

The Introduction of a Qualitative Perspective in Advanced Psychological Research Training: Narrative of a Mixed Methods Doctoral Dissertation

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The first mixed methods dissertation in the Department of Psychology in the Graduate School of Arts and Sciences of Fordham University is described. In research on pre-kindergarten through 3rd-grade school programs, the interplay of quantitative hypothesis testing and qualitative discovery was used to gain knowledge of how different educational outcomes are achieved. A narrative addresses such contemporary disciplinary issues as the growing interest in qualitative research methods; the effort to employ holistic, contextually sensitive investigations of complex social problems; and the need in graduate training to facilitate the learning of and an identity formation that includes multiple methods. This study highlights the value of dissertation research for learning qualitative methods and melding multiple methods into a unified research identity and stresses graduate students' need for coursework on qualitative research methodology and philosophy of science. The pragmatic approach (Fishman, 1999) is suggested as one methodological framework capable of successfully synthesizing multiple methods.

What follows is a narrative of the nonlinear methodological journey that began as an open-ended discovery process, developed into an hypothesis confirmatory ap-

proach, traversed a disconcerting phase of questioning the philosophy and methodologies underlying social scientific research, and finally resulted in an integration of quantitative and qualitative data and analytic procedures that fruitfully answered the original research question. This individual methodological process is placed within and mirrors the larger historical movement in which psychology is attempting to utilize multiple methods to gain better answers to pressing, applied research questions. The significant turning points and surprises contribute to contemporary debates about whether quantitative and qualitative methods can be integrated in a single study and by what means a student of psychology can form a research identity in which multiple methods and their underlying philosophical orientations can be brought together. This narrative demonstrates how a student's commitment to improving social praxis through research requires readings in and mastery of qualitative methods that are often not a part of the graduate curriculum in psychology. Such advanced research training requires support and mentoring in multiple methodologies and philosophies of science from the graduate education program. Finally, this study provides an encouraging example of how perspectives that are often considered to be incommensurate can be pragmatically integrated in a unified focus on the subject matter that is both scientifically rigorous and relevant to real world problems.

THE BACKGROUND PROBLEM OF QUALITATIVE AND MIXED METHODS RESEARCH EDUCATION

Over 60 years ago, Gordon Allport (1942), in a monograph commissioned by the National Research Council, called for an expansive pluralism of research methods in the science of psychology, one that includes a bold exploration of qualitative methods that would be rigorously formalized and accepted in the discipline's methodological norms. Only in the 1970s did this development of qualitative research methodology in psychology take place. Various approaches to qualitative research have emerged and developed. As psychology has followed Allport's suggestion to go beyond the relatively unreflective and unsystematic use of qualitative methods and to liberate them from the subordinate role of merely generating hypotheses for quantitative test, methodologists have articulated philosophical underpinnings and implications of these methods that require a major paradigm shift away from the dominant hypothetical–deductive paradigm that has dominated the field. Qualitative psychology has been recognized as a significant movement; Ponterotto (2002) has called it “the fifth force” and has predicted a disciplinary shift toward a qualitative research paradigm in the future of psychology. The recent explosion of text books on qualitative methods, including some from mainstream

sources (Camic, Rhodes, & Yardley, 2003), confirms a widespread and growing interest in qualitative research methods.

Paralleling general calls for a radical shift toward qualitative research methods since the 1970s (Gergen, 1973; Giorgi, 1970) have been especially strong arguments for such a paradigm shift in applied psychology, where the presumed opposition of the dual scientific values of rigor and relevance in research is most pressing. Fishman (1999) documents this history by showing how the long-standing, enlightenment–modernist promise of increasing social progress with the growth of natural science methods and the rational application of universal laws was questioned during the turbulent 1960s. He recounts how, by the 1970s, it became clear to many that psychology’s delivery on the promise of clear, objective answers to the problems of the complex, ambiguous troubles of the social world was scant at best and did not justify the huge funding resources that it had used (Fishman, 1999, p. 3). Fishman depicts beleaguered practitioners caught between irrelevant and ineffective guidance from science and inviting courses of action suggested by reflection in the field but without justification by rational science. The natural scientific methods of quantification and laboratory experimentation that had dominated psychology between 1879 and 1960 as a gold standard and had marginalized methods from the humanities, field research, introspection, and self report were not achieving their utopian vision. The critiques of positivism that developed independently in both post positivistic Anglo-American philosophy and the phenomenological–hermeneutic–poststructural philosophies on Continental Europe were merging with the conclusion of experts in applied areas that the results of “the great experiment” of applying natural science methods to complex social problems was a failure, indeed that the overdependence on theory testing and the lack of more context-sensitive methods close to real world situations was identified as the cause of the failure. In evaluation research, new, more holistic methods were called for, thought through, and developed in applied psychologies, drawing on qualitative traditions of phenomenology, hermeneutics, and pragmatism. A reconsideration of the value of verbal data and more reflective qualitative analytic procedures has begun to flourish in applied areas of psychology.

One of the central concerns accompanying the emergence of a qualitative movement is its relationship to the quantitative methods whose long historical dominance continues. Fundamental questions have been raised about the compatibility of quantitative and qualitative methods and the so called “paradigm debate” has ensued (see Reinhart & Rallis, 1994). Some have argued that methods used must be compatible with the paradigm guiding the research, “the paradigm-method fit controversy” (Hanson, Creswell, Plano, Clark, Pesker, & Creswell, 2005). Methodologists stress not just methodological but epistemological and ontological incompatibilities at the paradigm level that make it difficult to reconcile the two approaches, and some take the position that researchers who employ both

qualitative and quantitative methods cannot maintain a coherent and honest identity (Sciarra, 1999). Others argue not only that the apparent conflict is reconcilable but that a “merged identity” is possible and desirable (Ponterotto & Grieger, 1999). Even those who advocate a merged research identity acknowledge the great difficulty of learning and applying both qualitative and quantitative methods in a single researcher’s career.

Ponterotto (2005) has surveyed research training in one of the areas that has been most hospitable to qualitative research methods, counseling psychology. Although he cites a recent Delphi pole indicating that training directors identified sophistication and attention to methodological diversity as one of the top two trends in the field during the next decade, only 10% of the surveyed programs require a course in qualitative research methods. Training in qualitative research methods still appears to lag far behind quantitative training in graduate education as previous surveys have shown (Aiken, West, Sechrest, & Reno, 1990). Although the graduate programs surveyed by Ponterotto accept the use of qualitative methods, few students actually utilize them in their research. Hanson et al. (2005) note that although textbooks, chapters, and journal articles about mixed methods research (the integration of qualitative and quantitative methods in single studies) are increasingly available, mixed methods are absent from popular research design texts and mainstream peer reviewed journals. Hanson et al. also complain that almost nothing has been written on mixed methods in applied psychology (2005, p. 224). One of the great challenges in contemporary psychology is to understand how future generations of psychological researchers will master qualitative methods and learn how to integrate them with quantitative methods.

Allport, in his original call for multiple research methods in psychology, argued that progress in this direction would not be made by the employment of a research methodology invented in an armchair but would take place rather by explorations of researchers on the ground struggling with specific research problems and being bold enough to employ methods in original ways. The following narrative provides just such an instance and shows that this expansive process called for may take place in advanced graduate level research on the part of students, who in their own way with proper support and guidance, can contribute to the great disciplinary challenges of how qualitative methods can be learned and integratively employed with the quantitative methods that receive much more attention in graduate coursework. Moreover, this study documents the story behind the first doctoral dissertation using mixed methods in a Department of Psychology housed in a Graduate School of Arts and Sciences that has prided itself in its long-standing commitment to forming a quantitative research identity. It also shares, from a first-person perspective, the concrete experience of a student who has developed a “merged research identity” in the course of her doctoral level research while addressing pressing problems in applied psychology.

