points each).

--- External validity (Hunkins & Shapiro) - I have a difficult time understanding how they can make a generalization that all students can be taught to think critically when they only tested average to above average groups. There are other variables that could affect his study: geographical area, economic status, social status.

Total = 6

Lynda

Hunkins & Shapiro - (main idea; 1 point) By presenting a certain kind of approach or situation in a social studies class (rather problem oriented), we can encourage critical thinking. (manner of convincing; 1 point). They provide the reader with statistical proof.

Paley - (main idea; 1 point) The author says that a teacher needs to be curious about how her students are thinking. By listening carefully, a teacher can decipher students' thought processes. (manner of convincing; 0 points) none.

Cuban - (main idea; 1 point) He says that there are two kinds of change that can occur in schools. There are first-order changes that deal with quality control types of problems and second changes which seek to alter fundamental ways organizations are put together. In the last century, most school reform has been of the first-order type. (manner of convincing; 1 point) his illustrations and convincing style of writing.

Labeling different types of evidence:

Hunkins & Shapiro - (1 point) statistical approach
Paley - (0 points) personal approach
Cuban - (0 points) intellectual approach

Additional analysis of articles or research findings: (possible 2 points each).

--- (Positing different educational aims - national anthem finding) I've memorized lots of things I didn't understand, and then years later, you say --- it's like a light comes on. I mean it's fine. That doesn't mean she has to stop doing it.

Total = 8

Karla

Hunkins & Shapiro (main idea; 1 point) - The authors tested 2 groups to determine the outcomes of 2 different teaching strategies. According to the research, the experimental group showed a significant difference in their critical thinking ability. (manner of convincing; 1 point) use of control and experimental groups and pre-post testing.

Paley (main idea; 1 point) - Children, if left to seek out their own learning, will tend toward those things that are of most interest to them. . . The role of teacher is to use those things that are of interest to children and help them draw relationships between what they know and do not know. (manner of convincing; 1 point) - She convinces by using anecdotal stories and examples.

Cuban (main idea; 1 point) - Cuban is trying to tell the reader than even though a great of school reform has taken place over the last century, very little has changed in education. He suggests that second-order changes need to be made. That is, instead of throwing all of education out, keep those things that are already in place and are working and change and improve those that are not working. (manner of convincing; 0 points) - I didn't understand how Cuban gathered his information and came to his conclusions.

Labeling types of evidence:

Hunkins & Shapiro - (1 point) controlled experimentation.
Paley - (1 point) classroom observations.
Cuban - (1 point) historical information & personal opinion.

Additional analysis of articles or research findings: (possible 2 points each).

--- (Direct instruction finding) - I think it's just one way to present a lesson. I think that there are other times that others approaches need to be used. I don't know if I agree if chidren learn more in a precise, step-by-step organized lesson. . . I see myself as using a variety of delivery systems and not just one. (1 point)*

--- (Ignoring good research) - I would say you shouldn't use it if it doesn't fit your own style. I think there's a lot of different teaching techniques that may be excellent, but may not be appropriate for everyone. (1 point)*

* Teachers received one point only if they focused on <u>styles</u> of teaching or learning as opposed to different conceptions of learning or educational aims.

Total = 10

Leisa

Hunkins & Shapiro (main idea; 1 point) - The authors' aim was to show the need for teachers to instigate critical thinking among their students. The method that leads to higher results was based on discussion and questions rather than the usual lecture-discussion format. (manner of convincing; 1 point) - By looking at the numerical data, one can come to a conclusion about which technique is best to use.

Paley (main idea; 1 point) - Paley, by the use of her reflection, realized that she could use drama as a means of having fruitful discussions about fantasy, fairness, or friendship. Paley facilitated these discussions which allowed children to discover their own understanding of the topic. (manner of convincing; 1 point) - Paley realized that through the use of a tape recorder she could conduct her own research. It was helpful to see how Paley walked through the vignettes for the reader to get a concrete example of her experiences.

Cuban (main idea; 0 points) - Cuban is reminding us that we feel it is necessary to bring about changes in our educational system. Even though we have implemented various types of school reform, we still face a serious problem within our educational system. (manner of convincing; 1 point) - Cuban uses examples we can relate to, or that we are familiar with in order to see us on his point of view. He provides the reader with a definition which we can use to classify changes.

Labeling types of evidence -

"I think the articles were similar because they all presented data. They all use different means of collecting data for their article."

Hunkins & Shapiro - (1 point) They used numerical data along with information about the case studies.
Paley (0 points) - Leisa does not specifically cite the evidence Paley uses in her article.
Cuban (1 point) - He cited data which show various changes that have taken place over the years.

Additional analysis of articles or research findings: (possible two points each).

--- (Direct instruction findings) - I think I want to know what the teachers are trying to get out of that. Some students might not need the demonstration of it. And by demonstrating, it could help them, and it could take away some of the way they go about it (1 point).

--- (National anthem finding) - It might be just kinda of a tradition. . . . I think it still depends on the teacher's purpose. . In the first grade, they can't even say half of the words, but it's just part of their daily routine.

Total = 10

Jessica

Hunkins & Shapiro (main idea; 1 point) - They are trying to compare critical thinking in terms of cases versus lecture-based instruction (manner of convincing; 1 point) They convince you by how the kids did in the experimental group using that type of critically thinking skills versus just a lecture.

