EDITORIAL

Regina Panasuk

The structure of the education system, including curriculum and textbooks, modes of teaching, methods of teacher training, etc. is continuously changing. The changes may lead to an improvement, or a worsening, in the quality of education. Sometimes they may result in no impact upon quality in which case major intellectual and material expenditures on such changes have been wasted. A solid, reliable, consistent, scientifically warranted research in education is always in a great demand. Yet, in the words of David Berliner (2002), the ***educational research is the hardest science of all***.

I open this issue of the Colloquium Journal with the reprint (permission from Sage is granted) of D. Berliner's paper, which I found quite interesting and out of the ordinary.

It is my hope that you find much intellectual excitement in the pages. I also hope that the journal is perceived as a safe space to try new ideas.

I am deeply grateful to all contributors to this issues and invite all graduate students to submit papers to the next volume of the Journal.

R. Panasuk

CONTRIBUTORS

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The Graduate School of Education, University of Massachusetts Lowell

GUIDELINES FOR SUBMISSION

The papers submitted for the Journal must discuss psychological and pedagogical issues and trends related to educational research and practice.

WHEN SUBMITTING A PAPER, PLEASE USE THE FOLLOWING GUIDELINES:

1. Submit an electronic version of the paper, an abstract, approximately 150 words, and a biographical sketch, about 30 words. All pictures and diagrams must be submitted as a separate document.
2. Use double spacing with one-inch margins.
3. For references, tables, and figures follow the style described in the Publication Manual of the American Psychological Association (APA), Sixth Edition.
5. Paper must be submitted by December 1.
6. Authors will be notified about the status of their papers by January 15.
7. The Colloquium is scheduled in April.

A RESEARCH PAPER MUST INCLUDE

a) a rationale and an identification of the research question(s)

b) a conceptual framework or brief statement of relationship to the literature

c) an identification of research methodology

d) a summary of the analytical technique(s)

e) a summary of preliminary findings

The length of the paper length might be up to 30-40 pages, including pictures, tables, figures, and list of references.

A position paper for the **Educational Resources** section can be up to 20 pages. It must present new ideas and developments of major importance to practitioners working in the fields of mathematics and science education, language art and literacy education, and leadership and schooling. It must reflect a variety of research concerns within the fields and deal with didactical, methodological and pedagogical issues.

An ***abstract*** for a ***poster presentation*** can be about 150-250 words and must outline the major ideas of the research study (proposed or completed), or a teacher education program.

SUBMIT PAPERS AND CORRESPONDENCE TO:

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POSTERS ABSTRACTS

Sumudu Lewis, Ph.D
UML

Exploring the Nature of Science

National professional societies such as the NSTA and the AAAS, believe that if middle and high school students understand how science has been and is practiced, they will be more likely to question their own thinking, recognize the power of scientific theories and understand that for science nothing is ever known absolutely. In other words, students can soon begin to see how dynamic science really is. The online course, Exploring the Nature of Science addresses some fascinating discoveries in the history of science, examine controversial issues in science, and consider how to teach the history and nature of science. We will examine whether there really is a scientific method, why theories are not the same as beliefs, the importance of scientific models and explore what it means to be scientifically literate in today's society.

Melinda Willis
UML

Use of Web 2.0 Data Sharing Technologies to Support Authentic Inquiry-Based Experiences for Teachers and Students

Traditional secondary school science laboratory experiments are typically scripted with specific outcomes, limiting the opportunities for authentic inquiry-based learning. Web 2.0 tools use technology already familiar to today's students and are examined as opportunities by which teachers can implement authentic inquiry-based learning in their science lessons. This study, which implemented a case-study methodology, examined the use of Web 2.0 data sharing technologies in a northeast high school, whose teachers incorporated web-based data sharing and analysis practices into their science instruction. Data collection for this study included teacher interviews, student work samples, and classroom observation. The research questions that were investigated for this study are: In what ways do Web 2.0 data sharing technologies support authentic science experiences for teachers and students? How do Web 2.0 data sharing technologies facilitate inquiry-based instruction?

Edward Tonelli
UML

High School Kinematics: Is the Delay Between Sensing the Motion and Reading the Graph of the Motion Affect Student Learning?

Many physics teachers use electronic sensors and same-time graphing utilities to facilitate student learning of kinematics concepts. Both the teachers and students who use such technologies experience delays between data collection and graph production. Brassell (1987) stated that to be effective learning tools, such technologies must allow the student to see the graph drawn electronically at the same time as the phenomenon occurred. Hundreds of researchers have quoted Brassell's (1987) admonition, but few have tested whether delays really impede student learning. Kinematics students analyze motion, both qualitatively and quantitatively. Among science and math educators, there is strong consensus that graphing and graph interpretation are essential skills for physics students. Moreover, students need to be able to conceptualize position, velocity, and acceleration as functions of time. Various research efforts have attempted to assess the effectiveness of such technologies at helping students to learn to interpret motion graphs. Although there is little consensus as to whether these tools are generally effective at helping students to learn, some progress has been made at identifying variables relevant to their effectiveness. Whether the time delay between sensing and graphing is an important variable in student learning is worthy of close inspection.

Educational Research: The Hardest Science of All*

David C. Berliner
Arizona State University

ABSTRACT

Under the stewardship of the Department of Education, recent acts of Congress confuse the methods of science with the process of science, possibly doing great harm to scholarship in education. An otherwise exemplary National Research Council report to help clarify the nature of educational science fails to emphasize the complexity of scientific work in education due to the power of contexts, the ubiquity of interactions, and the problem of decade by findings interactions. Discussion of these issues leads to the conclusion that educational science is unusually hard to do and that the government may not be serious about wanting evidence-based practices in education.

"Scientific Culture and Educational Research," as well as the National Research Council (NRC) report from which it draws, are important documents in the history of educational research. I commend the authors and panelists who shaped these reports, and I support their recommendations. But it is not clear to me that science means the same thing to all of us who pay it homage, nor do I think that the distinctions between educational science and other sciences have been well made in either report. There are implications associated with both these issues.

DEFINITIONS OF SCIENCE

I admire Richard Feynman's (1999) definition of science as "the belief in the ignorance of authority" (p. 187). Unrestricted questioning is what gives science its energy and vibrancy. Values, religion, politics, vested material interests, and the like can distort our scientific work only to the extent that they stifle challenges to authority, curtailing the questioning of whatever orthodoxy exists. Unfettered, science will free itself from false beliefs or, at the least, will moderate the climate in which those beliefs exist. As politicians recognize that "facts are negotiable, perceptions are rock solid," so there is no guarantee that science will reduce ignorance. But as long as argument is tolerated and unfettered, that possibility exists.

Another admirable definition of science was provided by Percy Bridgman (1947), who said there really is no scientific method, merely individuals "doing their damndest with their minds, no holds barred" (pp. 144–145). I admire Feynman's and Bridgman's definitions of science because neither confuses science with method or technique, as I believe happens in recent government proclamations about the nature of appropriate, and therefore fundable, educational research. World-renowned scientists do not confuse science with method. As Peter Medawar said, "what passes for scientific methodology is a misrepresentation of what scientists do or ought to do."

The "evidence-based practices" and "scientific research" mentioned over 100 times in the No Child Left Behind Act of 2001 are code words for randomized experiments, a method of research with which I too am much enamored. But to think that this form of research is the only "scientific" approach to gaining knowledge—the only one that yields trustworthy evidence—reveals a myopic view of science in general and a misunderstanding of educational research in particular. Although strongly supported in Congress, this bill confuses the methods of science with the goals of science. The government seems to be inappropriately diverging from the two definitions of science provided above by confusing a particular method of science with science itself. This is a form of superstitious thinking that is the antithesis of science. Feuer, Towne, and Shavelson, representing the entire NRC committee, clearly recognize this mistake, and we should all hope that they are persuasive. To me, the language in the new bill resembles what one would expect were the government writing standards for bridge building and prescription drugs, where the nature of the underlying science is straightforward and time honored. The bill fails to recognize the unique nature of educational science.

HARD AND SOFT SCIENCE: A FLAWED DICHOTOMY

The distinctions between hard and soft sciences are part of our culture. Physics, chemistry, geology, and so on are often contrasted with the social sciences in general and education in particular. Educational research is considered too soft, squishy, unreliable, and imprecise to rely on as a basis for practice in the same way that other sciences are involved in the design of bridges and electronic circuits, sending rockets to the moon, or developing new drugs. But the important distinction is

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really not between the hard and the soft sciences. Rather, it is between the hard and the easy sciences. Easy-to-do science is what those in physics, chemistry, geology, and some other fields do. Hard-to-do science is what the social scientists do and, in particular, it is what we educational researchers do. In my estimation, we have the hardest-to-do science of them all! We do our science under conditions that physical scientists find intolerable. We face particular problems and must deal with local conditions that limit generalizations and theory building—problems that are different from those faced by the easier-to-do sciences. Let me explain this by using a set of related examples: The power of context, the ubiquity of interactions, and the problem of "decade by findings" interactions. Although these issues are implicit in the Feuer, Towne, and Shavelson article, the authors do not, in my opinion, place proper emphasis on them.

The Power of Contexts

In education, broad theories and ecological generalizations often fail because they cannot incorporate the enormous number or determine the power of the contexts within which human beings find themselves. That is why the Edison Schools, Success for All, Accelerated Schools, the Coalition of Essential Schools, and other school reform movements have trouble replicating effects from site to site. The decades old Follow-Through study should have taught us about the problems of replication in education (House, Glass, McLean, & Walker, 1978). In that study, over a dozen philosophically different instructional models of early childhood education were implemented in multiple sites over a considerable period of time. Those models were then evaluated for their effects on student achievement. It was found that the variance in student achievement was larger within programs than it was between programs. No program could produce consistency of effects across sites. Each local context was different, requiring differences in programs, personnel, teaching methods, budgets, leadership, and kinds of community support. These huge context effects cause scientists great trouble in trying to understand school life. It is the reason that qualitative inquiry has become so important in educational research. In this hardest-to-do science, educators often need knowledge of the particular—the local—while in the easier-to-do sciences the aim is for more general knowledge. A science that must always be sure the myriad particulars are well understood is harder to build than a science that can focus on the regularities of nature across contexts. The latter kinds of science will always have a better chance to understand, predict, and control the phenomena they study.

Doing science and implementing scientific findings are so difficult in education because humans in schools are embedded in complex and changing networks of social interaction. The participants in those networks have variable power to affect each other from day to day, and the ordinary events of life (a sick child, a messy divorce, a passionate love affair, migraine headaches, hot flashes, a birthday party, alcohol abuse, a new principal, a new child in the classroom, rain that keeps the children from a recess outside the school building) all affect doing science in school settings by limiting the generalizability of educational research findings. Compared to designing bridges and circuits or splitting either atoms or genes, the science to help change schools and classrooms is harder to do because context cannot be controlled.

The Ubiquity of Interactions

Context is of such importance in educational research because of the interactions that abound. The study of classroom teaching, for example, is always about understanding the 10th or 15th order interactions that occur in classrooms. Any teaching behavior interacts with a number of student characteristics, including IQ, socioeconomic status, motivation to learn, and a host of other factors. Simultaneously, student behavior is interacting with teacher characteristics, such as the teacher's training in the subject taught, conceptions of learning, beliefs about assessment, and even the teacher's personal happiness with life. But it doesn't end there because other variables interact with those just mentioned—the curriculum materials, the socioeconomic status of the community, peer effects in the school, youth employment in the area, and so forth. Moreover, we are not even sure in which directions the influences work, and many surely are reciprocal. Because of the myriad interactions, doing educational science seems very difficult, while science in other fields seems easier.

I am sure were I a physicist or a geologist I would protest arguments from outsiders about how easy their sciences are compared to mine. I know how "messy" their fields appear to insiders, and that arguments about the status of findings and theories within their disciplines can be fierce. But they have more often found regularities in nature across physical contexts while we struggle to find regularities across social contexts. We can make this issue about the complexity we face more concrete by using the research of Helmke (cited in Snow, Corno & Jackson, 1995). Helmke studied students' evaluation anxiety in elementary and middle

school classrooms. In 54 elementary and 39 middle school classrooms, students' scores on questionnaires about evaluation anxiety were correlated with a measure of student achievement. Was there some regularity, some reportable scientific finding? Absolutely. On average, a negative correlation of modest size was found in both elementary and middle school grades. The generalizable finding was that the higher the scores on the evaluation anxiety questionnaire, the lower the score on the achievement test.

But this simple scientific finding totally misses all of the complexity in the classrooms studied. For example, the negative correlations ran from about –.80 to zero, but a few were even positive, as high as +.45. So in some classes students' evaluation anxiety was so debilitating that their achievement was drastically lowered, while in other classes the effects were nonexistent. And in a few classes the evaluation anxiety apparently was turned into some productive motivational force and resulted in improved student achievement. There were 93 classroom contexts, 93 different patterns of the relationship between evaluation anxiety and student achievement, and a general scientific conclusion that completely missed the particularities of each classroom situation.