THE NARRATIVE

I chose to enter the field of applied developmental psychology (ADP) because it advocated the real world use of developmental research and theory to better the lives of children and youth. In line with this approach, my dissertation project was designed to find out how educational systems (schools) can be improved for economically and linguistically disadvantaged inner-city children so that they have the best opportunities to succeed in life that can be provided. To fulfill this goal, I initially designed a single case study of a school serving economically disadvantaged students, which achieved far above average scores in fourth-grade literacy and math assessments compared to district averages. My aim was to learn how the learning environment of this school was constructed so that the best practices could be generalized to other schools serving similar students. This initial research design grew into a comparative study of three urban schools with varying achievement results to investigate their relative fit with a model developed from the literature specifying the instrumental factors in optimal outcomes in school achievement. Through the process of conducting this research, I came to integrate the discovery orientation of the initial design with the hypothesis confirmatory approach of the subsequent design in mixed methods research.

The practical aims of this research grew out of my work as a graduate fellow at the Foundation for Child Development, where its president, Ruby Takanishi, proposed that the time was right to think about connecting the growing numbers of PK programs with the early elementary school grades. In the United States, PK programs (variously referred to as early education, early learning, preschool) developed separately from the K–12 education system, including the preparation of teachers. Kindergarten (K), now considered part of universal public education, developed separately as well and remains noncompulsory in most states. Drawing from her development background and experiences in both PK and elementary education, she proposed that the first level of publicly supported education should be reframed to begin at 3 years of age with quality PK programs and end at Grade 3. During this period, the learning experiences of children should reflect the *alignment* of standards, curriculum, instruction, and assessment, and teachers should be prepared to teach children during the entire age span from 3 to 8.

My literature search showed that there was a paucity of research on the early elementary grades, K–3 and that there was virtually no research on curriculum and instructional practices across Grades PK through 3. The few exceptions (Reynolds, 1994, 2003) did not link school-level policies with the activities of those engaged in the schools (principals, teachers, students, parents) in a manner that would help me operationalize the multifaceted process of aligning standards, curricula, and assessment practices within and across Grades PK through 3. Thus, what Takanishi was calling for—an aligned educational system for children 3–8 years old—was virtually unexamined in the literature.

The Initial Discovery-Oriented Approach

Because little research existed on how schools structured their learning environments for children from 3 to 8 years old, and how schools aligned experiences for children across grades was not documented and known, I considered natural the path of conducting an in-depth case study of one school that was relatively successful in educating children to explore what they did. The underlying assumption was that the school with successful outcomes would be implementing a seamless, or aligned instructional program, and my job was to discover, through observations and interviews, how Alignment was being achieved. Therefore, the research was initially designed to provide some information on how Alignment was conducted in a real world setting with the intention of using that information to inform future research. We view this as “discovery oriented research” because the goal was to acquire original knowledge of what “Alignment” involves and how it is achieved in the real world.

The planned method was two pronged: (a) interviews with teachers and principal and (b) classroom observations. By collecting data at the administrative and classroom levels, I hoped to see if the vision created by the principal was congruent with teachers’ understanding of the educational goals and their classroom practices. The main focus of the interviews was to determine how children’s experiences were aligned and coordinated within and across grade levels regarding three pedagogical components: standards, curricula, and assessment.

The Dissertation Research in Response to the Requirement of Hypothesis Testing

Prior to carrying out this case study, the Senior Program Officer at the Foundation suggested that I do my dissertation on PK–3. This was a turning point because a discovery-oriented project, designed to reveal how one school implements Alignment, was transformed into an academic research project with a goal of hypothesis testing, an effort to confirm the efficacy of a preconceptualized model of school-based education. The faculty of my program, lodged in a Department of Psychology in my university’s Graduate School of Arts and Sciences, advised me that for the project to be considered for a dissertation, it would be necessary to collect a larger sample of data that would be capable of evaluating a general model of education. I was directed to collect data in at least three schools to be able to compare and contrast their processes and map these processes onto achievement outcomes. I was told that research based on a single case study would neither be generalizable, nor provide evaluative data about educational policies and practices regarding outcomes. Simply documenting how a school, serving economically and linguistically at-risk students, functions to successfully educate children would not be rigorous enough for a dissertation. My faculty directed me to define the components of PK–3 that produce desirable achievement outcomes for verification. Thus,

I set out to create an education model based on empirical findings in the research literature on child development, program evaluation, early childhood education, and economics that could be tested across three schools with differing achievement outcomes.

To define the model that would be tested, my approach to the literature now focused on the components that were linked to student outcomes. In what I now view as a reductionistic approach to examining school processes, I found studies that examined “structural variables” such as class size, student–adult ratios, and teacher degree. More recent research on “process variables” examined child care environments and how caregivers supported children’s developmental needs (e.g., National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2003). An emergent body of work examined classroom environments in kindergarten and first grade (Hamre & Pianta, 2005; Pianta, La Paro, Payne, Cox, & Bradley, 2002). In these studies, *structure* and *process* variables were conceptualized as independent variables to be linked to child outcomes, conceived as dependent variables. The combined body of work on structure and process components was conceptualized as a single model in which a linear process leads from structural variables, through process variables, to outcomes that could be tested in child care settings. Structural components were viewed as moderating the relationship between process and outcome (NICHD ECCRN, 2002). Unfortunately, the research literature did not yield univocal results about these factors. The studies showed mixed results and called for continued research to establish the efficacy of the variables under consideration. Because I especially wanted to investigate the broader context including such school level factors as the principal’s vision and Alignment, I tacked Alignment, conceived as an additional component, onto the other components and arrived at a revised explanatory model of outcome that included Structure, Process, and Alignment. These sets of components were to be related to school achievement outcomes. I thought that by comparing sets of components (Structure, Process, Alignment) in my study I would be able to tease out the effects of one set over another.

However, the original and central focus of my interest, Alignment, still seemed vague and elusive as a measurable construct. I was not sure how I would compare it to Structure and Process. Because the literature did not help me here, I had to devise some method for gathering data about the nature and processes of Alignment. Takanishi’s conceptualization of Alignment provided a framework: (a) a vision or set of principles that views a coherent first level of education beginning at 3 years old through 8 years old, (b) Alignment between standards and a sequenced curriculum within and across grade levels, (c) teachers who are knowledgeable about children in this age range 3–8 years, and (d) a set of assessments that measure *what* children learned and *how* they learn. I designed questions that I could pose to teachers and principals in interviews that would tap into these topics, such as “Are standards aligned with curricula within your grade level and across the years

PK-3?” “How well are assessments aligned with what children learn in the classroom, and how do you use these assessments?” “How well did your training prepare you to teach kids from 3–8 years old?” and “What do you consider the foundational years for children’s learning?” I planned to code and assess all the variables, which could be laid out in a neat table, categorized as Structure, Process, or Alignment, and tested in relation to achievement outcomes (see Table 1).