Paley (main idea; 1 point) - She had a hypothesis that you need to listen to kids because they're saying alot more than you really think. (manner of convincing; 1 point) Her little vignettes -- what the kids said in response to her questioning.

Cuban (main idea; 1 point) - Lots of reform doesn't mean lots of change. There's alot of different reforms that have gone on in school, but there's not been alot of different changes. The form still looks basically the same, thre's just been some augmentation to the form . He's saying that you've got to recognize the different types of reform. (manner of convincing; 1 point) Because (he cites) all those things (different reforms that) have not stayed around.

Labeling different types of evidence:

Hunkins & Shapiro - (1 point) actual test data.
Paley - (1 point) classroom dialogue.
Cuban - (1 point) historical references.

Additional analysis of articles or research findings: (possible 2 points each).

---- (Questioning further data's consistency) - The only question I had (with the article) was team teaching because we do alot of team teaching in our school. (Cuban mentions team teaching as a fundamental reform that did not meet with much success).

Total = 11

Nicole

Hunkins & Shapiro - (main idea; 1 point) - that critical thinking doesn't just happen, that you provide it for your students by a different delivery of the same curriculum. And the experimental group, whatever that was called . . . the case method versus the lecture textbook method, that the case method was a better way to teach. (manner of convincing; 1 point) - the test scores.

Paley - (main idea; 1 point) to listen more, to be more open-minded. There isn't just one right answer. . . . You have to get down to their level and find where they're coming from, what's their thinking pattern. (manner of convincing; 1 point) - it's through examples of personal experiences.

Cuban - (main idea; 1 point). There has not been a whole lot of change, or if there is change it only last for awhile, then it goes back to the model at the turn of the century. I just never knew what his real main point was. I know he talks about reframing the fundamental questions, but he ends the article with all kinds of questions. . . I mean, I think these are questions that's probably been asked since the turn of the century anyway. I don't think it goes anywhere. . . I don't think he proposes much of anything except that we better ask the right questions. That was what I thought, we're asking the wrong questions first. (manner of convincing; 1 point) - Gives lots of examples of how schools have really worked for the last century. . . . I don't know, I don't know. I'm sure it must have something to do with the first order and second order reforms because he talks about that alot and distinguishes between them.

Labeling types of evidence:

The articles used similar types of evidence, "values, personal experience."

Hunkins & Shapiro - (0 points) "more concrete" than the other two.

Paley & Cuban (0 points) - The Cuban to me was all personal preference and feeling and also so was Paley. And this, teaching critical thinking, was certainly I think a personal preference. . . I think Paley and Cuban were more philosophical.

Additional analysis of articles or research findings: (possible 2 points each).

--- Internal validity (Hunkins & Shapiro) - There's nothing else about the traditional lecture. What the guy lectured about, or what his tests or hers looked like. . . . They should have shown what the other group did. . . They didn't give any examples what the person did, if he read all the book and then gave the test with the book.

. . . . . I don't know what they mean by similar enrichment activities (for the control group).

--- (Direct instruction finding) - (teachers could ignore direct finding research based on a teacher's) Philosophy . . . In higher level thinking skills where there isn't a right or wrong answer. I don't think this is the only way to teach. I don't think indirect instruction is all that bad either cause that happens all the time in the classroom . . .

--- (National anthem finding) - Alot of things I didn't know what they meant, and couldn't get the concept. I learned it, memorized it, you know, I think especially in religion to make my first communion I had to laern all this stuff. I had no idea what it meant, but I learned it. And I found out when I got older what it meant.

Total = 12

Bryan

Hunkins & Shapiro - (main idea; 1 point) That kids don't do enough critical thinking; they aren't taught enough. What we give them doesn't require that they think critically, and that we need to do more of it, and if we structure it right, we can make them more critical thinkers. (manner of convincing; 1 point) in their discussion parts they say that their sampling did better, was more able to critically think than the sample that didn't (receive the "materials").

Paley - (main idea; 1 point) I think her main point was that as teachers we sometimes get so distracted with all the teaching jobs that we forget to stop and be flexible and really let kids say what they need to say. An underlying message might be that we all need to listen or watch ourselves teach, and pay more attention to what we're doing than we normally do or have time to do. (manner of convincing; 1 point) I think she admits that she was having some problems, that she was trying to figure out how to be better at what she was doing. And I think alot of examples she used, the transcriptions, help support what she was saying.

Cuban - (main idea; 1 point) as you're thinking about change for the schools you've got to look at the two different ways change can be effective, and which one are you going to change -- the quality or the structure? And if you're going to change the structure you better be real well-planned, you better think exactly how you want to do that, and that it's going to be real difficult. (manner of convincing; 0 points) He doesn't seem to have evidence to prove why he thinks the way he thinks.

Labeling types of evidence:

Hunkins & Shapiro - (1 point) test scores.
Paley - (1 point) - I don't know if Paley had a lot of evidence or support, well alot of stories and things went along with it, transcripts. . . I think she used alot of ethnographic data.
Cuban - (0 points) - I don't think that there was ever really any evidence presented to support why he thought the way he did.

Additional analysis of articles or research findings: (possible 2 points each).

--- Internal validity (Hunkins & Shapiro). It seemed rather simplistic. It almost gives you the impression that if you get the right materials and sit down, you're going to be able to get these kids to think critically. I'm not sure they look at all the different aspects. They don't talk much about different levels. But

what is the grade level? (0 points - the authors talk about the grade level. It's fifth grade).

