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Crossing conceptual borders : teacher research as a process for change

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**CROSSING CONCEPTUAL BORDERS:
TEACHER RESEARCH AS A PROCESS FOR CHANGE**

**A Thesis
Presented To
The Faculty of the Division of Teacher Education
San Jose State University**

**In Partial Fulfillment
of the Requirements for the Degree
Masters of Arts**

**by
Amy M. Huddlestun
December 1996**

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ABSTRACT

CROSSING CONCEPTUAL BORDERS: TEACHER RESEARCH AS A PROCESS FOR CHANGE

By Amy M. Huddlestun

This thesis suggests that teacher research can be an effective process for teachers in crossing conceptual borders. This qualitative study involves teachers-as-researchers as they examine the personal and social impact of their taken-for-granted cultural assumptions. Conducted with teachers at an urban elementary school in San Jose, California, I document the change process as teachers reflect on their teaching and change. Such a critical examination is the result of grappling with, and incorporating, new approaches to the teaching of mathematics.

The findings of this research reveal modernist assumptions undergirding teachers' conceptual frameworks as they encounter change in education. Documenting the shifting understandings of participants regarding a new mathematics curriculum, this research suggests that critical teacher researcher may provide liminal space for reflection and transformation in moments of school reform. Such spaces may enable teachers to question assumptions, re-examine their roles as creators of curriculum, as well as critically discuss reform.

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My gratitude is extended to the research participants at the school site where this research took place. The full participation and guidance of those at the site helped breathe life into this thesis. It is their voices which touched me as a researcher and provided the lens through which the story of this research is told.

Finally I would like to thank my husband Derek and my family for nurturing me and for their patience. The support from each of them has given me the incentive to engage in this period of transformation. Furthermore, they have taught me the value of learning as a life-long and life-affirming process.

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CHAPTER ONE

POISED UPON THE BORDER

...borders are those spaces, both geographical and conceptual, where contradictions of power and repression, resistance and rebellion are painfully visible (Calderon 1990, 561).

Many borders exist in the world. From political to historical, social to economic, spiritual to geographic, borders are “established to protect what is “ours” from danger, from the “alien,” because they are also places inhabited by what is forbidden” (Calderon 1990, 561). Calderon plays with this metaphor of border crossing, referring to it as becoming *atravesada*, a border crosser. Whether it be a border in the geographic sense, the kind of borders which circumscribe our cultural and political understandings, or conceptual borderlands in our thinking, at some point we all stand poised at the crossroads.

Border crossing can be a metaphor for our making sense of blurred lines of certainty. As a lens through which we view our world, our paradigms represent borders in a metaphorical sense, creating patterns of reference that play an integral role in the construction of our understandings. The perspectives with which we view the world impact our decisions, beliefs, and actions, therefore, consideration of the paradigms upon which these assumptions rest is essential to self understanding and change. With this metatheme in mind, I examined the conceptual shifts made by a group of teachers at Gene S. Cloverdale Elementary School in Washington-Irving School District as they conducted

qualitative classroom research and engaged in an examination of their teaching practices.

Through analysis of personal observations, interviews, and informal conversations, I have documented changes in the quality and content of conversations among these teachers, their ideas and thinking about teaching and learning, and more broadly, evidence of their becoming *atravesada*, border crossers.

The literal sense of the border as a political boundary to immigration has long been a source of strife. Border crossing issues regarding immigration, however, often mask deeper anxieties about more imbedded conflicts of race, culture, and economic well being. Border crossing involves confronting issues of difference and change in societal, organizational, and institutional relationships.

Some borders present themselves clearly while others swell beneath our cultural and political views of the world. In the conceptual sense borders can symbolize shifting and transforming our understandings. Such shifting requires us to reconsider, reprioritize, or abandon our most treasured beliefs and assumptions. Only when such assumptions are brought to light is it possible to free ourselves from the confines of our own limited visions, enabling us to transform our thinking. Renato Rosaldo (1989) carries this idea further, stating,

More often than we usually care to think, our everyday lives are crisscrossed by border zones, pockets, and eruptions of all kinds. Along with “our” supposedly transparent cultural selves, such borderlands should be regarded not as analytically empty transitional zones but as sites of creative cultural production that require investigation (Rosaldo 1989, 207-8).

Rosaldo's (1989) optimistic view regards borders as more than place markers or barriers. For Rosaldo, borders become a metaphor for opportunities that can bring growth, change, and transformation.

Rosaldo's reference to borders as transitional zones eludes to their liminal quality. As teachers engage in making taken-for-granted beliefs explicit, a moment in the social and conceptual time of schooling is created where redefinition of meanings and practices can be made (Bowers 1987). This period of openness, of liminal space, is one in which transition and transformation are possible. Victor Turner (1974) describes this liminal space as being "betwixt and between" established patterns of thought and behavior.

Bowers (1987, 7) describes this period as one in which "new definitions can be presented and the conceptual foundation of authority renegotiated." It is this liminal quality, created as teachers grapple with issues related to their own practice, which may allow for transformation in their thinking and acting in education. It is this liminal space created as teachers engage in research on their own practice that may provide a context for becoming *atravesada*.

Education and Reform

Throughout this century, education has been the center of great controversy evidenced by many struggles and debates about diversity, resources, professional development and classroom methodologies. As a result, these "great debates" have emphasized a need for school reform and restructuring. The recent impact of these

debates can be seen in reform movements from reform in the *Mathematics Framework for California Public Schools* (1992) to the Charlottesville Educational Summit of September 1989 and more recently the reform package set forth in *America 2000*.

These reform efforts share a common thread that is embodied in a modernist conception of educational leadership. This thread is expressed in the desire to exercise control over the social and natural world, as well as in efforts to organize schooling and curriculum based on a belief in linear utilitarian and objective progress. Such reform efforts have often resulted in the isolation of teachers and generally fail to lead to substantive, long term change (Maxcy 1994). The real impact of such reforms, however, are alluded to by Owens and Steinhoff when they state,

Regardless of how captivated a school administration may be by a new idea, the real test of change in schools rests on the extent to which the organization... moves to put the idea into practice (Owens and Steinhoff 1976, 10).

Reform movements such as *America 2000* present an “agenda and a purpose for schooling” from an elitist standpoint, promoting top-down educational leadership approaches. Such views of schooling are “based upon a celebration of cultural uniformity” and a “return to the transmission model of teaching” (Giroux 1993, 14). The notion of educational leadership and reform put forth in programs like *America 2000* impact how administrators and teachers may view their roles. Informed by an ideological framework endorsing standardized testing and the “reprivatization of public schools,”

such approaches to reform fail to address the role schools must play in improving democratic public life (Giroux 1993).

Traditional reform efforts have emphasized standardized testing and the development of standardized curricula, giving little attention to teachers' understandings about the role of knowledge and power. Furthermore, a concern for the bottom line has drawn parameters which prescribe de-skilled roles for teachers. This de-skilling is manifested in pre-packaged curricula, as well as in standardized, norm based assessment models.

Such modernist oriented reform movements have ignored the "language of community, solidarity, and the public good," and have failed to strike a balance of power (Giroux 1993, 19). Instead schools have been revisioned as adjuncts of the corporation, emphasizing training of teachers as workers modeled on capitalist industrialized ideology (Shor 1992). Change and school reform, championed by school leadership as a means to address what has been called a "crisis in education," have failed to deliver on their promises of substantial change (Maxcy 1994).

The "New Math"

One area in which teachers find themselves facing change and reform is within the mathematics curriculum. There has been much controversy over what has been termed the "new math." In response to findings published in the new *Mathematics Framework for California Public Schools* (1992), much of the controversy has centered around

textbook adoptions. These adoptions accompany the philosophical underpinnings set forth in the *Mathematics Framework*. Emphasizing the need to reason logically and clearly, as well as focus on process rather than merely the number outcome, the “new math” has as its goal the development of mathematically powerful thinking. To be mathematically powerful is to have the ability to “discern mathematical relationships, reason logically, and use mathematical technique effectively” (1992, 1).

The 1985 edition of the *Mathematics Framework* (California Department of Education 1985) emphasized mathematical power for all students. It has influenced a number of other publications with the same goal. These publications, including *The Mathematics Model Curriculum Guide* (California Department of Education 1987), *Everybody Counts: A Report to the Nation on the Future of Mathematics Education* (National Academy Press 1989) and others, have influenced national, state, and local initiatives seeking reform in mathematics. Viewing reform as necessary, the current *Mathematics Framework* “asks that teachers and students raise their expectations and expand their vision of what can happen in a mathematics classroom” (1992, 2).

In keeping with the National Commission of Teachers of Mathematics’ (NCTM) strands set forth in the *Mathematics Framework for California Public Schools*, as well as in relation to the documents mentioned previously, publishers sought to become the adopted math text for California school districts. One such publisher, Creative Publications, has become the focus of controversy in the Washington-Irving School

District. Creative Publications' *Mathland* series was selected by a committee of teachers and administrators, in partnership with a district math committee. The committee's evaluations of *Mathland*, based on criteria generated from the *Mathematics Framework for California Public Schools (1992)*, gave the series a score of 98 out of a possible 100. This series received the highest evaluation of any textbook series under review for adoption (Estrada 1995).

What are the tenants of this "new math" approach set forth in the *Mathland* series? The series is purported to embody and foster in students,

...the ability to reason logically and clearly, trust their own conceptual framework, challenge historical thoughts and strategies, critical thinking, problem solving, and action in a team to develop richer solutions and depth of understanding (Estrada 1995).

Founded on the belief that knowledge is socially constructed, the *Mathland* curriculum moves beyond rote memorization of facts and figure, toward the development of "mathematical power." Echoing the 1985 *Mathematics Framework*, the emphasis of the *Mathland* series according to Creative Publications (Estrada 1995, 2) is one of a fundamental "concern for equity, giving every student in California fair access to mathematics education." The 1992 *Mathematics Framework* echoes the 1985 document and describes mathematically powerful students as those who "think and communicate, drawing on mathematical ideas and using mathematical tools and techniques" (Estrada 1995, 3).

Past math programs have focused on number, purportedly “minimizing the mathematical experience.” The *Mathland* literature claims to provide students with a mathematical “toolbox” containing a variety of “tools” to ensure access for all students. Using a variety of strategies, including an emphasis on communication and talking, students share ideas about mathematics and come to an understanding of math through “interactive math and language study” (Estrada 1995).

Such a change in orientation about the teaching of mathematics is not an easy one to make. Traditions of teaching run deep and beliefs about how to bring about changes in teacher’s practices tend to coalesce around in-service focused on indoctrination into new techniques.

Background of the Problem:

Teachers-as-Researchers and Change

Jananjelo, et al. (1993, 197) claim “change is really about asking questions and finding out what is going on at a given time, in a given place.” Often teachers are not part of such a questioning process. Without the opportunity to ask important questions and redefine relationships with change, resistance and fear may grow as a response. Hargreaves (1994, 261) agrees noting that in periods of rapid change, attempts may be made to “cling to the crumbling edifice” of modernity as nostalgia for “the good ‘ole days’ emerges.” The appeal of the status quo inhibits teachers and administrators from taking risks, giving up what is considered to be a degree of certainty.

In this research, I examined a teacher-as-researcher project involving the entire teaching faculty at Gene S. Cloverdale Elementary School in San Jose, California as they engaged in meaningful questioning of their own teaching practice. Through such a process, they explored the deeper transformations beneath the surface level of their district's curriculum restructuring efforts. I examined their conversations as they began to problematize areas of the value system previously taken-for-granted and embedded in their assumptions about teaching. In this way, the change process at Cloverdale has become an ongoing process of discernment, reflection and action and not merely an introspective event.

Gene S. Cloverdale School was selected as the site for this research because change is being viewed in this way by the faculty and administration, involving teachers at the heart. In response to the need to prepare for the *Program Quality Review (PQR)* process mandated by the State of California, these teachers initiated a process of self study in which they examined the implementation of Creative Publications' *Mathland* program at their site.

This "new math" embodies a change from past math programs in the district. *Mathland* came to represent a terrain in which boundaries could become blurred and transformation could take place. The discourse about the math program at Cloverdale created an opportunity to actively and critically observe teachers as they engaged in a struggle with traversing conceptual boundaries. *Mathland* and the teachers' orientation to

change presented themselves as a catalyst for critically engaging in conceptual border crossing.

Using qualitative research methodologies, this community of teachers began to “see beyond traditional ways” and to grapple with questions about their practice as they worked to transform themselves and their practice (Janangelo et al. 1993, xxi).

Each of the teachers at Cloverdale School began by identifying and examining research questions they were struggling with regarding the newly adopted math program. They collected data and discussed their findings with fellow teachers, thus laying the groundwork for a critical engagement with the change process at their school and creating opportunities for becoming *atravesada*. These teacher researchers risked releasing what they believed to be safe and certain, tried and true, in an effort to transform their own relationships with their students and with curriculum. In doing so, they opened themselves to the opportunity to transform their relationships with one another and with their conceptions of teaching. By making their assumptions and hidden cultural patterns explicit, teachers began a process of gaining agency.

First, however, teachers needed “knowledge of the culture being renegotiated” (Bowers 1987, 29). Through exploration of issues raised by the “new math,” teachers began to grapple with personal assumptions held about the nature of knowledge itself.

Unveiling these assumptions, many of these teachers were able to reconceptualize their practice, gaining new understanding of the paradigmatic underpinnings informing their approaches (Bowers and Flinders 1990).

As teachers articulated and explored their questions regarding the new *Mathland* program, they needed to grapple with the nature of teaching itself and their beliefs about the construction of knowledge. As a community of teachers working together they began to see the need to refocus their perspectives, to learn to be learners. The act of teaching through the teacher-as-researcher model may reveal an avenue for becoming *atravesada*, border crosser, in a process of continual renewal.

Can authentic change result if there is long term commitment to classroom research? Can such a project lead to more critical approaches to teaching and learning? This research will prove informative to those who, like myself, are interested in career-long teacher education and meaningful educational reform.

CHAPTER TWO

BORDERS OF CHANGE: PARADIGMS ON THE CUSP

We cannot take for granted the powerful role the border plays...The border is both a symbolic and a physical separation. It is a divide that must be crossed, a barrier that must be surmounted, a moment that must be transcended (Chavez 1992, 41).

Borders, both literal and metaphorical, although explicit some of the time, they conceal implicit cultural and political assumptions at other times. As society and individuals face greater change and diversity, these borders are sure to include not only the current debates about immigration and the changes in our demographics, but also barriers in our thinking and understanding about ourselves, our society, and our institutional roles. Using this metatheme of border crossing, this chapter provides a literary framework for exploring the research described in Chapter One.

When considering this metaphor literally, as the case has been with regard to immigration, the border between Latin America and the United States has long been a topic of heated debate. With changing demographics in education due to such literal border crossing, the border, the line or *la linea*, has become a central theme in multicultural writing.

Chicano narratives like those written by Anzaldua (1987), Calderon (1987), and Cisneros (1985) have set the stage for coming to understand borders in a poetic and

metaphoric sense, beyond the literal. Taking a critical look at borders in a metaphorical sense, such narratives allow us to examine cultural assumptions and understandings upon which boundaries are created. Authors like Calderon (1987) “would rather think of the border not as a limit but as a cultural and historical crossroads. . . both the same, yet quite different” (Mano and Rico 1991, 554-555).

Gloria Anzaldua (in Mano and Rico 1992) speaks of a new consciousness in border crossing. In creating a new self and experiencing the world in a different way, she envisions a cultural evolution. Her vision includes the arrival of a new understanding of the boundaries drawn by race, gender, class, and nationality. Anzaldua’s vision of cultural evolution parallels the concerns of this research.

Because I, a mestiza [multiracial woman] continually walk out of one culture and into another, because I am in all cultures at the same time, *alma entre dos mundos, tres, cuatro, me zumba la cabeza con lo contradictorio* [a soul caught between two, three, four worlds, my head aches with contradictions]. *Estoy norteadada por todas voces que me hablan simultaneamente* [I’m led north by all the voices that speak to me simultaneously] (Mano and Rico 1992, 386).

Anzaldua urges the creation of a new consciousness, a *mestiza* consciousness, in order to understand the “way we perceive reality, the way we see ourselves, and the way we behave” (Mano and Rico 1992, 389). Likewise, this research endeavors to bring such perspectives and understandings to language. “By exploring the geography of our own consciousness,” teachers may begin to question their prejudices and practices through engagement in teacher research (Bowers 1987, 33). Educators taking a critical look at their practice may be better able to cross conceptual borders in their thinking thereby taking

action to change their practice in thoughtful, meaningful, and appropriate ways in the face of a world of perpetual change.

Paralleling the border pedagogy described by Giroux, and the liminal state described by Turner, this research has considered change and transformation as a process. Turner (1974, 231-232) states that “when an individual is no longer in the old world but has not yet moved into, or been accepted into, the new world” that individual is in a state of liminality. It is within this liminal space that tradition is disrupted and opportunity made for transitioning from one role or station in life to another, for transcending our paradigms, for becoming *atravesada* (Turner 1974). Giroux (1992) discusses the concept of paradigmatic change stating that it,

. . . necessitates combining the modernist emphasis on the capacity of individuals to use critical reason to address the issue of public life with a post-modernist concern with how we might experience agency (Giroux 1992, 29).

Rather than addressing change in education more traditionally, through traditional teacher in-service, policy mandates, or imposed uniform standards, this project has made consideration of how teachers themselves might engage in conceptual change through discussion and reflection prompted by their personal engagement in research. By participating in a critical community of inquiry these teacher researchers have created a context for gaining insight regarding educational change, thereby redefining the power of the cultural traditions informing their practice. Such a context has allowed for the reconsideration of how school districts, administrators and teachers can create contexts for the construction of knowledge.

Change in Education

Owens and Steinhoff (1976, 1) state that “pressure for change is constant and insistent; and, these days, it seems to come from all directions.” In the face of global competitiveness, changing demographics, fiscal restraint, and ecliptic changes in communication systems, education itself stands at a crossroads. Hargreaves (1994) notes that “Few people want to do much about the economy, but everyone— politicians, the media, and the public alike— wants to do something about education.” Within such a terrain, it seems “people are always wanting teachers to change” (Hargreaves 1994, 1). In response to these demands, educators are asked to rebuild national cultures and identities, as well as address a purported crisis in education.

Following Soviet success with Sputnik (Shor 1991), a cry for reform blamed schools and teachers for the loss of national pride. Commentary followed in line with such blame in documents put forth by such groups as the National Commission on Excellence in Education. Its 1983 report entitled *Nation at Risk* , the commission purported a growing concern “to make education both more efficient and more equitable” (Davies 1990, 1).

The 1950s, 1960s, 1970s, and 1980s reform initiatives continued to place blame on teachers and schools. As a result, educators found themselves in a virtual age of reform. These years of reform made explicit “stunning change in the nation’s perception of teachers and teaching” (Burgess 1985, 139). The Casey Foundation funded many

restructuring projects in the field of education. Implementation guides were published and the National Center for Restructuring Education, Schools, and Teaching (NCREST) emerged (Hargreaves 1994). The Gardner Commission, the Carnegie Report, the National Science Board (NSB), and other publications enumerated this “failing” of schools in their lamenting a concern over Student Achievement Test scores, calling it a “crisis in teaching” (Ahhbach et al. 1989, 12).

With budget cuts, falling rolls, a scarcity of jobs, educational vouchers, a battle over resources, as well as changes in the relationship of central and local government, the 1980s and 1990s have proven a hostile environment for educators (Roy 1983). In response to the demands for reform, restructuring has become a fashionable buzzword. For the most part these attempts to reform education have met with failure. According to Owens and Steinhoff (1976, 11) teachers and schools have a “tendency to maintain a sort of equilibrium, [organizational reform] defies meaningful change.”