Moreover, the mechanisms through which evaluation anxiety resulted in reduced student achievement appeared to be quite different in the elementary classrooms as compared to the middle school classrooms. It may be stretching a little, but imagine that Newton's third law worked well in both the northern and southern hemispheres—except of course in Italy or New Zealand—and that the explanatory basis for that law was different in the two hemispheres. Such complexity would drive a physicist crazy, but it is a part of the day-to-day world of the educational researcher. Educational researchers have to accept the embeddedness of educational phenomena in social life, which results in the myriad interactions that complicate our science. As Cronbach once noted, if you acknowledge these kinds of interactions, you have entered into a hall of mirrors, making social science in general, and education in particular, more difficult than some other sciences.

Decade by Findings Interactions

There is still another point about the uniqueness of educational science, the short half-life of our findings. For example, in the 1960s good social science research was done on the origins of achievement motivation among men and women. By the 1970s, as the feminist revolution worked its way through society, all data that described women were completely useless. Social and educational research, as good as it may be at the time it is done, sometimes shows these "decade by findings" interactions. Solid scientific findings in one decade end up of little use in another decade because of changes in the social environment that invalidate the research or render it irrelevant. Other examples come to mind. Changes in conceptions of the competency of young children and the nature of their minds resulted in a constructivist paradigm of learning replacing a behavioral one, making irrelevant entire journals of scientific behavioral findings about educational phenomena. Genetic findings have shifted social views about race, a concept now seen as worthless in both biology and anthropology. So previously accepted social science studies about differences between the races are irrelevant because race, as a basis for classifying people in a research study, is now understood to be socially, not genetically, constructed.

In all three cases, it was not bad science that caused findings to become irrelevant. Changes in the social, cultural, and intellectual environments negated the scientific work in these areas. Decade by findings interactions seem more common in the social sciences and education than they do in other scientific fields of inquiry, making educational science very hard to do.

CONCLUSIONS

The remarkable findings, concepts, principles, technology, and theories we have come up with in educational research are a triumph of doing our damndest with our minds. We have conquered enormous complexity. But if we accept that we have unique complexities to deal with, then the orthodox view of science now being put forward by the government is a limited and faulty one. Our science forces us to deal with particular problems, where local knowledge is needed. Therefore, ethnographic research is crucial, as are case studies, survey research, time series, design experiments, action research, and other means to collect reliable evidence for engaging in unfettered argument about education issues. A single method is not what the government should be promoting for educational researchers. It would do better by promoting argument, discourse, and discussion. It is no coincidence that early versions of both democracy and science were invented simultaneously in ancient Greece. Both require the same freedom to argue and question authority, particularly the government.

It is also hard to take seriously the government's avowed desire for solid scientific evidence when it ignores the solid scientific evidence about the long-term positive effects on student learning of high-quality early

childhood education, small class size, and teacher in-service education. Or when it ignores findings about the poor performance of students when they are retained in grade, assigned uncertified teachers or teachers who have out-of-field teaching assignments, or suffer a narrowed curriculum because of high-stakes testing.

Instead of putting its imprimatur on the one method of scientific inquiry to improve education, the government would do far better to build our community of scholars, as recommended in the NRC report. It could do that by sponsoring panels to debate the evidence we have collected from serious scholars using diverse methods. Helping us to do our damndest with our minds by promoting rational debate is likely to improve education more than funding randomized studies with their necessary tradeoff of clarity of findings for completeness of understanding. We should never lose sight of the fact that children and teachers in classrooms are conscious, sentient, and purposive human beings, so no scientific explanation of human behavior could ever be complete. In fact, no unpoetic description of the human condition can ever be complete. When stated this way, we have an argument for heterogeneity in educational scholarship and for convening panels of diverse scholars to help decide what findings are and are not worthy of promoting in our schools.

The present caretakers of our government would be wise to remember Justice Jackson's 1950 admonition: "It is not the function of our government to keep the citizens from falling into error; it is the function of the citizen to keep the government from falling into error." Promoting debate on a variety of educational issues among researchers and practitioners with different methodological perspectives would help both our scholars and our government to make fewer errors. Limiting who is funded and who will be invited to those debates is more likely to increase our errors.

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The Team-Level Processes and Routines of Conversations in Teacher Learning Communities

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ABSTRACT

Selected data from a multi-case study of four teacher teams are presented and discussed in this article to illustrate the complexities of teacher collaboration and professional learning communities. Findings provide insights into why some individuals and groups are motivated to ask hard questions about problems of instruction and how particular interactions enable or obstruct changes in instructional practices. Observation, interviews, surveys, and post observation reflections were the central data collection procedures used. Findings reveal the power of the fine-grained processes of collaboration within teacher-teams as well as the significance of goals and teacher dispositions in determining the effectiveness of teacher collaboration in the context of professional learning communities.

"Learning occurs everywhere, all the time. In the classrooms the primary learners are students; in schools and districts, the primary learners are teachers and school leaders" (Moss, Girard, and Greeno, 2008, p. 301).

INTRODUCTION

Ongoing and continuous teacher learning is an imperative for all schools attempting to ensure high quality education for all students. From the perspective of school reform Little (2003) argues that "a central interest in teacher collaboration or community resides in its potential for all teachers to learn from and with one another in ways that support instructional improvement" (p. 931). Nevertheless, there is evidence over the past two decades that, although strong teacher learning communities are "important contributors to instructional improvement and school reform, not much has changed on the level of teaching and learning in the classroom" (Little, 2003, p. 940).

While teachers may argue that problems of instructional practice persist because teachers lack the time needed to engage in discussions about practice, studies which have looked closely at the use of structured time for teacher collaboration conclude that when such time has been made available it has yielded little improvement in the quality of teaching in U.S. classrooms (Horn & Little, 2010; Little, 1990, 2003). Therefore, the problem may not simply be the lack of time, but perhaps deeper issues within the process of collaboration. Engaging in a process of meaningful collaboration or participating in the "public airing of teaching issues, problems, or uncertainties [and] organizing ways of talking and thinking about students, subjects, and teaching" requires teachers to redefine their work and take on new professional roles such as leadership (Little, 2003, p. 928). Leadership in this context manifests itself in actions where individual members pose questions to one another, elicit specific accounts of practices, and maintain a focus on student and teacher learning (Horn & Little, 2010). Such leadership cuts against the grain of deeply entrenched occupational norms (Lortie, 1975) and is, therefore, rarely demonstrated in U.S. schools.

This article explores findings from a qualitative study of professional interactions between teachers in the context of their professional learning communities. I discuss findings that focus specifically on conversations within collaborative planning meetings where a problem or dilemma was raised and may or may not have been *taken up* by the group (Horn & Little, 2010, p. 189). The data highlighted here reflect patterns across content area teacher teams that took a more structured approach to common planning time and those who took a more organic approach. The approach taken by teams positioned teachers differently towards opportunities to learn by the way they utilized conceptual tools to delve deeper into problems and gain a greater understanding and link between instructional practices and student results.

Although in some cases problems of practice were raised, teachers rarely discussed the intricacies of their individual instructional practices. This led teachers on a learning trajectory, but not so much a change trajectory. In other words, teachers may have learned—meaning that connections were made and new understandings were developed from the conversations—but no changes were made in their practices following their team conversations. In this paper, I examine the clear differences in the ways problems of practice were taken up by the different groups, which I contend were related to the structure of the planning time, the presence of leadership and goals, and the dispositions of the teachers towards the work.

CONCEPTUAL FRAMEWORK

Opportunities for professional learning allow for the development of new understandings of curriculum and instruction that may lead practitioners to grapple with problems of student learning in ways that they have not before. Such learning engages teachers in sense-making and reasoning and necessitates the process of making tacit knowledge explicit. Tacit knowledge is intuitive and has historically served as the basis for teacher practice (Eraut, 2004; Lortie, 1975) Tacit knowledge is metacognitive and difficult to share because it does not have a description attached to it. In other words, tacit knowledge exists and is acted upon without awareness. Because teachers rely on tacit knowledge they typically experience considerable difficulty providing concrete descriptions of their own practice (Horn & Little, 2010). Explicit knowledge, on the other hand, is articulated and codified. Making knowledge explicit, and attaching language to it, allows for individuals to talk more intentionally, purposefully, and deeply. Thus, how *teacher talk* is structured can promote or impede opportunities for learning in collaborative groups. From a socio-cultural perspective "learning entails interactions between learners, other people and tools in their environment, all of which mediate learning" (Haertel, Moss, Pullin & Gee, 2008, p.7). Use of certain types of conceptual tools, such as those detailed in Table 1, position teachers in making their implicit knowledge of instructional practice, explicit (Horn & Little, 2010).

Opportunities for learning require *structured* interaction amongst members and the use of conceptual tools (i.e. conjecture, questioning, specifying, generalizing, and reframing) around conversations about instruction (Horn & Little, 2010).

The use of conceptual tools leads teachers on a trajectory towards improvements in practice. Conversely, in the absence of the use of these tools, practitioners seem to make only marginal changes to their instruction, "grafting bits of reform ideas and practices onto established, traditional teaching" (Cohen & Spillane, 1994, p. 136). Because such tools are rarely used to facilitate teacher collaboration, the nature of collaboration has changed little and classroom practice has changed but in limited, fragmentary ways (ibid, p. 137).

Furthermore, the use of conceptual tools structure collaboration in ways which allow teachers to delve more deeply into issues around practice, making solutions apparent that are not readily available without deeper inquiry, reflection and analysis. These successful use of these tools has an immediate impact on teacher efficacy. Teacher efficacy is intricately connected to feel-

Table 1
Examples of Conceptual Tools

Conceptual Tools	Examples
Normalizing Moves	"it happens to all of us," "I had a lot of students miss that question also."
Clarifying	"There are two things that they're doing there. One that they need to understand the difference between weight and mass."
Questioning	"In years past when I taught this, I don't know how many times we would discuss that friction is against motion. So why would they pick something that's not against the motion?"
Conjecture	"I think it's because they look at this, and their real world experience tells them that the more you have pushing down on an object the more friction you're going to have. I think that's why. It's not the right answer, but I think it's the one that jives more with their real world experience because you don't see anything pushing in your direction when you're trying to push, you know. It just makes it harder, but they know that if they see something pushing down on it, it's going to make it harder. So I think they just went with their gut."
Specifying	"You're going to have a lot more sliding friction if it's a massive object. To me static friction and sliding friction are the same thing except static means you weren't able to get it moving and sliding means you were able to get it moving."
Generalizing	"So I guess I would have to go with the assumption that either things were not discussed or they were discussed but not to that depth because…"
Reframing	"So possibly the issue could be their prior knowledge or real-world experience conflicts with the principles and that might have been the confusion?" or "I emphasized that point in spades that friction is opposite the direction of motion or potential motion. So I think it's the diagram."

ings and orientations about the work done in classrooms (Bandura, 1995), and a by-product of identifying problems of practice is the exhilaration of finding new solutions. This problem solving process and resulting formulation of new knowledge increases efficacy, which research offers is predictive of "student academic ability" (Bandura, 1995, p.20).

METHOD

Data from this study were collected through qualitative investigation guided by the following research questions: How, if at all, do teachers collaboratively inquire about problems of instructional practice within the context of their respective professional learning communities? What motivates or obstructs teachers' engagement in difficult conversations about practice? What knowledge, skills, and dispositions that individuals bring to the team shape individual and collective efficacy beliefs?

A multiple-case study design was used to examine the process and consequences of teacher collaboration in the real life contexts in which they occurred (Yin, 2009) and to take an in-depth look at how the policy decisions to implement professional learning communities (PLC) played out at the local-level (Darling-Hammond, 1990). The study followed a replication logic (Yin, 2009) based on a theoretical framework that hypothesizes the conditions by which deep inquiry occurs amongst collaborative teams. This framework proposes that in collaborative groups, certain normalizing moves (behaviors and actions which teachers make) and the use of conceptual tools create conditions by which teachers either maintain or lose agency. Effective use of such tools, in turn, leads to motivated teachers who engage in professional learning and make changes in their instructional practices.

Site Selection

Because the scholarship dedicated to teacher learning communities at the secondary level is limited, I took advantage of the opportunity to enlist the participation of high school and middle school teams in similar high-performing suburban districts, which were moving into their fifth year of instituting professional learning communities. I purposefully selected schools at this stage because teams are more likely to have clearly established expectations for student learning and may be beginning to use systematic processes to monitor student learning (Dufour et al., 2010).