--- Internal validity (Hunkins & Shapiro). I don't know if it says the same teacher taught these. Maybe it's the teacher that makes the difference.

--- Internal validity (Hunkins & Shapiro). It doesn't talk much about how well they isolated these kids from outside influences. If nothing else, just the fact that they were getting something different might have made the difference, or they might have known they were treated differently.

--- (National anthem finding) - Are you telling me that I shouldn't sing it anymore, are you telling that I should try to explain it? . . I think that memorization is good for things (as well as) group togetherness. I think starting the day out with a group activity that everybody can participate in is good.

Total = 13

Nick

Hunkins & Shapiro (main idea; 1 point) I guess the main point is that textbook lecture methods is not quite as effective as the case study method where you pick a case to illustrate a point and make that come more alive than just lecturing dates and names at students. (manner of convincing; 1 point) Well, they ran this experiment and they came up with all these wonderful numbers.

Paley (main idea; 1 point) What I saw as her main point was give the kids more credit. If you allow the kids their position and you really try to understand it on their terms you'll be able to do more with it, more with that information. (manner of convincing; 1 point) she gives examples. Besides her transcripts and her experience, there's no other real proof.

Cuban (main idea; 1 point) What I took from it is that reforming the school system in terms of curriculum or administration, the whole kit and kaboodle, is a difficult process. And we have tried different strategies to get at it before, and most of our strategies have been flawed, and therefore in the last 100 years or so, we're not that much different than we were when we started. (manner of convincing; 1 point) He sets up two different types of reforms, changes that have taken place, and he lists examples -- so there's classification. Then he goes through kind of a selective history and says, this is an example of this, this is an example of that.

Labeling different types of evidence:

Hunkins & Shapiro - (1 point) the case studies are more effective than lecture/textbook as teaching methods. For the evidence they do a (experimental) study.

Paley - (1 point) her whole transcript.

Cuban - (1 point) The theory was cleaner to me. In some parts, I guess I thought he was trying to show how well he could write . . . Cuban (says) here's something to think about and these are my (historical) examples which led me to my conclusions.

Additional analysis of articles and research findings:

--- External validity (Paley) - She did record everything and then she did transcribing, and then she did look for patterns. So, there is, I guress, for her sample the conclusions she draws are valid for her sample possibly, if she's not making huge assumptions in there. In some places, I can't see because I don't have all of her texts. Can you generalize from this? You know, is it useful for me? . . . They are not the same questions. But they're related. Because if you could generalize from her specific sample to a larger sample, my sample could be included.

--- Internal validity (Paley) - If you were doing this and leading the discussion, before you even got to it . . you might start to be expecting this, and you might be pushing it. And if you are expecting more, the more you get, to a point . . . . I mean she has a subject in mind and a way to discuss the subject may hit fairness, fantasy, or friendship. . . . And when those come up, I think her expectation may have slightly increased, and therefore, you would get increased participation. I don't know, this is just a little question I ask myself. Is this a fair objective test (of what topics kids wanted to talk about). And with case studies, it's hard to tell.

--- Internal validity (Paley) - It tends more towards literature. And I guess I would rather read her whole transcript and come up with my own conclusions, then read this and say, these are my conclusions, and here are two paragraphs that prove my point.

--- (Direct instruction finding) Not all students are concrete sequential learners. . . In terms of higher level thinking skills, you would think that this diminishes the possibility for that to happen. . . Indirect instruction is something that complements it very well. Where you give the children a certain set of phenomenon or information, um, what can you conclude from that. And then they have to think more than just regurgitate information.

--- (Ignoring good research) (use it) if it is comforable for you. . . I mean not every teacher can use every good strategy. That's probably why there's so many different strategies because there's alot of good teachers who have developed their own. If you can use a good strategy effectively, and it fits into your philosophy, use it. If it doesn't, I guess it would be counterproductive. . . . . Research findings, no matter how valid, that's not the end all. If that was the case, then we'd all be teaching robots (1 point: it can not be determined if philosophy means conception of learning.).

Total = 18

Geoff

Hunkins & Shapiro - (main point; 1 point) they had a hunch that inviting kids to enter into an arguments that was on a case card or something was a better way for them to develop the ability to wrestle with problems solving. . . They were saying let the kids wrestle, take sides (instead of lecture). They believed that method would work, and they tried it. And they had an experimental and a control group, and it was so clean it almost hurt. (manner of convincing; 1 point) They showed and used stats to show that there was a significant different in the experimental group as opposed to the control group.

Paley - (main point; 1 point) You have to be truly curious about what the kids are saying, and not be just looking the right answers. (manner of convincing; 1 point) She said early on that she was too task-minded. . . (and she wanted) to let the kids play off each other and not be determined already of what the final account is going to be. Then she goes on to say she's going to search for what that really means by trying things with kids, and she gives examples of trying thing with kids.

Cuban - (main point; 1 point) What are we really asking, what is really the problem here. He break it down into generally two types that you call first order and second order types of changes. It's a nice reference to look at this thing . . . Embedded in there is to be prepared to be patient if you are gong to look for whole school changes for teachers in a class with 30 kids. (manner of convincing; 1 point) I think he resorts or relates it to this NASA thing he talks about. I think the proof that he's given me in this article is, let's just think about how we solve problems, how scientists go about doing that, about how people formally go about attacking a situation in a scientific sort of thing. We have to be clear what it is that is the issue. I guess he doesn't need to connect that to alot of evidence since that's a pretty accepted way of doing it.