Although attempts have been made to address organizational reform in education, such reform efforts have relied on classical organizational theory based on highly centralized decision-making mechanisms. Such approaches have relied on the strong authority of experts and have failed to generate a critical posture. This is due, in large part, to the lack of opportunity for teachers to reexamine their assumptions about their own practice. Furthermore, groups engaged in writing reform literature have often failed to consult teachers about its meaningfulness for their practice. Despite movements to

decentralize the institution of education, schools remain highly centralized, relying on hierarchical supervision (Hargreaves 1994).

Hargreaves (1994) notes that teachers often face stifling supervision and repressive control. Using professional development in the form of workshops on techniques as a form of bureaucratic control, the mechanistic approach to restructuring schools has remained largely superficial. In addition, the assumption that “teacher proof curriculum” can assure mandated change has resulted in content diluted of meaning and the further de-skilling and disempowerment of teachers (Apple 1982; Giroux 1993). Viewed as “unskilled and unknowledgeable,” teachers face guidelines and the “imposition of standardized testing to control what they teach” (Hargreaves 1994, 11). Such political and administrative devices for change ignore and misunderstand the desire for meaningful change on the part of teachers themselves. Without opportunities for careful reflection and discussion, such restructuring may “restore and reinforce the crumbling edifice of modernity” and balkanize teachers in a defensive posture. The very “rigidity of the methods makes them fated to fail” (Hargreaves 1994, 33).

Embedded in this technocratic and mechanistic approach to school reform, positivist traditions and assumptions attempt to quantifiably measure and transmit change in a scientific manner. Without examining the system as a whole and without the input of teacher reflection and discourse, such reform can never be long lasting. In the face of technocratic controls teachers often revert back to old systems, leaving barriers in

place. As a result, the conceptual maps informing teachers' practices remain unexamined (Janangelo et al. 1993).

A new perspective on teaching is central to change as a process. It therefore becomes a crucial part of any reform for teachers to critically reflect on their own practice. Without the inclusion of self reflection and discussion as part of the change process, a mirror reality may reappropriate the status quo. Teachers need to grapple with issues that arise and have the opportunity to ask personally meaningful questions. Foucault (1977, 45) states that a process that is void of critical reflection assumes "an eye whose entire substance is nothing but the transparency of its vision". Reflection and dialogue, therefore, become powerful and crucial aspects of true change.

Past reforms have failed to encourage reflective discussion among teachers relying primarily on the recommendations of "experts." These reforms have thus redefined and relabelled traditional, outmoded, and ineffective patterns of managed change. As a result, the nature of teaching has become "defined by strong and lasting boundaries" (Hargreaves 1994, 236). Ahabach et al. (1989, 24) note that without an understanding of teachers' perspectives, the crisis in education will continue to be viewed as a problem within the teacher. At the same time, without opportunities for reflection, teachers are reduced to the role of a mechanic, objectified and isolated in the assembly line metaphor of education.

Educators at Cloverdale embarked on a search for a new metaphor for teaching through their research. Giroux (1992) points to this struggle for a new metaphor in his

discussion of *border pedagogy*. Realizing the emancipatory possibilities within a post-modern paradigm, Giroux details the dynamics of the teacher as transformative intellectual. By fashioning a critical post-modern notion of authority, educators can decenter power relations and transform their relationships with students, administrators, and the curriculum.

Members of the teaching community at Cloverdale, through engagement in teacher research, were enabled to explore their role as transformative intellectuals. Such a metaphor for the teacher transcends the mechanistic metaphor of a factory worker. By reflecting on and discussing their questions, frustrations, and disagreements with the new mathematics program, these teachers were able to locate themselves “within social, political, and cultural boundaries that define and mediate [their roles] in complex ways” (Giroux 1992, 140). Finding their own voices, educators as researchers and transformers, have opportunities to deconstruct the underlying principles informing their pedagogy, thereby enabling them to restructure their pedagogical relations. By problematizing their teaching practice, they have the opportunity to push against the boundaries of the modernist paradigm.

Ignoring the ability of teachers to ask unique questions, reform movements grounded in the science of positivism have engendered a sense of fear and repulsion against change among many teachers, often resulting in resistance. Viewing teaching as execution, separated from conceptualization, has led to standardized approaches to

reform, restructuring, and professional development. Such approaches have been based on claims of neutrality and assumptions of efficiency.

Kincheloe (1993, 103) states, “As we compartmentalize the world and knowledge about it, we draw boundaries between what is spoken and what remains unspoken.” The focus of traditional reform movements has been to impact behavioral change, the assumption being that “teachers need to demonstrate proper technique” (Ahbach et al. 1989, 183). As long as state reforms assume teaching to be a generic, quantifiably measurable act based on technique alone, such reforms will merely reproduce the modern construct of schooling. As a result, education is trivialized, “rendering it a meaningless game” (Kincheloe 1993, 5).

A first response to change is often that of resistance. In a period of rapid change, the appeal to the status quo and a sense of nostalgia for the past may lead to a culture of fear. Such a culture of schooling leaves teachers feeling vulnerable in the face of change (Janangelo et al. 1993). This tendency to resist change mobilizes all barriers so that true reform becomes impossible to achieve. Providing for liminal space and the exploration of uncertainty, teachers reflecting on their own practice may reduce the “specialization and blurring of roles and boundaries.” In such a transitional space, a shift “from cultures of certainty to cultures of uncertainty [may] collapse singular ideologies” (Hargreaves 1994, 57).

In order to facilitate such shifting and ameliorate fear and resistance, it is important to create a safe space where individuals in conversation with others may examine the reasons they have for the way they do things. Within such a safe place, teachers may begin to identify the assumptions upon which their judgments are based. Bowers (1987, 32) believes these assumptions tend to be invisible to us, unquestioned and unexamined. We “generally lack the necessary distance and objectivity to see it clearly.” Locked in our beliefs it becomes necessary to shift our paradigmatic views in order to engage in authentic change. A school context which fosters a safe environment for risk facilitates an openness to change as a “transformative process of living with questions” (Janangelo et al. 1993, 199). This open context enables resistance to be transformed into productive grappling, a positive step in crossing conceptual borders.

Gene S. Cloverdale School is a context where teachers have begun to examine the dynamics of how their “everyday sense and reality is constituted through interaction with others” (Bowers 1987, 32). As a community of learners, teachers have allowed themselves the freedom to be open to new ideas and cognizant of the underlying assumptions implicit in their treasured beliefs. By incorporating an orientation toward change in which interdependence and interaction are explored, the goal of the reform becomes self-renewing, self-generated. This goal, as opposed to that of a scientific approach to reform, is embedded within a more ecological approach (Owens and Steinhoff 1976).

A complex systems approach, supportive of an ecological view, regards change as a dynamic and interrelated system, not a static event. Doll (1993, 1, 3) details the impact of a complex systems approach in his discussion of post-modernity, stating that changing paradigms involves changing the “methods, problems, and standards a community uses as well as the broader constellation of beliefs, values, techniques it cherishes.” Critical teacher researchers create such transformative networks that often culminate in a “new concept of curriculum.”

The modern system, upon which past reforms have been based, embraces change from a closed system approach. Within such a system change occurs in a self-contained, independent, or self-sufficient fashion. Progress in modernity has been based upon “a specialized knowledge, gleaned most particularly from science” (Doll 1993, 7). It has not realized the multifaceted or creative aspects of curriculum as a complex system approach does. In the closed vision of the modernist paradigm, “only exchanges take place; there are no transformations.” Ilya Prigogine (1961) points out the transformative aspect of an open system in thermodynamics while Doll (1993) extends this knowledge to viewing curriculum construction. Recognition of the self-organizing and interactive qualities of the new biology in science has given rise to consideration of a post-modern approach to reform in education. Such an approach moves beyond curriculum “based on fragmentation, isolation, atomization” (1993, 69, 83).

In order to create a context in which boundaries become more permeable, there may need to be a shift from a mechanical concept of school organization (modern) to that of an organic conception of schooling (post-modern). Viewed as an organic, living system school becomes an organic entity. This vision of school surpasses corporate analogies often common in discourses on school reform and requires a paradigmatic change in our thinking. This reflects Kuhn's (1962, 125) thinking when he states, "Historically, conditions of rapid and radical change have typically given rise to paradigm shifts."

Teachers in the Modernist Paradigm

A paradigm is a theory, pattern, example, or model. Kuhn (1962) notes that as a perspective or frame of reference paradigms determine and inform how we interpret and understand the world. Paradigms represent the lens through which we view our world and with which we attempt to make sense of the world. Shifting paradigmatic views, therefore becomes a conceptual act of border crossing. Such shifts in thinking may lead to our becoming *atravesada*.

Teachers, as have others, internalize a sense of their professional approach as broken up into a complex series of simple linear steps. This has been promoted by highly technical approaches to teacher education and has led to the profitability of pre-packaged curriculum and institutionalized clinical models of teacher supervision and evaluation. Reform efforts have regenerated and calcified this technical approach to the profession. Having not come to question taken for granted assumptions implicit in the act of teaching, teachers facing modernist reforms have often been de-skilled (Bowers and Flinders 1993;

Apple 1982; Giroux 1993). Relying on predetermined, prescribed lesson plans, detailed by Madeline Hunter (1984), and following discipline procedures, outlined by Lee Canter (1979) and others, adherence to positivist formats have often been rewarded.

A hierarchy is thus established identifying teachers as subordinates to experts. These “experts” are the ones that “ordinary” people must look to for knowledge, insight, or inspiration (Giroux 1992). This perspective amplifies the modernist belief that knowledge exists external to the individual ignoring its social construction. Teachers are thereby reduced to believing that their roles are limited to the execution of skills and techniques required to meet pre-defined instrumental objectives. Within this mechanistic system, the teacher’s role is reduced to that of a technician, a posture implicitly required to meet the goals as advocated by the reform movements of the 1980s. This makes it difficult, if not impossible, for teachers to “transcend the boundaries of formal thinking” (Kincheloe 1993, 5). Grounded and informed by this modern paradigm, recommendations of school reform often depict the teacher as incapable of self direction. Packaged learning materials and a hierarchical authority structure have therefore reinforced positivist social stratification.

A culture of passivity is generated as expertise sustains equilibrium within this modernist ideology (Kincheloe 1993). The cult of the expert places faith and trust in the knowledge of external experts and is supported by a belief in objective scientific

knowledge. This belief system separates the knower from the known, the teacher from the creation of professional knowledge, and conception from execution.

Emerging in the Middle Ages, the modern paradigm was primarily a response to the pre-modern view of science. The pre-modern age, as detailed by Doll (1993), emphasized balance and order and was grounded in Thomist-Aristotelian synthesis of faith and reason. With the coming of the Black Death and the corruption of the Church, pre-modern ideals became an inadequate way of explaining this period of flux. Instead, reformist thinkers such as Descartes urged for a separation from judgment (at that time imposed by the Church) and pre-modern faith, embracing scientific reasoning.

The Enlightenment marks the historical onset of modern scientism. As a departure from the pre-modern, Habermas (1987, 9) writes that this Age of Reason was informed by the assumption that “. . . transformed and social progress achieved by systematic development of scientific and technical understandings.” This was to be the result of social emancipation lifting humanity “out of the particularism, paternalism, and superstition of pre-modern time.”

The modernist paradigm, as conceived by Descartes, envisioned a universe as a giant clockwork. Knowledge was assumed to exist *a priori*, waiting to be discovered “out there.” Linear skill and a “one-truth epistemology affected all aspects of western life, all institutions” (Kincheloe 1993, 3). Bowers (1987, 10) states that, the modern position assumes “givens,” pursues progress in a linear fashion, exalts the power of

rational thought and the autonomous individual devaluing judgment, and regards change as “part of the natural attitude toward everyday life.” This way of thinking and approaching an understanding of knowledge has informed the way education and educational reform have been enacted.

The conceptual traits associated with the modern mode of consciousness was brought to full flower by education curricularists in the early 20th century. In *Technocratic Education*, Ralph Tyler (1974) embodies and exalts this scientific management approach. This approach patterned the role of the teacher as a subordinate factory worker, obedient beneath the strong authority of external experts and managers. Hargreaves (1994, 4) captures the modernist’s concern querying, “If the knowledge base of teaching has no scientific foundation. . . on what can our justifications for practice be based?” By bringing the modernizing mode of consciousness to language, teacher researchers may be able to recognize its influence and constraints on their own thinking and practice, thus enabling them to become *atravesada*. The use of an organic system approach in school reform may provide teachers with opportunities to transcend the blinders of traditional scientific ways of seeing. A new and more useful knowledge base for teaching could emerge from such a conceptualization of the change process, placing primary emphasis on asking critical questions rather than depending on external expert resources and recognizing the social role in construction of knowledge.

Teaching in the Post-Modern Paradigm

With the role of the teacher expanding in a post-modern era, new problems and mandates emerge. Forced to grapple with ambiguity, teachers must come to terms with modernity's cult of certainty. As Kuhn (1962, 89) notes,

Almost every significant breakthrough in the field of scientific endeavor is first a break with traditional old ways of thinking, with old paradigms.

Emerging from the discovery of the nature of subatomic particles, post-modern ideas were developed further with Ilya Prigogine's Nobel Prize in chemistry, his endeavors with thermodynamics, and his book, *From Being to Becoming* (1977). Prigogine pointed out the qualities of an isolated or perfectly stable system, as the universe was once described. Such isolated systems exchange nothing, they merely transfer and transmit information.

A continuum or a constellation, as opposed to the dichotomy detailed by Prigogine and others, emerges in a post-modern venture. This constellation refers to a relational and interaction oriented construction of meaning. Stripped of the foundation of outmoded scientific foundations, the post-modern border crosser finds a challenge in the struggle and opportunity for change (Hargreaves 1994).

In becoming *atravesada* the post-modern educator comes to an awareness that there is no "privileged framework from which to assess all knowledge claims" (Janangelo et al. 1993, 195). In giving up certainty, educators need to find comfort in approaching change as a questioning act where dialogue becomes central. Grasping the connection

between school and culture, the post-modern educator must explore the conceptual maps which inform their teaching practice and the structures of schooling. As the embodiment of our taken-for-granted assumptions, these maps represent

...historically grounded message systems that cause thoughts and feelings to be organized in ways that reflect the categories, assumptions, and patterns of thinking acquired through socialization to the culture's way of organizing reality (Bowers 1987, 14).

Teachers may come to understand the epistemic categories which Bowers states "make them carriers of the modernizing and relativizing mode of consciousness rather than effective critics" (1987, 26). To do this they must engage in dialogue with one another about their beliefs and practices. In doing so, they may come to redefine themselves and their practice as they become able cross paradigmatic borders.

The Role of Dialogue

Only dialogue, which requires critical thinking, is also capable of generating critical thinking. Without dialogue there is no communication, and without communication there can be no true education (Freire 1970, 81).

In *Pedagogy of the Oppressed* (1970), Paulo Freire emphasizes the importance of dialogical action in bringing about transformation. His writings focus largely with changes in cultural action and stem from an interest in promoting literacy, yet his works also represent an opportunity for addressing transformation within the broad spectrum of a changing educational system. As education faces the change from modernity to post-modernity, the writings of Freire provide a frame for considering the assumptions we make as educators in relation to the visions we hold for our students' futures.

Furthermore, Freire's writings on the impact of critical dialogue in promoting transformation coincides with the tenants of this research.

For Freire, dialogue plays a major role in developing *conscientizacao* which in turn breaks the "culture of silence" of the dispossessed. As products of paternalism, Freire noted that illiterate Brazilian peasants were kept submerged by an educational system whose impetus was toward the maintenance of an oppressive culture. In order for change to bring about a world of "ever new possibilities of fuller and richer life individually and collectively," Freire (1970, 12-13) notes the necessity for creating a new social vision through "dialogical encounter with others." Deprived of voice, the oppressed remain in the position of dependence, almost never realizing that they too know things.

In many ways, teachers in today's changing educational landscape parallel the oppressed peasants in Freire's writing. Involved in a patriarchal system which prescribes guidelines for teaching behaviors and student outcomes, teachers, as well as their students, are deprived of their voice. Teachers' intellectual capacities are often undermined by the myriad of outside experts, leaving them in positions of dependence and isolation. Without opportunities to confront reality critically, through dialogue and reflection, teachers are disenfranchised within what Freire terms a "banking system" of education. It is the realization of teachers dialoguing about their "intellectual discovery, involving action and including serious reflection," which Freire determined would lead to transformation (52).

Dialogue as Power

“To exercise power is to engage in a knowledgeable discourse” (Maxcy 1994, p.125). Foucault (1977) states that power is exercised through discourse and the structure of discourse may serve either to silence or give voice to subordinates and marginal members within an organization. Hargreaves (1994) also notes the importance of language, debate, and critical verbal analysis as “the stuff of reflective moral culture.” Through dialogue, critical action research involves the examination of cultures of teaching. It therefore becomes important for teachers to find ways “to protect, promote, and validate their contributions” through dialogue (p. 75-6). As Hargreaves (1994) states, teachers must begin to explore the content of their own culture in order to facilitate change. He observes that

. . . most teachers still teach alone, behind closed doors, in the insulated and isolated environment of their own classrooms. Despite numerous efforts at improvement and reform, individualism stubbornly prevails within the teacher culture (16).

The culture of teaching, as with any culture, is inevitably bound in language. Therefore teacher researchers’ articulation of the conditions and context of their practice reclaims teachers’ voices and provides opportunities for making assumptions opaque. Making assumptions explicit opens the door to critical examination and transformational change. Resistance may be transformed into critical questioning as discourse provides a means “for naming the world, thinking and framing interpretations of experience” (Spring 1994, 29). Exploring idiomatic phrases born out of lived experience, teachers in a community of

discussion become reservoirs in which “the richness of human experience is deposited,” and fossilized in such a way that we can view it in a new light (van Manen 1990, 61).

Max van Manen (1990, 12) notes that “nothing is so silent as that which is taken-for-granted or self-evident.” By bringing assumptions to language, educators may begin to redefine their roles. In gaining awareness of pedagogical intentions, teachers-as-researchers are able to make their pedagogical lives “conversationally available, debatable, accountable, evaluable” (1990, 91).

In order to redefine their profession, teacher researchers must begin by redefining themselves. For this to occur they must understand the central role language plays.

Bowers (1987, 3) emphasizes the integral role language plays in “reproducing in individual consciousness the conceptual maps” associated with the culture of teaching. Communication within the culture of school acts as transmitter and reinforcer of taken-for-granted beliefs. When these assumptions or patterns of thought are made explicit, teachers are able to obtain the distance needed for critical reflection. Language systems communicate and sustain beliefs as “unconscious carriers of our past,” thus teachers must explore their assumptions and the role language plays in “reproducing the collective culture in the consciousness of the student” (Bowers 1987, 50). It therefore behooves educators to engage in intellectual discourse as a means of reestablishing conceptual foundations and reforming authority.

Careful attention has been paid to the types of conversations which occurred among teachers regarding their roles as researchers. Several major themes emerged in conversations at the site, such as the teacher's role and the role of the students, the nature of knowledge and the nature of learning, as well as the role of text and assessment. These themes regarding the roles of teachers are presented in Chapter Four as prevalent metaphors for teachers' roles within the school community. In looking at the context of the actual conversations themselves, it became apparent that discourse remains a function of power. Characteristics of the teacher conversations played a major role in either promoting or prohibiting the type of critical engagement which Freire believes can lead to transformation, or border crossing. These characteristics are detailed further in this chapter as antialogical and dialogical actions.