Data Collection Procedures

To understand the way teachers experience, view, and reflect upon their collaborative work, I relied on a

Table 2
Summary of Study Participants

Teacher	School	Team	Age	Gender	Ethnicity	Education	Years Teaching	Years on Team
George	Walsh	1	42	M	W	MA, CAGS	18	4
Alex	Walsh	1	32	M	W	MAT	7	4
Bill	Walsh	1	38	M	Haitian	MAT	14	5
Gerry	Walsh	1	36	M	W	M Ed.	13	1.5
Raymond	Walsh	2	44	M	W	M.A.	8	2
Olivia	Walsh	2	45	F	W	Ph.D	5	1
Gretta	Walsh	2	33	F	Indian	MS	11	5
RJ	Walsh	2	58	M	W	BS	8	0.5
Catherine	Walsh	2	44	F	W/Hisp.	MBA	4	1
Mildred	Greenpark	3	26	F	W	BA	3	3
Miles	Greenpark	3	38	M	W	MA	9	3
Jose	Greenpark	3	39	M	W	MA	12	3
Gina	Greenpark	4	60	F	W	PGCE	15	0.8
Simon	Greenpark	4	42	M	W	BA	4	4
Townes	Greenpark	4	39	M	W	MA	7	4

wide variety of qualitative methods, including semi-structured focus group interviews, individual interviews, surveys, [nonparticipant] observations, post-observation reflections, and document analysis. For a more detailed explanation of data collection procedures, see Appendix A.

In order to control for variability, I chose cases within demographically similar contexts—both schools and their districts have similar demographic student populations, as well as the same percentage of highly qualified teachers. The teams chosen were representative of the larger population of teachers in both schools. Both schools are considered high performing and, because they are in the same state, were subject to the same accountability policies. Other than sub-group challenges at the middle school, the schools are high performing and are not feeling undue external pressure to improve student performance.

Case Selection

This investigation of teacher collaboration was conducted through the study of four cases. The cases incorporated four teams of teachers from two different schools. The teams chosen were representative of the larger population of teachers in both schools. Table 2 summarizes the relevant demographic information of these teachers.

Analysis of Qualitative Data

Initially, I created a broad list of codes, and with the assistance of NVivo9, I sought to reduce the large amounts of data, and conduct meaningful analysis, utilizing queries. The broad list of codes emerged from the field note summaries, as well as literature relevant to the various topics of interest [i.e. bureaucracy and professionalism, leadership, conceptual tools]. For example, in order to understand the role leaderships approached to implementation played in the work of collaborative groups and feelings towards the work of PLCs, I coded the data with terms such as "role of administration," "feelings towards collaboration," "efficacy," "external accountability," and "internal accountability." This strategy resulted in a manageable data set that focused on specific topics, which pertained to reaching answers to the study questions. I also did quite a bit of journaling throughout the study, which assisted in the data reduction.

The researcher analyzed interview and observation data using case study analytic techniques that included both a grounded theory approach and a theoretical propositions strategy. The theoretical propositions strategy relied on my theoretical framework to shape the data collection plan and gave priorities to the relevant analysis of data (Yin, 2009, p. 130). Data were transcribed and categories of information (open coding) were conducted on the major pieces of the framework. The process included observation notes, journaling, individual and group transcripts, which were also organized, and then coded. Within the data analysis phase, examination of classroom artifacts were used to verify the impact of the collaborative conversations, and, when possible, correlate them back to whether or not those conversations led to changes in practices of participating teachers.

The use of a "pattern-matching logic, which compares an empirically based pattern with a predicted one, helped this case study in strengthening its internal validity" (Trochim, as cited in Yin, 2009, p. 136). Patterns, themes and descriptions were interpreted and weighed against themes in the theoretical framework. These included factors such as commitment and motivation of the collective team to address hard conversations about practice, interdependence and ability to attain consensus, focus on the personal nature of instruction, and confronting affects or practices on student learning. Four different collaborative teams were compared to maximize the similarities and the differences of information.

FINDINGS

Data from both teams at the Walsh Middle School suggest that when meetings were structured, driven by data, and conducted from the perspective of students, teachers were more likely to take up problems of practice and use conceptual tools to engage in deeper conversations.

A Structured Approach to Collaboration

When asked if and why student learning issues were discussed, Olivia, a member of the 8th grade science team shared, "I think we do quite a bit of that and I think it's often in response to student performance on assessments and trying to understand the outcomes." According to her, this led to questions like, "What are we trying to get at here, and are these really the right kind of assessments that we should be giving?" According to Olivia, structured conversation around the common assessment data made her "think about aspects of the assessment [that she] had not previously thought about." Bill, an 8th grade Social Studies teacher in the same school described his team's interactions similarly:

> …when you sit down in a structured format, I think that enhanced us moving forward in

> looking at the work that we've done through analyzing the data. I think much more this year—I think we have more data with the technology. I'm using that to move forward to assist the students, as our goals are better instruction and getting students to a level that we want to get.

The presence of goals in the meetings and student learning results in the form of data opened up opportunities for Walsh teachers to utilize conceptual tools. This facilitated their examination of curriculum content, instructional practices and also prompted them to interrogate assumptions about what led to the results (Lee, 2008). Although teachers acknowledged that this can sometimes result in PLC members feeling as Olivia put it, "stilted," they agreed that structured meetings work against "the natural inclination to stay in your classroom and prep for the next class." Structure meant there was a plan for teams at Walsh and, according to Olivia, "without one…it wastes time."

Goals. At the beginning of the 2010-2011 school year the 8th grade social studies team at the Walsh Middle School agreed to engage in a team project of sorts within their PLC; focusing on reading in the content area, teaching and assessing specific discrete skills, developing common assessments, and analyzing them publicly. According to Gerry, the Department Chair, "There was a shift from looking at the content and being so unfulfilled and wanting to focus on skills." Bill shared that at the "beginning of the year we were talking about not being redundant and George took the lead and came up with a proposal for this work." George shared that it was about this time that the team established their goal to improve the skills of students in these areas, which then drove much of the work throughout the year. According to Bill, "That moment, that's when we defined our goal. I think we became more focused on right now what we're doing with the primary source documents."

The establishment of this shared goal positioned the team to take mutual responsibility to see the work through, and also establish a shared frame of reference—"shared concepts, principles, and terminology—to structure their talk, justify their decisions, and guide their interpretations of classroom practice" (Horn & Little, 2010, p. 209). This team also shared that establishing this as a goal made a profound difference in their work. According to Bill, "Yeah I think when you have a specific goal it gives you sense of a better way of measuring. You have a target and whether you fall short or you've achieved or surpassed, and I think without that you're in limbo. You're just shuffling your cards."

Gerry, the department chair also shared that he had been pushing the team to discuss instructional practices and correlate the results of the data as well. He noted, "I try to be mindful to bring the conversation back to our common purpose: teaching and learning. I try to frame these conversations using concrete terms like, how will this change my teaching?" Gerry's intent in leading the group was to be "more deliberate and focused" as the team implements, experiments, and innovates using data improvement cycles because, "we are invested in the process and enjoy the challenge." Gerry made a point to say that he reinforces to his team-mates, "whatever you're doing you want to make sure that you follow through to the teaching stage; otherwise you're just looking a bunch of numbers on a spreadsheet." He explained:

> Data doesn't make decisions. It's ultimately what you do in class, and that's what I think this whole process has made me look a little bit more targeted to, 'Okay what am I doing in class, and with the rest of the team. What I want to get at is more specifically, like, what did you do?'

The presence of goals and use of data at the Walsh Middle School play an intricate role in creating the conditions for the use of conceptual tools. In the absence of school-level goals, the team (with the presence of strong teacher leadership) began to question the focus and purpose of this time they were required to use. This resulted in them coming to agreement on a goal they all valued, and shared mutual accountability for working toward. The inherent result was delving deeper and deeper into problems and questions that arose around the goal and the learning results the team was getting.

Dispositions Toward the Work and the Use of Conceptual Tools

On the social studies team at the Walsh Middle School, the presence of common goals, strong teacher leadership that modeled the use of conceptual tools, and certain dispositions toward the work, resulted in interactions and conversations that utilized conceptual tools. This arguably enabled teachers to take up problems of practices and led them on a learning trajectory.

Dispositions. The 8th grade social studies team at the Walsh Middle School shared that they had a "seriousness of purpose" around the work they did on team. They had a great amount of respect for one another as professionals and for their time. They felt their work around PLC was ultimately about the students, and understanding the teaching and learning process from

the "students' perspective." These teachers felt strongly that it was their responsibility to make sure students were getting "what they should be [getting]," and from an "equity standpoint," or at least a similar if not the same experience. From the perspective of Gerry, George, Alex, and Bill this meant developing better and new techniques to try to teach "what we're responsible for, be it content or skills." According to Bill, "we push one another one another to do our best whether it's a lesson or project." Alex added, "we are committed to doing professionally what's best for kids." According to Gerry, this means, "being very purposeful at looking how you're teaching, how you could do it differently." He elaborated further shedding some light on the dispositions of this team and their attitudes towards the work:

> I want you to remember those two phrases: how you're teaching and how you can do it differently. And I don't want to say better but how you could do it differently. I would say these conversations happen right now because of the high level of trust and the kind of open dialogue that we have. I would say that there's a little bit of competition; that's healthy competition. No one is getting an end-of-year bonus based on this stuff. It's more of just kind of being inquisitive, being curious, and taking risks. That's what I love about these guys—they are willing to take risks.

Other members of the group also emphasized risk-taking and the attitude of the teachers. George shared that, "From the beginning, we simply had the attitude, 'let's see what happens.' Instead of, 'we can't do that, we can't do that, and we can't do that.'" The team started by putting together a couple of assessments and collecting data. They reflected upon the work from the perspective of the students, making conjectures as to the level of complexity of the work they were asking students to do. Gerry pushed his perspective on this, "Well, I think they should be able to answer that. They should be able to answer that. They should be able to answer that." They also looked more closely at what instructional strategies they used in relation to what they were asking students to do. George at one point said:

> Oh I didn't really teach that or—I remember sitting there going, 'Question 11, there's no way my kids are going to get that.' But we just said, "Let's give it a try." And remember that time we would say, "Well we'll take question 11 and count it for us, but not count it for them.

The team shared that they figured they had nothing to lose to try the process out and take the "risk." They said, "Let's give it a try and see what happens." This led to the team being more purposeful and paying closer attention to what their assessments were actually asking students to do.

In public schools, norms of individual autonomy and egalitarianism have been cited as barriers to instructional improvement and reducing the variability of instructional quality within and across schools (Lortie, 1975). However, this team's norms ran contrary to that, and they exhibited a strong sense of internal accountability which guided their work. When asked, "why at the end of the day, do you guys go back to your classrooms and although you can do what you want, you don't all the time? In fact, you do what the team has said you're going to do? What has happened in this evolution that has made the difference?" Alex responded for the team, which resulted in agreement from the others:

> It's about being—wanting to be professional, wanting to in many ways prove myself to my colleagues here not because I think they're going to judge me otherwise, but I want to show that "hey, I'm working on this." This is something that we put time in to, and it's worth doing, and maybe this worked, this didn't work. Just a general accountability, but a voluntary accountability that I'm not going to guess them to death and go back and do what I want but—it's deceptive, and it's not the way I operate. This is my perspective.

Interestingly, these similar dispositions, looking at practice through the eyes of students, a sense of internal accountability to one another, mutual responsibility, the ability to take risks and a commitment to equity were present in teams that engaged in deeper collaborative conversations. This team's collective disposition as described above is what Little (1982) describes as being fundamentally important to creating conditions for continuous improvement in schools.

Conceptual tools.

The 8th grade social studies team at Walsh regularly relied on data and conceptual tools to facilitate teacher collaboration and professional learning. Their work was captured during an observation and portions of the observation are presented and discussed here to

illustrate the ways in which they used data and tools to think about problems of practice.

Inquiry Through Data. The focus of the PLC meeting was to conduct an analysis of common assessment data. The data were prepared by Gerry and put into a spreadsheet prior to the meeting. The team sat down and began working immediately. Within the first three minutes, the teachers looked at the prepared data and began to analyze the assessment, which focused on higher order skills such as inference, the identification of tone, synthesis, and sequencing through the comparison of three primary source documents. The team developed pre- and post-tests to analyze learning over time with the goal of answering the question, "what instructional practices," are reaping what results? Gerry had put all the data from the four teachers up on the Google Docs, which he said took about "45 minutes." He explained to the team that he went through the data and how each individual student did by standard because it seemed to be the "most useful and helpful way of looking at it—comparing how we do with the pre and then the post." He continued:

> I decided not to do the effect-size stuff too much this time around. But what I did do is I looked at our standard deviation as a total on the pre and then total on the post, and then I subtracted them out and you can see right across the board our range decreased. So—and if you look at the total, the achievement overall at an average level for everyone increased.