Labeling types of evidence:

Hunkins & Shapiro - (1 point) Paley and Hunkins & Shapiro both give evidence that the kids were able to do something when they did what the researchers asked them to do. . . But the way they tried to prove it was different. (The evidence in Hunkins & Shapiro) is a comparative study with a control group.

Paley - (1 point) she gives examples of interactions.

Cuban - (0 point) I think he just draws back to how people solve problems that are intelligent. How do they go about it? And we're not doing that with this one. . . And I think he assumes we have some understanding of good problem-solving behaviors.

Additional analysis of articles or research findings: (possible 2 points each).

--- Internal validity (Hunkins & Shapiro) I guess I don't know what they did in the control group that much. They were kinda brief about that. It just said -- if they said -- that they did it in a traditional way or something. I assume that meant that you read out of a text, were lectured, and then you take a test.

--- Internal validity (Paley) I think she kept having some hunches that she kept looking for evidence to see. But she seemed predisposed to believing it anyway at times, and so that's where I guess the care in structuring an instrument . . . that you make sure that you are not just saying, god, I know I'm right about this, and I'm going to go prove it to myself by finding the right sort of responses.

--- (National anthem finding) I may have a belief that it's important for us all to be loyal beyond understanding at that age.

--- (Relevance of reading a study) I'd want to see the research he's talking about (when the psychologist tells the teacher the finding about the national anthem).

--- (Relevance of reading a study when a research finding suggests good evidence for a teaching practice) it gives me good reason to read it thoroughly, to understand, to make sure I read whatever I need to read about it to understand it, and to try it, to experiment. . . To not say, oh yeh, that's just politically done so that they can get the grant next year. But instead to look at it critically and think, is there something there?

Total = 18

Kathleen

Hunkins & Shapiro - (main idea; 1/2 point) The main idea was that elementary schools can and must play a vital role in the development of critical thinking skills. That's the main idea, and the reasons is because kids have to be able to keep up with scientific and technological advances. (This is from the first paragraph of the article. The main idea relates just as much to whether and how fifth graders can be taught critical thinking skills.) (manner of convincing; 1 point) they used this one piece of research . . . . and then with the case studies there was a test that was supposed to test improvement.

Paley - (main idea; 1 point) What she was saying was that it is important to listen to children. That I thought was her primary message. (manner of convincing; 0 points) She didn't. I already knew that. I mean I think that's sorta of self-evident that we oughta really listen to kids. Now, she went to great extremes and alot of analysis in her own mind about what was going on with these kids, and she just lost me.

Cuban - (main idea; 1 point) The main idea was that changes that can fit into the structure of school as it has been with the various roles defined. That (type of change) has much greater chance of succeeding than if it is a radical change in the structure, the design. (manner of convincing; 1 point) First of all he broke them down into the kinds of reforms that have been attempted. The first order kind -- improving the efficiency and the effectiveness of the school structure as it was and has been for a long time. He makes a long list of those. And then some of these other ones -- open classrooms, non-graded schools -- the second order, which is a major design changed. And he showed how those simply lasted for a while and then radically watered down and fit into the existing structure as it was.

Labeling types of evidence:

Hunkins & Shapiro - (1 point) an actual experimental situation.
Paley - (0 points) none.
Cuban - (1 point) reviewing the literature to find out how schools had in their present shape and form and role delineation had come about. And then also, from the literature he pulled out the various kinds of reforms that had been attempted.

Additional analysis of articles or research findings:

--- Drawing conclusions based on main idea and evidence (Cuban) - I thought he developed it just beautifully and supported it with facts very nicely. . . . . It makes you understand why there is so much wasted effort and time. And if you have an understanding of this, when new things would be proposed, I think I could take a look at it very quickly and say -- That doesn't have a chance (or) that's going to be a short term thing, or yeh, that has some real possibility. . . . . When as a teacher you serve on curriculum committees where the objective is to think about what kind of things should these kids have in the next 10 years to fit into the real world -- this kind of thing can be very helpful.

--- Internal validity (Hunkins & Shapiro) - The control group and the experimental group came from the same new developments and they had equivalent IQs and equivalent reading levels. And probably their backgrounds were somewhat similar. New developments in suburbia. . . . So I think the groups were well-matched.

--- Internal validity (Hunkins & Shapiro) - It was neat because it was the same teacher for both classes. . . . . The fact that you had the same teacher for both groups was excellent. You didn't have to worry about the teacher variable (one point - Kathleen does not note that one of the investigators did the teaching for both classes. Especially given the authors' advocacy of critical thinking, this is a problem).

--- Construct validity (Hunkins & Shapiro) - And then with the case studies there was a test that was <u>supposed</u> to test improvement. Now I don't know anything about that, but they say so, so you accept that I guess. Although I always questions a little because I don't really know.

--- (Direct instruction finding) - It just says that this is one way that is effective. And if this appeals to a teacher's teaching style -- I think any teacher reading would know whether this was his or his style. But it doesn't say that other ways aren't effective. So, I wouldn't say that they should use this then. . . . It might be too rigid (for students' learning styles also). (one point -- focus on teaching and learning <u>styles</u>.)

--- (National anthem finding) - But I would certainly keep them singing it because it's much more (than understanding the words). It has all kinds of symbolic significance to kids. . . . It gives them a feeling of participation in a ceremony that has to do with their country, freedom. I think they would probably grow up with respect for the flag, find some other way to protest -- a more dignified way to protest than stomping and burning the flag . . .