Freire terms the characteristics which prohibit the development of dialogue which is critical and thus transformational, as being antialogical action. The banking educator represents the antialogical in that such an educator confuses authority of knowledge with their own professional authority, making deposits within the passive consumer or student. Education within this antialogical system is an exercise of domination, as is its discourse. True dialogue is contingent upon trust and generates critical thinking, according to Freire. It does not reduce students to objects receiving information. Freire's antialogue is necessary for the oppressor as a means of maintaining authority and is

characterized by the following four categories:

1. *Conquest*- A dialogue which involves conquest attempts to mythicize the world and maintain the status quo. Internalized myths, such as the myth of equality, continue the subjugation of the oppressed.
2. *Divide and Rule*- A dialogue which promotes isolation in order to weaken the oppressed. Labeling things or groups as dangerous in order to establish rifts, this aspect of antialogical action breeds insecurity.
3. *Manipulation*- A dialogue which attempts to enforce conformity to the objectives of the oppressor and anesthetize people so they will not think on their own.
4. *Cultural Invasion*- A dialogue which attempts to penetrate the cultural context of another group so as to impose the world view of the oppressor.

These characteristics of antialogical action inhibit transformation as they impede true dialogue. As Freire notes these traits of conversation are implicit in a banking system approach to education. Many school cultures mirror Freire's articulation of this oppressive system which does not foster a vision of the teacher as *atravesada*. At Cloverdale, the administration and teachers have taken many steps to create a school culture which is opposed to a banking system approach to education.

At Cloverdale the pedagogical implications, transforming nature of knowledge and teaching, and changed understandings of the learning process during this state of being "*betwixt and between*," presented themselves as a rich context. This research has

examined the cultural assumptions which shaped individual teachers' conceptual maps.

This chapter has detailed the literary foundations for conceptual border crossing the junctures of modernist and post-modernist thinking in education and has presented historical aspects of the change process in education. Chapter Three builds on this framework and elaborates on the methods by which data was culled and analyzed for meaning.

CHAPTER THREE

CRITICAL RESEARCH METHODOLOGY

The people who come to see us bring us their stories. They hope they tell them well enough so that we understand the truth of their lives. They hope we know how to interpret their stories correctly. We have to remember that what we hear is *their story* (Coles in Glesne and Peshkin 1992, 1).

The proceeding Chapters have outlined the challenges facing educators in a rapidly changing landscape. The challenges or boundaries facing educators in a virtual age of reform and as they are posed on the borders between modernist and post-modernist notions of education, may manifest themselves as opportunities for conceptual border crossing. By exploring the paradigms which inform pedagogical decisions, liminal spaces may be created which foster transformation. The metatheme of border crossing has been introduced as a means of coming to understand the changes in thinking required by educators in the face of rapid changes in society. This Chapter will focus on the use of teacher research on the part of participants at the school site, as well as on the use of participatory critical research in approaching change. As a vital link to understanding this change, consideration of the methodologies employed both in the teacher research project and within this research project are essential.

Praxis Through Teacher Research

We shall not cease from exploration
And at the end of our exploring we will
be able to arrive where we started
And know the place for the first
time (Eliot 1962, 143).

Having sensed a crisis in the teaching profession, Kincheloe (1991) set out to detail teacher research as a means of “questioning the dominant assumptions in modern industrialized societies.” Grounded in critical theory, Kincheloe purports teacher research to be a means by which educators can embark “on a quest for new meaning and practices” (1991, 1). Critical teacher researchers refuse to succumb to external authority, protecting the creative, active, and constructivist qualities of their practice. In doing this they construct their own understandings and bring to language the process by which they form new perspectives.

There have been many types of educational research. Burgess (1985) details basic educational research, strategic educational research, problem oriented research, action research, and statistical data research in his discussion of qualitative methods in education. Pamela Lomax (1989, 1-2) examines aspects of educational research, noting that “values are often problematic and tend to be left unquestioned” in traditional approaches. Though teachers have “implicit theories about their work in classrooms,” teacher researchers have the opportunity to make such ideas explicit by posing questions and seeking understandings through a community discourse.

Action research aims at practical problem solving and is a form of inquiry enabling “teachers to reflect on their classroom experience” (Lomax 1989, 22). It is often pursued in order to improve the efficiency of practice and classroom contexts. Moving beyond the parameters of an action research orientation, critical action research on the part of teachers allows for ownership, an opportunity for creativity, and an orientation to question status quo descriptions and values. Teachers involved in critical action research seek instead to look at multiple descriptions and values as more representative of the real world. To do this they engage in critical self reflection within a community of discourse. Teacher researchers approaching their practice from this perspective have a means of attaining transformation, personal and social growth, as well as professional development that go beyond searches for certainty and predictable learning outcomes and extend to taking action in the world.

The School Context

This research investigation took place at Gene S. Cloverdale Elementary School in the Washington Irving School District in San Jose, California, between January 1995 and May 1996. Located in the south central section of San Jose, California, the school serve a multicultural population of working class families. According to Principal Lea Evans, of the approximately 800 kindergarten to sixth grade students 52 percent are limited English proficient (LEP), 22 percent English Proficient (EP), and 26 percent monolingual English (EO). Over ten languages are represented at Cloverdale, including English, Tagalog,

Spanish, Vietnamese, Cambodian, Thai, and others. In addition Cloverdale is the educational home for many students who have moved to San Jose from many countries, Cloverdale stands as a microcosm of the larger, diverse community. It is due in part to this sense of community and interdependence among faculty and students that Cloverdale was selected. Second, the school theme and goals were conducive to an exploration of the tenants undergirding this research. This research focuses on the conceptual metaborders educators face in a landscape of growing diversity and rapid change. It is, therefore, important to examine how these borders are manifested within this particular context and how dilemmas in the execution of the program are interpreted by the Cloverdale teachers. Cloverdale's Teacher as Researcher Project focused on the *Mathland* math program initiated in the 1995-96 school year and presented itself as an opportunity for examining teachers in a state of flux.

Cloverdale's mission, school theme and metatheme are consistent with the aims of this research. Cloverdale's Mission Statement emphasizes a "commitment to preparing children for a future [in which they] will be increasingly interdependent upon each other." Encouraging students to see "themselves as an integral part of the world and to recognize their importance to its future," the mission statement guiding Cloverdale appears to be in keeping with issues at hand in this research (Cloverdale 1994, 3). As teachers explored the roles they envisioned within an increasingly interdependent world, cultural

assumptions presented themselves as boundaries to be traversed. This research paralleled the goals of teachers at Cloverdale in preparing their students for a changing future.

Emphasizing global understanding as the school theme, the approach to education that teachers and administration take at Cloverdale relies on the facilitation of students' growth in "knowledge and appreciation for the complexities of our world." Reflecting the philosophy that "the school is a shared partnership between families and the staff," this metatheme is implemented in policies on school climate and instruction making it a rich terrain for examining conceptual borders (Evans 1994). As teachers work to prepare students to know and appreciate the complex nature of the world, they find themselves in an arena which encourages the exploration of their own conceptual maps.

Another characteristic of the Cloverdale site which made it a prime candidate for this research is the implementation of Cloverdale's metatheme within its programs to develop global citizenship. The stated goal of the Cloverdale School Policy on School Climate is to "enable the students to become responsible global citizens." The heart of this development is said to be "the realization of positive self-respect" (Cloverdale 1994, 5). As a foundation for the micro-goals at the site, this macro-goal is specifically aimed at achieving goals in a social setting. In combination with the theme of global understanding the goals at Cloverdale are part of a community effort. Programs such as Good Morning Cloverdale, Global Citizenship Awards, Olympic Award Assemblies, and Tribes are

representative of the school's concern for the creation of an interactive school community and thus were in keeping with this participatory research.

In addition to the metatheme and goals set forth in its mission statement, Cloverdale has received many honors and awards which highlighted it as a rich context for this research. In 1993, the school site was designated a *Distinguished School*, one of California's highest honors. The school also received the City of San Jose's Mayor's Award for its Safety Patrol in 1991-1992 and 1992-1993 school years. Furthermore, Cloverdale received the *Program of Excellence Award* from the California Council for the Social Studies during the 1992-1993 school year. This professional organization of social studies teachers recognized the school's programs that "catch the interest of children in history and other related fields" (Cloverdale 1994, 2). This mark of excellence served as a doorway for this study because much of the understandings to be culled from research with teachers focused upon societal concerns and meaning created in a social context. Teachers had the opportunity to bring to language powerful historical perspectives on their practices.

Cloverdale and *Mathland*

In order to implement a new math curriculum and gather data regarding the quality and form of student generated work in math for Cloverdale's Program Quality Review (PQR), the administration and teachers came together to find a process for looking at change. The principal at Cloverdale, Lea Evans, has been with the school from its

founding five years ago and works with faculty and staff in a highly collaborative manner.

As Owen and Steinhoff (1976, 139) maintain,

To meet the challenge successfully, the administrator must frankly consider whether he feels it necessary to play the role of mentor in his school- an all-knowing “teacher of teachers”- or whether he is prepared to continue learning with the faculty and staff.

At this site the principal views her role as that of a co-learner. This learning posture, on the part of teachers, administration and staff are central to the current PQR at Cloverdale.

The Program Quality Review (PQR) process mandated by the State of California currently embodies a self study to be conducted at the individual school site. Once every five to six years, teachers are asked to examine an area of the curriculum, to self assess their work and needs, as well as to plan for future innovation.

Over the years the PQR process has undergone many transformations. These phases parallel changes in format of school leadership. Historically, PQR reflected the traditional modernist approach to school leadership in that the study was conducted by outside experts. The next evolution in the PQR paralleled elements of a consultative approach to change in that there was an exchange involved with the members of the school site. Despite this exchange, the locus of control remained outside the school site. The PQR process currently used in schools is an innovative learning community approach to school leadership. This PQR process incorporates self study. Leadership has become a shared function within this system, coupled with an understanding of change as an integral part of the growth process (Maxcy 1994).

In carefully observing, reflecting upon, and discussing their research findings, teachers began to “see beyond instinct and methodologies.” As *atravesada*, the teacher emerged with a sense of “true empowerment and a movement toward agency” (Janangelo et al. 1993, 199). Teachers had an opportunity to cross borders in their conceptual thinking regarding the nature of knowledge, their role as teachers, and the purpose of schooling within such a context.

Research Questions

Throughout the process I participated as a researcher and participant (student teacher and later substitute teacher) as I documented teachers in their attempt to map a shifting educational terrain. The change from traditional mathematics instruction to manipulative based *Mathland*, caused teachers at the site to conceptualize both themselves and their practice in a transformative fashion, establishing and redefining borders. Kincheloe claims that as

. . . teachers] deconstruct the taken-for-granted practices, beliefs and assumptions of teaching...teachers [may] break through the fog of expert knowledge that has often served to stifle progressive change in the schools (Kincheloe 1993, 220).

In doing so, teachers identify their basic truths about teaching and learning. The following research questions undergird this study as teachers explored *Mathland* and their role at Cloverdale:

1. In what ways do conversations of teacher researchers provide opportunities for the examination of their taken-for-granted assumptions?

2. How do conversations of teachers involved in a teacher-as-researcher project lead to shifts in their thinking about their practice?
3. In what ways can personal and social transformations be enhanced as teachers discuss their practice with peers?

In coming to understand the *Mathland* program through a teacher researcher orientation, teachers at Cloverdale gained new insights regarding how change impacts their thinking and may impact the frameworks upon which they build their teaching practices.

Cloverdale's Teacher-as-Researcher Project

During the 1995-1996 school year, the Cloverdale faculty faced decisions regarding how to implement the *Mathland* program as well as their need to collect relevant data for their school's upcoming PQR process. As stated previously, the State of California mandates a review of a curriculum content area every five to six years. Collecting and gathering student work and information regarding the context which fosters such work, this process is to include advisement for improvement of the curricular program examined. The teachers and administrators at Cloverdale, in preparation for the *Program Quality Review* (PQR), decided to concentrate their focus on the new math program. The question for the school site community became one of how to collect data for the PQR in a manner which might foster personal and social growth.

To meet their needs in accord with school goals, Cloverdale administration and faculty chose to engage in a *Teacher-as-Researcher* program, thus combining their efforts

through an integrated curriculum program self study. This program was developed and facilitated in a collaborative fashion with faculty at San Jose State University. Piloted in the Spring of 1995 by Shirley Potter and Paula Vista, two teachers at Cloverdale, this program involved teacher research at the school site. Employing qualitative research methods within Potter and Vista's classrooms, the teachers received support and guidance from Dr. Carolyn Nelson and Dr. Kristine Pemberton at San Jose State University in San Jose, California. Having chosen their own research questions, one regarding reading groups and another regarding citizenship skills, Potter and Vista kept journals of observations and insights. These journals served as data for the teachers to explore their questions and cull personal meaning and enabled teachers to focus their attention on the new math curriculum.

The success and interest of Potter and Vista in conducting teacher research within their own classrooms, prompted them to suggest this orientation be used as a means of pursuing the PQR and exploring the new terrain of *Mathland*. Dr. Victoria Harper and Dr. Carolyn Nelson from San Jose State University were invited to visit the site and present information regarding teacher research. Meeting with school-wide approval, Harper and Nelson were then asked to facilitate the Teacher-as-Researcher Program at Cloverdale. Teacher research became an avenue for PQR data collection, a means for exploring personal and social concerns with *Mathland*, as well as a plausible matrix for coming to deeper understandings about the nature of change in schools.

Research Participants

The participants for this research include the school administration, faculty, and staff at Gene S. Cloverdale. As a school-wide project, the Teacher-as-Researcher project included teachers across grade levels. Initial interviews included three teachers from the kindergarten through first grade, three teachers from the second grade and third grade, three teachers from fourth and fifth grades, and three teachers from the sixth grade. Later discussions and interviews included most of the faculty at the school. The school site administration also played an integral role in shaping the insights in this research. A research group composed of fellow student teachers from San Jose State University in San Jose, California collaborated in the pilot interviews and preliminary analysis of pilot data during the fall 1995. The following is a brief profile of the teacher researchers at Cloverdale School in the Washington-Irving School District:

Millie

A veteran teacher in the district, Millie is actively involved in the community and has earned a great deal of trust through such involvement. A risk taker and innovator, she is always willing to try new things, like frequently switching grade levels. Her concerns with new programs like *Mathland* stem from her concern for the success of her students.

Lea

As principal, Lea combines her understanding of teaching and of democratic leadership to enhance the staff and development of programs at Cloverdale. Modeling

shared decision-making with students and co-workers, Lea takes a thoughtful approach to developing new programs like *Mathland* and encourages her staff to do the same. She seeks the assistance of those outside the Cloverdale community as needed and reaffirms the interests of the school as a community when necessary.

Flora

Having taught throughout the district over many years, Flora places emphasis upon discipline in learning. Maintaining a drive toward order in the classroom, the activity oriented learning environment supported by *Mathland* has created a challenge for Flora. Group activities and dialogue as essential to the success of lessons in the new program seem to collide with the type of environments Flora prefers.

Jeanie

A dynamic and energetic staff member, Jeanie is driven to impart her enthusiasm for learning to her students. Her engagement with making *Mathland* work in her classroom stems from her passion for developing a group dynamic among her students. Because she finds her philosophy closely tied to the undergirding philosophy of the *Mathland* program, Jeanie remains positive in her modifications of aspects of the lessons.

Carlie

Carlie has taught both upper and lower grades for many years. Despite the age level, Carlie believes that students need a variety of approaches to any given topic in the classroom before they will have any success applying the information. She find that the

Mathland program honors this belief though she fears that there is not enough depth of understanding cultivated before moving on to a new concept.

Anna

An avid volunteer and politically active part of the Cloverdale community, Anna has seen many programs come and go. Excited by the invitation to continue to learn, embodied in the teacher-as-researcher project, she fosters a sense of risk-taking in her classroom. Concerned with the students gaining mastery of skills, Anna hesitates to embrace any new program without utilizing her years of experience in making appropriate modifications for her students.

Shirley

With a background in psychology and behavior modification techniques, Shirley finds the *Mathland* approach to learning to be “chaotic” and “disorganized.” In her attempts to make information clear for her students, Shirley modifies and adapts content to meet her students’ needs. She sees the value in new programs, yet holds fast to the professional role of the teacher in making necessary accommodations for students.

Trina

Having worked almost exclusively with the primary grade levels, Trina has developed a program uniquely her own. Despite her trial and error approach to new programs, Trina refuses to call her efforts in the classroom “research.” She regards her years of experience as part of her “specialization” of a sort of “expertise.” Her aversion

to the terminology implicit in a research orientation has kept her from realizing the impact of her innovations with new programs like *Mathland*.

Emma

A newer member of the Cloverdale community, Emma has a shared concern with the rapid pace of the *Mathland* lessons. Sharing a fear that students will be left behind with only a partial understanding of the concepts, Emma struggles to make the lessons work to her advantage. This struggle with the program mirrors her struggle to become a part of the school community.

Barbara

As a member of this largely veteran staff, Barbara is very vocal about her perspectives. Striving to “give” her students “what they need to survive,” she prides herself on her ability to mold the future. Having used many programs over the years she is stern in her resolve that none will help students alone. She realizes the essential role educators play in guiding success.

Sylvia

Sylvia has recently switched to the upper grades and is concerned with the mathematics curriculum. This concern is partly associated with the new program as well as associated with her fear of inadequacy in the field of mathematics at this level. Because of her familiarity with math concepts at the lower grades, her feelings of expertise were not challenged until the switch to upper grades came about. She appreciates the role

students play in creating their own understandings within the new program, yet is concerned with her ability to know when to step in and guide.

Janice

Janice has taught for many years, maintaining her own program despite the many changes throughout the years in educational programs supported by the schools. She strives for success as related to her students performance levels on tests and is steadfast in her delivery of necessary information for such success. Though willing to incorporate new ideas in meeting such goals, she is hesitant to embrace any new program.

Margaret

Margaret, another newer member of the Cloverdale community, has taught the upper grades for several years and enjoys the challenge of learning with her students. She is thrilled with any challenge to learn more and fosters this love of learning as an opportunity for growth with her students. Though willing to embark on a risk taking venture, Margaret is concerned with the assessment of her students' performance. For this reason, *Mathland* has been a welcome, though scrutinized part of her curriculum.

Pat

One of several staff members considering early retirement, Pat has given her life to providing students with an understanding of aesthetics and an appreciation for a "higher sense of order." Uncomfortable with the principles of the *Mathland* program, Pat has sought the advice and recommendations of her colleagues in approaching lessons.

Methodology of Teacher-as-Researcher Project

Embarking upon teacher research, the teachers at Cloverdale were faced with yet another decision. Unfamiliar with qualitative research, many teachers were unsure or cautious about their role as researchers. In initial conversations, teachers were perplexed as to whether or not what they were doing was really research. In their trial and error approaches and personal reflections in everyday situations, teachers at Cloverdale had already begun collecting data. Though unaware of the research methods they had been implementing, the teachers were now faced with bringing to language the method by which teaching decisions were being made. Heck and Williams state that,

The role of the teacher as researcher is a very natural one considering that teachers, because of their daily observations and interactions with students, are in a key position to gather data constantly over a long period of time (Heck and Williams 1984, 94).

In the role of researcher, a door was opened for conversations regarding the beliefs undergirding their practices as teachers.

This conversational format became the cornerstone of the teacher research project at Cloverdale. As part of faculty development days and faculty meetings, this orientation to conversation became a context for learning from one another, as teachers and researchers. Slowly finding its way into the lunch room, work room, and hallways, this orientation involved the sharing of ideas and attempts to try new things. It served as a means for understanding the data they collected. Within such learning conversations,

teachers began to explore their beliefs regarding the curriculum and their roles as pedagogical decision makers.