At the beginning of the meeting, George and Gerry both conducted normalizing moves, by saying "…the achievement overall at an average level for everyone increased." Gerry and George also shared some of the personal challenges evidenced in their own data. This is an important use of this conceptual tool because it established a sense of safety for the individuals on the team and the feeling that, "we are in this together." George followed Gerry's opening with "Right. So we can see every—every teacher on average had their students improve." Immediately following, Alex asked the 'elephant in the room' question, "Did anyone go down? I had individual students. I mean obviously, you know, it wasn't that much." George and Gerry were quick to share that they indeed had students who went in some cases, "way down," which was reassuring to the team. Alex, after looking a bit closer at his data then said, "Oh, actually, yeah, my sequence went way down." Gerry again provided reassurance about the results from a global perspective, "Oh, actually we were all down in sequence. Look at that. We were from a 76 to a 70 as a total." This exchange set a unique tone for the team, and as Horn & Little (2010) point out, such exchanges serve as a "starting place for a deeper discussion of the problem" (p. 194), because it was the team's problem: they all shared in it and now would investigate possible reasons why the problems existed.

Raising a Problem

Tenacious tone. Three minutes into the meeting, Bill shared with the team that he noticed how as a "group," their highest percentage was in assessing tone. He shared, "I tried to stress to the students it's about circling the adverbs, and adjectives, to get the sense of the tone of the author." This led George to wonder aloud if, in fact, this explicit approach with the students resulted in Bill having a significantly higher percentage of students who scored well on that skill. Bill responded and shared with the group how he elicited the assistance of the ELA teacher:

> Yeah. I had a conversation with Cristina, and we were talking. She hinted that that might work, and I tried it. You know, it would highlight the key facts and underline the key facts, but also look for some of the adverbs and circle adverbs or adjectives and to see how the author is describing—what kind of word the author is using to describe a person or…

This dialogue between Bill and George caught the attention of Gerry, the Department Chair, whose students had struggled with the standard on tone on this assessment. His scores on this particular standard were significantly lower. He physically leaned in and questioned Bill curiously, "and this is for tone?" Bill responded, "Yes, for tone." And Gerry again responded with, "Oh, WOW [with emphasis]!" Bill clarified further, "You know, this is kind of giving a sense of the author's tone." Gerry then paused, and said, "Wow, I never thought of that." Bill responded with, "It's good to see it worked a little."

This short dialogue would begin to make explicit the link between a practice which Bill engaged in and the results of his student data. It also positioned Gerry on a learning trajectory, of which he would later describe in his post-observation reflection. This engagement was again repeated with another surprise in the data. Important to emphasize is the micro/fine-grained perspective of the conversation highlighted here and in the next section. This type of discourse, which has often been dismissed in the research until recently, is our

most accurate window into the processes of teacher learning in PLCs. It provides insights as to what effective collaboration should "look like" and "sound like," so that it may be modeled, practiced, and improved upon.

Shocking sequence. About four minutes into the same meeting, Alex came upon a surprise in his data. He shared his results on the sequence standard with his team and made some conjectures as to why he got the scores he did, and immediately tried to make the link explicitly to what he'd done in class:

> I'm looking at my sequence, and I—I'm a little bummed about my sequence, too. No, I mean look at—I dropped—my kids dropped 15%. That's—I mean I have my theories but—to be honest, I didn't do much between the pre-test and the formative.

This comment shifted the groups focus to the questions on the sequence skill. Gerry then shared, "Yeah, but here's the thing. I did a lot on that, and mine still went down." This transitioned the team into a discussion on the variety of possibilities for the drop over the next three minutes. Gerry shared, "Yeah. I did some very specific things for sequence, you know, number the test. I told them that. We did some practicing of sequence..." George shared that he pointed sequence out to the students and had them practice. He said that his higher performing students even said it was "harder," and this led him to question if it was fair to hold the ELL students, who struggled greatly to the same standard. In an exchange with George, Bill offered:

> I have the same question with my best students who are in small English classes. They did worse this time around, and the reading is a little bit more difficult. And as far as practicing, I saw that they were able—they were able to get through some of the standards if we isolated and just worked on one standard. But once we put reading with several standards, they're off the chart. They're off the chart.
>
> George: Off the chart down?
>
> Bill: Down, right. But if it's—let's just say we're reading, and we're going to focus on sequence whether it's one document or two, um, they're okay because they're—they have a tough enough time, um, decoding, you know, going through, uh—I mean this was for my, uh, my small English students.

Gerry interjected at this point to try to connect explicitly what he did in class to the conversation. This positioned the group to begin to analyze the problem on a deeper level and generalize it for further exploration by the team:

> So this is what I did between the pre and the formative. I worked a good—a fair amount in class looking at different sources. We would look at a primary source document, then we would look at a secondary source document, then we look at a lot of visuals, cartoons and just—and there was a lot of questions about it, and then a lot of partnered work on this by proficiency on the pretest. I did one multi-doc. Look at this and look at this to kind of see how they relate but not much—not much on vocabulary, you know.

Gerry also sought feedback from the students upon completion of the assessment, which he shared with the group. He pointed out that even some of his strongest students struggled with some of the questions, calling them "tricky." Based on feedback from students, Gerry then suggested, "the rigor of this was harder than the pre-test, and the lack of prior knowledge could have had an impact" as some of the topics in the reading such as "Westward Expansion," hadn't been covered yet.

> We're just getting to that today actually. So I haven't gone over, you know, Texas or anything. So I don't know the comfort level. They might look at the—the first document and be like, "Whoo, I have no idea. I've never seen this before." But... I don't know.

This dialogue resulted in Alex reflecting aloud as he analyzed his assessment results, sharing explicitly what he did and did not do: "Just talking to you guys before, I did the least amount of work on these types of things between, you know, pretest and that." After hearing the specific instructional approaches taken by his colleagues, it made him wonder if some of his results were directly tied to student exposure due to his choices in instruction, the "choppiness" of the time of year, or an anomaly. He shared that following the pre-test, he focused on tone, which he saw a jump in, but saw his sequence slide. He questioned this phenomenon aloud:

> I don't know why my sequence went that—because you'd think that, okay, kids got a 77, you know, on the first sequencing which was actually decent. I mean that drop is an

> anomaly to me and the synthesis evaluation. Now they're dropping even three points. But I guess the solace I can take is that the little I did was focused on tone and it went somewhere. But overall it's not what I would have wanted to see.

This exchange pushed the group, especially Gerry and Alex to really grapple aloud with the results they had gotten on these specific topics [tone and sequence]. The team collectively wondered aloud if research skills such as the ones they were assessing were more of a priority and students had more exposure, the results would have been different. They made some conjectures, wondering if it was the "lack of prior knowledge some students had about the topic." They questioned if it had to do with motivation, and students being distracted by other things, or "going to the IMC [i.e. Library]?" George, who got different results than Matt and Alex shared that he felt he simply had the kids do more practice on it. He offered specific examples of how he went about trying to reinforce the strategies making them "habits of mind, again and again" and how the students began to develop their own strategies, "creating little charts and such." Gerry replied, "Yeah. I don't think I did any of that, but hmmm, that's a good idea."

The sharing of explicit strategies activated agency in the teachers. Interestingly, when there were positive results of student learning and the teachers were able to make connections between those results and explicit strategies they or their colleagues used, the agency that was activated in members of the team was observable. For example, Bill interjected into the conversation that he started the instructional process by "looking at the pretest, just looking at the standard, having the students understand what the questions are asking or what standard is being targeted." This seemed to resonate with Gerry who responded, "Oh, wow! I don't mean to interrupt. You actually told the kids the standards?" In fact, both Bill and George, who ironically got the higher results on these specific skills, approached instruction similarly. As Bill shared further, "I was explicit, I actually did tell them. I told them out right that I'm going to be looking at things like: can you know what the author's point of view is? How do we know this?" Alex then generalized for the group, which put the action Bill took into context and made it easy to transfer to other similar situations. Alex shared, "So without saying—actually, probably even in going over it, I might say; 'now this is clearly a vocab question.'" Bill responded by clarifying for the team: "Yeah, I clearly told them, 'we're looking at the main idea' or again when I worked on the author's tone, I take the author's tone and kind of—they have a sense of what to look for." George then connected that to the upcoming assessment that would be given by the team. "We're—we're—we're scheduled to do another one so we can, you know, take all these lessons to that."

Bringing it back to instruction. For the next ten minutes, the team talked about a variety of logistical topics, such as when the next assessment would be given. Alex shared that, due to a variety of factors, he would need longer to prepare his students and reflected on the "choppiness" of the time of year. However, at the 24th minute in the conversation, Gerry, the Department Chair asked the question. "So I guess the big question is like, what are we going to do differently? George quickly offered, "I'm going to practice more, but I think this is good teaching anyway. I—I feel like doing these thing has been really good." Gerry jokingly interjected, "I'm going to take your word on that."

An Organic Approach to Collaboration: Greenpark High School

Within the teams at Greenpark, there was little evidence of the use of conceptual tools in the collaborative work. There was also no administrative structure to encourage the use of or create the conditions for deeper inquiry into the work on teams. In the absence of conceptual tools and imposed structure, the teams assumed an organic approach to the work, meaning that they determined how and what they did during their meeting time. This agenda generally resulted from passing conversations, or in some cases they simply got together to talk about their current content issues, and waited to see what would emerge as a result. Many times they came together and the conversation just evolved into a variety of topics. Data suggest that this approach to collaboration did not result in an optimal trajectory of learning. Data from the 9th Grade English team illustrates how an organic approach to collaboration shaped teachers' trajectory of learning.

Goals. The ninth grade English team at Greenpark High School described their approach to collaboration as "organic and spontaneous." According to Simon, "a lot of our meetings are not agenda driven. It's more of a, 'hey let's get together and talk about things that are top of our mind,' a swirl of everything we're doing." The content of this team's collaboration consisted mostly of sharing of ideas [i.e. what we want to do with what we have in the curriculum, and assessments, of what we want to emphasize], storytelling, and debate. They reported that on their team, a course of action comes up

because of "mostly spontaneous ideas." Townes shared that this approach worked for them, "because there is a consistency to the challenges and to the goals that, you know, we obviously all face." Gina shared that she looks to this time as a means of reassurance that, "I'm on the right track and that we're working to the same—to the same goal." Ironically, although the teachers report a strong value of the free-flowing, and open-ended approach to collaboration, in post observation reflections, they openly struggled with the effect on their work. According to Simon,

> I'm torn—a part of me feels we should commit to identified and achievable objectives, because the flipside of a lot of ideas is not feeling as though we have necessarily come to a consensus or really made decisions, concrete decisions that can help with planning and implementation in some of those goals, but I also don't want to stifle our ideas/creativity.

Simon also shared that at times he found himself frustrated, "because we don't necessarily have the defined sets of goals." Townes offered in one reflection that he was surprised at how "passive" he was and learned "how much continued clarification we need regarding goals and skills we want to align across the three of us. It was a reminder that it is a recursive process that will never actually be complete." This tension between structure and the need to feel unconstrained interaction would be a recurring theme and a struggle for this team; one that was exemplified in their dispositions towards the work, and contributed to their approach in collaboration.

Dispositions towards the work. The 9th grade English team at Greenpark High School described themselves as the "most open to change," compared to other teams, holding "no sacred cows." In this case, sacred cows meant certain books they have taught, or papers that have long been held as practice by their department. Ironically though, according to Townes, "we aren't cogs in a wheel, we swap and share things; but clearly, each of us has strengths in certain areas that the others don't and so we try to leave a lot of room for individuality." Over the course of the study, this team evolved quite a bit from their first interview, but multiple data sources reflected a deep tension and dichotomy that existed among them in regards to autonomy and standardization. Townes, the self-described "iconoclast," shared that he felt the tension was "important" and "wouldn't want it to go away." He felt that having this "opposing force as resistance" was really important, and without it, he argued, "you are sort of rudder-less." From his perspective, having this opposing force makes an individual "rethink what you think and reassess and reevaluate how you go about things and why you go about things."

Interestingly, Townes and Simon shared their struggles with the notion of defining equity and the idea of "kids coming to your class and having had three different teachers coming in with the same skills and knowledge." Simon called it a "struggle" for him. He was not sure if he could embrace the idea that if a group of students are divided into classes and are all reading different things and their teachers are, in theory, emphasizing the same skills that, "that is a common experience." Simon conceded, with agreement from his team-mates, that the way the teachers go about things are going to be different and the way they are delivered will be varied, but ultimately, "I feel at least having the same texts, assessments, the same focus. That's ultimately what we are talking about when we talk about alignment."

This team enjoyed an interesting dynamic that was reflective of strong opinions, values, and tension. According to Simon this team had a willingness to "question the status quo," and express that there was "some real value in that." He continued "I think we do ask ourselves, 'Why does this matter? How is this going to benefit us?'" He also made clear that the team did not always agree.