--- (Ignoring good research) I don't think that you have to do everything good research says. For one thing, good research may very well be good research, but it doesn't mean that there aren't other ways of doing things equally well, getting the same outcomes. Cause there are some things they can't research very well. I have seen very little on how a teacher interacts with a student who has to learn a whole lot of social and study skills and has an absolutely incredibly bad home situation that you can't do a thing about. . . And becuase of that kid's particular achievement level, background, difficulties, and emotional state, you may have to adapt teaching that child that is a little bit unusual. But it fits that kid and it works, and that's what you're going for, And you don't worry about what the research says -- . . . It focuses on the general; and in general, it does meet the majority of kids' needs; but not every child's need.

Total = 18.5

Fran

Hunkins & Shapiro - (main idea; 1 point) (critical thinking) is something that could be taught. Critical thinking can be taught to a greater degree than letting it happen. (manner of convincing; 1 point) By simply having 2 groups, a control group that uses the lecture textbook approach, and then having the other group, and measuring the outcome of how they react to the same issues or materials.

Paley - (main idea; 1 point) looking at the child's world with them, letting their world occur and look for sensemaking through their stories. Not guiding or misguiding them. Many times not really understanding their world, but continuing to question and trying to understand (them). . . . Instead of jumping right away and thinking you know what children are saying and doing, you need to problem a little deeper. (manner of convincing; 1 point) stories.

Cuban - (main idea; 1 point) how can schooling have changed so much over the last century, yet still appear pretty much the same as its always been. (reading) If policymakers and practitioners understood the inherent dilemma of schooling and could distinguish between types of planned change, a very different dialogue about the problems that beset schools would occur. (manner of convincing; 1 point) He went back and used reference to research or articles, or act that had been implemented. He talked about previous reforms that had not worked.

Labeling types of evidence:

Hunkins & Shapiro - (1 point) control group and statistics to support their findings.

Paley - (1 point) tapings and dialogue and stories.

Cuban - (1 point) he did a review of the past literature events and history, (he took a) historical perspective.

Additional analysis of articles or research findings: (worth a possible 2 points each).

--- Noting relevance of reading studies to determine their validity - We as teachers are very willing to have people tell us that this works, so therefore we assume it works somewhere else, and therefore assume it works with us. Or, if we say it doesn't work with us, then they'll tell you you're not using it properly, or maybe there's something wrong with you. . . This is one key issue that struck me. I also think that we need to be tenacious enough to keep at an issue until we come up with some answers. Even if we have to go back to the source of the research, and say, what kind of control group did you have? How long a period of time was this? That type of thing.

But we're too willing to accept kind of a top down approach . . . and as a teacher you start questioning, and you're getting into some very touchy ground.

--- Noting relevance of reading studies (reference to external validity) - School systems seem to jump on the bandwagon too quickly wihtout laying down the groundwork for it, without looking critically, carefully at their population. I found it amusing that they would bring something back to our schools and say this will really work when the population in our school just did not fit the kind of model that someone had designed for a large urban school where kids dodge all kinds of problems everyday. Our kids have problems, but not the same kind of problems. . . . . (One has to ask) how does this fit with the on-going philosophy of the school district, or the population in our school-district.

--- (Direct instruction finding) - My question is, does it narrow the amount of learning that child would learn. . . So if you do direct instruction, the low ability students will learn more. And I suppose the average ability students will learn more. But what about those above average students who grasp it very quickly. . . . Higher ability students can process things at a higher level -- as opposed to a child who needs to be taken through step by step. (1 point; The finding speaks to this issue somewhat, and Fran overlooks it.).

--- (Noting relevance of reading studies that are on a reference list). Interesting the references (on the direct instruction finding). . . . . I also would think that you have to be aware of who the researcher was and what that perspective was in order to do that kind of thing. And while I'm not as knowledgeable as I should be, I do read teacher magazines and periodicals. And I particularly read in one of the articles I receive -- there's a monthly article by Berliner -- and I kinda know the perspective and I don't always disagree with it, but I don't always agree. . . . I see some of the people on there (the reference list) as being very prescriptive.

--- (National anthem finding) - Well, first of all there may be something in them singing that brings about a source of community. It may not have anything to do with the words of that particular song.

--- (Ignoring good research with reference to its external validity). (If) you came to me and told me that this (teaching practice supported by research) will work in my classroom. And I work with an entirely different population, entirely different economic system, entirely different educational background. Your research might prove quite well-founded based on the population you did your research, but it does not work with my kids. Yes, I would refuse it.

Total - 20

Ana Marie

Hunkins & Shapiro (main idea; 1 point) Teaching critical thinking is a good idea. . . . . It did show that with the kids there was a response to some of the different methods they were using (manner of convincing; 1 point) (the experimental group) raised the scores on the test.

Paley (main idea; 1 point) Listening is the key to observing, interpreting, and integrating the living drama of the classroom. And I took that right from her article. (manner of convincing; 1 point) The evidence she gave was . . . the conversations the kids had.

Cuban (main idea; 1 point) I think that he wanted to address reform, and how is it done, how it is being done, and the different ways that it's been done. . . . I think he was saying that it's alot easier to make first order changes because second order changes would require basic social and political changes to occur outside of schools. (manner of convincing; 1 point) I think he did do some research about previous school functions . . . He had done alot of reading and came up with some of his own ideas about school reform and pulled them together. . . . I could take it as evidence because I've been in this system and I know exactly what he's talking about.