TABLE 1
List of PK–3 Components

Structural
Full-day PK (T & P)
Mandatory full-day kindergarten
Well prepared teachers for PK–3 (T)
BA + ECE certification for PK teachers
Additional training beyond a MA in general education (e.g., special ed., bilingual)
PK–3 teacher certification
Ongoing in-service professional development that is useful for practice (T & P)
Reduced class size (≤ 20) (T)
Student:adult ratio 10:1 (T)
School-based parent involvement activities (T & P)
Extended programs: after school–before school/summer/weekends (T & P)
Connects low-resource families to services (P)
Single and clear governance structure (P)
Process
Integration of children from diverse backgrounds and English language learners (T & P)
Strong principal leadership to ensure fidelity of implementation of program (P & T)
Supportive and positive environment for teachers (T)
Responsive and sensitive teacher–child interactions (O-PC, TS, OC, NC)
Engaging classroom activities (O-ILF)
Instructional methods
Teacher instruction builds on children’s interest (O-EF & CD)
Mix of small group and large group activities (O)
More time on learning versus routine activities and disciplinary actions (O-Pr + BM)
Assessments used to improve classroom practices (T)
All areas of student functioning are emphasized (T & P)
Alignment
Alignment of standards, curricula, and assessments (T & P)
Within grades
Across grades
Continuing professional development of teachers to maintain alignment (T & P)
Accountability system that tracks classroom practices to child outcomes (T & P)

Note. T = teacher interview; P = principal interview; T & P = teacher & principal interview; O = observation; PC = positive climate; TS = teacher sensitivity; OC = over control; NC = negative climate; ILF = instructional learning formats; EF = evaluative feedback; CD = concept development; Pr = productivity; BM = behavior management.

At this point in the research Alignment was to be investigated by quantitative means, as low, medium, or high level of implementation, and examined in its linear relationship with achievement across schools. Based on my training in a positivistic framework, I had no other way to conceptualize Alignment except as a variable quantitatively related to other variables in a general way. This research was innovative in that it would test a model that comprehensively included the known, researched constructs along with the newly delineated construct suggested by Takanishi, Alignment.

METHOD

I proposed to test the model in three urban public schools. Each school was purposefully selected using strict criteria for internal and external validity. All three schools served an economically disadvantaged ($\geq 97\%$ eligible for free lunch), ethnically diverse student body. Each school's fourth-grade test scores in English language arts (ELA) and mathematics were different. School performance in fourth grade was to be related to the number of PK–3 model components each implemented. The hypotheses were linear in nature, quantitative, with the goal of mapping individual variables onto a preconceived model. Although I had introduced interview data, it was intended to provide a basis for measurement for hypothesis testing rather than, as intended in the initial discovery oriented project, to explore concretely what Alignment involves, how a successful school implements it through teacher practices, and how it relates to the principal's leadership and school-level policies.

Administrative data were used to select the schools for participation based on the aforementioned criteria, and to describe differences in student and teacher characteristics among the schools. Quantitative classroom observational data (ratings) were used to measure many of the Process components at the classroom level including the emotional and instructional climate within each school using a well-validated measure—the Classroom Assessment Scoring System (CLASS; La Paro & Pianta, 2004). Climate scores were then statistically compared across grade levels and schools. Qualitative interview data from teachers and principals provided information on the Alignment components in the PK–3 Approach within and across grades. Additionally, information on teacher preparation and experience was gathered via qualitative interviews to examine the relationship between teacher characteristics (Structure components) and classroom climate (Process components).

Archival, administrative data from the Department of Education was used to select the three schools for the study. Principals of three schools, called M, Q, and L throughout this narrative, agreed to participate. The Department of Education in

this school system ranks schools serving similar student populations by the percentage of students demonstrating proficiency in ELA and Math in third, fourth, fifth, and sixth grade.¹ In comparison to schools with similar populations, each school is categorized as far above average, above average, average, below average, or far below average. In 2005, the year for which data were collected, one school was in the “far above average” category (M), one in the “above average” (Q), and the third school was labeled “average” (L).

The principals selected two teachers at each grade level from PK–3 to participate in the study.² Classroom observations, lasting for about 2 hr each included note taking related to the CLASS constructs that were coded when the period ended while still in the classroom. After each observation, a 20-min interview was scheduled with the teacher whose classroom was observed. The interview typically took place within a week of the classroom observation.

Tension Between Hypothesis Testing and the Real World: Beyond the Limits of the Model

During the dissertation proposal meeting, Takanishi expressed discomfort with the confirmatory turn that the project had taken, given the newness of the topic. Her observations of PK–3 schools and efforts indicated that there were likely to be multiple ways that schools achieve alignment, and that are related to beneficial outcomes for children. The language presented in the proposal implied that a potentially efficacious educational model for PK–3 was already known, whereas rather little is known about the different ways that PK–3 could be implemented. She suggested replacing the term “PK–3 Model” by “PK–3 Approach,” which indicated an openness to the various ways schools could achieve Alignment. This was not only a shift in language, but also a shift in the direction of an exploratory way of conducting science. Nevertheless, the anticipated methods of data analysis remained in place, limiting the means of the discovery process.

A significant turning point transpired when I realized that the qualitative data collected in the interviews with principals and teachers addressed issues beyond those posed by my questions and that the significance of the data were not sufficiently utilized by attempts to measure the mere *extent* of Alignment. The data collected in the first school (M), which had the highest achievement outcomes, offered rich descriptive information about that school’s functioning and overall organization about which I did not ask. For instance, teachers discussed the centrality of the principal and his leadership as the driving force behind a highly coor-

¹Determined by percentage of students eligible for free lunch, percentage of special education students, percentage of English Language Learners, and an overall student need category.

²Two teachers at each grade level PK–3 were selected in School L, but because there was only one PK classroom in Schools M and Q, only one PK teacher participated in each of those schools.

dinated program. The principal, in turn, explained an ongoing professional development program that included teachers designing their instructional practice through collaboration with one another. The interviews had elicited meaningful information beyond my preconceived questions. What to do with this data?

This excess data was disconcerting because it was outside the model I aimed to test and the variables I planned to measure yet this data contained research participants' descriptions of matters that they believed, and appeared to me, to be of tremendous relevance to the research topic and value for the knowledge I was seeking. Indeed, what teachers were telling me was more intelligible than individual isolated component mapping that my correlational methodology could utilize. They were telling me about holistic school qualities and functional interactions among school stakeholders (teachers, principal, and other support staff) in the school. The teachers emphasized the shared vision held by the principal, teachers, and administrative supports that all children could succeed. They also expressed the importance of their shared vision, that it is the responsibility of the school to find ways that children could become proficient in literacy and math. Teachers described collaborative, solution-focused meetings in which assessment, curricula, and instructional practice were discussed and creatively modified. It was clear that this data was meaningful, but I did not know how to analyze it or report what I was hearing, in what way it was meaningful, or even how it related to the PK–3 Approach my research proposed to test. To me one thing was certain: Quantification alone would not do justice to this data that did not fit neatly into my table of variables.

There was so much information to collect, that during the interviews, I did not have time to systematically analyze or even formulate opinions about what I was observing. However, because the qualitative data carried me far from my hypotheses and the quantitative data seemed to disconfirm them, I started to panic at the thought that my model would not be confirmed and my research would come to naught. How could the highest performing school have the largest class sizes, which exceeded 20 students, and the fewest adults—only one per classroom? Twenty was the magical number that was recommended by policymakers and people who designed early childhood programs. Moreover, a teaching assistant was considered crucial for a high-quality program. These components were included in the classic early childhood programs, which were found to have strong short-term effects on child well-being. When I reported to Dr. Takanishi that I did not know if my hypotheses would be supported by the data I was collecting, she wisely advised me to try to put aside my preconceptions and biases while I was observing in the classrooms. The interview data were rich, holistic, interactive, and important. Even though my head was spinning with all of the information being gathered that did not fit my method or hypotheses, I retained all of it and kept on taking notes—even in the principal's office while waiting to observe classrooms, after walking through the cafeteria, and on my observations in the hallways. On my way home, I

would try to make sense of all of my observations, but could not come up with any definitive answers. I felt that I was on an expedition through uncharted territory. Like other studies that I had read, I figured that some of my hypotheses would be supported, and others would not. I started to believe that with each qualitative interview, unlike other studies, I would be able to say something about “why,” and that these experiences would help to explain the quantitative findings in the end.