> Do we always agree? Ah, no, [emphasized] and I think that our styles are very different and that can be sometimes, because our styles are different, having us agree on how we are going to work within a specific unit or towards a specific goal, you know, that's always going to be a challenge. That's always going to be—you know, we come at it from different places, you know. Some of us… may be a little bit more stubborn than others and so that can be challenging.

What emerged here was a tension that existed between individual style and preference and the establishment of standards of practice (City et al., 2009).

In multiple data sources [i.e. interviews, post-observation reflections, and observations] it was clear that the individual dispositions (e.g. iconoclast, mediator, pushiness, personal efficacy, lack of answers, lack of control) and values (e.g., autonomy, individualization, creativity) the team had impacted their willingness and approach to addressing or taking up problems of practice. Individuals on the team reported both in surveys and interviews that they felt members of their team did

not publicly discuss the most difficult problems they were having in the classroom. According to Townes:

> As far as like teaching a lesson and it doesn't go quite the way that I want. Do I come in here and talk to them? I would say I almost never do that, but I will do the flip side of that. Like if I think something went extraordinarily well, I will very freely share it with them and say, "Look, this actually really worked. I don't know if it will work for you, but I was surprised at how effective it was.

Simon offered up that, "this job is challenging enough as it is, and personally, I don't like to dwell on what did not go well and don't feel the need to solicit feedback when I know that a lot of the time, it was my own doing." Gina offered up: "We're all different," and Simon said, 'Yeah that's it, and I typically know when things don't go as well, I know why, because "Simon didn't do as good a job as he should have, or their brains are out the door." According to Gina, "or it might be because the heating is off in the room and it's cold." Again, here instead utilizing conceptual tools, which might have taken the team on a learning trajectory and deeper inquiry, the team lays blame on forces outside of their control. This occurs frequently when teachers do not have the "answers" to questions that confront them.

When asked why he only shared the successes and not the failures, Gina jumped in and said, "You do sometimes, but what happens is you don't come in and present it as a problem, the reality is, you present it as a complaint that was kind of frustrating, and people see things differently." When pushed further as to why the team really doesn't inquire into problems, Townes replied,

> "Why don't I?"—I don't know that I have a really salient answer for that. Probably because I feel like—when I sort of present something as a complaint, that that's probably more than enough really, and I don't want to be a complainer. [Townes was next asked if he wanted a solution to his problems of practice.] Not always. Because I don't know that I'm ready for a solution necessarily. I mean some problems you know need more time, you know. You can't come to a resolution.

Clearly, in this case, the dispositions, mindset, and values have an impact on the approach to problems of practice within the team. These dispositions and mindset include avoidance when there are seemingly no answers, and not wanting to come off as a complainer. Even more interesting, was simply "not being ready," or having the "mindset" for a solution. During interviews, this team felt very strongly, that some problems simply are not "easily fixed." According to Simon, sometimes that is because "individuals on the team, have very strong feelings, or values," towards those things and "it is what it is." However, they shared that if it is a "big enough problem," it will come around again. The team shared that one problem that continues to "stalk" them, was the way in which grammar is taught at Greenpark. Townes simply said:

> …part of that is that it is a question of values—ultimately. A lot of what we do at sort of bare, sort of stripped form comes down to a question of values. What is it that we're going to place more value on versus this other thing? I just think we are even more comfortable with a sort of state of not having a resolution. Because sometimes problems will arise where there are no easy answers. We all know there are no easy answers, and we would want to come up with meaningful ones.

Gina differentiated between two levels of decisions teachers have to make in their work, the day-to-day ones and the more conceptual ones. The team's struggle with these distinctly different types of problems and decisions may be best understood as a struggle to make tacit knowledge explicit, which requires complex reasoning and problem solving. According to Greeno & Gresalfi (2008) the different level of tasks, require in differing kinds of agency. The "execution of procedures," which takes a low level of cognitive complexity, "involves disciplinary agency, whereas constructing meaning from and understanding methods and concepts, requires conceptual agency, which affords very significantly different opportunities to learn" (p. 179). When pushed again on the desire to find solutions, Townes referred to the importance of the mindset of the individual: the tacit versus explicit drivers of the actions taken in the process of teaching. He explained, "I mean, what I would say is that all of the high level grander decisions, and you know, values that you establish drive everything on the day to day, and so even if they're not even consciously driving it, they are driving it, and you have to be in a place where you are ready to receive feedback." In the case of this team, the teachers were not able to explicitly discuss the unconscious drivers of their work. As a result, they were unable to talk meaningfully about their practice. Townes also acknowledged that the perspective could just be him due to the fact that "I'm sort of perpetually on the verge of an existential crisis," meaning his

propensity for living in a constant state of tension, especially with others was due to the importance he places on meaning, sincerity, free-will, values, and emotions.

Clearly, the individual and collective dispositions have a significant impact on the way in which this team conducted its work and took up problems. The ideal situation for this group, they felt were "open ended discussions, conversation filled with questions, and debate," which was very representative of the way in which they engaged in collaborative conversations. But with this team, their discussions, questions, and debate did not get below the surface because they did not share the same professional values or practices. Much of their conversation is what Dufour et al., term "coblabberation" (2006, p. 89), with the result being the perfect example of how the term PLC has been overstated and used in schools.[1]

A different trajectory. The following excerpt exhibits a consistent pattern of dialogue for this team and the trajectory this team took in the learning process, specifically how they raised and addressed problems of practice in their collaborative meetings. When the team was asked what a "good" conversation was, Gina shared that it helped her when her colleagues made her "think," by saying "provocative" things. According to her, "We're pretty rough—I mean we're not—we don't treat each other with kid gloves." When asked for an example of a provocative dialogue, Gina shared a conversation she'd had with Townes and Simon over her desire to take her college prep students through the novel *Great Expectations.* Simon described this endeavor as "ambitious." Townes, chimed in with "admirable." Basically, the sense Gina got was that her team-mates felt it was "crazy," as she put it, because of the level and difficulty of the book for ninth graders. During the discussion, Simon qualified the conversation by sharing why he felt that this was a challenging book to approach, based on his prior experience;

> again, which is not to say that, you know, that, you know, you're completely insane for trying this because you obviously have a strong confidence level with your—with this text. You know, based on my experience with this level with the majority of our students at that level, I think that—I think it's—I think it's going to be a big leap.

This made Gina question whether or not she was "100%" sure she wanted to move forward with it, and definitely made her "re-think," or moderate the way she would approach it. According to Gina, the 'provocative statement' was, "aren't you biting off more than you can chew?" During her interview, Gina responded to questions about this exchange with her colleagues:

> Interviewer: So these guys put on the reins a little bit, and said to you, "Whoa, whoa, whoa, maybe this—you know, that's a bit ambitious," which didn't cause you to give it up, but what will you do differently?
>
> Gina: Yeah, absolutely. I don't—I don't intend to be less ambitious. I'm going to still be—I'm thinking myself as extremely ambitious with it, and I want them down the full experience, but I will definitely do more scaffolding and look at other ways to make it more accessible.
>
> Interviewer: So they really got you to see it in a very different way.
>
> Gina: Absolutely.
>
> Interviewer: What way is that?
>
> Gina: So looking at slightly different angles to it than—quite different angles than I would have before. Yeah, yeah. So it was very useful, very helpful.

Despite the fact that the conversation never went below the surface in this instance, meaning it went deeper than just "reporting on a problem, or brainstorming quick advice" (Horn & Little, 2010, p. 190), Gina still felt it was a "very useful and helpful exchange." For example, questions were not raised as to the technical aspects of the scaffolding that could be done in an effort to make the novel accessible to all students. The team did not discuss much other than the novel was above the "heads" of college-prep ninth graders. There was no use of conjecture, or hypothesizing as to what a unit on *Great Expectations* might look like that was accessible [i.e. what if we were to do… then students would… would students benefit from…?]. The team did not engage in collective problem solving to anticipate and find solutions to some of the challenges Gina might face. The result was Gina would teach this book on her own, providing a very different experience for her classes, in comparison to the other members of her team. Although inadvertently, both Simon and Townes made value judgments regarding their assumptions about both the students' ability to learn and Gina's ability to teach such a complex text to

1. Coblabberation is a term used to describe "teacher talk," without any real purpose or results gained from the conversation.

ninth graders. Although she said it provoked her to think more deeply about the challenges of teaching the book *Great Expectations*, a deeper question emerged as to the impact on her own expectations for student learning and her own agency/efficacy. Although Gina may have been left with ideas to "think" about and try with her students, it would be done in isolation, and the team as a whole did not take on a learning trajectory that may have led to a change in practice. If we relate this to Bandura (1997) and his theories of agency and efficacy, individuals feel more agency when they are told by others that something is possible, or if they hear from others that they have accomplished similar feats. For Gina, this exchange most likely had little positive effect in reinforcing her agency or efficacy in tackling *Great Expectations*.

Raising problems of practice without the use of conceptual tools. Horn and Little (2010) posit that "workplace groups are more likely to prove generative for learning if they develop a capacity for talk that centers on dilemmas and problems of practice," (p. 183). Without the capacity to do so, some groups close learning opportunities without even realizing it. It is this inability to make tacit knowledge and information explicit, which creates barriers to learning. This makes the use of conceptual tools even more essential to the collaborative process.

The following exchange around the "passage paper," an assignment given to ninth grade English students at Greenpark High School, began simply as a sharing of expectations and ideas. However, at one point in the exchange, Simon reflected publicly on the paper, pointing out the difficulty that ninth grade students have with the personal narrative because they have not been exposed to the discussions around personal narrative before. Gina qualified students' difficulty as a lack of exposure, but not because they are incapable of doing it developmentally. The exchange led Simon to reflect on how he tried to model the personal narrative for the students using the "sow's head" passage and he seemed unsure if his approach met the goal he had in mind. He questioned the validity in using an exemplar to get at what he really wanted, which was a deep understanding of what he wanted them to know and be able to do. In this case it was a depth of understanding of writing the personal response narrative where students are able to express why they chose what they chose, the influence it had on them, what they liked about it, and how they describe it.

In doing so, Simon posed a problem of practice to his team: the problem of developing in students a deep understanding of what he truly wanted them to know and be able to do. His attempt of using a model was met with concern from his colleagues, who felt the practice resulted in something the students just copied, versus, truly knowing the underlying concept that would transfer to future assignments. As shown in the brief exchange below, Simon was explicit about his rationale for using a model and his concerns about using it as well:

> I had thought that that would, you know, certainly kind of give them an idea of depth and what not in using that as a model and I'm not so sure that I accomplished the goal that I'd wanted it to… Whenever I find myself providing examples or I guess you'd say exemplars prior to the writing, you know, my concern is always it becomes a process

In this exchange only Townes responded to Simon by asking, "Templates?" suggesting that Simon's modeling exercise really just becomes a template for students to copy. Townes' response served as affirmation of Simon's concerns, as illustrated when Simon said, "Yeah, that's it… it becomes a process of duplication, especially for the honors level classes [because] they're so eager to just, "Show me the way to do it, and I'll do it"

In this specific exchange, Simon's team-mates did not normalize the struggle he described or further specify about the problem, which would have given Simon the opportunity to re-frame or revise his perspective or open up an opportunity for learning. Here, the team could have posed a question to Simon such as, "why do you think students simply want to replicate the work?" Simon might have responded that, "maybe the students don't have a solid understanding of the underpinnings of a personal narrative. If they don't, then the simple way out is to see a model and replicate." This might have led the team to reframe the problem and identify a possible solution (e.g., greater emphasis in instruction on the conceptual underpinnings), and identifying clearly how he would assess understanding of that. Furthermore, this could have been a moment where they realized that, as a team, they did not have shared expectations for the skills students should be able to demonstrate with the task they were asking for. In other words, the realization that they did not have shared expectations could have led to a discussion of best practices associated with students' learning the skills. The idea of modeling, or exemplar practice would then have provided an avenue to ensure that students with lower skill levels have access to and can execute the tasks,

while serving as a baseline standard for others.

This was a missed learning opportunity for the team. Rather than pursue the problem of practice, Gina shifted the conversation away from the problem to a question she had about the summer reading assignment for students. In response, Simon again raised a problem that he'd seen students struggle with when they are left to choose an appropriate book for a research paper; essentially an important, deep underlying skill necessary for students to do successful research. He said to the team, "You know what this is bringing back memories of is our previous research paper project before we did the I-Search[2]. " Simon continued:

> I can remember as much as we struggle with the—the, you know, bringing them to the right topic in the I-Search, I can't even tell you trying to lead some of our ninth grade students to the right book to read for their—and author to research for their research paper; Oh, it was maddening. I can remember the kids who had really struggled or not being motivated. I used to have like—it—it reminded me of the old image of, you know, the fraternity party, and you bring the kid like over the corner because there will be like the same books that I would always bring them to, you know. How about John Steinbeck and the Pearl? You know things like that.