Labeling different types of evidence:

Hunkins & Shapiro - (1 point) test results.
Paley - (1 point) I think that the Paley article didn't use much. Well wait, the evidence she sued was just her own experience in the classroom. The evidence that they used was what they learned in the classroom. . . . and she referred to other books, her own book. So I think that she was pretty much just writing about her own experience with a group of children.
Cuban - (0 points) Cuban did go back and kind of set a framework of information from other writers.

Additional analysis of articles or research findings

--- Internal validity (Hunkins & Shapiro when describing the two groups in their sample) Listen to this sentence. Most of the families were engaged in skilled and professional work making the area slightly above average when compared to other neighborhoods in the city. Above average in what? Does that sentence make sense to you? Did they mean that made the community of slightly higher socio-economic status? . . I didn't think that that made sense.

--- Construct validity of tests used in the study (Hunkins & Shapiro). I don't know enough about the Otis IQ test to know what the reliability of it is. Okay, and then they used the Stanford

Achievement test scores for their reading ability. And I know just from my class that if they took the California Achievement test scores for my class, it would not necessarily be a real accurate -- but you have to use something and I understand that. You have to use something. . . . Also, you don't even know the tests that they used (to determine improvements in critical thinking between the two groups).

--- Questioning further the data's consistency (Hunkins & Shapiro) I wasn't really sold on the case study method. But then as they on, they talked a little bit about the kids who had been in the case studies, and they made statements like this: the pupils seemed to develop a probing attitude after experiencing these discussion. What does that mean? What did the children do that indicated they had developed a probling attitude? If they had said, the pupils asked questions that probe deeper . . . That seemed like an awfully general thing to say.

--- Internal validity (Hunkins & Shapiro) They say that with the control group they used similar enrichment activities. They should have been the same activities. The same activities should have been given to them, don't you think? The only thing that should have been different was that they used the case studies.

--- Drawing conclusions based on main idea and evidence (Paley) I would be really really cautious about drawing any conclusions from what her experiences were. I think it gave some really good ideas -- put a tape recorder in your room or listen to the kids while they're playing . . . . I put down that there were too many variables. The teacher and her teaching style, her interests, the development age of the kids, the chronological age of the kids. To draw conclusions, you don't any of that information about them.

--- (National anthem finding) Third graders don't need to fully understand them (national anthem concepts). It's okay to talk to them about it and let it sit with them where it sits at that point in their life. And hope that's a foundation for it to grow and mean more as they grow older. Love is an idea that children don't understand fully in third grade. But that doesn't mean that we don't teach them about it.

Total = 20

Cheryl

Hunkins & Shapiro - (main idea; 1 point) I think the main point here is that materials that are simply lectured to kids and no parallels drawn, no relevancy to today, um, it has to be one step more -- there has to be interaction that the learner has with the knowledge base. (manner of convincing; 1 point) They try to give pre and post tests between case method and the lecture/textbook method.

Paley - (main idea; 1 point) I think the main point was that teachers need to be curious about why kids respond the way they do to questions that they're asked or to the world that they live in. (manner of convincing; 0 points) She didn't. . . I wasn't convinced of anything because it was a given before she began (Cheryl tranlates, how did she try to convince with, did she convince).

Cuban - (main idea; 1 point) He pulls it (the idea of reform) apart, teased it apart, and looked at it a little bit differently in terms of why some of the reforms are not going to work . . . . He's got a set of things that can be changed, things that can be worked on, and things that can't. And the problem with reform is that we try to change the things that are so strongly embedded in the system that it can't work. There's too much from outside. (manner of convincing; 1 point) Well, he gives some specific examples (of reforms), Sizer's work, and he used alot of general, general observations about the way schools work.

Different types of evidence:

Hunkins & Shapiro - (1 point) description of a method and then test results.
Paley - (1 point) classroom dialogue.
Cuban - (1 point) historical references.

Additional analysis of articles or research findings:

--- Internal and external validity (Paley) It's not really research to me until it's added to a battery of additional observations. For instance, if Paley did this over a long period of time, did it in her classroom as well as someone else's, and they could draw some generalities out of that, I think I would probably tend to take it more seriously than if it's one isolated space.

--- Creating and explaining distinctions based on the article (Cuban) I think the use of words is interesting . . . Provocative and interesting this whole reformation thing struck me, and the question of democracy in schools as an oxymoron, a word that contradicts -- democracy in schools is a phrase that probably deserves a whole lot

more attention than it gets . . . And I think he opens up the door to thinking about those issues . . .

--- Questioning further the data's consistency (Cuban) Structurally the schools I've been in in Japan and England and here -- including the New York high schools for the performing arts, didn't structurally look very different than our schools . . . I think schools around the world -- the very definition of school itself has some implied kinds of relationships between teacher and student and teacher and principal that I have not seen very often to be terribly different, even if you were in a very different political and social system.

--- Creating and explaining distinctions based on the article (Hunkins & Shapiro) I don't think I understand what critical thinking is. I've been reading a number of articles about critical thinking and I'm not sure what it means. Because the question I keep having to deal with is -- as opposed to what kind of thinking, non-thinking? But that isn't really thinking. Critical thinking as opposed to memorization? Would that be an opposite pole? It's really hard for me to conceptualize any other thinking except critical thinking because that's what thinking is to my grain. If you're thinking hard about something, you're thinking critically -- you're looking at the pros and cons, the different sides. I still have alot of trouble with the term, so the article was interesting to me because I've been trying to get a handle on the term.