ANALYSIS WITHIN A CONFIRMATORY FRAME

Finally I had data to analyze. This is the moment that all researchers wait for. The defining moment was here. Quantitative analyses were simply conducted as planned. Using SPSS 10.0, I ran statistical tests to determine if there were statistically significant differences among the schools on the PK–3 Structure components such as class size, teacher degree, and number of adults in the classroom. I ran a factor analysis on the seven coded variables that characterized Process components and compared the schools on two summed constructs—instructional and emotional Climate. Then I statistically compared the schools on these scores. The main goal of this task was to literally check off which variables were present against the model’s Structure and Process variables.

I presented school achievement over time for each school via percentage of children achieving proficiency in ELA and Math (Figures 1 and 2).

I conducted chi-square tests and a multivariate analysis of variance, which examined mean level differences across schools on the Structure and Process vari-

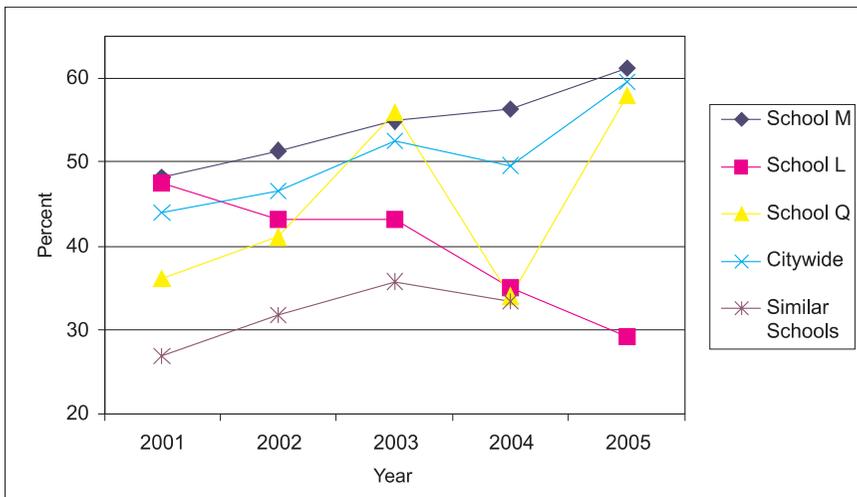


FIGURE 1 Percent of fourth-grade students meeting proficiency in ELA from 2001–2005.

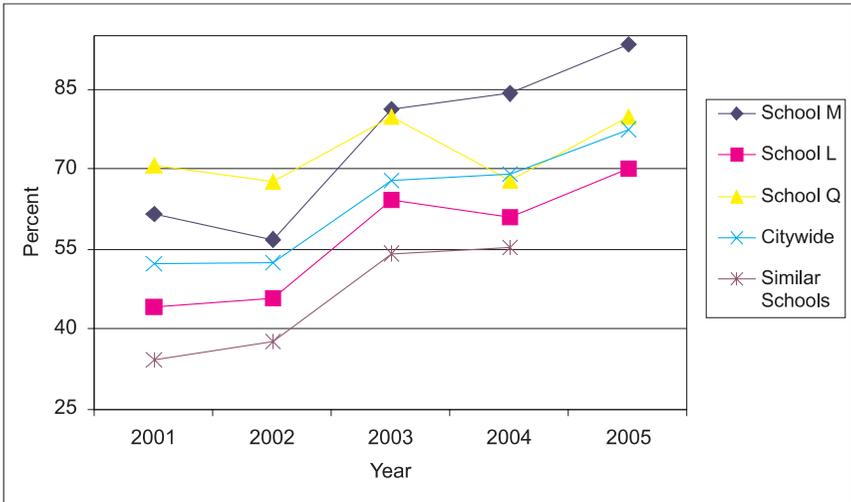


FIGURE 2 Percent of fourth-grade students meeting proficiency in mathematics from 2001–2005.

ables (Tables 2 and 3). Relationships among Structure and Process variables were examined via correlation (Table 4). The results of these statistical analyses showed no significant difference among schools on teacher characteristics. Additionally, Structure components, such as class size and student–adult ratios, were significantly different across schools, but not in hypothesized directions. For instance, School L had lower class sizes on average than School M (18 vs. 24). The Process variables, instructional and emotional climate, significantly differentiated the two higher performing schools (M and Q) from the lowest performing one (L), but failed to distinguish between schools M and Q. Moreover, correlations indicated statistically significant relationships between variables such as climate and number of adults in the classroom so that more adults were related to lower climate scores.

Probably the most meaningful statistical analysis was a 2×3 analysis of variance, which showed school as a moderator between Structure and Process variables. In effect, school (M, L, Q) moderated the relationship between preservice teacher training and instructional climate. This result suggests that, depending on which school teachers work in, training is more or less related to the instructional climate, or how well teachers manage and instruct students. Figure 3 shows that School L teachers with specialized training had their classrooms rated higher on instructional climate than teachers in that school without specialized training. No significant relationship between these two variables was present in the other two, higher performing schools. So, what makes School L different from Schools M and Q that could influence this relationship between Structure and Process? Not in

TABLE 2
Principal Components Analysis of the Classroom Assessment Scoring System Across Three Schools (Process Components)

Items	School M (N = 9)				School L (N = 10)				School Q (N = 9)				Factor Loadings ^a (N = 28)	
	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max	Factor 1	Factor 2
Instructional climate														
1. Teacher sensitivity (TS)	5.44	.88	4	6	4.06	.97	3	6	5.33	.71	4	6	.80	
2. Behavior management (BM)	5.56	.88	4	6	4.80	1.13	3	7	5.89	.93	4	7	.81	
3. Productivity (Pr)	5.44	1.13	4	7	5.10	.74	4	6	5.22	.67	4	6	.92	
4. Concept development (CD)	5.22	1.20	3	7	3.30	1.16	2	5	4.89	.93	4	6	.59	
5. Learning formats (ILF)	5.22	1.09	4	7	4.60	1.07	3	6	5.11	1.05	3	6	.70	
6. Quality of feedback (QF)	4.00	1.00	2	5	3.30	1.34	2	5	4.56	.73	4	6	.58	
Emotional climate														
1. Positive climate (PC)	5.89	.78	5	7	4.70	.82	3	6	6.33	.50	6	7		.72
2. Negative climate (NC) ^b	1.44	.53	1	2	2.10	.88	1	4	1.11	.33	1	2		-.83
3. Over control (OC)	1.67	.71	1	3	2.90	1.20	1	5	1.22	.44	1	2		-.82
													<i>F</i> _{school}	<i>F</i> _{grade}
Emotional climate (N = 28) ^c	18.78	1.56	17	21	15.70	2.16	12	18	20.00	.70	19	21	15.23** (M & Q > L)	ns
Instructional climate (N = 28) ^d	30.89	5.21	21	36	25.70	5.33	18	34	31.00	3.90	23	37	2.96* (M & Q > L)	ns

Note. ^aFactor loadings < .55 are not reported. ^bNC displayed a positive skew (3.39), with the majority of classrooms scoring a 1 or 2. All other variables had skewness < 3.0. No variables showed significant kurtosis (i.e., none over 3.0). ^cSum of PC + NC reverse coded + OC reverse coded. ^dSum of TS + BM + Pr + CD + ILF + QF.

*p < .10. **p < .001.