At the start of this exchange, the problem is normalized by Townes, who responded, "Oh, like yeah, this kid is a—the—yeah, this kid is a clear reader. "Townes said this with some sarcasm. He normalized the problem in a way that let Simon know that he had seen this approach by students before in choosing books, and reinforced Simon's perspective that the student lacked some sophistication in the reading process. Instead of the conversation positioning the group towards an opportunity to discuss the teaching practices by questioning or further specifying and reframing the problem, [i.e. what skills students might be lacking that impact their motivation and skills to effectively find appropriate texts and conduct research], the conversation was never taken up by the group. Instead, the conversation took a trajectory away from a possible learning opportunity when Gina posed an unrelated question about who in the school ever taught *Call of the Wild*.

Although the group had been deliberating throughout the meeting on finding book choices for the students, a deeper learning opportunity was missed. In their final interview, the team was asked about this specific missed learning opportunity. Gina shared that she was a bit "lost" with the "whole summer reading thing because she hadn't been through it yet." She also proposed that maybe what the group could come up with at that moment "isn't the answer right now, so we go and think about it and do it next time perhaps." Simon went more in-depth offering up the possibility that when things of that nature come up and are not "really even identified as a challenge explicitly," they cannot be faulted for not taking up the problem. He even put the responsibility on himself, for not making that explicit:

> You know that comes up in discussion and shame on them for not identifying my need, [laughter] but did I formalize the request? Meaning to me, the difference is the fact that it was not an identified goal at the beginning of our discussion. No, it just kind of came up and I think as we work together more I think it can be extremely cool if we were to be at the point where all of a sudden one of my colleagues would say, 'dude it seems like you need some help here, let's just talk about that.'

Gina suggested that some of the hesitation to address the challenge Simon raised might have been because, "if it were her in that situation," she did not want "somebody telling [her] how to do it." She went on to say, "I mean for us to jump in and say 'well why not try this,' would be too close to 'let us tell you how to do it.'" She suggested that it be addressed in a more organic fashion, maybe a week later in a casual conversation where one member of the group says, "So we have been thinking about this thing and why don't we try… we do come back later and I think we tend to have a rolling conversation later on." Townes reinforced his teammates' sentiments when he explained:

> We often say we don't want to be told what to do unless you ask us. We work in a department where everybody is like quite cranked to tell you what you should do or what they do and that's probably not necessarily very helpful and because what you should do or how you address a problem has to sort of emerge after you have had sometime to sort of think about it.

As mentioned throughout the study when asked about addressing problems of practice, the team felt strongly that, "some problems are bigger than others."

2. I-Search paper: is a form of research paper where the author picks a subject to which they have a personal connection and write about it from a personal point of view.

According to them, the small ones are "simpler" so you "don't sweat them as much." However, when it came to bigger problems, Townes felt "I think they need to marinate a little while before you are ready for an answer. You know; whether it's yours or whether it's firing a round at somebody else."

Because the team relied on organic, unstructured collaboration, there was very little that was intentional or purposeful about the group's work and little "collective responsibility for student learning" (Curry, 2008, p. 758). What stands out in this case is the common challenge faced by many teams engaging in collaborative work: establishing shared expectations for student learning. It is widely known and documented that teacher expectations have direct implications for instruction. Interestingly, in the narrative above, the teachers go back and forth around which books to pick, whether to provide exemplars, and what students can or can't do. Perhaps this situation had less to do with what 9th grade students can actually do, and more so with the individual efficacy of the teachers and their beliefs around the abilities to get students to a particular level. If the teachers were more aware or were able to take the time to analyze the questions being raised and problems they are posing, they might be cognizant enough to confront their underlying or tacit assumptions about students. In other words, if they were able to say, 'I don't think kids can do this level of work,' and explore why they had this belief, then they could possibly make connections between where they want students to get, where the students are, and establish a theory of action that would put them on that trajectory of new learning and change of practice.

As Curry (2008) described, like many teams, this high school team came together to "accomplish work-related tasks, rather than engage in inquiry oriented collective learning challenges" they faced in their classrooms (p. 735). Of all the teams in the study, the 9th grade English team engaged in the use of conceptual tools the least, which impeded their ability to get below the surface and discuss deeper instructional issues. Interestingly enough, the dispositions of the team clearly aligned with the way in which they approached their work together, with norms of egalitarianism and autonomy creating tensions, which were clear obstructions to deeper inquiry. Despite working on a team, they were clearly "independent contractors" (Huberman, 1993), who met once a week, but practiced in isolation. Even when a member of the team raised problems of practice during the observation, the problem was not taken up, which unintentionally thwarted the agency of the individual who raised the problem. Problem solving and sharing of experience amongst knowledgeable and experienced teachers sounds like an easy task, but in reality it presents a formidable challenge, because of the complexity of the work. The challenge is to create representations of that which is implicit into a theory of action, a conjecture of sorts in order to make the tacit practices more explicit in a public way.

DISCUSSION

The teams profiled in this paper offered very different pictures of teacher collaboration, even though both were considered PLCs. Their fine-grained interactions are important to study because it is in these conversations that we can truly come to understand *how* teachers learn, and *what* contexts and conditions are most conducive to learning and improvement. According to Argyris (1993) "learning occurs when we detect and correct error." He continues by arguing that "learning is an action concept. Learning is not simply having a new insight or new idea, but occurs when we take effective action" (p. 3). But what happens when teachers don't know how to take action, and there is no resource for them to find those answers? The group has only the capacity of the "group," and therefore, this limitation poses a great risk for effectiveness of school-based learning communities and the ability for these communities to make a real difference in student learning outcomes.

The social studies team at the Walsh Middle School clearly took on a learning trajectory in their collaborative meetings, which resulted in "cumulative learning" (City, Elmore, Fiarman & Teitel, 2009). This allowed for connections to be made between their instruction and student results, and generalizations that could be transferred to broader research skill development for students. Conversely, the English team's interaction at Greenpark High School simply led teachers on a trajectory that maintained the status quo. Although problems of practice were raised, the teachers were either unable or unaware, due to the structure of the meeting, to engage in thoughtful inquiry around the issue. Horn & Little (2010) in their study on conversational routines, argued that learning is more likely to occur if learning communities of teachers developed the "capacity" for dialogue that centered on problems of practice; hence, the importance of determining what positions teachers differently and what is the result of these conversations. Findings suggest that four factors account for the difference in the excerpts, and experiences of teachers in PLCs, which has significance for the successful implementation of teacher learning communities. These include: the use of conceptual tools, leadership on

team, the presence of shared goals, and the dispositions of the teachers who come to the table to do the work of improving teaching and learning.

Use of conceptual tools. Evidence from this study confirms that deeper collaboration around problems of practice and changes in teaching require "greater conceptual sophistication and a set of highly polished pedagogical skills" (Lord, p. 182). Developing a deeper conceptual understanding of content and pedagogy, requires the development of a shared language and practices for discussing expertise, which gradually introduces concepts and theories to help people make more sense of their experiences (Erault, 2004). The two episodes analyzed in this paper show great disparity in the use of conceptual tools, [i.e. questioning, specifying, making conjectures, reframing, and generalizing] which positioned teachers very differently towards or away from learning opportunities. Data from the study show evidence that dialogue, which includes the use of conceptual tools actually results in the activation of agency in teachers, allowing them to make explicit the connections between what they do and the results they see in students, motivating them to make changes in their practices. However, in the absence of these tools, teachers reported not feeling "pushed" and being more "passive," with the meeting feeling like there was a "lack of closure."

According to Gee (2008), language is the foundation to learning. Because teachers do not have the language to talk about instruction in ways that lead to changes in practice, the results are idiosyncratic and individualistic assumptions about teaching. This plays an important role in the process of collaborative dialogue within groups because tacit knowledge is essentially and most prominently what "lies behind" the performance of teacher in the act of instruction. The role of tacit knowledge in professional practice "limits what people are able to say, as well as what they choose to say," (Erault, 2004, p. 3) which makes the use of conceptual tools so powerful. These tools allow for the possibility of deeper conceptualization of practice that might lead to the ability to discuss them more explicitly. According to Cohen and Spillane (1994) only a modest number of our teachers have the depth of content knowledge to engage in a conceptual approach to teaching and learning. This limits their ability to "make sense of" (Greeno & Gresalfi, 2008), and engage in deeper reasoning which leads to the creation of new knowledge. Important to underscore here is that the use of conceptual tools may mitigate what has long been a secondary schools fragmentation problem associated with isolated practices, the territorial nature of teaching staff at the high school level, and the claim of content area expertise and specialization, all which have served as barrier's to changing the industrial model of high school education.

Structure and goals. Another significant difference in the approach both groups took to the work was the presence of structure in the form of clear and shared goals. The presence of structures and clear shared goals which focused on either student learning, or instructional practice positioned teachers to take collective responsibility to attain those goals, as well as positioning them on a learning trajectory. Even when time was limited, the presence of goals and structure made the meetings conducive to productivity and learning. Even on teams where autonomy was the overarching norm, when there was no focus or set goals, the feedback was almost always negative in terms of the structure and organization of the meeting being conducive to being productive. This created a tension on some teams because the introduction of shared goals was perceived as a possible threat to creativity. Recall, as Simon aptly put it, "I'm torn—a part of me feels we should commit to identified and achievable objectives, but I don't want to stifle our ideas/creativity."

Dispositions towards the work. Socio-cultural literature provides a lens by which we can explicitly identify what learners bring to their learning environment [i.e. prior learning experiences, values, interests, motivations] and how those dispositions shape their interactions, engagement with new learning, and affect their learning trajectories (Haertel, Moss, Pullin, and Gee, 2008). Important to the work of professional learning communities and the work of collaboration is the idea then that "teacher knowledge and attitudes have consistently proven to be important predictors of student academic success" (Lee, p.154). In their study on conversational routines, Horn & Little (2010) acknowledge that dispositions vary within and among groups in ways that are consequential to their work. Contrary to their findings that the "generativity of the group discourse cannot be attributed to the individual teachers' personal and professional dispositions" (p. 211), data from this study shows that prior knowledge, experience, and feelings of confidence impact teachers efficacy and had a direct impact on their participation and engagement in conversations that lead to learning.

As evidenced in the data, the groups differed greatly in their values, feelings toward the work, focus on student learning, and use of evidence to drive their conversations. This clearly had an impact on the ways teachers were positioned towards or away from learning opportunities. However, interviews with teachers about how their feelings evolved regarding this work provid-

ed evidence that effective leadership and the use of conceptual tools are strong mediating forces against these individual factors. Furthermore, the comfort level of some teachers with the topic at hand, the knowledge and level of efficacy in regards to issues that were raised definitely showed evidence of having some impact on individual participation. When teachers felt there were simply "no answers" to the questions that arose, in many instances, those questions were simply not taken up. Almost all the teachers in the study shared that circumstances and pressures they feel and face both professionally and personally affect their motivations and dispositions towards the work at any given time.

CONCLUSION

For years, researchers and reformers have argued that professional learning communities can be a powerful vehicle which promotes inquiry, reflection, internal accountability and collective responsibility; of which participation in such learning communities is directly connected to improvements in teacher and student learning (Dufour, Dufour & Eaker, 1998, 2008, McLaughlin & Talbert, 2006). The irony is that communities of practice have flourished in other types of organizations in the private sector because of the persistent focus on the "task," or "technology" (Wenger, 2002), while in the realm of education, teachers rarely use their communities as a place to explore the "task" or "technology" of teaching because they do not typically use conceptual tools to establish a common language. Until recently, there has been little research done about how effective talk [i.e. what it looks like and sounds like], "reflection and practices are undertaken in PLCs," and what kinds of conditions result in "actual changes in classroom teaching and/or policy" (Curry, 2008, p. 736).

Data from this study clearly show that the process of collaboration is both complex and multi-faceted. The presence of certain dispositions, goals and structure, leadership, and the use of conceptual tools manifested themselves in other groups and sessions throughout the study. This leads one to the conclusion that these are factors pertinent to foster if PLCs are the vehicle by which schools engage in continuous and lasting improvement. Yet, even teams that demonstrated a learning trajectory did not always apply their learning. This leads us to even more complex questions regarding the broader role of accountability and professional learning communities.

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APPENDIX A: DATA COLLECTION

In total, I conducted 16 collaborative team observations, collected 56 post observation reflections. I distributed 28 total efficac y surveys [one personal and one collective]. I had a 100% return on all surveys and post observation reflections during the study. The interviews, one individual and two team [focus groups], were held at times and places that were convenient to the teachers, lasting about 60 minutes each. The initial interview protocol focused on getting to know teachers as practitioners, learning about their experiences in PLCs, and hearing their perspectives about their teams, and the work they do in collaboration. The follow up interview protocol for the second team interview was more specific to the individual teams and patterns revealed in data accumulated during the study. All interviews and observations were transcribed verbatim. The use of diverse sources allowed not only for triangulation of findings (Yin, 2009), but also helped in the analysis and understanding of the interplay between individual and contextual factors that influenced teachers' interactions in their collaborative groups

Understanding the personal and professional histories of participants enabled me to develop a greater understanding of their individual and collective approaches to their work, the knowledge, skills, and dispositions they showed in the face of challenges and their level of resilience. I captured this information through interviews, observations, and an efficacy survey that each of them took. In order to better understand their self-efficacy beliefs and what motivated them, I used a modified version of the New General Self-Efficacy Scale developed by Chen, Gully, & Eden (2001).