--- Creating and explaining distinctions based on the article (Hunkins & Shapiro). What was very interesting to me was that this whole American revolution example -- it seemed to me that the children first had to have some kind of background on the american revolution. They had to first have some knowledge base. Then they could . . . see the same concepts from 200 years ago still operating in a modern day situation. And that made me do alot of thinking about what you do first. Do you give kids the mock situation and then have try to apply it to something academic that they're working with, or do you give them the academic base and then ask them to apply it. Or, maybe it doesn't make any difference as long as you are giving them some kind of way to process new information . . . But in the model, although they did not say it, I'm assuming that the children had to have some background in the american revolution before they began the case studies.

--- Internal validity (Hunkins & Shapiro) Anyone who has seen a middle school american history text would have a clue how god awful boring those textbooks are. So, anything a teacher did, absolutely anything that was past the level of outlining the text and doing fill in the blanks would certainly make a difference -- even if kids read the text dramatically out loud for fun -- I think you'd get a significant score difference because these particular of textbooks are notorious for being dry. So, I'm not sure it's particularly the

case method that could be making a significant difference, but that's it's a break in a routine, dry, pattern.

--- Construct validity (Hunkins & Shapiro) I still would have had the same question about the test itself, and how it was scored, and if they're testing critical thinking. I have lots of questions about what a test would look like that tested critical thinking.

--- (Direct instruction finding) I am not sure I agree with the finding on the onset. I'm not at all convinced that the kids need to before they start what they are expected to learn and what all the steps are. If science taught us anything at all, it is that there is a distinct difference between deductive and inductive reasoning. And sometimes in the classroom I think it's much wiser for a teacher to set up experiences and then let the kid figure out what the heck they learned out of that than to tell them ahead of time this is what you're going to learn. . . . I'm not sure kids want or need to know about the goals in their learning. When you're dealing with poetry, there's not a single goal. And I'm not sure that even if you could formulate it that you'd ever want to tell the kids ahead of time because then what you're taking away is their investment and willingness to react in the class. (Cheryl goes on to say that this type of finding would also be a problem at the elementary level) . . . The conclusion I would draw is that somebody is trying to find very simplistic answers to very complicated questions.

--- (National anthem finding) I think there's an awful lot of things I know that I don't understand even now, but I'm so glad I know. Poems that I know by heart that I think about alot. I'm not sure I really understand the concepts (i.e. implicit is everything that you learn you do not have to understand for it to be valuable; 1 point).

--- (Ignore good research) If there's good evidence to show that screaming at kids and being abusive to them makes them obedient and score higher on tests because they are scared, I'm not interested and I really don't care how good the research is. As a professional that's my right to make those judgements within the parameters of what I believe is important in my classroom. . . . I think lots of time we discard perfectly good research for alot of wrong reasons too. But I think it would be irresponsible and unprofessional for every teacher in the country every time a good piece of research came out to go whole hog into it.

Total = 27

APPENDIX C

DESCRIPTION OF MASTER'S LEVEL COURSE ON CLASSROOM RESEARCH

AND

TEACHERS' COMPARATIVE ANALYSIS OF THREE ARTICLES

DESCRIPTION OF MASTER'S LEVEL COURSE ON CLASSROOM RESEARCH

TE 829 -- A Seminar in Curriculum and Teaching:
Introduction to Classroom Research
Spring, 1990 -- Michigan State University
Department of Teacher Education

Course Description: This course is designed to present an overview of educational inquiry about classroom practice with an emphasis on understanding resaerch as one tool for asking questions about classroom practice rather than using research as providing answers or a set of prescriptions for practitioners. This course is not intended to teach you how to conduct research but rather to give you an opportunity to think critically about how research can inform educators about teacher practice, student learning, and curricular issues within the school context. You should gain an understanding of the research questions, methods and findings embodied within three conceptual orientations to social science inquiry: instrumental, interpretive, and critical theory. In addition, you will learn how to read and critique various forms of research publications, such as: research articles, reports, case studies, historical studies, and essays. You should also come to understand that research represents various human interests and beliefs, that research is ever evolving, and that research takes place within a social, historical, and political context. Finally, you will learn how to become a wise practitioner in relation to classroom research as you begin to make connections between the questions, ideas, and techniques represented in that research and the questions, ideas, and techniques that originate from your own teaching and/or administrative practice.

Readings: A packet of readings will be available. A complete reading list is attached to the syllabus. Readings for each session are indicated in the course schedule.

Course requirements and grading:

Participation. Since the course will be run as a seminar, your participation in discussions is important, not only for your own learning but also the learning of others. This requires careful analysis of the assigned readings (approximately three per week) as you think about the content of the readings, make connections to your own practice, and consider how you will participate in the class discussions. The quality of your participation in the seminar will comprise 20 percent of your final grade.

Analytic Memos. You will write three analytic memos, approximately three to four pages in length. Each memo will be based on one reading for a particular week and chosen by the instructor. This assignment requires that you succinctly discuss various key points of

a research article. In addition, an opportunity for reflection will be built into the assignment so that you are able to keep track of your own questions and concerns as well as respond to those questions and concerns of educational researchers. The format for the assignment will be distributed in class. The analytic memos will be worth 30 percent of your final grade (10 %) each.