TABLE 3
Teacher and Classroom Structural Characteristics Collected From Teacher Interviews and Class Observations

	School M (N = 9)				School L (N = 10)				School Q (N = 9)				<i>F</i> _{school}	<i>F</i> _{grade}
	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>		
Years of experience	11.56	9.06	1	30	9.00	8.23	2	22	11.00	11.50	4	35	<i>ns</i>	2.64
Class size	24.00	2.74	18	27	18.10	4.28	13	25	19.44	2.96	16	24	5.97**	<i>ns</i>
Number of adults in classroom	1.56	.53	1	2	2.30	1.16	1	4	1.11	.33	1	2	4.96*	<i>ns</i>
Student:adult ratio	17.56	7.24	9	27	9.85	5.10	3.5	20	18.44	4.59	9	24	5.46*	2.79†
			<i>Percentage</i>				<i>Percentage</i>				<i>Percentage</i>			
		<i>N</i>	<i>Within School</i>		<i>N</i>		<i>Within School</i>		<i>N</i>		<i>Within School</i>		χ^2_{school}	χ^2_{grade}
Teacher degree														
BA + certification		1	11.1		0		0		1		11.1			
In the process of MA		1	11.1		0		0		2		22.2			
MA + certification		2	22.2		2		22.2		2		22.2			
Teachers with specialized training ^a		5	55.5		8		88.8		4		44.4		<i>ns</i>	12.28**

Note. ^aSpecialized training includes any coursework or degree beyond a MA in general education (e.g., special education, early childhood, bilingual, and literacy)

†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

TABLE 4
Correlations Between the Classroom Assessment Scoring System Scales
and Teacher and Classroom Characteristics

<i>N</i> = 28	<i>Grade</i> <i>PK-3</i>	<i>Special</i> <i>Training</i>	<i>Years</i> <i>Experience</i>	<i>Class</i> <i>Size</i>	<i>Number</i> <i>Adults</i>	<i>Student:</i> <i>Adults</i>	<i>Instructional</i> <i>Climate</i>	<i>Emotional</i> <i>Climate</i>
Grade PK-3	1							
Special training	-.24	1						
Years experience	-.10	.22	1					
Class size	.10	.01	.01	1				
Number adults	-.44*	.45*	.06	-.06	1			
Student:Adults	.49**	-.42*	-.10	.46**	-.82***	1		
Instructional climate	-.08	-.24	.05	.19	-.40*	.30	1	
Emotional climate	.04	-.13	.12	.32†	-.46**	.44*	.69***	1

Note. †*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

support of my hypotheses and model (but in line with my observations during data collection), Structure components such as lower class size, teacher training, and more adults in the classroom were not significantly related to higher classroom climate scores; nor did Process components discriminate among the three schools in a linear sense as I hypothesized. Overall, at this point my study did not appear to support the PK-3 Approach I was testing and would do no more than add to the mixed findings existing in the literature. The only set of components that could save my model was Alignment.

But how would I analyze Alignment? In contrast to the other variables, the data were not quantitative measurements, but verbal expressions. Doing what I was trained to do, I set out to measure Alignment. The number of teachers who responded to particular questions was summed. I found articles that delineated how

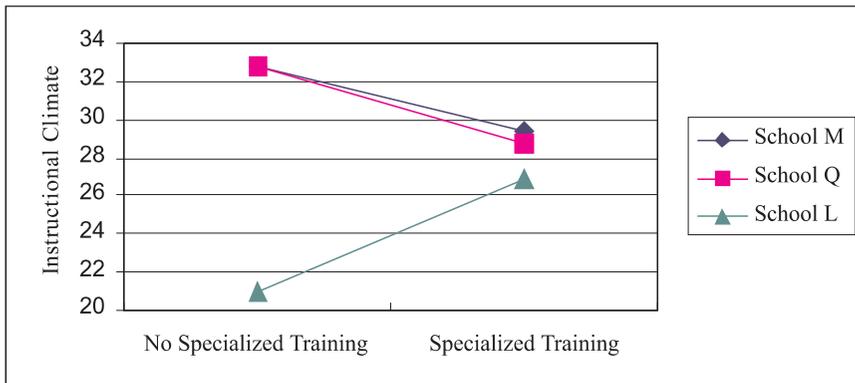


FIGURE 3 Interaction between school and specialized training.

interview data could be coded as themes and subthemes. The goal of this analysis was to report the number of teachers who responded similarly to a question on the interview protocol, which I could measure by the frequency of each theme. I painstakingly transcribed my handwritten notes word for word into Microsoft Word under the topics of the interview protocol (La Pelle, 2004; Ryan, 2004). Then I organized interview passages across teachers within school by theme to draw out the variation in how teachers viewed their school functioning. Next, using the interview data, I created a codebook. Each passage was coded according to the theme that best described it and put into a large table that listed the school code, grade, teacher code, and theme code in the first four columns. Comments by teachers were placed in rows that corresponded with the teacher, grade, and school codes. The master table allowed me to view responses both within school and grade and across schools and grades.

The data were to be reported in the results section by presenting how many teachers responded similarly to a given topic. For example, in reference to the question about a sequenced curriculum across grade levels, the following was reported:

In School M five teachers commented on the standardized curricula across grades in all subjects. A third-grade teacher stated that she sees a difference between children who had the scripted phonics curriculum in grades one and two, and those who didn't ... In School Q, six out of eight teachers reported that the curriculum is not a good fit with their population of children. For instance, a third grade teacher pointed out that the independent work the children are expected to do as part of the curriculum is not realistic for the weaker students in general.

Since I did not want to lose any data, I included all comments that were recorded during the interviews. Every comment made was coded and summarized via frequency under each theme. The dissertation committee members did not know what to conclude from the initial draft of the results. Each theme was compartmentalized as its own isolated variable, and there was no apparent overarching structure to the data. After reviewing over 30 pages of qualitative results reported in this fashion, committee members recognized their limited expertise in qualitative data analysis and interpretation and suggested bringing on the dissertation committee a faculty member who had been trained in qualitative analysis.

GAINING FIDELITY TO THE REAL WORLD: LEARNING QUALITATIVE ANALYSIS AND NEW PHILOSOPHIES OF SCIENCE

Receiving mentorship in qualitative methods, data analysis, interpretation, and new philosophies of science was perhaps the most significant turning point in the

research project. Through readings that delineated the use of qualitative methods independent of the quantitative hypothesis testing paradigm, I was able to acquire knowledge that utilized the interview data in a comprehensive manner that reflected its richness, contextual complexity, and holistic structure and to engage in process of scientific discovery with a rigor equal to, though radically different from, that with which I had been trained to test hypotheses. Data analyses conducted over the next several months then shifted the weight from confirming a model made up of isolated, testable variables being mapped onto the preestablished list of PK-3 components, to discovering the essence of each school's organization and typical mode of functioning with qualitative data at the center of the findings. Most important in this process was a shift, something akin to a religious conversion, from the positivistic philosophy of science in which I had been trained, to continental philosophies of science developed in phenomenology and hermeneutics and the pragmatic approach that attempted to integrate these.

Books by Kvale (1996) and Fishman (1999), along with articles by Wertz (1985, 2005), provided a framework enabling me to interpret my verbal data and solidified my belief in qualitative data as a valuable source for informing research questions. I came to learn that the uncertainty I felt throughout much of the process of the qualitative data collection and analyses was not only normal but a good thing because it reflected the fresh, prereflective nature of the data and the absence of prejudicing preconceptions in my interpretation. I learned that research does not necessarily require a hypothesis beforehand and that a process of discovery is possible in which the unvarnished expression of research participants drives data collection, reflective analyses, and interpretation in a manner that answers a research question. In contrast to a confirmatory paradigm that allows the researcher to test a model based on what is already known, whereby data is collected and subsequent analyses are predetermined by the researcher's ideas, the qualitative approach begins with an openness to participants' experience of real world situations allowing the analysis to be less prejudiced and more radically grounded in empirical reality.