Questions used in the second half of the interview were driven by my theoretical framework and dedicated to getting the teacher's interpretation of interactions that occurred during the observation. Therefore, the protocol for the first half of the interview was very structured and the second part had a few stems that were filled in based on the part of the observation that required follow up such as what action steps teachers' took following their conversations, or how they responded to data.

Following each observation and interview, I wrote a summary of the events, highlighting specific patterns relevant to the research questions in this study. These summaries captured information such as descriptions of body language during the observations, similar responses

about implementation of learning communities, feelings on leadership, dynamics of the teams, evidence of conceptual tools, and ways in which teachers interacted and responded during the meetings. These summaries also captured relevant information about each teacher's reports of engagement and investment in their work, and allowed me to compare those reports to the actual processes, which occurred during the meetings. This early round of data analysis helped me to identify themes, which I subsequently pursued and the initial codes which I brought to the analysis of the transcripts.

An Exploration of Preschool Teacher Preparation Programs

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ABSTRACT

Recognizing the importance of early childhood education for young children, states are planning and implementing initiatives to assure greater access to high-quality, elementary-school based preschool. In the field of early childhood education the leading professional organizations, such as the National Association for the Education of Young Children (NAEYC), have defined and recommended certain grounding and instruction for teacher preparation. These groundings and instructions are focused on training early childhood teachers who are well prepared for organizing quality environments and positive child outcomes in early childhood education.

Specific literature on how preschool teachers are being prepared in institutions of higher education is sparse. Accurate information on both the factors leading to developmentally appropriate practices and outcomes in preschool education and the preparation of teachers is necessary. Developmentally appropriate practices are known as frameworks and guidelines for the practices that have been acknowledge and recognized as best practices for education of children from birth to age eight. The National Association for the Education of Young Children (NAEYC) outline practices that aim to promote optimal learning and development. Bridging the gap between traditional K–12 teacher preparation programs and the needs of 21st century students requires a purposeful model aligning the demands and realities of teaching in public P–16 schools.

INTRODUCTION

Identifying the successful process to generate "great" teachers is a question that lingers in the minds of many teacher educators across the country. Institutions of higher education, which offer teacher education programs recommend an array of programs for becoming public school teachers. However, a formula for the 'best' teacher preparation programs has not been found. While much attention has been concentrated on K–12 schooling and its corollary teacher preparation programs, less has been focused on preparing public preschool[1] teachers. Though the majority of states offer preschool education in their elementary schools, corresponding research that investigates the quality of the preschool teacher preparation is hard to find.

The Growth of Early Education

Recognizing the importance of early childhood education for young children in the United States, individual states are planning and implementing initiatives to assure greater access (and for some, universal access) to high quality, elementary-school based preschool education for four-year olds. In this study, elementary-school based preschool education is defined as formal education for four-year olds, established by and housed in public elementary schools. High-quality early childhood education has direct and persistent positive effects on children's development across the developmental domains (Barnett, 2008; Blau & Currie, 2005; Camilli, Vargas, Ryan, & Barnett, 2010). Research finds that young children's learning and development depends on the educational qualifications of their teachers (Barnett, 2004). Studies have concluded that highly qualified and well-prepared preschool teachers increase student success (Ackerman, 2005; American Association of Colleges for Teacher Education, 2004; Barnett, 2004; Whitebook, 2003). Among all school-related factors, teacher quality is found to have the strongest influence on student achievement, even when student characteristics such as social economic status and language background are controlled (Darling-Hammond, 2000; Haycock, 2000). The concept that children's success in school, or lack thereof, is impacted prior to entering kindergarten was expanded during the 1990's research on early brain development. The Carnegie Corporation's (1994) report, *Starting Points*, focused on the critical importance of brain development in early childhood.

Early childhood education, offered through public school preschool programs in the United States, is taking hold in the K–12 landscape (National Governors Association, 2005). During the last three decades, there has been growing recognition of the benefits of high-quality preschool education. In 1987, the number of states funding public preschool was 26; today 40 states and the District of Columbia have funded public preschool education; two additional states are piloting new preschool programs (Barnett, Epstein, Carolan, Fitzgerald, Ackerman, & Friedman, 2010; Pre[K]Now, 2010).

In 2008, twenty-nine governors cited preschool or early childhood education in their state of the state

1. In this study, public preschool refers to elementary-school based preschool programs only. It does not include public community based preschool programs.

speeches, and 23 proposed increased investments in state funded preschool programs (Doctors, 2009). During the 2009–2010 academic year, nearly 1.3 million children were enrolled in state funded preschool education in the United States (Barnett et al., 2010). If voluntary public preschool was available to all four-year olds in the United States, taught by certified teachers holding a Bachelor's degree in early childhood education, it is estimated that an additional 150,000 teachers would be needed to meet the current need (Maxwell & Clifford, 2006). Though there is a growing focus on early childhood education, and a growing demand for early childhood educators, currently there is open discussion on the preparation and qualifications of early childhood educators. As demands for elementary-school based preschool education become more integrated into PreK–12 education, requirements for qualified teachers for children aged five years and younger will demand appropriate teacher preparation and certification. A number of national organizations (e.g., The American Federation of Teachers, The Committee for Economic Development, and The Council of Chief State School Officers) advocate for universal access to preschool for four-year olds. As the capacity for elementary-based preschool education increases, as reflected in current practice, legislation, and funding (No Child Left Behind, 2004; Race to the Top Executive Summary, 2009), the demand for qualified preschool teachers will consequently increase, as well as the demand for capacity of teacher preparation programs preparing these preschool teachers. The Bureau of Labor Statistics offers, "Employment of preschool teachers is expected to grow by 19 percent from 2008 to 2018, which is faster than the average for all occupations. Continued emphasis on early childhood education is increasing the demand for preschool teachers" (n.d., ¶ 16).

Statement of the Problem

In 2009 a new education reform initiative, *Race to the Top*, was proposed to address issues in our educational system and to improve K–12 education in the country. *Race to the Top* includes preschool education, though in a limited fashion. As this is the first instance of preschool education being included in national education reform, it is important to understand the scale of such inclusion.

Substantial funding was proposed for the FY11 budget to support bold and comprehensive State plans for raising the quality of early learning programs. The competition calls for states to take a comprehensive approach to developing integrated, high-quality early learning systems, which in turn will help ensure that more children, especially high-need children, enter school ready and able to succeed. Applicant states will need to,

> …take actions to increase the number and percentage of low-income and disadvantaged children in each age group of infants, toddlers, and preschoolers who are enrolled in high-quality early learning programs; design and implement an integrated system of high-quality early learning programs and services; and ensure that any use of assessments conforms with the recommendations of the National Research Council's reports on early childhood. Awards in Race to the Top will go to States that are leading the way with ambitious yet achievable plans for implementing coherent, compelling, and comprehensive early learning education reform. (U.S. Department of Education, ¶1, 2011)

This may be the first step toward full inclusion of preschool education in national reform. To ensure quality preschool education for young children, there is a need to understand how teachers are being prepared.

The Research Question

Given that there is consensus on best practices and standards for professional preparation programs for preschool teachers in the field of early childhood education, the overarching question is, "How are elementary-school based preschool teachers being prepared at the undergraduate level at public institutions of higher education in Massachusetts?"

The study is guided by the following research questions:

1. How are the National Association for the Education of Young Children's (NAEYC) standards for early childhood professional preparation programs integrated into and evidenced in teacher preparation coursework and field experiences?
2. What are the required experiences (i.e., field experiences, capstone) of preschool teacher candidates?
3. What are the academic credentials and practical experiences of the teacher education faculty?
4. What are the teacher education faculty's perceptions of the challenges in preparing preschool teacher candidates?

The foundation for quality preschool education is found in its history and in the literature. An examination of the literature on early childhood education and

preschool teacher preparation reveals suggestions for strengthening preschool teacher preparation, therefore strengthening the experiences of preschool children in public schools.

BRIEF ANALYSIS OF THE LITERATURE AND RESEARCH

There is research readily available on the impact of strong teachers on students' outcomes and success (Darling-Hammond, 2000; Goe, 2007). As well, there is research available on the importance and need for early education and care. Additionally, there is research available on general concepts to include in teacher preparation programs, to graduate high quality novice teachers (Darling-Hammond, 2000, 2006a, 2010). However, there is limited research on the preparation of preschool teachers. In order to address the need for high quality teachers to educate the growing number of preschoolers, we need to understand how public preschool teachers are being prepared. As early education and care research began in the 1960s, there are limited longitudinal studies, and a lack of research on public school preschool students and teachers. The next three sections describe history and development of early childhood education, teacher preparation, and the gap between teacher education and the preschool context.

Early Childhood Education

A brief history of early childhood education. Although relatively new as a formal education system in the United States, early childhood education has a long history about child development and how children should educated. The idea of early childhood education has been known since Plato, who described a sanctuary for children between the ages of three and seven (Swiniarski, 2006). Ongoing support for early childhood education is evidenced from the work of Rousseau, Pestalozzi, and Vygotsky. The drive for more formalized early childhood education began to grow across the world in the mid to late 19th century, and continues to expand today (Barnett et al., 2010).

There was little formalized organization of early education and care in the United States until Head Start began operation in 1965 as a comprehensive child development initiative funded by the Equal Opportunities Act. By this time, the civil rights movement has drawn attention to the movement of addressing educational needs of impoverished children. In 1965 a "War on Poverty" was declared. A comprehensive early childhood intervention program, Head Start began as an eight-week summer program, and then flourished into nine-month half-day programs. The program worked to promote school readiness and ameliorate the effects of poverty by providing young, poor children and their families educational, health and social services.

During the last 20 years expansion in the provision of early education and care services for three- and four-year olds has been striking. Increases in preschool services resulted from numerous initiatives established by The Goals 2000: Educate America Act of 1994 (Goals, 1994, 2001). Simultaneously, there is a growing understanding of the role that early education programs plays in later school success (Gormley, Phillips, & Gayer, 2008; Wong, Cook, Barnett, & Jung, 2008). This has resulted in the expansion of early education and care programs, and a shift in the nature and amount of federal engagement in response to changing social, political, and economic needs within the early education and care realm.

Starting in the 1980s, a number of states moved toward developing their own preschool initiatives linked with their systems of public schooling, either for targeted "at-risk" populations or, in a few cases, as voluntary programs for more "universal" populations (e.g., in Georgia, New York, and Oklahoma) (Gormley & Gayer, 2003; Gormley, Phillips, & Dawson, 2004; Henry, Gordon, Henderson, & Ponder, 2002; Henry, Henderson, Ponder, Gordon, Mashburn, & Rickman, 2003; Lekies & Cochran, 2001). As the number of state funded preschool programs increases, the need for highly trained teachers in these programs also increases.

Benefits of early childhood education. Research has proven the effectiveness of early childhood education, thus supporting the importance of, and need for, quality preschool education (Barnett, 2002; Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2002; Temple & Reynolds, 2007). High-quality early childhood education has direct and persistent positive effects on children's development, across the developmental domains (Barnett, 2008; Blau & Currie, 2005; Camilli et al., 2010). Shore (1997) notes, "Researchers have gathered new evidence on the importance of the first years of life for children's emotional and intellectual development" (p. 4). "High-quality pre-kindergarten is one of the few educational strategies with a quantifiable positive impact on school preparedness and later academic achievement and life outcomes" (Strategies for Children, 2011b, ¶ 7).

Current practice too frequently underestimates children's capabilities to learn during the preschool years. Clear and appropriate expectations for learning and development across all domains are essential to an

educationally effective, high-quality preschool program (Barnett et al., 2010; Bowman, Donovan, & Burns, 2001; Kendall, 2003). High-quality early education is linked to improved learning outcomes. Characteristics of high-quality early education programs include well-educated and caring teachers, program quality standards, curricula that meets a child's developmental needs, on-going assessments of children's progress, and a balance of play and structured activities (Dearing, McCartney, & Taylor, 2010).

As preschool education continues to grow in the United States, there is the need to address the preparation of teachers for this age group. Preschool teachers are currently prepared in institutions of higher education (IHE) teacher preparation programs, resulting in bachelor degrees in either early childhood or elementary education. To ensure quality preschool education for young children, we need to understand how teachers are being prepared. The next section explores the components of teacher preparation, and why it is important to include preparation for preschool teachers.