Critical Qualitative Research

The stated purpose of this research was to gain insight into teachers' understandings and beliefs about border crossings in a metaphorical sense. In addition, this research was concerned with coming to understand the boundaries which we all must face as society becomes more diverse and the amount we need to know increases. Critical qualitative research acknowledges particularity, diverse values, and individual voice. This research has crosscut disciplines, addressed the socially constructed nature of reality, and involved a relationship between the researcher and what has been studied (Freire 1973).

In light of the interdisciplinary and social nature of this research, and due to the fact that a critical stance was sought, qualitative research incorporating anthropologic participatory methods was selected for this study. Crossing the boundaries of a variety of disciplines, it became essential to respect the nature of the topic which is value laden, naturalistic, and ambiguous. Furthermore, it became necessary to include the understandings, opinions, and voices, of participants. Critical research provided a lens through which such contextually bound understandings emerged.

Dialogic Retrospection

In his description of *dialogic retrospection*, Kieffer (1981) enumerates characteristics of participatory research formats. In combining notions of

phenomenology (the study of human experiences), critical theory, and ethnographic study, exploration using Kieffer's model involves the research participant as a collaborator in constructing understanding. By capturing the "qualitative and relational aspects of the phenomena studied," Kieffer's model for participatory research provides a framework for the study of human interaction and socially constructed understandings (Kieffer 1981, 8).

In order to apply this dialogic model, efforts were made to provide an understanding of the participant as active in the world of lived-experience. Viewing research as a process of becoming, the participant became empowered with awareness of the potent role of the self, critical comprehension, and functional competence (Kieffer 1981 Freire 1973). The structure or rigor of *dialogic retrospection* maintains the "strangeness" and purity of the "presuppositionlessness" of experience. It provided a framework for each participant to describe their lived experience as fully as possible, "in their own language . . . unhampered by the researcher's prejudice." In addition, truthfulness and reliability of the reporting were insured through interviewing while structural inequity was avoided through participants' reaction to transcribed interviews giving them ownership of the data (Kieffer 1981).

Through this interactive sharing of experience, characterized by an open and active exchange, a boundary in research methodologies was crossed. Stressing the importance of participant exchange through face to face dialogue, this research addressed issues of

central import in a manner which acknowledged relevant contexts. Conducted in an open ended, flexible, and conversational manner, the exchange became one of “depth interviewing.” Conversations with interviewees were electronically recorded. Participants were interviewed a minimum of two times in which open-ended questions were used to promote conversation. Following each interview I transcribed the audio recordings and returned them to the interviewee for review, reflection and comment. The first interview became a starting point for further discussion. Issues of “disagreement” and areas requiring further elaboration were also explored. Interviewees were given opportunities to share control of their interview data. This approach to data collection is rooted in the phenomenological tradition, allowing the data to speak for itself (Kieffer 1981).

Data Collection and Documentation

Begun during the researcher’s student teaching experience at Gene S. Cloverdale in January 1995, the type of data collected was mainly observational. A log was kept regarding reflections and observations made at the site. In the researcher’s second semester of the Cross Cultural Language and Academic Development (CLAD) Credential Program at San Jose State University, a log was kept in addition to the journal. Interview transcriptions, meeting agendas, board meeting transcripts and other artifacts were also collected.

Serving as a historian for the Cloverdale's Teacher-as-Researcher Project during my second semester at the site, I collected material regarding the implementation of the *Mathland* project at Cloverdale. Washington-Irving Educator's Association (WIEA) articles, memos from school and district administration, meeting agendas, staff development day schedules, memos from board meetings, materials provided at staff meetings, as well as parent newsletters and Parents and Teachers Association (PTA) meeting materials. Such documentation served as a form of assessment for the implementation of *Mathland*, enabled teachers to follow their personal and professional growth as they explored their own research questions, and provided historical data for further examination.

Documentation of both the change process and the teacher research process has benefited the teachers, the school, and the district as it has provided information about how a school or a district might approach the introduction of a new curricular program like *Mathland*. Providing insight into how teacher research can be used as a form of ongoing in-service for the introduction and implementation of new curricula, as well as for restructuring current programs, teachers are thus able to develop a more relevant and systematic approach for informing their own instructional decisions.

Journals and Observation Logs

Based upon observations within classrooms, the staff room, and during a variety of meetings, a journal was kept regarding personal reflections as a researcher. Keeping the

issue of conceptual borders in mind, these close observations were detailed daily. An observation log was kept which focused on the nature of the dialogue taking place among the teacher researchers within their school community. Major categories or themes of conversations, without names, were kept in this confidential log. The daily log also captured personal observations of the researcher and detailed a variety of contexts in order to shed light on individuals' understandings as they emerged. These formal and informal observations provided insight regarding the conceptual maps of these teachers and the crossing of conceptual borders manifested within a changing school setting.

Conversational Interviewing

Traditional models for interviews in research have focused on the researcher as controller of both the process and the outcome, thereby serving to disempower teachers, parents, and children through the process, obstructing them from the outcome (Kieffer 1981). To ameliorate the disempowering effect of such interviews, semi-structured interviews were conducted with school administration and teachers at the research site using Kieffer's model of *dialogic retrospection*.

Influenced by a critical interest in crossing conceptual boundaries, the focus of this study has been upon the maintenance of participant empowerment. Accordingly, the researcher and participants joined in a collaborative effort. This effort incorporated the interviewee as an integral force in the construction of a meaningful outcome. Based upon Kieffer's use of *dialogic retrospection*, research participants were engaged in the research

process as follows.

1. Participants were involved in an introductory meeting in which possible interviewees were informed of the project and confidentiality issues and consent discussed.
2. Participants were interviewed, according to Kieffer (1981), twice. The audio taped interviews were transcribed and returned to the participant for review and reaction.
3. Within twenty-four hours of each conversation, observations, reflections, and thinking was recorded by the researcher.
4. A second interview addressed issues that emerged from the first interview. These issues served as the basis for a deeper level of discussion. In some cases a third interview was conducted (Kieffer 1981).

The First Interview

To create a context for participatory conversations, the first stage of the interviews was composed of open-ended questions which were aimed at developing a historical perspective of the participants. As a foundation for critical theory in this research, the gathering of personal biographies was used to uncover aspects which bridge the gap between the research and the participants' personal experience (Freire 1970). Once such a history of the interviewee was established, questions moved toward discussion of taken-for-granted assumptions. In many cases these assumptions presented

themselves as boundaries to be crossed. Additional questions depended on themes which emerged in the discussions and reflections based on transcriptions from the first interview.

The Second Interview

The questions formed for the second interview expanded on the data received from the first interview as well as from new directions inspired by further readings on the part of the researcher. By transcribing the interviews personally, I was able to reflect upon the rich data provided. In allowing for the participants to do the talking and in providing a means for sharing the research process, new themes emerged which could not be anticipated *a priori*. As a result, the role of the researcher became that of a provoker and participant in conversation. A third interview was conducted when needed to clarify or expand on the data provided in the first and second interviews.

Data Analysis and Interpretation

Max van Manen (1990) outlines the use of human science research for developing an action sensitive pedagogy. In using hermeneutic phenomenology to study the life-world of research participants, van Manen attempts “not to prescribe a mechanistic set of procedures, but to animate inventiveness and stimulate insight” (p.30). Six research activities are detailed in his methodical structure of human science research. They are described by van Manen as follows:

1. Examination of a phenomenon of true interest to the researcher

2. Investigation of experience as it is lived as opposed to how it is conceptualized
3. Reflection on essential themes characterizing the phenomenon being researched
4. Description of the phenomenon through writing and rewriting upon reflected themes
5. Maintenance of a strong pedagogical foundation in relation to the phenomenon
6. Consideration of the research context in relation to its parts and whole (van Manen 1990)

This research has sought to employ van Manen's six research activities in its conception, design, data collection, and analysis. A first step in this process focused on the explication of assumptions and pre-understandings. As van Manen states, the problem of this form of inquiry is "not always that we know too little about the phenomenon...but that we know too much" (1990, 46). In researching the understandings teachers have regarding their own practice, paradigms in action are revealed. The life-world context of this research allows for the interplay of what is often held as "common sense" and what is viewed as an existing body of scientific knowledge. The teacher-as-researcher process allowed for critical reflection regarding these lived experiences.

Another aspect of the transcriptions and other data considered in analysis involved the search for idiomatic phrases. The common expressions teachers associate with their practice were pursued in hopes of obtaining the interpretive significance of

such phrases. In this way, ordinary language becomes a reservoir “in which the incredible variety of human experience is deposited” for interpretation (van Manen 1990, 61).

Having reflected on the assumptions and understandings in transcriptions of interviews, profiles and themes emerged. In cooperation with participants, these lived-experiences were explored in combination with “close readings, plus judgment” (Seidman 1991, 90). Coming to the transcripts with an open attitude allowed me to focus on emergent themes. Within this context, the data are able to “breathe and speak for itself” (Seidman 1991, 89).

Seidman (1991) provides a guide for researchers in education and the social sciences. This research employed some of Seidman’s recommendations in analysis of data. After searching the data for phrasing and assumptions in light of van Manen’s work, Seidman’s approach to analysis was used to identify emergent themes. A first step in this process involved marking the text passages that were of interest to the research with brackets. In judging which passages were of interest, emphasis remained on “aspects of individual experience and social structure to which I respond when they appear.” Illuminating this process further, Seidman states,

I am alert to conflict, both between people and within a person. I respond to hopes expressed and whether they are fulfilled or not. I am alert to language that indicates beginnings, middles, and ends of processes. I am sensitive to frustrations and resolutions, to indications of isolation and the more rare expressions of collegiality and community. Given the world in which we live, I am sensitive to the way issues of class, race, and gender play out in individual lives, and the ways hierarchy and power affect people (Kanter 1977). I do not, however, come to a transcript looking for these. When they are there, these and other passages of interest speak to me and I bracket them (Seidman 1991, 90).

Vignettes and profiles of participants were formed after such close readings in order to “allow those words to reflect the person’s consciousness” (Seidman 1991, 91). These narrative profiles are transformative in their shared understandings. As a compelling way to make sense of interview data, this story telling format has provided a link between the individual’s experience and organizational context in which that individual operates. The data, as a story, thus relate the way in which people made sense of themselves and their social world during a time of change. Being faithful to the words of teachers and protecting their anonymity were vital in this process of sharing stories. The following steps were taken to ensure confidentiality.

1. Participants were informed of their rights as part of this study
2. Written consent via an agreement form was completed by participants
3. Confidentiality of all data was kept by the researcher
4. Transcriptions of interviews were made by the researcher
5. Transcripts were returned to the participant for reflection and comments
6. Any material reprinted was coded with pseudonyms for all participants involved

The use of these vignettes or profiles in this research has ensured participant voice, while protecting participants’ rights. Through their stories, salient issues within individual profiles emerged and connections were made with other profiles. In addition to this format, excerpts from transcripts were organized into categories and presented thematically. As passages were read, tentative labels were used to code insights. Sorting

and culling meaning in this fashion served as another avenue for ensuring participant voice.

Involved in analysis and interpretation of the data, the researcher organized what was seen, heard, or read at the research site. Through reflection and critical engagement with the data, patterns emerged and were organized in a variety of ways. In addition to van Manen (1990) and Seidman (1991), this research has relied upon methods described by Glesne and Peshkin (1992). A reflective field log was used to develop thoughts and begin analysis of data. Material from these logs and other documentation collected were combined with emergent themes in transcript materials. In this way, material from the logs and from interviews was categorized by salient themes.

A coding process was used to sort and define relevant themes applicable to the purposes of this research. Piecing together these coded understandings, an organizational framework for further interpretation was created. The amount of time spent at the research site (full time for one year) and with the participants allowed for the trustworthiness of this data. By remaining continually alert to my own biases as a researcher, trustworthy interpretations were also ensured. Again, this interpretive process was shared with participants. Throughout analysis the development of a trustworthy ethnography was emphasized in order to make “familiar what at first seemed strange, the other.” This “other” parallels the “alien” as described by Chicano writers in reference to border crossings.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF THE DATA:

PERSONAL TRANSFORMATION

Because change is one of the most frequently used words in the literature of an organization, as well as elsewhere, it is not surprising that it often seems to lack clarity if not precision in use. (Owens and Steinhoff 1976, 21)

The following presentation and analysis of data collected at Cloverdale school is concerned with looking at moments of personal border crossing. In considering the thoughts, reflections, and dialogue of teachers in a variety of settings over the period of over one year, it became apparent that change has occurred on two levels. The teacher-as-researcher orientation has become a process not only introducing the new math program, but also for crossing borders. As a liminal space, the project allowed for critical engagement with issues of personal and social import, resulting in transformation of this educational community.

In looking at these changes, Chapter Four presents moments of personal transformation, including transformed visions of the nature of knowledge and learning, the role of text and assessment, as well as changes in personal visions in the roles teachers and students play in school. Chapter Five moves on to document moments of social transformation, including the nature of dialogue at the site and the changing school culture. These moments of personal and social transformation mark border crossing moments

apparent as teachers shared their insights about the new math program and their orientation to teaching and research.

Before highlighting the moments in which the teacher as *atravesada* shifted across personal and social conceptual borders, a brief synopsis of the format for the teacher as researcher project is presented. This shall orient the reader with the process teachers engaged in throughout the introduction of the new math program during its pilot year at Cloverdale.

Moments of Personal Transformation

The teachers, grouped largely by grade level, met in order to discuss possible research questions as part of the PQR and teacher-as-researcher project. These groupings mirrored friendship among colleagues as well as professional connections. The primary grades featured larger groupings for the most part, whereas the upper grades tended to faction into smaller enclaves. The larger groupings of the lower elementary included veteran teachers as well as new teachers to the profession.

The upper elementary reflected a close knit group of veteran teachers who have taught in a more individualistic mode for the years they have spent in the profession. Though there is collaboration among the upper grade teachers, there is a more independent spirit in planning and developing class events in the upper elementary structure at the site.

Time was set aside on staff meeting agendas and during staff development days for such groups to officially meet and discuss their ideas. They engaged in dialogue about new ideas sparked by their experiences with the new program and grappled with concerns regarding *Mathland*. This time spent discussing experiences and insights was not limited to such organized sessions. Many groups could be found clustered in the hallway between classes discussing which *Mathland* lessons were “working” and which “bombed.” On one such occasion, a pair of upper grade teachers stood in the doorway during a brief encounter. Millie and Flora braced against the door frame as the following conversation ensued,

Flora: Millie, have you been doing the graphing and survey part of Chapter One? I’ve tried to do what it [*Mathland*] says, but. . .

Millie: Yeah, the circle graphs just confuse most of my kids! We’ve been using bar graphs instead. I don’t know if that’s the way they’re [the students] supposed to be doing it, but the other way wasn’t working! Sometimes I just don’t know what they [the publishers of the *Mathland* series] were thinking when they dreamed up this stuff!

Flora: Or if they were thinking at all! Sometimes I question whether they just threw stuff together or if there is any reason to the activities. Sometimes I don’t even get [understand] what they want us [the students and teacher] to be doing. I end up changing it [lessons] a lot and putting in my own stuff.

Millie: That’s what I’m forever doing, Flora, filling in the gaps!

Such conversations were brief and contained both their aversion to the program as well as their triumphs in recreating the curriculum anew.

Once these grade level groupings had officially met several times, the groups chose a question to be researched. The emerging questions reflected frustrations that teachers like Millie and Flora shared in their brief encounter. There was a wide range of questions

that emerged from such conversations. The following is a sample of some of the initial questions:

1. How can we optimize learning through the grouping of students?
2. How can we successfully assess student understanding and skill development?
3. How can we determine the appropriate time to move on to new concepts?
4. How can we determine student mastery of unit material?
5. How can we facilitate LEP (Limited English Proficient) student development?

Groups who were finding difficulty in embracing the new program were especially apprehensive about narrowing in on a question. One such upper elementary group made this clear at a staff development session. Jeanie, their group leader, stated,

I'm not sure of what question we should be asking. With this program we have a LOT of questions! How do we know students are getting it [math concepts]? Where is the computation and skill development? How are my kids going to do on the CAP test? The list goes on and on!

There was much agreement among the other teachers during this proclamation of distaste for the program. Heads nodded and a rumble of discontent swept the room. Principal Lea Evans stepped in to guide the discussion by stating,

I think what your group is really asking is "Can we trust *Mathland*?" This is obviously a concern that you and others share at this point and it will be up to us to work together to make the program meet the needs of our students. For the purpose of this research project however, I think we need to change focus to a concern we can observe and track through this process.

By facilitating the discussion in this manner, Lea was able to dissuade the direction the conversation was headed in and restate the goal of the teacher-as-research project. With further facilitation from Dr. Harper and Dr. Nelson, who visited during part of this

session, the group was able to agree upon a research project in which they kept track of areas which were of concern and where they felt the program had gaps. Keeping notes on color coded cards, they then met as a group of colleagues to discuss approaches to modifying the program. This dovetailed their concerns in the beginning of the question forming session in that it allowed them to see their valid role as creator of a more complete program. Jeanie later thanked the professors for their participation, stating,

I knew there was no program that could succeed without the teacher making it succeed, but you want so much for the class that you get skeptical of something which you have to greatly modify in order to make it work. I guess it [modification of lessons] is something I do all the time, but hadn't thought much about.

In this way, the teacher as researcher process made it possible for teachers to come to grips with the notion that they had an important role in creating the curriculum and that the curriculum was not some external entity which they merely executed at the feet of experts. This border crossing moment reflects the type of personal transformation which was prompted by this matrix for change.

Upon selecting a question, each group began collecting and discussing data. These data included close classroom observations. This occurred within individual classrooms as well as within classrooms of colleagues. Several teachers chose to visit classrooms of their colleagues. This was often prompted by interests in improving teaching skills. Carlie, an upper grade teacher, decided to visit Anna's classroom. She commented,

I always heard great things about Anna's teaching. She is just outstanding! I don't know how she comes up with some of the stuff she does, especially with *Mathland*, but it seems to really work for her and her class. I thought I'd drop in and see what was

going on and I learned a lot. I'm not sure I would do everything she does. I wouldn't feel comfortable with the noise level and all, but I picked up a few ideas and will try them out myself.

In addition to their meetings and observations, teachers kept journals as their students customarily have done in class. In these journals teachers kept notes regarding what they were doing and what their students were doing in *Mathland*. Shirley, a lower grade teacher, was exploring concerns with grouping. She chose to keep a running list of which students worked well together during certain sessions.

I kept these scribbled notes during group activities to try and determine which pairs would be best suited to working together. I didn't have much time to take notes, so they are brief, but they have helped in making better decisions for future lessons.

These journals were as varied as the teachers and their concerns with the program. In addition to quick notes and lists made during lessons in class, some teachers chose to make personal reflections based upon classroom observations. For example, Carlie decided to write in her journal after school as opposed to during lessons. She wrote about things she was concerned with in her room as well as insights she had in visiting other classrooms.

I wrote a lot that day I visited Anna. We teach so differently you know. I don't think I will be able to be as comfortable with some of the group activities like she is. I tend to do more individual projects. But I had a lot to think about after that visit. I even thought about retirement. Maybe it's time! Things are so different now and I don't know if I have all the energy that people like Anna seem to have.

These insights were of a very personal nature and incorporated concerns that teachers like Carlie had with teaching as their way of life. They were powerful deposits of their

insights in a period of flux as opposed to logs of data extrapolated from examination of student outcomes.

Depending upon the question being asked in the group, a variety of data were collected. For example, when considering grouping, some teachers chose to try a variety of groupings, from ability to friendship, keeping notes on the activity and what they felt worked or did not and why such may have occurred. This trail and error approach was not always seen as “research” by the participants, but rather as a way of survival in teaching. Trina, a lower grade teacher, commented that she always explored new approaches to teaching, but insisted this was not research. She states,

Trying out new things and adapting things to what works year after year is just what I do. It isn't research. I just try it and if it works I keep doing it , if it doesn't I try something else!