Specifically, Kvale's book on interviewing helped me understand the legitimacy and even necessity of the open-ended process in which I had allowed my participants go beyond my preformulated questions and to describe what was most relevant to them as engaged participants in the reality under investigation in response to my research questions. I wish I had read this book prior to the very uncertain exploratory phase of the work when I was receiving information from teachers and principals that I had not anticipated, because it might have allowed me to be more tolerant of ambiguity and secure in uncertainty.

Fishman wrote about the benefits of conducting case studies to answer real world questions within a framework he calls *pragmatic* psychology. He indicates specific guidelines for checking reliability and validity of data in case study designs, which gave me comfort in knowing that a qualitative case study approach is real science. My dissertation had been proposed as an atypical and innovative way

to test hypotheses using both quantitative data and qualitative interviews. Reading Fishman led me to reconceptualize the entire dissertation as a pragmatic, comparative case study design that contained hypothesis testing through quantitative analysis but also integrated qualitative data *and strictly qualitative analysis* utilizing reflective analyses (drawn from phenomenology) and contextual interpretations (from hermeneutics). The pragmatic approach to research begins with a guiding conception that dictates the type of data to be collected (Fishman, 1999)—in the present research, the PK–3 Approach. The comparative case study is particularly good for conducting research in schools, which may be categorized according to measurable outcomes that can be rendered intelligible in the context of school organizations as pathways to these outcomes. Specifically, student educational experiences, teachers’ professional experiences, a principal’s leadership style, and the dynamic interactions among these components at the classroom and school levels are rarely measured or conceptualized together in one quantitative study, but can be reflected on as a whole given full descriptions of school situations by participants. Whereas purely positivistic studies focus on isolated levels or factors (e.g., teacher degree) and try to associate them with student achievement, a pragmatic, embedded, mixed research design does not treat each school as simply a conglomeration of isolated factors and approaches it by means of a systematic examination and in-depth understanding of the dynamic interrelations among the constituents of the human order within each school. By characterizing schools according to their implementation of specific components found in previous research to facilitate student achievement, and according to the ongoing dynamic interaction between these components, the relationships between school organization and school type can be examined. Relating these characterizations to student outcomes moves toward an informed and applicable typology of schools. According to Fishman (1999), the findings of case analyses can be related back to the guiding conception in a hermeneutically progressive fashion, in a way that informs the original conception. In this research, the original conception of the PK–3 Approach could be revised and possibly transformed by the empirical research in an informative way. This change in the overall conceptualization of the dissertation research from a strictly postpositivist epistemology and methodology to a pragmatic one provided an openness to multiple ways of knowing in which phenomenological and hermeneutic perspectives could assume the prominent position demanded by the data and goals of the research project.

The most important literature that I read was phenomenology, which helped me to see the larger organizations of the human order in schools through my data, to grasp the essence of each school’s functioning in a holistic way. Phenomenology also changed the way that I thought about gathering knowledge. For instance, I read about Husserl’s *epoché* (XXXX) as a means to secure unbiased description of subject matter, and to withhold scientific preconceptions about the subject matter to access and reflect on “the things themselves.” With these methods, real world

manifestations of the subject matter as it exists prior to and independent of scientific knowledge could form the basis of original conceptualizations that closely reflect the essence of that reality. This *return to phenomena as they are lived* in contrast to beginning with hypotheses is a methodological procedure and does not imply that previously established scientific knowledge is false; it simply suspends received science, puts it out of play, and makes no use of it for the sake of fresh research access to the matters to be investigated (Wertz, 2005, p. 4).” The idea of *intentionality* taught me that the data I had collected, as conscious expressions of life in school, allowed me genuine access to my subject matter, Alignment within its meaningful context. I could conduct an analysis of Alignment as it is present in the school-worlds of my participants and trace this “intentional object” back to the personal and social performances through which its shape is generated. This *intentional analysis* would not focus on the verbal data itself but would empathically move *through* the perspectives of my participants’ expressions to the school situations in which they live, thereby entailing my meaningful *reflection* on the performances that establish Alignment. The idea of *eidetic intuition* (sometimes called seeing of essence), as a rigorous scientific practice, provided me with a research method through which I could conceptualize my subject matter in its essence with maximal fidelity to meaningful life found in the real world schools. I used empirical comparison among my three schools, supplemented by *free imaginative variation* in which I identified the essential characteristics of each school, grasping what would be unimaginable in each school given its *typical* mode of functioning. Discussions with my mentor, who was trained in phenomenology, helped me carry out these admittedly difficult methods and continually motivated me to reflect harder, and look deeper through data into the school situations to discover specific characteristics of Alignment in each school, to understand the processes through which it was achieved, and to invent language that adequately expressed the essence of each school’s reality.

Qualitative Findings

Whereas the quantitative analyses took place over a few weeks, the qualitative analyses were ongoing and changed considerably as my reflections deepened and gained precision over a period of several months. The process of reflecting on the interview data collected from 28 teachers and three principals across three schools, and gaining a more sophisticated and confident understanding of how these schools operated, paralleled my own guided development as a qualitative researcher. I started out carefully organizing and coding information about isolated variables that could be mapped onto the constructs of the PK–3 Approach. Although this method allowed me to generate categories, which could be viewed as themes, the method did not allow me to grasp the interrelation of variables, or to reflect on their functional significance or meaning in reference to the research phe-

nomenon of Alignment. Increasingly employing the phenomenological mode of reflection, I began to look through the data for the presence of Alignment to understand how it presented itself in the schools and to analyze its essence and that of the generative processes giving rise to Alignment. My first great realization was that Alignment was indeed present and achieved in, particularly School M. Conceptualizing what Alignment involved there, what it meant to the teachers and principal, and how it was achieved through their well-orchestrated practices and efforts was no less than exhilarating for me. On this basis, I was able to conceptualize the multifaceted essence of Alignment and the school organization of interrelated practices that brought it about. In the bold light of School M's exemplary manifestation of Alignment, School Q lacked the full structure and many of the processes necessary to achieve it, and school L was almost completely deficient. I began to get a handle on Alignment in School M and how the other two schools were relatively deficient. Excerpts from the findings of this analysis follow:

School M: A Dynamically Aligned School. School M is a dynamically aligned school. The principal organizes teachers' schedules so that they can meet with other teachers both within grade and across grade levels to continually discuss curricula and assessments, and their fit with standards and the student population. These are dynamic problem-solving meetings with teachers as the shapers of continuity of classroom-level experiences within and across grades for the students.

School Q: On the Cusp of Dynamic Alignment. Some of the above Alignment ingredients exist at School Q that could enable the school to become a dynamically aligned school in the future, but those elements are static and not currently interactive. The means to move them forward toward increased and complete alignment are absent.

School L: No Alignment. The goal of working toward Alignment between curricula and assessments to meet standards is missing. Teachers do not meet across grade levels to gain knowledge of the experiences with which children come into their classrooms from previous years, or take into consideration in the current grade level what students will face in subsequent years, for which they must be prepared

My mentor suggested that even though my initial analysis yielded an identification of Alignment and a beginning conceptualization of its essence and the functional intentionalities that brought it about in School M, the qualitative analyses of Schools Q and L were limited to their deficiencies. In a sense, this analysis was implicitly model building and testing in that it identified a standard in one school to which the other two schools did not measure up, a quality (Alignment) of which they simply had *less* than School M. To put it another way, although I had begun to characterize the functional organization of the first school, I was still in a confirmatory state of mind in analyzing the two schools that did not fit the model derived from the first. Once I discovered that the high-performing school actually did fit the Approach better than the other two, it was difficult for me to see how the other

schools functioned in their own different ways. My mentor suggested that I analyze Schools Q and L in their own right and attempt to grasp how Alignment is achieved (to whatever extent and in whatever ways) in these two schools. He emphasized the need to grasp the essence of each school and to identify three *types* of school organizations if the data suggests different modes of operation in each of the three schools. By comparing and contrasting the interview material within each school to grasp that school as a whole and then comparing and contrasting the schools with each other, I began to see how the various themes I discovered in each school were integrated in different functional wholes, each characteristic of a *typical school structure* capable of achieving Alignment in its own (limited) way. Instead of stating what was missing from the two schools' operations in comparison to the first school, I began to draw out evidence of how each school functioned in context of PK–3. I began to realize that what each school typically did, how the stakeholders interacted on a regular basis, could be richly described. I went from using speech as facts for confirming a hypothesis to taking a larger, encompassing perspective and using speech across participants to discover the overarching form of life in each school across facts as stated by teachers and principals. Only then could I report how schools actually functioned. I came to understand that, by comparing, contrasting, and finally combining individual pieces of information from each participant who was interviewed into a holistic view of working relationships, I was able to characterize what I began to refer to as each school's typical organization. One of the most difficult tasks in this process was to name the essence or typical structure of each school in a manner that was faithful to the way the school achieved Alignment. Illustrative excerpts follow.