Group Projects. There will be an activity designed for small groups of participants which reflect the ideas and methods used within the various research traditions. Participants will choose an educational issue for which they might like to pursue a line of inquiry and develop plans for a potential research project. This activity will be initiated in class, will require some time outside of class, and a short, informal presentation in class. The quality of this project and your presentation will determine 20 percent of your final grade.

Final Project. The final paper will build on the baseline data you provided during the first class when you responded to questions regarding your conceptions of research. The focus of your paper will be the evolution of your conceptions of research. The final paper will determine 30 percent of your final grade.

COURSE SCHEDULE

Session # 1 -- March 28: Getting Started
Response to and analysis of vignettes which portray the various ways teachers see the influence of research. Overview of course content and policies.

Readings: (to be done in class)
L. Cuban. A Fundamental Puzzle of School Reform.
Hunkins and Shapiro. Teaching Critical Thinking in Social Studies

Session # 2 -- April 4: What is Research?
Discussion and analysis of assigned articles. Build a semantic map of our personal conceptions of research. Discussion of what research is.

Readings:
L.J. Cronbach and P. Suppes. Research for Tomorrow's Schools: Disciplined Inquiry for Education.

Vivian Paley: On Listening to What Children Say.

Written Assignment Due: Analyses of Research Articles (using questions in Interview Protocol, see section VI, questions 3-9 in the protocol)

Session # 3 -- April 11: Why Research?
Discussing different perspectives on how research may influence teachers' thinking and practice.

Readings: D. Berliner. Knowledge is Power.
C. Clark. Research in the Service of Teaching.
G. Fenstermacher. On Understanding the Connections Between Classroom Research and Teacher Change.

Session # 4 -- April 18: What Guides Research?
The relationship between underlying conceptions of teaching and learning and research agendas.

Readings: S. Rowland. The Enquiring Classroom.
D. Phillips. What Do the Researchers and Practitioners Have to Offer Each Other?
K. Zumwalt. Research on Teaching: Policy Implications for Teacher Education.

Written Assignment Due: Reflective Writing

Session # 5 -- April 25: Introduction to the Processes of Educational Inquiry and Issues of Educational Equity

Examining the logic of social science inquiry. An overview of the research continuum. Analyzing examples of research on educational equity.

Readings: J. Anyon. Social Class and School Knowledge.
J. Coleman. The Concept of Equality of Educational Opportunity.
J. Oakes. Twenty-Five Schools.

Session # 6 -- May 2: Introduction to Research Traditions and Research on Student-Teacher Interactions

Introduction to prominent research traditions. Examine differing perspectives on teacher-student interactions.

Readings: K. Au and C. Jordan. Teaching Reading to Hawaiian Children.
L. Cuban. How Teachers Taught. Chapts. 1 and 3
Palincsar, A. The Role of Dialogue in Providing Scaffolded Instruction.

Session # 7 -- May 9: **Continuing to Analyze Research from the Various Research Traditions and Research on Teaching Mathematics**

Readings: S.H. Erlwanger. Benny's Conceptions of Rules and Answers.
Good, Grouws, and Ebemeier. Building a Treatment Program.
Lampert, M. Mathematics Learning in Context.

Session # 8 -- May 16: **Research on Classroom Management**

Readings: C. Cummings. Management.
C. Evertson and E. Emmer. Effective Management at the Beginning of the School Year in Junior High.
M. Lampert. How Do Teachers Manage to Teach?

Session # 9 -- May 23: **Evolution of Research**
Research as an evolving process.

Readings: L. Anderson, et al. Making Seatwork Work.
G. Duffy, et al. How Teachers' Instructional Talk Influences Students' Understanding of Lesson Content.
L. Roehler, et al. Teacher Explanation During Reading Instruction.

Session # 10 -- May 30: **Teachers as Researchers**

Readings: M. Cochran-Smith and S. Lytle. Research on Teaching and Teacher Research: The Issues That Divide.
E. Duckworth. Teaching as Research.

Session # 11 -- June 6: **Final Exam Week**

Teachers Work on Comparative Analysis of Three Articles
(see below)

A COMPARATIVE ANALYSIS OF THREE ARTICLES

Final Project
TE 829
Spring, 1990

-- For this final project you will select two research articles from the syllabus that represent two different kinds of research. You may select from these articles:

D. Phillips, J. Anyon, L. Cuban, A. Palincsar, S. Erlwanger, L. Anderson, M. Lampert (mathematics article)

In addition, you will be given one new article to use in your comparative analysis -- C. Cummings, Motivation, Chapter 8 in Teaching Makes a Difference (1983).

-- Please respond to the following questions in a way that represents a coherent argument rather than responding to one question at a time for each article.

1. In light of what you think research is, do the articles seem like research to you? Why or why not?

2. Briefly state the main thing the author seems to be trying to convey. In other words, what is the main message and/or what do you think the intentions of the message are?

3. What does the author do to convince you that the message has merit?

4. Are there different types of research evidence used in the articles that you chose? Explain.

5. Was any message/evidence more convincing to you? Why or why not?

6. In light of how you think research should help teachers, does any article succeed more than any other? Why or why not?

7. In what ways does you analyses of these three articles differ from your first written assignment of the term when you analyzed the Cuban, Paley, and Hunkins and Shapiro articles?

-- Your paper will be evaluated on (1) the logical flow and congency of your argument; (2) your use of a few, well-chosen, and specific examples and sources of evidence from the readings and class to support your arguments; (3) your use of standard spelling, grammar, and syntax.

LIST OF REFERENCES

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