Such insights or results of experimentation were shared with others researching grouping as well as with the whole school. In this way, personal moments of transformation were able to impact the larger social system in the school.

Many of the group conversations about such findings led teachers to go beyond observations of their original questions with *Mathland*. Some began looking at other issues in math as well as other curricular areas. Sylvia, another lower grade teacher exploring grouping, began to extend her findings in other curricular areas, as she states,

I started taking a closer look at what was happening in my classroom during language arts and reading. The groups that worked in math didn't always work out well during reading. I think ability levels count more or have more impact in reading pairs than in mathematics. It seems like the math groups tend to work out well despite ability level differences, at least from what I have seen in my class.

Student work depicting a variety of levels of understanding became another source of data for a group considering when to move on to a new topic. Concerned that “*Mathland* moves the kids on when they may not be ready,” teachers like Emma began experimenting with finding examples of work that depicted the students’ mastery of a subject. She comments,

I started making portfolios of students work a long time ago and now that I have *Mathland* in my room, I decided to use them [the portfolios] for finding when to move on to the next unit. I wasn’t satisfied with the way *Mathland* moves the kids along. I found that if work was not meeting the rubric I developed that I would supplement and not yet move on to the next activity. Some of it, a lot of it, involves your intuition as a teacher too. After many, MANY years of teaching I feel I know when it is time to move on and when it is not.

Student portfolios were also used by an upper grade grouping who mirrored some of Emma’s concerns. Teacher generated assessment sheets and other evaluation tools became a source of data for this group of teacher researchers. More than being concerned with when to move on, the group was concerned with how to assess the skill attainment and mastery level of students. Barbara best explained their concerns regarding assessment, stating,

Before [past math programs], I was always sure of whether my students were succeeding or not. I knew when they were drowning and when to dive in to rescue them. I also knew what areas to nurture them in because it was very cut and dry. The skills were apparent in their worksheets and quizzes. If I follow *Mathland*’s assessment I feel like I’m as lost as I think my students are. I need a new assessment format and I guess we have to come up with it ourselves or our students are going to die on the CAP test.

As a result of such concern, the teachers generated materials they felt were more complete and appropriate for assessing student progress. In addition, students work was used to

assess how future lessons might be designed in order to achieve the standards teachers like Barbara hoped to find.

All of the teacher researchers at Gene S. Cloverdale were highly focused upon which pieces of student work they would chose to represent the *Mathland* program embodied within their classroom, both for the PQR process and for the purpose of the teacher-as-researcher project. The teacher researchers then analyzed their data and made suggestions for future approaches to the math program. Barbara, Flora, Millie, and Carlie met one day to share the work they had collected from the same unit in *Mathland*. They were shocked by the varied responses the data held.

Millie: I can't believe that this was from the same group of lessons! Did we have the same book? This was unit three right!

Barbara: Well we aren't robots, so we are going to do stuff differently. I am shocked though that the work does show my students comprehension, or lack of. I mean look at this kids answer. You know who this has to be. Only Gerona would come out of left field like that!

Carlie: Oh, is that Gerona's paper? Let me see it. I had the worst time trying to think the way that kid did when I read his work in my class! He is probably brighter than I am 'cause I sure could not see the way he approached some of the problems.

Flora: All I want to know is who is going to be able to call such a variety of answers an A, a B, a C grade and so on! I know this group of kids is right on with their work, but they don't all look the same. How can I give them all the same grade? They may all deserve a high grade because they know what they are doing, but how can I say, o.k. this group is A work?

This group grappled with this issue of what qualified as an A, B, or C for quite some time. Though there was not a definitive solution in their estimation, there was a realization that they had to view their students differently. They were individuals and this process, along with the new approach to math in *Mathland*, was allowing them to see

this individuality in their students. As a liminal space, this moment of reflection and critical dialogue about their teaching was allowing for personal and social transformation.

In looking at the methodology employed by these teacher researchers at Gene S. Cloverdale one finds participatory research in action. As active participants in this project teachers have begun to grapple with issues through the use of their observations, journals, group dialogue, and teacher and student generated material. Through their research, teachers like Carlie have struggled with *Mathland*, the PQR process, and what it means to teach. Others, like Sylvia considered issues beyond *Mathland*, other curricular concerns as well as the change process and their views on education in general. The teacher researchers began the process of examining the beliefs which inform their teaching and exploring the paradigms on which such views are built. It was within the liminal space created by this teacher-as-researcher program that moments of border crossing have begun to take place. Implicit in valuable personal insights, these border crossing moments marked a changing educational terrain as it emerged at Gene S. Cloverdale School.

The Transforming Nature of Knowledge and Learning

One consideration of personal transformation taking place throughout the PQR process and teacher-as-researcher project has been in the area of a transforming view of the nature of knowledge. As Carlie and others grappled with variety in teaching styles and learning styles, insights regarding their roles as teachers and the outcomes they expected came to the forefront. In talking with the teachers throughout this process and

in the examination of teachers' communication with one another, these moments of personal border crossing began to emerge.

Teachers' views of knowledge and learning have been especially impacted through this process. Prior to their engagement via classroom research, many teachers assumed knowledge to be something which existed *a priori*, somewhere out there. In keeping with the modernist paradigm, the thought was that curriculum was a packaged entity which was somehow given to students. Having taught within this paradigm for many years, the assumptions implicit within such a system had become a part of routine, and therefore were left unexamined and transparent. Creating a liminal space, the teacher as researcher project at Cloverdale had exposed and made such issues more opaque for many teachers.

The most notable instance of coming to grips with packaged curriculum and the type of learning implicit within such a belief system was evident in the upper grade engagement with *Mathland* and their research questions. Though the primary teachers were faced with the notion that curriculum was something they invented through their intuition and teacher professionalism, the upper grade teachers seemed to struggle with the issue. The prospect of having to rethink their teaching styles and modify the curriculum was, at first, seen as a detriment to the program.

As Jeanie's group illustrated, there was a suspicion of a program that was not "complete." Having not been spelled out in great detail and having a different assessment and vision, this program left teachers like Jeanie in a state of questioning their role. Flora

mirrored such concerns, but stated that she “always fills in the gaps, even more so with *Mathland*.” She went on to comment on this need to create the curriculum, stating,

I guess we [the upper grade teachers] are just so used to having the necessary materials and moving through the curriculum. It is harder now to cover the material because it isn't the same material. Some of it is the same, but is dressed up differently. Most of it comes from us now though. We have to think up how it will work and that is a lot harder for us. It is frustrating after years of teaching to find out you have to restart all over again!

This comment by Flora reflects the notion that teaching is a process of life long learning.

It also reflects the realization that the curriculum is something developed in a process between the teacher and the students. It is not the pre-packaged curriculum critiqued by Apple (1982). No longer a quantifiable substance, knowledge was emerging as an ongoing process rather than something to be given and received. This area of transformation was a break from the quantified notion of knowledge described by Freire (1970) as a banking system model of education and by Bowers (1987) as recipe knowledge.

Freire's Banking Model for Education

Within a banking model of education, knowledge is considered a quantifiable entity. As a passive vessel, students receive educational deposits through transactions made by educators. Freire (1970) described such a model which reflects the tenants of a modern technical learning system. Teachers as experts in such a closed system possess knowledge which is to be dispensed to the passive students. Janice, a lower grade teacher, mirrored such sentiments when she stated,

I didn't think they [the students] could do it [learn math] without me being the predominant figure. I didn't know when to step down and let the children take over. Stepping aside has been very hard for me.

The role of the teacher within a banking system is thus relegated to that of distributor of packaged knowledge. The student, as a receptacle, is passive and dependent upon the guided instruction by the holder of knowledge, (i.e. the teacher). In grappling with concerns through teacher research, the assumptions of this banking system were slowly emerging.

In addition to these defined roles within a banking system approach to education, learning becomes an act of listening, memorizing, and giving back pre-defined responses. Learning then is not an action, not a verb, but rather an object to be given, a noun. Because the *Mathland* program focuses upon the “new math” approach to divergent responses and active exploration, there was ample opportunity for engagement with this issue of the nature of knowledge and learning.

Prior to the introduction of *Mathland*, many teachers at Cloverdale had been familiar with the Silver Burdett Math Series, Scott Foresman, and Houghton Mifflin math programs, where the bulk of the material is textbook and workbook driven. In other words, the teacher dispenses the material or knowledge implicit in the pages of the text provided. As a recipe to be followed for student success, the program is a paper and pencil approach to math with drills for assessing skill development. A highly individual program, group work and projects are not the main thrust for learning.

The nature of knowledge and learning presented through these programs are indicative of Freire’s banking system and required the prominent role of the expert

teacher. Furthermore, the programs were implicit of a modernist paradigm with pre-packaged curriculum and clear roles for educators and students. Margaret, an upper grade teacher, best stated the differences she and her colleagues noticed in using the new math program. She explained that,

Before we were a total pencil and paper system and now we have gone to the opposite extreme. The focus was on the bottom line, textbook driven. With *Mathland* they're asking you to describe things, they're asking things to be written and the bottom line right answer is not in the forefront of what's going on.

From this focus on the skill and drill approach to learning through textbook delivery and lecture, a gradual transformation was taking place at Cloverdale in the teachers' personal approaches to thinking about knowledge, learning, and the roles of the teachers and students. As the groups worked on their questions and collected data in their respective classrooms, changes in their views took place. As Janice grappled further with this dilemma, she stated

Learning when to step down has really given me a wealth of ideas! I am learning to listen when I step down and stop talking and the kids are saying things I never would have thought of. It has been hard for me to give up the predominant figure status in the room, but it's very exciting because it is the children's thinking and focusing on their group when they explore. It's not necessarily the ways I predict, but they're coming up with different solutions. It's amazing!

Relinquishing the role of expert and moving away from a lecture delivery system of canned knowledge, teachers began to transform their personal relations with the act of knowing and learning. Crossing these boundaries has led to a reexamination of student and teacher roles in the classroom as well. As Janice began to "step down" she began to redefine and renegotiate the learning process and roles with her students.

Changes in Thinking

In addition to this transformed understanding of knowledge from the “paper and pencil” format to manipulative based *Mathland*, teacher conversations revealed a change in the process of learning. Taking on action as a verb within the classroom walls, the type of math once processed through drill and kill approaches to building skill gradually took on a new appearance. Pat, a primary grade teacher, came to terms with this issue during the teacher research process, stating

I expected to find a resistance from some of the children to take the activity seriously because it can be seen in their minds as more of a play time rather than a math time. There is a lot of working in pairs and groups and using manipulatives to explore. Actually in terms of the social learning, we have learned that the *Mathland* program allows the children to learn how to cooperate with each other socially as well as achieving the *Mathland* objectives.

Pat’s remarks reflect a transformation in thinking in that *Mathland* had opened the doors for viewing the process of learning as more than the skills involved. The social learning aspects and assumptions of roles for activities defined within a program have become more apparent for teachers like Pat. Pat went on to state that,

More than the skills, they capable of achieving with each other and they are capable of cooperating and going about a project without my direction throughout math time. They process the way they wish to process, having the freedom to explore and be noisy if they need to be, but realizing that they have a goal or an objective that they have to meet.

In this way, the teacher-as-researcher orientation has allowed teachers to critically examine issues regarding the nature of knowledge and learning, beyond the curricular area of mathematics. Much as Sylvia began to explore issues pertaining to language arts and the relationships involved in her room, so have teachers like Pat begun to rethink the

process of learning. These personal transformations mark paradigmatic shifts or border crossing moments in conceptual thinking.

The Role of the Text

As teachers gained new orientations toward knowledge and learning through critical engagement with the math program, new visions of the role of the text itself took place. Whereas textbook programs had once driven the curriculum, *Mathland* and its lack of student textbooks prompted changes in the role text played in the classroom. Emma, who had been concerned with student mastery and when to move on to the next subject area, was concerned with this change in the curriculum. She commented,

The *Mathland* guide tends to move right along and goes on from topic or subject or one area to another and I was wondering whether I needed to stick right with that book or go by my experience in other programs I've used and sort of do it the way I had done in the past. I wasn't sure if what I had been doing was correct or not.

As implied in Emma's comments, traditional textbooks have tended to drive the classroom learning and have placed true authority upon the shoulders of external "experts" who publish the programs. Ultimate authority was held by the book, not with the teacher. Control over the learning is placed external to the classroom.

There was noted fear and apprehension in using this new form of text. Relying upon the intuition of the teacher as a professional was something new for many teachers at Cloverdale. Though they have been creating materials for years and modifying lessons to make them "work" with their students, the extent to which they were called upon to

modify and become personally engaged with the material surprised many of the teachers.

As Barbara explained,

I was afraid that without a textbook I would not be focused. The textbook keeps you focused down a steady line. Someone has paid someone big bucks to pull all this stuff together and I feel like why should I reinvent the wheel?

Dependent upon the textbook as a recipe for what would take place in the classroom, teachers sharing Barbara's concerns had come to see themselves as de-skilled in their role. The role they would take prior to *Mathland* was clearly delineated and was clearly defined in the teacher's manual. As a "guidebook" as opposed to a handbook, the *Mathland* series invited the teacher to be a creator and this threw many teachers, like Barbara, into a state of disequilibrium. She went on to state that,

I like the concept of not using textbooks, but the textbook was always there as a backup for if we needed to practice something or for computational skills, so not having it at all is kind of scary and difficult.

Even with apprehensions, teachers forged ahead, trying new approaches to teaching and learning without a traditional textbook. The autonomy of the teacher as a professional decision maker, independent of a textbook, was a struggle. It proved to be an area of marked personal growth for many teachers.

As the year progressed, teachers began to take ownership of the lessons and the notion of the text as an all powerful factor in developing skill began to lessen. As Shirley, a primary teacher working with grouping stated, she began "marking up the guidebook" and encouraged others to do so in their books. "Making modifications is what we do as teachers," she states. She went on to say, "Why shouldn't we write in the margins?"

Then we can tell others what we did and remember the following year when we plan again.” Whereas teachers had anthropomorphized the text in the beginning, referring to what “*Mathland* says to do,” what “*Mathland* expects,” and what “*Mathland* asks us to do as teachers,” teachers began to take a stand as professionals in the field of education. Comments like Shirley’s were reflected in comments from other like Sylvia who stated,

It’s nice to realize and get more excited about developing some of my own things and coming up with new ways of doing things. I have begun saying hey, I do have the power to do this!

This realization of the modifications teachers make everyday became one of the most widespread moments of border crossing. Others, inspired by Shirley’s comment to mark up the guidebook, began to share a sense of empowerment. This was illustrated in such comments as made by Sylvia. She commented,

There are lots of things that if they don’t work then you’ve got to change them right away. You cannot keep doing something that you know is not going to be successful. I am constantly changing plans. You modify them, you adapt them. You keep trying and trying to find what works best for your students.

Though empowered, such a process was noted as being far more time costly than the textbook programs of the past. Required to be more thoughtful and to realize the role of the teacher as a creator, Sylvia went on to comment on the amount of effort put in by her and others with the new program. She stated,

I am constantly taking home *Mathland* and wondering how to make innovations so that there are more well developed lesson or a more complete program. So now I guess I try to fill in the gaps and that takes time.

Giroux Transformative Intellectual

In *Teachers as Intellectuals* Giroux (1988) details the empowering role educators might play in engaging students in risk-taking, promoting change, and participating in political activism. As a struggle for democracy, education in a transformative system acknowledges the teacher's creative role in developing and restructuring a critical pedagogy. Some teachers at Cloverdale began to take on this role of the transformative intellectual, detailed by Giroux. This was largely prompted by the modifications teachers made throughout their engagement with the new program. Personal ownership resulted in a growing sense of empowerment and independence from the control of outside authorities. For some this experience was not a new one. Shirley discussed her need to change in regards to her preparation for *Mathland*. She commented,

Whenever there is a new program you have to make changes. Some lessons are very well done and it is very clear and then there are other lessons you ponder over and really wonder what the writer is trying to accomplish on this. Then you start to make adaptations so that you can meet what you want to accomplish. The amount of time that you have to spend is great, but a more well rounded program is worth the hours you spend in preparation, sometimes on one subject alone.

Teachers who had come to this realization began writing in the margins of their teacher editions, as had Shirley. They made appropriate modifications for the goals of their classrooms and in accordance with the abilities and expectations of their students. As this process of exploring personal ownership with the text expanded, teachers spoke less of what *Mathland* wanted and more of what they, as professionals, had decided.

Inspired by Shirley and others, Barbara stated,

I finally decided, o.k. this is the suggestion that is provided and here is what I know needs to happen for my students to understand the content. My lessons took time but were more comprehensive in my opinion. I feel confident that I am making the appropriate decisions for the needs of the students in my room. After all, I am the one who knows them well and who is there to assess and meet their needs.

Realizing their creative powers as professional educators, teachers like Shirley and Barbara began to realize their transformation as intellectuals.

The Transforming Nature of Assessment

Along with changes in their orientation to knowledge and learning, as well as the changing role of the text, teachers began to grapple with a transforming notion of assessment. As the concern had been illustrated in the upper grade conversations, the focus had been on the “bottom line, right answers” in past programs. With the new program, teachers were often left feeling a bit weary of how to assign grades. As detailed earlier, Flora, Millie, Carlie, Margaret, and Barbara were left wondering how to assess and provide grades for the individuals they now viewed in their classrooms. Margaret stated,

Around the time of our first report card I felt like we didn’t have any grades for math and even though I had a general idea of where the kids were from working with them, I didn’t have any grades because *Mathland* doesn’t necessarily give grades. I just didn’t feel like we had enough to draw from to do a report card. like there wasn’t a lot of backing.

Though as professionals, they felt they knew their students’ ability levels, they were unsure of how to relate such information to parents. This was an area which teachers throughout the schools grappled with in reassessing their roles and the role of assessment.

Another concern regarding assessment dealt with the fact that much of *Mathland* involves group work. There was concern over “individual accountability” as well as grading for participation. This concern was shared among both the upper and lower elementary grade teachers. Sylvia stated,

I had portfolios that we had been using for writing and other things besides math. I wanted to account for individual work because there is so much group work as well as to have a more substantial backing system for the grade so that if a parent were to say “why did he get this” I could pull out something and say “look at this sample of how they are doing it.”

Sylvia goes on to express concern over group interaction, as she states,

I was very interested in looking at assessment because the children are always in groups. You can’t get a representative sample or an accurate sample of their ability because they could be copying off each other and taking answers. It is more difficult to assess participation that way.

Language is an important part of the *Mathland* program. Teachers were confused over the issue of what part of the grade belonged to math and what could be attributed to language skills. This concern was provoked by their realization that the students’ mathematical thinking was to be shared through writing. As Margaret stated,

A lot of the lessons involve writing about what they did or what they learned. It was difficult to give a math grade to such aspects which were really more language arts oriented. It was a thin line between content areas.

Margaret’s comments emphasize the blurring of lines of certainty within the context for questioning educational decision making. The questioning process she was engaged in had led her to rethink her assumptions regarding the discrete divisions between content areas.

As a school with a large population of second language learners, teachers also focused on what they believed to be an “injustice” of a program that is so highly focused upon language and relaying critical thinking through writing. Barbara stated,

The biggest thing for me was what are we assessing? With *Mathland* they ask you to describe things and write about them and I was concerned with whether or not we were assessing the right answers and math skill or the thinking process that gets them there or are we assessing their use of language in explaining their thought processes to get there?