Dynamic Alignment (School M). School M is a dynamically aligned school because of its working synergy among stakeholders, ownership of the teaching curriculum and assessment practices, and responsibility for ensuring that instruction fits with standards and assessment as well as the student population served. The principal is both a visionary leader and practically provides the time, space, and guidance for team-oriented meetings designed to air problems, find collective solutions to challenges, and implement shared methods that integrate the constituents of teaching and evaluation across all Grades PK–3. Through these meetings, teachers become aware of students' activities and skills in previous and subsequent grades and creatively modify curriculum to foster increasing continuity across the PK–3 grade span. These group interactions integrate new insights and make adjustments to changing conditions by modifying existing methods and inventing new methods that assure progressive change from PK to third grade.

Unidirectional Alignment (School Q). Alignment and coordination are organized around the literacy curriculum and directed by a literacy coach who, selected by the principal, meets with teachers within each grade level to discuss implementation standards, assessment tools, and instruction that fit with each other from PK through third grade. Teachers are the tools to implement the standardized curricular plan,

which was developed by others and is handed down to teachers by the coach. The coaches meet with teachers within grade level on a weekly basis to explain how the curriculum should be implemented in all classrooms. This process and organization are unidirectional and static in that Alignment is established by the coach, with little input from the teachers and little change in this process over time.

Teachers Operating in Silos (School L). Teachers within grade level meet monthly to discuss literacy themes related to one curriculum, which many teachers use. Each teacher then individually reflects on how to best implement these themes in classroom experiences and to assess students' work to meet those broad monthly goals. Teachers perform this work in isolation from each other with little if any discussion about common and unique instructional practices that individual teachers devise to meet the curricular goals. Assessment practices are also individually designed rather than common or coordinated in each teacher's attempt to determine if students were achieving the curricular goals deployed in monthly meetings. Alignment is achieved at the level of each individual classroom and grade level in and of itself. Its connection to practices and student outcomes at prior and subsequent levels is indeterminate and therefore has a self-enclosed character. Variability in assignments, assessments, and supplementary curricular materials even within grade levels reflects the typical individuality of each teacher's mode of operation.

It is not possible here to go into all the qualitative findings. One unexpected and very significant finding was that teachers across all three schools and all grade levels, virtually without exception, described the formal coursework in their education to be remote and irrelevant for the actual work of teaching in which they were currently engaged. The one exception was the part of their curriculum that taught behavioral management in the classroom. They reported uniformly that their involvement as a student teacher, in hands-on educational settings, was valuable but that most of their learning came on the job after they were fully employed.

INTERPRETATION OF MIXED METHOD FINDINGS

Not uncommonly, even in dissertations whose plausible hypotheses are carefully drawn from the literature and whose methods are fundamentally sound, predictions are not supported by the quantitative analyses. In my dissertation, few of the relationships among variables achieved significance and those that did were not predicted as found. Typically, this leaves the researcher in a state of uncertainty, able only to speculate about the results of the study. Models and hypotheses are rarely abandoned, and surprising results are often attributed to methodological problems. Although mentors may reassure students that the dissertation has been successful in training methodological competencies, the resulting impossibility of drawing solid conclusions rarely provides satisfaction to students and sometimes even disillusionment and demoralization, regarding scientific research, is the re-

sult. Even the persevering young scientist who continues to engage in research after nonsignificant dissertation results usually admits that the first major foray in their research career did not live up to its promise. These experiences would have been mine if my dissertation had been limited to the quantitative analyses of variables. Although I experienced tremendous uncertainty at the outset and throughout the qualitative part of the research, the completion of the analyses brought rich and solid real world significance where no statistical significance was found. These discoveries, the result of extensive work and struggle, were exhilarating, intrinsically rewarding, and made worthy contributions to the field independent of the quantitative portion of the dissertation and strongly motivated me to continue to pursue and expect to achieve success in a research career. The qualitative findings were highly interpretable and even helped me interpret the quantitative findings.

The quantitative analyses began to make sense only once the qualitative analysis revealed the typical human order of each school including its vision, working relationships, and implementation means to achieve that vision. The quantitative analyses alone, although limited due to small sample sizes, were confusing and did not provide any further information than the mixed findings already in the literature, but the qualitative data helped make the quantitative results intelligible. First, teacher characteristics such as training and years of experiences (Structure components) did not differ as predicted across schools and thus did not discriminate among the low-, medium-, and high-performing schools. The apparently anomalous result that teacher training and years of experience did correlate with quality of instruction solely in the lowest performing school only could be understood contextually via the qualitative insight into teacher training and school organization. Qualitative findings indicated generally that teacher education was not helpful or useful and that, with the exception of student teaching and behavioral management techniques, learning to teach takes place on the job. Teachers in School L, who were left to their own devices in the school setting, were relying primarily on their prior training and experience because they received very little training and guidance on the job. It is understandable that teachers in this school with higher levels of education and therefore more student teaching would engender better achievement outcomes in that setting. In schools Q and M, the largely remote and irrelevant formal education was overcome by strong learning activities for teachers in the work settings, offered by the literary coaches in the better performing school (Q) and by the dynamic teacher meetings in the top performing school (M). These school-specific processes revealed by the qualitative analysis, along with the general insight into the remoteness of formal education, render the nonsignificant relationship between formal teacher education and student outcomes intelligible.

Second, the number of adults in the classroom and class size (Structure components) were related negatively, in the *opposite* direction predicted, to both instructional and emotional classroom climates, with the low-performing school having

significantly less children per adult in the classroom compared to the higher performing schools. The qualitative research, with its identification of educationally productive practices such as strong leadership, ownership of shared educational programs by teachers, and well aligned and coordinated curricular organization, explained how better classroom atmospheres and higher levels of achievement were generated with even larger class sizes. Such interpretations cast doubt on the role of the isolated factors that have traditionally been emphasized by previous researchers and policymakers and were featured in the tested model. Quantitative relations among variables are evidently context dependent. Research results that are not sensitive to or control unknown and unmeasured contextual factors may yield mixed, unpredicted, and anomalous results.

Relationships among variables and the meaning and role of a given variable must be understood within a holistic framework that considers the organizational context as revealed by relevant expressions of research participants and grasped through reflective analyses. The intentional analysis of the processes that generate Alignment across grades went far beyond the original intent of the research to simply measure the *degree* of Alignment in relation to achievement outcomes. School type was described as a highly organized set of practices that included the principal's vision of education, materials, and coaches brought in for professional development and training, the working relations among teachers within and across grade levels, and goal-directed interactions among various stakeholders such as students, parents, teachers, and school administrators. For example, the dynamic Alignment of School M was traced to the generative structure involving a principal whose vision was focused on building a foundation for literacy and math in Grades PK through 3 and creative problem solving group processes in which teachers took ownership of, and shaped all components of a progressive educational milieu from PK to Grade 3. School Q's static Alignment was generated by a unidirectional, top-down process, in which a literacy coach directed instructional practice. The principal who enlisted this expert placed a heavy focus on parent participation. Alignment was problematic and unstable in School L, where teachers were presented uniform curricular goals with no directives regarding assessment and operated in isolated silos, each determining their practice on a day-to-day basis with very little professional communication about how instruction was related within and across grade levels. A clear relationship was brought to light among these types of school organizations and student achievement. The meaningful relationship of these large school organizations in which Alignment is embedded stood in stark contrast to the array of statistical results among the variables that were quantitatively analyzed, and featured in the educational literature and in the deliberation of policymakers.

The qualitative data, in combination with quantitative findings, informed the original conception of the PK-3 Approach that was the starting point of this pragmatic research. Combined quantitative and qualitative analyses suggested that per-

haps Structure variables are not as important in academic outcomes as Process variables, that Alignment is central, and that the type of organization a school employs is paramount. Designing a study that allows for the discovery of what is essential in the real world though not included in hypotheses is important if research is to learn maximally from practice and real world implementation of educational methods, and to transform conceptualization in a way that is more radically grounded in observations of empirical reality than quantification alone provides. The confirmatory approach to model fitting using quantitative methods allowed for some statements about which school fit the best, but even in this it lacked in its ability to explain *how* each school fit the Approach and why some data were not supportive of the model. Answering questions about *how* schooling is implemented and *how* stakeholders interact is particularly important for program development, intervention work, and evaluation in addition to informing policy. The quantitative data were important to provide a point of departure, identifying schools with different standardized achievement outcomes, but the qualitative data and analysis were required to explain relationships or lack of relationships among measured variables.

The value of the qualitative data and proper analysis in this study in relation to the quantitative findings cannot be overemphasized, as the qualitative analysis pointed to the underresearched area of the relationship between the macrocontexts of school organization and teacher practices in connection to achievement outcomes. Bronfenbrenner and Morris (1998) state that it is the interactions that take place over an extended period of time at the microlevel (e.g., classroom) that most influences child development. This study indicates that there is a higher level organizational context within which microlevel interactions take form and which can be accessed through qualitative methods. These typical organizational forms on which good outcomes depend need to be considered in studies examining the impact of teachers and classrooms on child outcomes.

IMPLICATIONS FOR FUTURE RESEARCH

This research provided empirical evidence for Takanishi's position that we need to learn much more about what actually happens when schools implement a PK–3 approach, and that there are likely to be multiple pathways to connect PK programs with K–3 education that result in positive outcomes for children. Mixed methods research such as found in this dissertation can be extended to investigations of other schools at various achievement outcome levels, and best practices can thereby be identified and related to desirable outcomes. Future evaluation studies based on this kind of research in the field of education can test whether or not implementing Alignment activities and other functional features of the best performing school as discovered in my, and similar, future research will enhance achieve-

ment outcomes in schools. However, qualitative research should not be viewed as merely generating hypotheses for later tests. Future studies, including even tightly controlled experiments, need to include qualitative methods to provide contact with the concrete real world with its various, multiple contexts, and holistic systems, for outside of these, relations among variables cannot be understood. Quantitative achievement labels, if combined with the qualitative analyses that characterize school functioning, provide rigorous and relevant evaluation of the relationship between school organization and student performance. Both achievement outcome data and verbal expressions relevant to human experiences in the schools are necessary. Future research cannot afford to overlook the value of a qualitative methodology for gaining knowledge of the meaning, essence, and overall orchestration of working relationships that take place in real world contexts within which relationships among measurable variables are embedded. Only by integrating a rigorous and methodical discovery paradigm will research move from a reductionistic view of how the world operates by analyzing isolated, additive variables with detached statistical methods, to a holistic understanding of how multiple contexts and the interactions within and between them influence behavior and child outcomes—a more realistic and grounded view of how the world operates in all of its complexities (Overton, 2006).

CONCLUSION

Perhaps my personal scientific journey in the quest to find answers to a pressing applied research question parallels the shifting focus of science over the past 30 years. My research question, rooted in real world problems, was motivated by the need to discover something unknown. The literature and mentorship from professors in an arts and sciences graduate program with a vision of science and training in confirmatory research techniques led me to modify the original discovery goals, to testing a model constructed from variables derived from the literature. I went fishing with the quantitative data to include all possible relationships among variables previously known not to miss any important relationships. When my fishing expedition was complete, I was left with only one significant interaction signaling a moderating relationship with school as the moderator. To understand what was driving the moderating effect, I needed to discover the characterizations of each school and how they functioned, and the qualitative part of the research provided a rigorous and successful process of discovery.

This dissertation research attests to the value of a pragmatic approach as advocated by Fishman (1999) as a means of effectively integrating methodological paradigms that have been thought by some to be incommensurate. Quantitative and qualitative methods can be integrated and graduate students, in their research training, can develop what Ponterotto and Grieger (1999) call a “merged research iden-

tity” in the process of conducting doctoral dissertation research. The main problem is a lack of training at all levels—coursework and practice that emphasizes not only the nuts and bolts of qualitative method but the overarching methodologies and philosophies of science that provide students with a critical reflective understanding of the assumptions in, limits of, and relationships among multiple methods. Another great obstacle, given the rarity of faculty members with training or postgraduate achievement of integrative research identities, is the lack of collaboration among faculty researchers who favor qualitative and those who favor quantitative methods. Systematic, well-formulated methodologies of both sorts do exist, and with proper training and resources (books, articles) graduate students can learn how to do good qualitative work combined with quantitative approaches in dissertation research.

Psychology is now at a turning point like the one that was traversed in the dissertation narrated here in that there is a need for the combining of quantitative and qualitative methods to answer applied research questions about complex, unknown social realities. The resources and expertise are available. It is time that researchers break down the barriers that divide these two worlds and move toward more sophisticated ways of knowing that capably incorporate multiple methods to answer critical research questions that can inform the pressing policy decisions. If these decisions are to bear fruit in the real world contexts, guiding knowledge that integrates multiple methodologies is needed.

REFERENCES

- Aiken, L. S., West, S. G., Sechrest, L., & Reno, R. R. (1990). Graduate training in statistics, methodology, and measurement in psychology: A survey of PhD programs in North America. *American Psychologist*, *45*, 721–734.
- Allport, G. W. (1942). *The use of personal documents in psychological science*. Prepared for the Committee on the Appraisal of Research. Bulletin #49, New York: Social Science Council.
- Bronfenbrenner, U., & Morris, P. (1998). The ecology of developmental processes. In R. M. Lerner (Ed.), *Handbook of child psychology* (Vol. 1, 5th ed., pp. 993–1028). New York: Wiley.
- Camic, P. M., Rhodes, J. E., & Yardley, L. (Eds.). (2003). *Qualitative research in psychology: Expanding perspectives in methodology and design* (pp. 131–156). Washington, DC: American Psychological Association.
- Fishman, D. (1999). *The case for pragmatic psychology*. New York: New York University Press.
- Gergen, K. (1973). Social psychology as history. *Journal of Personality and Social Psychology*, *26*, 309–320.
- Giorgi, A. (1970). *Psychology as a human science*. New York: Harper.
- Hamre, B. K., & Pianta, R. C. (2005). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development*, *76*(5), 949–967.
- Hanson, W. E., Creswell, J. W., Plano Clark, V. L., Pesker, K. S., & Creswell, J. D. (2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology*, *52*(2), 224–235.
- Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.