Barbara also was concerned about her second language learners, a concern that was widespread. In order to meet the needs of the children at Cloverdale, the teachers spent a lot of their time trying to create opportunities for sheltered instruction. Though manipulatives provided one means of access for such students, teachers were frustrated with the emphasis in the program on writing and oral language. Answers were not provided by the publisher for them, therefore the teachers began to develop and modify lessons reclaiming their role as professionals.

As the year progressed, teachers began to see unexpected results in their students’ performances as modified assessment techniques were tried. For example, the assessment sheets and rubrics developed by the upper grade team whose research question focused on assessment allowed for multiple abilities to be seen in their classroom learning communities. As the teachers’ orientation towards the learning process changed and as there was a growing belief among teachers that modification on their part was more beneficial than the textbook delivery of past programs, they gained a new perspective

about student learning outcomes. Janice states,

Most often I am surprised at the results in the class. They [the students] have started asking each other questions that I would normally not think of. It is exciting to sit back and enjoy the different ways they are arriving at their answers. I always thought that I knew my students really well. I can't make the same predictions I used to. I thought certain kids would not be able to function because of language barriers or poor communication skills and that wasn't true! The research made me concentrate more on my students and how they work together, not so much on the end product.

In this way, the teacher-as-researcher orientation has allowed Janice to change her focus from a concern over the finished product to viewing her students in a more holistic and appropriate manner.

CHAPTER FIVE

PRESENTATION AND ANALYSIS OF THE DATA:

SOCIAL TRANSFORMATION

The School Culture at Cloverdale

If one of the most prominent heresies of educational change is the culture of individualism, then collaboration and collegiality are pivotal to the orthodoxy of change (Hargreaves 1994, 186).

The implications and assumptions of the modernist technocratic perspective in education have been juxtaposed with the open system of post-modernity in order to highlight the impact of border crossing in achieving authentic change in education. As the quote above by Hargreaves indicates, the culture of schooling has traditionally been characterized by a cherished value placed upon rugged individualism. Past reforms have reinforced this by attempting to prescribe roles for a standardized system of education. Teachers are often left to teach alone, with little opportunity to extend their practice beyond their classroom walls.

In stark contrast to this modernist orientation of school culture, the culture at Cloverdale School has paved the way for a collegial approach to school reform. Many aspects of Cloverdale have contributed to personal and collective border crossing moments. Cloverdale's unique school goal and mission within its community qualify it as a context for shifting perspectives. Working closely with one another, teachers, staff, and

administration have opened doors of opportunity for community development. Parents and caregivers join with the school community in order to provide a positive atmosphere for learning and growth. This school culture embraces all cultures and represents that of a global village as opposed to the rugged individualist paradigm that makes some schools.

Along with Principal Lea Evans, the school site council and leadership team have redistributed the roles of authority and administration at Cloverdale. Decision-making is a joint effort with staff and administration. It is not a top-down construct and is not closed to the teachers. Asked to take on leadership roles, teachers help make financial and political decisions which impact the school community. Principal Evans often invites and encourages members of the staff, who may be reluctant, to join in the various committees.

The unique nature of this leadership team format at Cloverdale would not be possible without the guidance and facilitation of the school principal. Principal Evans takes an active role in the school community. She is an ever present figure throughout the school and helps maintain the goals and missions set forth for this learning community. Modeling the approaches she encourages, her conversations with staff members are insightful and thoughtful. She welcomes and encourages input from the staff on all points and is organized and efficient in her planning of staff events. Inviting others to join in the efforts at the site, she facilitates the development of the established goals in an unassuming, quiet manner.

The faculty and staff at Cloverdale are quite aware of the special leadership qualities their principal displays. As Barbara commented,

She [Lea] is always coming into individual classrooms and giving advice or feedback. We all really appreciate that. It can be a little nerve wracking because you never know when she'll pop in, but I would much rather have her do that than never see her like most principals. We are lucky to have her here!

Principal Evans demeanor is professional and greatly respected throughout the school district. As evident in the incident with Jeanie at one staff development day, she is ever an ally to helping reinstate the goals that the school community has agreed upon.

The efforts of the principal at Cloverdale are mirrored in the efforts of the faculty and staff. The faculty and staff are always open to trying new things, even if they are skeptical at the outset. The innovative posture of this group of educators is apparent in their willingness to take on the role of teacher researchers. Though at times reluctant and even resistant, the impetus to try was always evident. It is this effort and perseverance, modeled by the administration, faculty and staff, that moves in to individual classrooms and is expressed in the attitudes of the students that occupy them. As a students teacher and researcher, I was privy to many dialogues with students in which this was witnessed.

At the outset of the new math program, many students were, as were there teachers, unclear and unsure of the new math structure in the classroom. Though many had used manipulatives in the primary grades, this was a much different approach in its structure and vision. The children, however, were quick to notice the new orientation.

During a lesson involving graphing, one of Shirley's students commented,

This is math? I thought math was lots of numbers and stuff and this is way different. When are we going to do real math, like we had before, last year and all? I'm good at doing that stuff but this is different and kind of weird!

Just as teachers had been unsure of the mathematical skills in the program, so too were the students. They knew this was a departure from the norm.

As the project progressed and as teachers continued to modify the program to make it work for their students, so too did the students' perspectives change. Students on their way out the door were saying things like "I like math! It didn't seem like math. I like to do my homework and I like what we get to do with our friends." Students seemed as willing and excited about learning in this new way as were their respective teachers. This depended on the attitude being modeled by their teacher. At times, some teachers would revert to teaching math lessons they were comfortable with or felt that they needed to interject some of the traditional methods into their practice. They would occasionally give out traditional drill review papers with problems on a sheet to be solved. The difference was apparent in the type of learning atmosphere witnessed in the classroom. Such a difference in atmosphere was evident in an observation made in Shirley's room. Given a sheet of addition and subtraction problems, the cooperative spirit among students witnessed during group activities in *Mathland* disappeared. The class, once a jovial setting with active participation and lively chatter about math, became drab and serious as the black and white sheets placed on students' desks. The inclination of students to share and discuss their findings diminished as traditional boundaries were placed between them.

These boundaries were both physical in nature, with binders being raised to protect individual responses, and spiritual in nature, with sideways glances and a sense of quiet apprehension.

This episode made it apparent that when teachers reverted to the traditional patterns students reverted to individualistic competition, borders reinstated and border crossing avoided. Students and teachers alike would attempt to protect what was “theirs” from the “outsiders” the “alien. This incident is testimony to the importance of the school culture in shaping the educational environment and impacting school reform. This incident was in stark contrast to what had become an interactive group environment during students mathematics time. When teachers are willing to try and to experiment, so will students be willing to make such efforts. Teachers at Cloverdale, in conjunction with the staff, administration, and parent community, are working to help to ensure this model for their pupils thereby helping them to become *atravesada*.

While these steps have been taken, there remains some aspects of antidualogical action at Cloverdale. Detailed by Freire (1970) in *Pedagogy of the Oppressed*, antidualogical action imposes the objectives of the “conqueror” on the “vanquished.” “Dispossessed of their word, their expressiveness, their culture,” the vanquished are reduced to things (134). Such action at the site may need to be addressed so that personal and social moments of border crossing may continue to emerge and be encouraged. The categories of antidualogical action which were noted at the site fell into three main

characteristics. Although subtle and sparse, these instances were noted to have a substantial effect upon prohibiting critical conversations. The impetus for true dialogue is in developing critical consciousness and a transformative framework for reform. It therefore behooves us to consider these impeding aspects at the site. The noted characteristics are as follows:

1. *Extinguishing*- A dialogue which attempts to halt the dialoging of others.
2. *Sarcasm/ Humor/ Cynicism*- A dialogue which diverts attention from intellectual activity within a conversational setting.
3. *Silencing*- A lack of dialogue which is perpetuated by dominant group leaders.

Antidialogical Action at the Site

There were several instances observed at the site which exposed antidialogical action. These aspects of conversations were evident at school faculty meetings, district development days, lunch room conversations, as well as casual encounters in the hallways. Though not as prevalent as in a banking system school culture, these instances were influential enough to prohibit the types of conversations which could enable a teacher in becoming *atravesada*.

The first antidialogical action noticed by the researcher involved *extinguishing* and took place largely at the onset of the school-wide teacher as researcher project. In addition, it was often observed within large group casual settings, such as the lunch room

or during the gathering time period prior to a staff meeting. The most common and recurring example of extinguishing behavior revolved around the following episode.

Extinguishing Behavior and the Lunchroom

Like the ebb and flow of tides, teachers slowly filtered in and out of the staff lunch room. As several rushed in on the last fumes of energy remaining, others slowly trudged their way to their usual perches. Though not mandated or rigid in their patterns, the movement and placements chosen represent somewhat of a celebration in ritual. The primary, intermediate, and upper primary inevitably arranged themselves in their daily seating arrangements. The typical conversation in the lunch room usually begins this way:

How was your weekend?

Did you do anything exciting?

I've just got to try to go on a diet!

You'll never guess what Gerardo said in class today!

Much as the pattern of seating mysteriously reappears without mention, so too does the pattern of lunch time conversation emerge. About halfway through the typical lunch period, never before, conversations may begin to turn their focus toward concerns involving school issues. Typically this occurred on a Mondays when the agenda for the staff meeting for the following day were distributed in the teachers' mailboxes.

Perusing an agenda sheet in silence, such limited conversation focused around the teacher-as-researcher project. "Oh, we're going to meet with our grade level groups

again,” one notes. “Yes, it looks like we are,” responds another so as to avoid the awkward silence. Gradually, conversation turns toward the issue raised by the introduction of the agenda sheet:

What question did your group decide on again?

I have forgotten.

And your group?

Just as such conversation begins, someone typically looks up at the clock. Remarks generally follow regarding the time limitations that teachers face:

I’ve got so much to do!

Me too. With the assembly coming up and report cards!

Have you been doing your research in your room?

Have you?

Quick glances and mutual silence follow with statements like the following:

Gotta run! There’s so much I’ve got to get done and so little time to do it in!

You know what I mean?

Of course I do!

The potential of further conversation is extinguished as teachers rush once again.

This extinguishing behavior was repeated on several Mondays during lunch at the site. Again, this largely occurred toward the outset of the project and seemed to involve the testing of participants as they attempted to hone in on the thoughts of their colleagues. A very subtle aspect of conversation, it made enough of an impression so as to halt any further discussion about the project. It also had the effect of limiting

intellectual conversations. Clouded by the issue of time constraints, there was a lack of opportunity within such a context for further critical investigation to take place.

A second area of antidiological action noted at the site involved sarcasm, humor, and cynicism. Similar to the manipulation category described by Freire, this aspect of conversation was most common throughout school contexts and were most damaging to the development of true dialogue. Minor, yet influential episodes, ranged from physical gestures like the rolling of eyes in reference to the project to other moments where comments were made such as “Oh yeah, I’ve been writing in my journal like a mad man! And you?” The following episode is indicative of a larger concern at the site and is representative of the antidiological action which impedes critical engagement with issues.

Insipid Commentary During SIP Days

It’s 8:02 a.m. and teachers are milling about in the library awaiting the late arrival of colleagues so that the staff development day can begin. Flora states,

It seems like we’re forever having School Improvement Program (SIP) days! They are great and all, but I have so many other things to do! I wish we could spend more time doing prep in our rooms or something!

In many cases, the sentiment seems to be shared that events need to get under way for after all, the “sooner we start this thing, the sooner it’ll be over.” Laughs are shared over this statement as the group begins settling in much the same lunch time pattern within the setting of the library.

Much of the morning has been reserved to discuss what the *Mathland* experts have learned at their training sessions. Video tapes are shared representing math lessons

in the upper and lower elementary and comments shared regarding personal reactions to the tapes. A conversation ensues in response to the lower elementary taped lesson regarding what represents mathematical thinking. Conversation takes on a more abrupt tempo as a variety of perspectives emerged.

Barbara: Whoa! How did he [a student on the tape] get that [a response to an addition problem on the board]!

Jeanie: He told you how! Did you hear him?

Barbara: Well yes, but it makes no sense to me!

Jeanie: Sure it does!

Others joined in the conversation, explaining what the student had meant in his approach to his exhibition of a two digit math addition problem. “That’s not what I meant by how did he get that,” remarked Barbara. She went on to say,

I guess what I mean is how do you as the teacher get it? Maybe it’s just because I’m not used to the lower grades. You must be extremely patient to deal with all of these different answers. I mean two plus two is four and that’s that!”

In response to this, conversation turns toward the tenants of *Mathland* as valuing many approaches to math. Millie shared her thinking regarding the new math program stating,

I think it is wonderful to see such active learning and to see the divergent thinking being nurtured and respected in the classroom. We haven’t seen this variety of student responses with past programs.

“Oooh! D-i-v-e-r-g-e-n-t!” Barbara retorted. Made by an upper grade teacher, this comment met with snickers from fellow upper grade teachers and with silence and lowered eyes from the lower elementary teachers. A sense of a power hierarchy was reinforced by this comment, leaving the lower elementary teachers to feel disempowered

and silenced. At this point conversation quickly diverted from a critical look at teaching and learning within a changing math curriculum. Nervous laughter and silence marked a transition to the next order of business on the agenda, a break.

Such commentary is antidialogical in its orientation and aims at avoiding a critical engagement with education. Although this same event also embodies a learning conversation at the site, the sarcasm, humor, and cynicism of such events holds a powerful place in prohibiting the types of meaningful dialogue which allows for transformation and personal and social growth.

The silencing of voice experienced through ridicule is only one way this third aspect of antidialogical action at the site is expressed. Statements such as “I don’t even want to talk about that [the teacher-as-researcher project]” and “Let’s not talk about it [the project] now” display the impact of such dialogue in silencing further conversation. One episode of silencing involved the initiation of self-silencing on the part of a conversation group when two influential staff members walked into the supply room. The following represents such an episode.

Silencing Amid the Mechanic Hum of the Copy Machine

Clustered in the supply closet as the mechanic hum of the copy machine whirled over head, a small group of teachers were discussing some of the findings they had noticed in their journals regarding *Mathland*. “I’m noticing that the lesson is driven by the

manipulatives more than it is by anything I do in class,” remarked Emma. She continued saying,

. . . no matter what I think is going to happen, it’s what they [the students] do with those [the manipulatives] that determines what the outcome will be and it doesn’t so much seem to matter how I pair them [the students] up, they seem to be most influenced by what happens when they explore with whatever manipulative we’re using that day. In any case, I never get the responses I expect or that the text mentions!

In response, Shirley pondered over a similar reflection.

Yeah, I know what you mean. It’s like you don’t present the concept to them until the end instead of at the beginning. They kind of find a way on their own and then you step in at the end.

At this point boisterous laughter grows louder over the buzz of the copy machine as two influential members of the staff emerge. Involved in leadership activities both at the site and within the district, their social impact in group settings is great. Conversation on the part of the original group quickly dissipates as only the mechanical drone is audible. Diverted eyes glance up from time to time as the original group slowly filters out in silence.

This poignant episode of self-silencing was not as prevalent as the second antialogical action (sarcasm, humor, cynicism), yet is an area which impeded the dialogue of others. All three of these characteristics of dialogue at the site reflect the categories highlighted by Freire, who states that such action can create a climate much like the cult of silence, reappropriating the status quo of a patriarchal, technocratic culture.

In addition to these aspects of discourse, Freire outlines what he terms to be dialogical cultural action. Such aspects of dialogue for transformation attempt to break

the internalization of authority so as not to repeat rigid patterns. The elements of such action include the following.

1. *Cooperation-* A fusion which leads to a focus of attention on the reality mediating a given context. Such communion elicits a problem posing stance.
2. *Unity for Liberation-* Leaders dedicate themselves with others in an effort to achieve liberation. Possibilities are made for the oppressed to perceive their own adhesion in order to prompt their role in transforming an unjust reality.
3. *Organization-* A shared effort with a consistency between words and actions. A natural development of unity requiring the joint struggle for liberation as a common task.
4. *Cultural Synthesis-* A mode of action which goes beyond prescribed roles in order to resolve contradictions. The focus is the enrichment of multiple views as opposed to the invasion of one culture by a dominant world view.

Dialogical Cultural Action at the Site

Aspects of Cloverdale school represent Freire's dialogical cultural action. These unique aspects of the site presented itself as a context in which transformation was being fostered. Unlike the banking system model for education outlined by Freire, the school culture at Cloverdale attempted to break the patterns of rugged individualism and to create an environment in which personal and social action could be fostered. The aspects

of Freire's dialogical action observed at Cloverdale are characterized as follows:

1. *Collegiality*- A community of learners dedicated to a common goal.
2. *Cultural Synthesis*- A shared history and sense of a joint struggle.
3. *Vision Fusion*- The unity of personal and social philosophies with respect to a common task.

Collegiality was apparent at Cloverdale as the community of educators met to reaffirm their common goals. These meetings took the form of staff meetings each Tuesday afternoon, as well as during events like staff development days. Despite the antidiological action at these same meetings, the impetus for joining in a sense of unity also emerged. In describing this community sense at Cloverdale, Anna stated that

I just can't explain how much we all respect one another. Don't get me wrong... We are incredibly different in many ways, but when it comes down to working side-by-side, there's no contest, our school has the best of the best!

Pat went on to add that despite such differences "we all know each other really well and can bounce ideas off each other without being afraid of being scrutinized." Having the opportunity to meet and re-establish goals together, this community spirit is strengthened.

The sense of collegiality was noted as one dialogical action at the site. This spirit of community is closely linked to the second dialogical action observed. Much of the sense of connectedness comes from the shared history of the teachers at Cloverdale. Having taught with one another in the district, teachers have had the opportunity to bond

as professionals and friends. Their years of experience with one another and with the Washington-Irving community at large has enhanced the connections they have made.

As a new school in the district, Cloverdale has assembled many of the district's leading figures in the educational struggle to nurture a linguistically and culturally diverse population. Principal Lea Evans played a major role in assembling and facilitating the growth of this community. Janice recalled her past work in the district stating,

We've [the staff at Cloverdale] been through some tough times together. It hasn't all been bad or anything, but we know the ups and downs of working here and can commiserate about things as they used to be. It's been fun having the chance to come together in a new place and help make it our own.

Barbara went on to comment that "Having been around each other before lets us get past a lot of stuff you might have to deal with if you didn't have respect and a past together." This shared history has given the foundation for the collegiality which has emerged at Cloverdale School.

A third instance of dialogical action at the site was characterized as vision fusion. Having a sense of collegiality and a shared history, teachers at Cloverdale have come to an understanding of the role their personal and social views on education impact their common tasks. Through dialogue about their common goals, mission statements have emerged which honor their philosophies as individual teachers and members of a professional community. Emma touched on this dialogical action by stating that,

We know we all agree about where we want to go as a school, but we have very different ideas of how to get there. It's nice to know that even though I may not do as many cooperative things in class like Janice and Anna do, we still want the same things for our classes. We share that but can be different in our individual ways of teaching.

Margaret went on to state that “Despite our own ways we all have the interests of the students at heart and that’s what counts.” Though one teacher approaches *Mathland* and many other curricular areas in a different pedagogical manner from the teacher next door, the common goals and missions of their community have been cultivated and maintained through their shared history.

CHAPTER SIX

CRITICAL RESEARCH CONCLUSIONS AND IMPLICATIONS

Strengths of Cloverdale's Teacher-as-Researcher Project

Throughout this research, emphasis has been placed upon the aspects of teacher research which warrant it as a means for becoming *atravesada*. In documenting the process of teachers engaged in teacher research at Cloverdale, the strengths of this orientation in bringing about authentic educational reform have become evident. The following is a synopsis of some of the areas of strength implicit in the venture taken on at Cloverdale during the 1995-1996 school year. The strengths provide an example for those interested in educational reform, the change process, and the implementation of new curricular programs at a school site.

One of the greatest strengths of the teacher-as-research project at Cloverdale was its impact upon the school culture already set in place. As mentioned before, the school culture at Cloverdale embraces many cultures, creating what they refer to as a sort of global village. This community of learners was strengthened by the orientation to explore insights and try new methods of teaching mathematics. The impact upon teachers and administration was great, as a sense of cohesion and a common purpose was reinstated by the project. Mirroring the school goals and missions, the sentiments of the research orientation dovetailed one another well.

The school culture was not only strengthened by the project, but was reflected in the strengths of the students. The models provided by the teachers innovation gave students an impetus to risk trying new approaches. Working together to learn the new terrain of *Mathland* as their teachers were helped create a mutual understanding of learning as a life-long process. Done in a community setting, this collaborative spirit was one of the strengths of the endeavor.

In addition to the positive attributes of this unique school culture, the strengths of the program were evident in the personal and social transformation that took place at the site. Detailed in earlier chapters, transformations took place in the teachers' perceptions of the nature of knowledge and learning, the role of the text and assessment, educational roles of students and teachers, as well as changes in visions of the purpose of education. The framework of the teacher research project provided opportunities to bring these issues to conversation. The impact was one on a personal level, causing teachers to question and redefine their ideas of practice, as well as on a social level, regarding the goals of the school community in a new light. Combined with the benefits the project had for building upon the school culture at Cloverdale, the perusal and social moments of border crossing are evidence of the strengths of this project for initiating authentic change and school reform.

A mark of true reform is that the reform has led to substantive change in the life of the institution. There is strong indication that long term impact of the teacher-as-

researcher process has taken place at Cloverdale. There is a movement to continue the examination of reciprocal teaching as related to the language arts curriculum. Furthermore, the new evaluation processes introduced by Lea Evans are in alignment with the border crossing elements noted in this research. Factors at Cloverdale which most contributed to this orientation to change are as follows:

1. The principal's invitation to join in decision-making.
2. The school community and culture.
3. The dialogical actions observed at Cloverdale.

These factors have contributed greatly to the success of the PQR process and have fostered a willingness to approach a challenge like teacher research.

Implications of Cloverdale's Endeavor

This research has detailed the impact of the teacher-as-researcher project in fostering border crossing in an age of educational reform. There are strong indications of the long-lasting benefits of a program like this for initiating substantive change. The educational community at Cloverdale has agreed to continue researching their teaching in the 1996-1997 school year. This is evidence that the impact of the program was widespread among members of the staff. The benefits of examining their practice has extended beyond the mathematics curriculum. In a new endeavor, teachers have decided to examine *Reciprocal Teaching* methodologies in the language arts program. In promoting reading comprehension, teachers have begun making efforts to engage students

in a close examination of text. Questioning, clarifying, predicting, summarizing, and restating material read together, opportunities for a joint venture in critical examination of text through dialogue is being explored at Cloverdale. This is indicative of a strong current of authentic change and life-long learning. It bears witness to the impact of becoming *atravesda* at Cloverdale.

Coupled with the continuation of the teacher-as-researcher project at Cloverdale is a new venture to develop a more authentic approach to teacher evaluation. As part of an effort to create a more meaningful and relevant approach to teacher evaluation, the staff has joined with Principal Evans in piloting a new evaluation program. In stark opposition to the standardized format of the old evaluation system in place in the district, teachers are opting to try one of two new evaluation plans. Process II and Process III are approaches which have as a goal a more meaningful and engaging format for teachers. As a facilitator, the principal becomes a guide working with teachers to hone in on and nurture aspects of teaching which the teacher helps identify. Group projects are also encouraged, as is a portfolio form of assessment.

There is yet another area in which the project at Cloverdale has proved to be influential in bringing about substantive change. A new partnership has emerged between the Washington-Irving School District and San Jose State University. In a joint venture, the educational community at the district and university have developed a Masters of Arts program based in the district. Begun as part of the summer 1996 program through

San Jose State University, this venture is a testament to the impact of teacher research and professional development modeled by the community at Cloverdale. The implications of the endeavor at Cloverdale are vast and seem to indicate a strong commitment to crossing conceptual borders.

Areas for Growth at Cloverdale

Though many aspects of the school culture presented themselves as strengths for Cloverdale and though the teacher as researcher matrix tended to foster a sense of cohesion with these strengths, there were also areas of school culture which were not conducive to authentic reform. There is an underlying sense of a modernist school culture present beneath the strength of the global village at Cloverdale. Though minimized by common goals and missions with a post-modern impetus for life-long learning, there still remains an anti-culture which is reverted to when something new, like a new math program, comes along. There is an attempt to cling to the “crumbling edifice of modernity.”

At times the culture at Cloverdale reflects elements of anti-dialogical action and an individualistic spirit. Unless this school can address the negative aspects of its current culture, as veiled in antidualogical action, barriers remain to border crossing. Reflecting a banking system or metaphor of the factory, the remnants of this culture inhibit the social aspects of transformation from emerging. Though personal transformation may still occur

within this type of system, the impact to a new social vision will be hampered by the antidiological.

A negative school culture is also characterized by an anti-intellectual movement. Avoiding and discouraging the act of critical engagement with issues is something which must be addressed if border crossing is to occur. Though Cloverdale was, for the most part, innovative in its endeavor and spirit, there were aspects detailed in earlier chapters which must be addressed by the school. Without doing so, the belief that what they were doing was not research will become pervasive as teachers may revert to rigid patterns and old routines.

In addition to the negative school culture which undergirded some teacher conversations and to the antidiological actions witnessed in this research, the following elements of the school context at Cloverdale must be addressed for future growth and development of the teacher as a border crosser. Though there is collaboration and collegiality at the school site, there is an undercurrent of a power hierarchy in place. Though not a top-down structure, there is an awareness of a definite pecking order. From the lunch room to the supply closet and all places in between, there is a definitive structure to school political action. The school leadership style is quite innovative in its structure and design, yet there are remnants of a hierarchy which has led to some antidiological actions such as silencing. This proves to be an area which may need to be addressed for Cloverdale to become a more cohesive learning community.

Implications of Becoming *Atravesada*

Cloverdale faced many barriers in attempting to relinquish what was once tried and true in their educational practices. The barriers of the modernist construct of schooling have remained a challenge throughout the endeavor. It is apparent that despite the innovative spirit of a school community like that of Cloverdale, attempts must be made to address the technical interests of a banking system of modernist education. Such a system has a strong hold over the educational community and it remains a challenge to cross such conceptual boundaries. Becoming *atravesada* is not an easy or comfortable process. It has proved to be characterized by ambiguity and this remains an uncomfortable state for many educators. These teachers may need to explicitly discuss the nature of a modernist technical orientation and openly examine both post-modern and critical qualities that could expand opportunities for personal and professional transformation.

There are great benefits in relinquishing the technical interest in education. As evident at Cloverdale, the strength of remaining flexible in orientation to change and reform can reap personal and social benefits. Transforming and redefining educational roles and rethinking tried and true methods has proved to benefit the long term changing educational terrain for teachers at Cloverdale. Continuing to cross conceptual barriers with new programs and impacting district changes, Cloverdale stands as an example of the power of becoming *atravesada*.

This research is not meant to present a recipe using the teacher-as-researcher process for school reform. It has documented the process of one school, using teaching as research in its own particular fashion, and involving one curricular area. While many lessons and guidelines can be drawn from this staff and their endeavors, it is not a packaged approach for reform. Cloverdale possessed many unique attributes which fostered and dovetailed the aspects of transforming and crossing borders. There are, however, ways in which the staff at Cloverdale would change if they were to do the process all over again. These are issues which have been taken into consideration in planning for the 1996-1997 project. The Cloverdale community suggested guidelines to strengthen a teacher-as-researcher orientation.

1. Methodological Preparation: Many of the teachers agreed that having more knowledge of types of teacher research and their history would have enriched their understanding. Having such an awareness may also have helped ameliorate fears and dissuade beliefs that what they were doing was not "research." The teachers had many misconceptions about the research project and having more readings and discussions prior to the outset of the program was something from which participants felt they would have benefited. Jeanie reflected this sentiment in her comment that "I still feel like what I was doing was not research. Maybe if I read some other teachers work or research I would have felt more like I was doing it [research]."

2. **Choice of Content Area:** Many teachers were interested in trying the project, but were not comfortable with trying it with the new math program. Pat mirrored this concern stating, “I felt like I was charting unknown waters already. Having the teacher as researcher project at the same time was making me feel even more lost at time.” Several teachers felt that given the opportunity to choose content areas which teachers were interested in, instead of all focusing on the same content area, would have improved the experience.
3. **Facilitation of Question Formation:** Because this was a new terrain for teachers, many felt uncomfortable with the ambiguity. Several longed for a question that was already defined for them. Jeanie stated that “If I had been given a question, I might have had a more easy time with it. It was all so new to me that I wish we were all researching the same question.” Others agreed that having the same question for the whole school might have been a starting point for expanding on future questions. Jeanie continued, “I think that if I had a model or example to follow, it would have been a little less awkward. If we worked through the same question the first time it might have helped.”
4. **Choice in Grouping:** While grouping was not enforced or determined for the teachers, it was suggested that they group by grade level. Some teachers felt they would have enjoyed following a friendship grouping. The choice was there, yet teachers like Janice stated that,

Even though that choice was there I still felt the need to follow the suggested grouping. It's not that I don't like working with my grade level, we love working together and all. I just would have liked the freedom to explore across grades.

Even though this option was there for teachers, the rigid patterns of hierarchy left some feeling that they had to follow defined roles, when in fact they were merely suggestions.

These guidelines or suggestions were put forth by teachers after careful consideration of their personal involvement with the project. The concerns and findings may not reflect that of another school community. Cloverdale may serve as a model or suggested approach that one school took. As a guide not a recipe, their project may be used as a starting point for another school's consideration of critical teacher research. The main indicator of success for the Cloverdale community seems to have been its innovative and flexible orientation to change. Perhaps a factor stemming from its rich multicultural and multilingual population, this school site represents flexibility in action. It is this sense of flexibility which seems to have transferred to the crossing of borders.

The strength of the teacher as researcher process has largely revolved around the opportunity that has been created for examining critical change. Some further elements supporting critical change at Cloverdale include the following:

1. *Reflective Dialogue*- In a community setting, teachers at Cloverdale had the opportunity to discuss not only the new mathematics program, but their concerns as educators in general.

2. *Anti-Individualism-* Though there was respect for individual differences and teaching styles, there was also a sense of shared practice as teachers re-examined, observed, and discussed education with peers. Such action helped lead to the deprivatization of teaching as a profession.
3. *Collectivity-* Teachers collectively looked at learning as a process. As a community of life-long learners, teachers at Cloverdale are learning to question rigid patterns, obligated to fulfilling their common vision.
4. *Collaboration-* Sharing understandings as well as materials in staff development situations greatly strengthens the staff at Cloverdale.
5. *Shared Priorities-* The teachers have come together to share their expectations as educators, affirming common goals and expectations.

In order for these elements of critical change to take place, there needs to be a structure set in place. Prior to substantive change through a process like teacher research, the following elements need to be in place:

1. *Time and Place-* There needs to be a time and place for teachers to meet and talk about educational and personal issues. For some schools, a first step in establishing this is to focus in on the staff lounge. Though Cloverdale's teachers make regular use of their lounge, there are many lounges which go largely unused or are characterized as a sort of battle zone. This may be an area of focus prior to any new program or change process.

2. *Proximity*- Wherever possible, teachers benefit from being physically close to one another's classrooms. The layout of Cloverdale greatly facilitated such proximity. Shaped as a wheel, the wings provide access for teachers to one another and supplies. This proximity is atypical and presents itself as a challenge for other school sites. When possible, such closeness promotes a sense of teamwork and interdependence.
3. *Empowering Dialogue*- There needs to be a framework for modeling and promoting open communication. Such a free flow of ideas and information strengthens the community and may lead to critical conversations.

By taking these factors and structures into consideration, one may be able to establish some of the benefits of a teacher-as-researcher process. Any such endeavor must respect an openness to improvement. With a sense of trust and respect as well as an understanding of effective teaching strategies, teachers may begin to question and re-examine their profession like educators at Cloverdale have begun. A supportive leadership and opportunity for socialization may also be factors to consider.

Transforming Metaphors for Teaching

This research has documented the ways in which a teacher-as-researcher orientation has facilitated personal and social transformation at Cloverdale Elementary School. The benefits and strengths of becoming *atravesada* have been outlined as the process unfolded. While there have been many areas of growth and areas which may need

to be addressed for further growth, the main impact of the project seems to have been the creation of new metaphors for the act of teaching. The modernist paradigm has been exposed throughout this research, along with its metaphor of the factory. Within this technical approach to education, the teacher is a technician dispensing information to passive students. The efforts of the staff at Cloverdale have crossed conceptual borders in rethinking teachers' roles. In redefining the roles that students and teachers play in the learning community, a new vision of the purpose of education has slowly begun to emerge. The following represents some of the emerging metaphors of teaching at Cloverdale.

1. *Teacher as Facilitator*- It was very difficult for some teachers to “step down” from the role of expert in organizing and conducting classroom activities with *Mathland*. Teachers like Janice felt “...it was impossible at first to step aside. I am so used to being up front and all that it was a big shift for me as a teacher.” This stepping aside and becoming a facilitator was part of the process in using *Mathland* and its guidebook. The teacher as researcher framework allowed teachers like Janice to discuss this feeling as it emerged. The teachers were then able to grapple with its meaning in a more positive and useful manner. After talking with others, Janice realized “ I wasn’t alone! Others were having a hard time with it too. I always thought that other teachers must be doing more group activities than I am, but they were all in the same boat as me.”

2. *Teacher as Creator*- In addition to becoming aware of their changing role as a facilitator in the classroom, the teachers at Cloverdale began to identify and find strength in their abilities as creators of curriculum. Juxtaposed to the packaged programs they were used to, teachers were beginning to rely upon the strength of their professional decision-making in the classroom. Jeanie stated that “The innovations in *Mathland* required us to create a more complete program for our students. To fill in the gaps, we needed to present a more well developed lesson.” Others, like Barbara echoed this sentiment. “I started to get more excited about developing some of my own things and coming up with new ways of doing things. It’s like saying hey, I do have the power to do this!” Teachers, like Barbara began to feel empowered by this process. As Shirley stated, “It has been more meaningful for me because its taken from our experience, our knowledge of the students, our knowledge of the curriculum, our observations.”
3. *Teacher as Learner*- Learning once again to be a learner was difficult for many teachers. Teachers like Millie stated they “felt very intimidated by something new. I am so used to feeling comfortable by my years of experience. I guess we’re always learning as teachers and we should always be learning. I feel very much like a student.” Others mirrored Millie’s statement. Flora commented that “Every teacher should get into that mode...to always feel like a student, so you can really understand your kids and keep yourself fresh and new is something we

should be doing.” Emma went on to say that “Learning is a life-long process. You never know the right way, there are always new ways and different ways and you need to be open to suggestions and change as a learner.” For teachers like Pat, this notion of ongoing learning was not new. Pat stated “Oh I am ALWAYS learning! I don’t think I’ll ever quit. I love to learn something new!” Pat went on to comment,

You always can learn and don't think that you aren't learning yourself! Trying different things and different ways is fun and in some respects it makes you look at things, the world differently. It is always interesting to learn about yourself and others and to share that learning as you go along.

4. *Teacher as Researcher*- One of the most poignant transformations of metaphors of teaching that took place at Cloverdale involved a changed perspective of research. At the outset of the project, teachers were not sure of what to expect. Sylvia stated that “It seems like when you say research you think of scientists sitting off somewhere that are doing something, but you think that what you are doing in your classroom is not research.” Emma continued this thought stating that “I think what I have been doing is just figuring out what will work in my classroom to help my kids, but I guess now that is research too. I think the biggest barrier for me has been realizing that what I am doing IS research.”

Carlie shares some of the perceptions held about research. She commented that “in college it wasn’t this stuff. You would count so many things and make phone calls and play with the statistics. It was a different way of thinking then.” Millie recalled this

more formal type of research stating, "It seems like a way for an easy answer and was more quantitative I guess, lots of facts and figures." As the research process continued and more teachers began to realize what they were doing was research, the perspectives began to transform. Jeanie stated that she

...felt more empowered because it was my own question and maybe I never called it research, but it is something that I do all the time. I question things and wonder about them and try new things.

Margaret also felt this empowerment stating "I think it is something good teachers do all the time. I laughed at this research question at first and this whole idea, but I'm not laughing now. I got in and tried it and it's o.k."

The notion of the process as being part of good teaching was reflected in many teachers comments. Flora mentioned,

I think it is all about paying more attention and good teachers do that already. We are all researchers here and we all collect data and I like what we are doing because I feel strongly about it.

In addition to this vision of teaching as researching, teachers began to share a new sense of viewing students. Shirley stated that the process helped her to,

...learn more about the student who blend into the woodwork. When you are teaching all day you are always focused on the end product and this process has allowed me to view my students in a new way.

Sylvia mirrored this comment stating that,

I began to concentrate more on my students as individuals. Answers for me came in watching the students, thinking about them and recording my thought. It is a valid form of research.

Emma added that the process made it

harder to make generalizations about students. It is not like putting them in little boxes and saying this is what this group of students is like. It is a new way of looking at them [the students]. I'm glad to have the chance to see their special qualities shine through.

In looking at the powerful commentary of these teachers, one can see the ways in which great transformations have begun at Cloverdale. A next step for these educators might be to publish their findings so that others may benefit from their expertise. Teachers listening to other teachers may then contribute to more substantive change. This research has documented the ways in which teachers like those at Cloverdale, may be able to transform their roles and thinking through teacher research. Becoming *atravesada*, the teacher in a post-modern context may

take leave of the cultural, theoretical, and ideological borders that enclose him or her within the safety of those places and spaces we inherit and occupy, which frame our lives in very specific and concrete ways. Being a border crosser suggests that one has to reinvent traditions not within the discourse of submission, reverence, and repetition, but as transformation and critique (Leonard and McLaren 1993 178)

This research has mirrored the sentiment of this quote and has presented the transformations of the teachers at Cloverdale as they have begun the process of becoming *atravesada*.

It was a difficult, arduous process for some, yet the transformation began to take place. Shirley summed up the transformative nature of this metaphor for teaching best when she stated,

I always thought I knew my students very well, but having to write about them in my journal and focus on students more individually made me realize that maybe I didn't always know them as well as I thought I did. I really value this kind of research and see it as an integral part of teaching. I think it is one of the ways in which we can kind of take hold of our profession. So many times people are the experts and they come and kind of tell you what to do and this is a way for us to say NO! We know already what we are doing and we are the experts. Maybe we can now say look, here is OUR data and

this is why we have come to these conclusions. Before you would make these statements and maybe felt like you had nothing to prove, that you were just speculating. Now you can say this is my research and this is why I think this way and it helps you take control over what you are doing.

EPILOGUE

Myself as a Learner

From the time I set foot in a university lecture hall, I knew I had a passion for learning. I will never forget the day of my first lecture at San Jose State University. It was a lecture for an art appreciation class. It was a brisk autumn morning. The floor sloped from the back to the front of the hall. Dust swirls filled the light funnel emitting from the slide projector as Impressionism paraded before my eyes. The professor's drone faded in the background as I fell in love with the images, the smell of the books, and the feeling of living history. I was five years old and couldn't have been happier that my mother had to bring me to class with her that day. Whether one were to call it fate, destiny, or chance... my grandmother's inability to baby-sit me that day had changed my life forever.

I have a much deeper appreciation and understanding of Impression today, but my love of learning has remained as passionate as when I was five. What has changed between that time? I am critically aware of my learning now, something which was not possible for me as a five year old learner. Even as an undergraduate at San Jose State University, I cannot say that I was critically aware of my learning. I reflected on what I learned and processed the information, however there was little awareness of what it means to be a learner.

What then is a critical learner? At the beginning of my masters program I was a concurrent masters and credential candidate. I had just finished my Bachelor of Arts degree in Humanities with a European Studies Concentration and felt stuffed full of knowledge. Asked to reflect on my own learning in my first masters class was a challenge. The assignment seemed unclear and I merely reported a sequential account of how I processed information. Writing about how I read an article through for main ideas, scanned for new words, made connections to lecture material, and took notes did not translate to a deep level of awareness with who I was as a learner. I was not critical, but mechanical in my approach.

Through more readings and a new understanding of what it means to be critical, I began to see what it truly means to be a learner and regard learning as a life-long process of becoming. Whereas I thought of myself as Locke's *tabula rasa*, waiting to be inscribed with knowledge, I was now aware of what the implications of such a system meant for education. Reading the works of Doll (1993), Bowers (1990), Freire (1970), Giroux (1992), and others, I lifted the blinders of a modernist perspective and began to question the underlying assumptions of my prior understandings. To be a blank slate may have led to success on tests in my courses, but I had cheated myself of many other connections with the curriculum.

Myself as a Teacher

With the blinders of modernism lifted I was able to see the implications of such a perspective in schooling. I began to critically question what I observed in my student teaching and applying such concepts in designing my own lessons. Coming to see myself as a learner in a critical sense was helping me to be a critically aware teacher in the credential program. The full implications of gender preference, relationship, and time/space orientation in the classroom was now at the forefront of my thinking when planning a lesson. The idea of a lesson itself was transformed as well. No longer a discrete chunk of information to be dispensed to passive students, the curriculum had come to life before my eyes and I fancied the many possibilities to take part as a creator, not executor.

Knowledge was a quantifiable substance, exterior, and apart from my life as an undergraduate student. Though I found much of what I learned to be personally meaningful and though I had a passion for learning, it was a superficial celebration of success. Mastery of a subject was once the goal that I cherished and relished the race from the start to the end of the semester. With definitive limits around what I learned, I was operating in a closed system. Rarely engaged in any kind of dialogue and rarely critical of what was read, I was a good student, but not an active learner.

Myself as a Researcher

Engaged in a qualitative study of border crossing I crossed many conceptual borders along the way. As I observed the grappling and struggling of the teacher researcher participants, I too questioned my assumptions and the implications of a closed system approach to change. While the teacher-as-researcher process had become a liminal state for the participants at Cloverdale, the process of becoming a critical learner, teacher, and researcher had become a liminal space in my personal transformation. I too had become *atravesada*, border crosser.

Reflecting upon my Humanities undergraduate work, I re-examined the Renaissance and its powerful implications for modernity. For the Renaissance artist to be called a creator was to liken oneself to God. This seemingly simple shift in terminology embodied the deeper implications in this time of change. This incredibly powerful change in thinking was a break from traditional assumptions. Such a shift was taking place within the community at Cloverdale as teachers saw themselves as creators of their curriculum and I began to see my creative powers as a teacher and learner through my research.

Myself as *Atravesada*

Through my research and the masters program I have begun to regard myself as a critical learner, teacher, and researcher. In addition, I have come to see myself as a border crosser. In my personal journey of learning this shift implies a deeper awareness of where I have been, where I am, and where I would like to be in my assumptions and understandings. It is now possible for me to name the perturbations that were lingering in the back corners of my mind. Having been transformed intellectually, I have also found a voice. I have become aware of the power of a knowledgeable discourse and the necessity of critique for authentic change. While my passion for learning has remained from my childhood, it has been the experiences and readings of my research which has given new purpose in my learning, teaching, and border crossing moments.

REFERENCES

- Ahbach, Philip G., ed., Gail P. Kelly, ed., Hugh G. Petrie, ed., Sheila Slaughter, ed., and Lois Weis, ed. Crisis in Teaching: Perspectives on Current Reforms. New York: State University of New York Press, 1989.
- Anzaldua, Gloria. American Mosaic. Edited by Barbara Rico and Sandra Mano. Boston: Houghton Mifflin Company, 1991.
- Apple, Michael. Education and Power. Massachusetts: Routledge and Kegan Paul, 1982.
- Bowers, C. A. The Promise of Theory: Education and the Politics of Cultural Change. New York: Teachers College Press, 1987.
- Bowers, C. A. and David J. Flinders. Responsive Teaching: An Ecological Approach to Classroom Patterns of Language, Culture, and Thought. New York: Teachers College Press, 1990.
- Burgess, Robert G., ed. Issues in Educational Research: Qualitative Methods. Philadelphia, Pennsylvania: The Falmer Press, 1985.
- _____. Education, Schools and Schooling. London: Macmillan, 1985.
- Calderon, Hector. "Reinventing the Border." Edited by Barabara Rico and Sandra Mano. American Mosaic. Boston: Houghton Mifflin Company, 1991.
- California Department of Education. A Nation at Risk. California: California Department of Education, 1983.
- Canter, L. and M. Canter. Assertive Discipline. Santa Monica, Claifornia: Canter and Associates, 1977.
- Chavez, Cesar. "The Organizer's Tale." Edited by Barabara Rico and Sandra Mano. American Mosaic. Boston: Houghton Mifflin, 1991.
- Cisneros, Sandra. "Woman Hollering Creek." Edited by Barabara Rico and Sandra Mano. American Mosaic. Boston: Houghton Mifflin Company, 1991.
- Cloverdale Elementary School. "Cloverdale Parent Handbook." California: Cloverdale Elementary School, 1995.
- Davies, Lynn. Equity and Efficiency? Management in an International Context. New York: The Falmer Press, 1990.
- Descartes, Renee. Discourse on Method. Translated by L. J. LaFleur. New York: Liberal Arts Press, 1950.
- Doll, William E. A Post-Modern Perspective on Curriculum. New York: Teachers College Press, 1993.

- Eliot, T. S. The Sacred Woods: Essays on Poetry and Criticism. London: Methuen, 1920.
- Estrada, Larry, Creative Publications Representative. Interview by author, November 1995, California. Tape recording. Washington-Irving School Board Meeting, California.
- Evans, Lea, Principal of Cloverdale. Interview by author, October 1995, California.
- Foucault, M. Language, Culture, Memory, and Practice. Translated by D. F. Bouchard. Ithaca, New York: Cornell University Press, 1977.
- Freire, Paulo. Education for Critical Consciousness. New York: Continuum, 1973.
- _____. Pedagogy of the Oppressed. New York: Herder and Herder, 1970.
- Giroux, Henry A. Border Crossings: Cultural Workers and the Politics of Education. New York: Routledge, 1992.
- _____. Living Dangerously: Multiculturalism and the Politics of Difference. New York: Peter Lang, 1993.
- Glesne, Corrine and Alan Peshkin. Becoming Qualitative Researchers: An Introduction. New York: Longman, 1992.
- Habermas, Jurgen. The Theory of Communicative Action: Lifeworld and System. Boston: Beacon Press, 1987.
- Hargreaves, Andy. Changing Teachers, Changing Times: Teacher's Work and Culture in the Postmodern Age. New York: Teachers College Press, 1994.
- Heck, Shirley F. and C. Ray Williams. The Complex Roles of the Teacher: An Ecological Perspective. New York: Teachers College Press, 1984.
- Janangelo, Joseph, Phyllis Kahaney, and Linda A. M. Perry. Theoretical and Critical Perspectives on Teacher Change. Norwood, New Jersey: Ablex Publishing Corporation, 1993.
- Kieffer, K. "Doing Dialogic Retrospection: Approaching Empowerment Through Participatory Research." Scotland: University of Edinburg, 1981.
- Kincheloe, Joe L. Teachers as Researchers: Qualitative Paths to Empowerment. New York: The Falmer Press, 1981.
- _____. Toward a Critical Politics of Teacher Thinking: Mapping the Postmodern. Connecticut: Bergin and Garvey, 1993.
- Kuhn, T. The Essential Tension: Selected Studies in Science, Traditions, and Change. Chicago: The University of Chicago Press, 1977.

- _____. The Structure of Scientific Revolutions. Chicago: The University of Chicago Press, 1962.
- Mano, Sandra and Barbara Roche Rico. American Mosaic: Multicultural Readings in Context. Boston: Houghton Mifflin Company, 1991.
- Mathematics Framework for California Public Schools: Kindergarten Through Grade Twelve. California: California Department of Education, 1985.
- Mathematics Framework for California Public Schools: Kindergarten Through Grade Twelve. California: California Department of Education, 1992.
- Maxcy, Spencer J., ed. Postmodern School Leadership. Connecticut: Praeger Publishers, 1994.
- National Research Council. Everybody Counts: A Report to the Nation on the Future of Mathematics Education. Washington, D.C.: National Academy Press, 1989.
- Owens, Robert G. and Carl R. Steinhoff. Administering Change in Schools. New Jersey: Prentice-Hall, Incorporated, 1976.
- Prigogine, Ilya. Introduction to Thermodynamics of Irreversible Processes. New York: John Wiley, Interscience, 1961.
- _____. From Being to Becoming: Time and Complexity in the Physical Sciences. San Francisco: W.H. Freeman, 1980.
- Roy, Walter. Teaching Under Attack. London: Croom Helm, 1983.
- Rosaldo, Renato. Culture and Truth: The Remaking of Social Analysis. Boston: Beacon Press, 1989.
- Seidman, I. E. Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences. New York: Teachers College Press, 1991.
- Shor, Ira. Culture wars: Schools and Society in the Conservative Restoration 1969-1984. Boston: Routledge and Kegan Paul, 1986.
- _____. Empowering Education: Critical Teaching for Social Change. Chicago: The University of Chicago Press, 1992.
- Slattery, Patrick. Curriculum Development in the Postmodern Era. New York: Garland Publishing, Incorporated, 1995.
- Spring, Joel. Wheels in the Head: Educational Philosophy of Authority, Freedom, and Culture from Socrates to Paulo Freire. New York: McGraw-Hill, 1994.
- Turner, Victor. Dramas, Fields, and Metaphors. London: Cornell University Press, 1974.

Tyler, Ralph. Basic Principles of Curriculum and Instruction. Chicah: Universoty of Chicago Press, 1950.

van Gennep, Arnold. The Rites of Passage. London: Routledge and Kegan Paul, 1975.

van Manen, Max. Researching Lived Experience: Human Science for an Action Sensitive Pedagogy. New York: State University of New York Press, 1990.

RELATED WORKS

- Acquarelli, Kris and Judith Mumme. "A Renaissance in Mathematics Education." Phi Delta Kappan. March 1996.
- Apple, Michael. Official Knowledge: Democratic Education in a Conservative Age. New York: Routledge, 1993.
- Aronowitz, Stanley. The Politics of Identity. New York: Routledge, 1992.
- Ball, Deborah Loewenberg. "Teacher Learning and the Mathematics Reforms: What We Think We Know and What We Need to Learn." Phi Delta Kappan. March 1996.
- Ball, Deborah L., David K. Cohen, Penelope Peterson, and Suzanne M. Wilson. "Learning by All." Phi Delta Kappan. March 1996.
- Barnes, Carol and Penelope L. Peterson. "Learning Together: The Challenge of Mathematics Equity, and Leadership." Phi Delta Kappan. March 1996.
- Baudrillard, J. Simulations. Colombia University, New York: Semiotext, 1983.
- Bell, Cecil H. and L. French Wendell. Organizational Development. Englewood Cliffs, New Jersey: Prentice-Hall, Incorporated, 1973.
- Bennis, Warren G. Changing Organizations. New York: McGraw-Hill Book Company, 1966.
- Berne, Robert, ed. and Stephen L. Jacobson, ed. Reforming Education: The Emerging Systemic Approach. California: Corwin Press, Incorporated, 1993.
- Bernstein, Richard J. Beyond Objectivism and Relativism: Science, Hermeneutics, and Praxis. Philadelphia: University of Pennsylvania Press, 1983.
- Beyer, L. E., ed. and Michael Apple, ed. The Curriculum: Problems, Politics, and Possibilities. New York: State University of New York press, 1988.
- Black, Max. Models and Metaphors: Studies in Language and Philosophy. Ithaca: Cornell University Press, 1962.
- Bridges: Promising Programs for the education of Immigrant Children. California: California Tomorrow Immigrant Students Project, 1989.
- Carnoy, M. and H. Levin. Schooling and Work in the Democratic State. California: Stanford University Press, 1985.
- Cossey, Ruth, Jean Kerr Stenmark, and Virginia Thompson. Family Math. California: U. C. Printing Services, 1986.
- Cummins, Jim. Empowering Minority Students. California: California Association for Bilingual Education, 1989.

- Darling, L. Hammond, A. Lieberman, and D. Zuckerman. Early Lessons in Restructuring Schools. New York: National Center for Restructuring Education, Schools, and Teaching (NCREST), 1991.
- Dougherty, Jim, ed., Harvey Holtz, ed., Irwin Marcus, ed., Judy Michaels, ed., and Rick Peduzzi, ed. Education and the American Dream: Conservatives, Liberals, and Radicals Debate the Future of Education. Massachusetts: Bergin and Garvey Publishers, Incorporated, 1989.
- Doyle, Clar. Raising Curtains on Education: Drama as a Site for Critical Pedagogy. London: Bergin and Garvey, 1993.
- Edelman, Murray. Political Language: Words that Succeed and Policies that Fail. New York: Academic Press, 1977.
- Eisner, E. W. The Educational Imagination. New York: Macmillan, 1985.
- . The Primacy of Experience and Politics of Methodology. New York: Educational Researcher, 1988.
- Evidence to the Select Committee on Education, Science, and the Arts. London: N.U.T., 1981.
- Fiske, Edward B. Smart Schools, Smart Kids: Why do Some Schools Work? New York: Simon and Schuster, 1992.
- Foucault, M. Power and Knowledge. Edited by C. Gordon. New York: Pantheon, 1980.
- Freire, Paulo. The Politics of education: Culture Power and Liberation. Massachusetts: 1985.
- Giroux, Henry A. Postmodernism, Feminism, and Cultural Politics: Redrawing Educational Boundaries. Albany: State University of New York Press, 1991.
- . Schooling and the Struggle for Public Life: Critical Pedagogy in the Modern Age. Minneapolis, Minnesota: The University of Minnesota Press, 1983.
- . Teachers as Intellectuals: Toward a Critical Pedagogy of Learning. Massachusetts: Bergin and Garvey Publishing, Incorporated, 1988.
- Gergin, K. The Saturated Self: Dilemmas of Identity in Contemporary Life. New York: Basic Books, 1991.
- Gilligan, Carol. In a Different Voice. Cambridge, Massachusetts: Harvard University Press, 1993.
- Gore, Jennifer M. The Struggle for Pedagogies: Critical and Feminist Discourses as Regimes of Truth. New York: Routledge, 1993.

- The Holmes Group. Tomorrow's Teachers: A Report of the Holmes Group. East Lansing, Michigan: The Holmes Group, 1986.
- Hopkins, David. "The Role of the Practicum in Bridging the Gap Between the School and the University." Canada: The Western Canadian Association for Student Teaching, 1980.
- Huberman, M. and M. Miles. Innovation Up Close. New York: Plenum, 1984.
- It's Elementary! Elementary Grades Task Force Report. California: California Department of Education, 1992.
- Johnson, David W., Roger T. Johnson, and Karl A. Smith. Active Learning: Cooperation in the College Classroom. Minnesota: Interaction Book Company, 1991.
- Johnson, Mark and George Lakoff. Metaphors We Live By. Chicago: The University of Chicago Press, 1980.
- Kagan, S. "Constructive Controversy" in Cooperative Learning. New York: The Falmer Press, 1990.
- Kirk, David. "Beyond the Limits of Theoretical Discourse on Teacher Education: Towards a Critical Pedagogy." New York: McGraw-Hill, 1986.
- Konicek, Richard and Gruce Watson. "Teaching for Conceptual Change: Confronting Children's Experience." Phi Delta Kappan. May 1990.
- Kuhn, T. The Copernican Revolution: Planetary Astronomy in the Development of Western Thought. Cambridge: Harvard University Press, 1957.
- Leonard, Peter, ed. and Peter McLaren, ed. Paulo Freire: A Critical Encounter. New York: Routledge, 1993.
- Lindquist, Mary Montgomery, Robert E. Reys, and Marilyn N. Suydam. Helping Children Learn Mathematics. Boston: Allyn and Bacon, 1992.
- Mauch, James E., ed. and Paula L. W. Sabloff, ed. Reform and Change in Higher Education. New York: Garland Publishing, Incorporated, 1995.
- McCaleb, Sudia Paloma. Building Communities of Learners: A Collaboration among Teachers, Students, Families, and Community. New York: St. Martin's Press, 1994.
- McLaren, Peter. Life in Schools. New York: Longman, 1981.
- Merton, Robert K. Science, Technology, and Society in Seventeenth Century England. New York: Fertig, 1967.
- Nisbet, Robert A. Social Change and History. London: Oxford University Press, 1969.

- Paquette, Jerry. Social Purpose and Schooling: Alternatives, Agendas, and Issues. New York: The Falmer Press, 1991.
- Peacock, James. "Society as Narrative." In Forms of Symbolic Action, ed. Robert F. Spencer. Seattle, Washington: The University of Washington Press, 1969.
- Pepper, Stephen C. World Hypothesis. California: University of California at Berkeley Press, 1942.
- Popkewitz, Thomas. "Ideology and Social Formation in Teacher Education" in Teaching and Teacher Education. New York: McGraw-Hill, 1980.
- . "The Study of Schooling: Paradigms and Field-based Methodologies in Educational Research and Evaluation" in T. Popkewitz, ed. and B. Tabachnick, ed. The Study of Schooling. New York: Praeger, 1981.
- Poplin, Mary and Joseph Weeres. Voices from the Inside: A Report on Schooling from Inside the Classroom. California: The Institute for Education in Transformation at the Claremont Graduate School, 1994.
- Purpel, David E., ed. and H. Svi Shapiro, ed. Critical Social Issues in American Education. New York: Longman, 1993.
- Rogers, C. R. "The Interpersonal Relationship in the Facilitation of Learning" in R.R. Leeper, ed. Humanizing Education: The Person in the Process. Washington D. C.: The Association for Supervision and Curriculum Development (NEA), 1967.
- Sartre, Jean-Paul. Search for a Method. New York: Knopf, 1963.
- Schifter, Deborah. "A Constructivist Perspective on Teaching and Learning Mathematics." Phi Delta Kappan. March 1996.
- Spring, Joel. American Education: An Introduction to Social and Political Aspects. New York: Longman, 1989.
- Suppe, Frederick, ed. The Structure of Science Theories. Urbana: University of Illinois Press, 1974.
- Sykes, Gary. "Reform of and as Professional development." Phi Delta Kappan, March 1996.
- Tietlebaum, Kenneth. "Schooling for Good Rebels." Ph. D. diss., University of Wisconsin, 1985.
- van Manen, Max. The Tact of Teaching: The Meaning of Pedagogical Thoughtfulness. New York: State University of New York Press, 1991.
- Walling, Donovan R., ed. Teachers as Leaders: Perspectives on the Professional Development of Teachers. Indiana: Phi Delta Kappa Educational Foundation.

Warren, Thomas, ed. A View from the Top: Liberal Arts Presidents on Teacher Education. New York: University Press of America, 1990.

Young, R. A Critical Theory of Education: Habermas and Our Children's Future. New York: Teachers College Press, 1990.

Znaniecki, F. The Method of Sociology. New York: Farrar and Rinehart, 1936.