Teacher Preparation

The educational reform movement of the late twentieth century and the beginning of the twenty-first century has had an important impact on teacher education programs. Educational reform influences in teacher education programs include increasing technical and academic achievement, increasing assessment and accountability requirements, designing meaningful instructional tasks based on real world problems, using technology, teaching teamwork and collaboration skills, and developing leadership skills (McCaslin & Parks, 2002).

Each year more than 150,000 public school teachers are hired to meet the ongoing demands of replacing teachers who retire or who have left the profession, and to fill new positions in growing school districts or to address special needs or meet new requirements, including public school preschool (Hussar, 1998). The large number of teachers expected to retire over the next text years, coupled with enrollment increases, will drive the need to hire many teachers, including preschool teachers.

Nationally, approximately one third of beginning teachers leave the field within five years, with proportions higher for teachers with less teacher preparation (Ingersoll, 2003; National Center for Educational Statistics [NCES], 2011). Teachers who have completed student teaching during preparation are twice as likely to remain in the field after one year. Thus, it becomes clear that incorporation of the early and varied field experiences for preservice teachers supports their retention in the field. Those student teachers who have been exposed to learning theories and theories about child development are even more likely to remain in teaching (Henke, Chen, & Geis, 2000; Luczak, 2004; National Commission on Teaching and America's Future, 2003). After three years of experience, teachers' effectiveness improves significantly (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007; Clotfelter, Ladd, & Vigdor, 2007). Approximately 30% of new public school teachers leave the profession within the first five years of teaching, but attrition rates are lower for teachers with greater initial preparation (NCES, 2011). Among recent graduates entering the field of teaching, almost half of the uncertified graduates left the profession within the first five years, while only 14% of certified teachers left within the same time period (Henke et al., 2000; NCES 2011). The National Commission on Teaching and America's Future (2003) found that new teachers who lacked student teaching and teacher education coursework left the field within their first year, double the rate of those who had teacher preparation programs that included specialized coursework and student teaching.

Since 1990, there has been a great deal of policy directed at teacher preparation programs. This has resulted in debate on whether and how various teacher preparation programs make a difference. Beginning in the mid-1980s with the report of the Carnegie Task Force on Teaching as a Profession, the Holmes Group (1986, 1990), and the founding of the National Board for Professional Teaching Standards (NBPTS; 1989, 2002), a collection of analysts, policy makers, and practitioners of teaching and teacher education, argued for the centrality of expertise to effective practice and the need to build a more knowledgeable and skillful professional teaching force (Darling-Hammond, 2010). The policy initiatives were launched to design professional standards, strengthen teacher education and certification requirements, increase investments in induction mentoring and professional development, and transform roles for teachers (National Commission on Teaching and America's Future, 2003). No Child Left Behind legislation impacted elementary and secondary teachers, though it has not had the same impact on early childhood teachers in preschool classrooms.

While there is research available on K–12 teacher preparation and on center-based early education and care, there is a paucity of research and literature on preschool teacher preparation programs. Since the need for high-quality preschool teachers has been proven, it is important to study the nature of preschool teacher preparation programs. The gap between the preschool context and teacher preparation programs is addressed next.

The gap between K–12 teacher education and preschool context. Though there is support for standards for early childhood professional preparation programs, there is not detailed and longitudinal data available on preschool teacher preparation programs. Thus, there is need for research in the area of preschool teacher preparation.

> A miscellany of institutions has historically carried out the preparation of ECE (early childhood education) teachers and caregivers, resulting in fragmentation among multiple constituents. An overarching recommendation for the education community is to build a seamless curriculum for ages 0 to 20, with each level of education contributing to the foundations of the next ones. Teacher preparation curricula complete the cycle by aligning with PK–12 standards. ECE teachers traditionally have been seen as caregivers rather than as teachers. (AACTE, 2004, p. 8)

The availability of wide-scale elementary-school based preschool is a relatively new phenomenon. Though there is consensus on best practices and standards for professional preparation programs for preschool teachers in the field of early childhood education, these have not been universally adopted in preschool teacher preparation programs. The review of content and institutional capacity to meet the need for highly qualified preschool teachers is a primary shortcoming of the higher education system (Bellm & Whitebook, 2003; Governor's Task Force on Universal Access to Preschool, 2002; Lekies & Cochran, 2002).

Whitebook (2003) found that there is a lack of research exploring the role of completing a particular degree in early childhood education, and that there are few studies that use experimental designs and few longitudinal studies in the early childhood education literature. Teachers need to have sophisticated skills for teaching challenging content to diverse learners (Darling-Hammond, 2006a, 2010; NCATE 2010). These skills include teaching diverse learners, systematically organizing the learning process, presenting critical ideas and materials in powerful ways, adapting instruction to the differing learning styles and backgrounds of their students, looking at, evaluating, and assessing learning and student progress, serving in new kinds of roles prompted by new school designs, and inquiring reflectively and systematically into the nature of learning and the effects of teaching (McRobbie, 2000). Not only are these skills applicable for K–12 teachers, but also for teachers of young children.

> This is relevant to children from all racial, ethnic, language, socio-economic, and socio-cultural backgrounds; and particularly those children deemed at-risk. This perspective is evident in the federally mandated No Child Left Behind and Race to the Top legislation, and is particularly relevant for young children. (Darling-Hammond, 2006a, p. 300)

It is important to recognize that the population of young children in the United States is changing. Forty-five percent of the children under age five are not White, with 25% of children under age five living with a parent who speaks a language other than English at home (U.S. Census Bureau, 2000, 2004). The diversity and preparation of the teaching force are important components of preparedness for dealing with diversity in preschools (NAEYC, 1995; Stayton, Miller, & Dinnebeil, 2002). "Preschool teachers often work with students from varied ethnic, racial, and religious backgrounds. With growing minority populations in most parts of the country, it is important for teachers to be able to work effectively with a diverse student population" (Bureau of Labor Statistics, n.d., ¶ 4). The current preparedness of early childhood teachers is questionable. As few as 20% of early childhood degree programs even cover the age range of three- to five-year olds (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009). The National Research Council (2001) recommends in its *Eager to Learn* report that every preschooler have access to a teacher with at least a Bachelor's degree in early childhood education, supporting the No Child Left Behind mandate of "highly qualified" teachers.

The National Research Council (2001) touched on the gap a decade ago, when they wrote:

> A central goal of the early childhood field should be to advance the understanding of what it takes to help the most vulnerable children thrive, and to determine the most cost-effective strategies for doing so … furthermore, as advances in research generate more findings, the gap between the cutting edge of science and the working knowledge of service providers will widen, and the challenges facing practitioners will be formidable. Recommendation: Leaders in education and in health and human services should engage in a collaborative assessment of the challenges of improving the professional development of early childhood personnel. (p. 4)

One of the most crucial variables leading to high-quality early childhood preschool education is teacher education and training, including field experiences in preschool settings. Attainment of a Bachelor's degree has been shown to positively affect beliefs regarding developmentally appropriate practices in the classroom (McMullen & Alat, 2002), while teachers with a Bachelor's degree in early childhood education or a related field (e.g., child development) tend to have even higher quality classrooms (Burchinal, Cryer, Clifford, & Howes, 2002). Concentration in early childhood coursework in Bachelor's degree programs is positively correlated not only with teachers' beliefs in developmentally appropriate practices, but also with broader appropriate classroom practices for young children (McMullen, 1998, 1999, 2003; Vartuli, 1999). Pre-service teachers enrolled in early childhood education certification programs have shown to favor developmentally appropriate practices on a more consistent basis than pre-service teachers enrolled in elementary certification programs (File & Gullo, 2002), even when practicum teachers do not share the same beliefs (Smith, 1997). Teachers who received specialized training in early childhood education also display more interactions that facilitate young children's language, cognitive, and social skills (Honig & Hirallal, 1998).

Teacher preparation programs. Teacher preparation programs are not uniformly preparing highly qualified early childhood education teachers; programs vary considerably and may not be addressing the developmental areas unique to young children (NAECTE, 2004). Bowman et al. (2001) argue that there is a "mismatch" between early childhood teacher preparation and the expectations and realities of teachers' jobs. Policy initiatives have been launched for professional standards and strengthening teacher education and certification (Darling-Hammond, 2010), though these have focused on K–12 education, excluding PreK education. National standards for preschool teacher preparation are equally important, though they have not been institutionalized. "The bottom line is that we need highly effective, adequately resourced models of preparation for all teachers, without exception" (Darling-Hammond, 2010, p. 39).

"Early childhood is a distinct period of life that has value in itself as well as creating foundations for later years" (NAEYC, 2002, p. 3). Just as curriculum for preschool children is more than a list of skills to be mastered, professional preparation for preschool teachers is more than a list of assessed competencies or completed courses (NAEYC, 2009). Preschool curricula should not be "watered-down" kindergarten curricula. Similarly, preschool teacher preparation programs should not be "watered-down" early childhood education (K–3) teacher preparation programs.

Teachers of young children need to understand the continuum of development and learning from birth through age eight, and use this knowledge in developing effective curricula and instruction for young children (Bredekamp & Copple, 1997; Connor, Morrison, & Katch, 2004; Maeroff, 2006; National Association for the Education of Young Children & National Association of Early Childhood Specialists/State Departments of Education, 2004). As few as 20% of early childhood degree programs even cover the age range of three- to five-year olds (Barnett et al., 2009). The National Research Council (2001) recommends in its *Eager to Learn* report that every preschooler have access to a teacher with at least a Bachelor's degree in early childhood education. In addition to the attainment of a Bachelor's degree in early childhood education, many hold that IHE should be preparing pre-service teachers using the National Association for the Education of Young Children's (NAEYC) standards for early childhood professional preparation programs. These are discussed next.

NAEYC Standards for Early Childhood Professional Preparation Programs

Two national organizations have developed standards for early childhood teacher preparation programs; they are the National Council for Accreditation of Teacher Education (NCATE), and NAEYC. NCATE and NAEYC incorporate the growing body of research on teacher characteristics into their suggested standards. Their research indicates that good preschool teachers should have a minimum knowledge of child development based on sound theory and practice, understand developmentally appropriate practice and assessment, and have a sound understanding of the children and families with whom they work (American Association of Colleges for Teacher Education, 2004 [AACTE]; Association of Teacher Educators & National Association for the Education of Young Children, 1991; Hyson, 2003).

"NAEYC Standards for Early Childhood Professional Preparation Programs represents a sustained vision for the early childhood field and more specifically for the programs that prepare the professionals working in the field" (NAEYC, 2009, p. 1). NAEYC, with its long-standing commitment to the development and support of strong early childhood degree programs in institutions of higher education, developed standards for early childhood degree programs in institutions of

higher education more than 25 years ago. These standards are grounded in research on how young children learn best (NAEYC, 2009).

Research supports the contention that professional preparation of preschool teachers, focused primarily on child development and early childhood education, is the primary factor in assuring the quality of preschool programs and positive student outcomes (Bowman et al., 2001, NAEYC, 2009). AACTE (2004), NAEYC (2009), and NAECTE (2004) contend that every child between the ages of four and eight years of age deserves a teacher with a Bachelor's degree in early childhood education and certification in the early childhood field. NAEYC's standards for early childhood professional preparation programs represent "a sustained vision for the early childhood field and more specifically for the programs that prepare the professionals working in the field" (NAEYC, 2009, p. 1). The knowledge base for pre-service teacher education of early childhood educators typically is thought to be inextricably linked with the concepts of child development, pedagogy, and assessment (Allen, 2008). Though NAEYC's standards are accepted within the field of early education and care and endorsed by NCATE, they are not universally incorporated into teacher preparation programs across the country. There are no uniform systems of preschool teacher preparation programs in the United States that are comparable to the structure of elementary and secondary teacher preparation programs (Lohkamp, 2009).

To begin to understand the systems of preschool teacher preparation, the proposed study will focus on the components and practices of eight public undergraduate IHE in Massachusetts offering teacher preparation programs for public preschool teachers. The study design and methodology is addressed next.

STUDY METHODOLOGY

The purpose of the proposed study is to investigate the nature of the existing preschool teacher preparation programs in Massachusetts, and their alignment with NAEYC standards for early childhood professional preparation programs. To address the research questions, a mixed methodology including qualitative and quantitative components will be utilized. The quantitative methods include document analysis and close-ended survey questions. The quantitative analysis is two-folded. First, it will consist of descriptive statistics for the close-ended survey questions, and queries for frequency of terms within NAEYC standards found in individual documents. Qualitative methods will incorporate face-to-face interviewing to collect data from teacher education faculty in their natural settings (Glesne, 2011; Maxwell, 2005; McMillan & Schumacher, 2006). Second, it will also include the open-ended questions of the survey, and language used in course descriptions and academic catalogs, from which deductive themes will emerge from coding. The

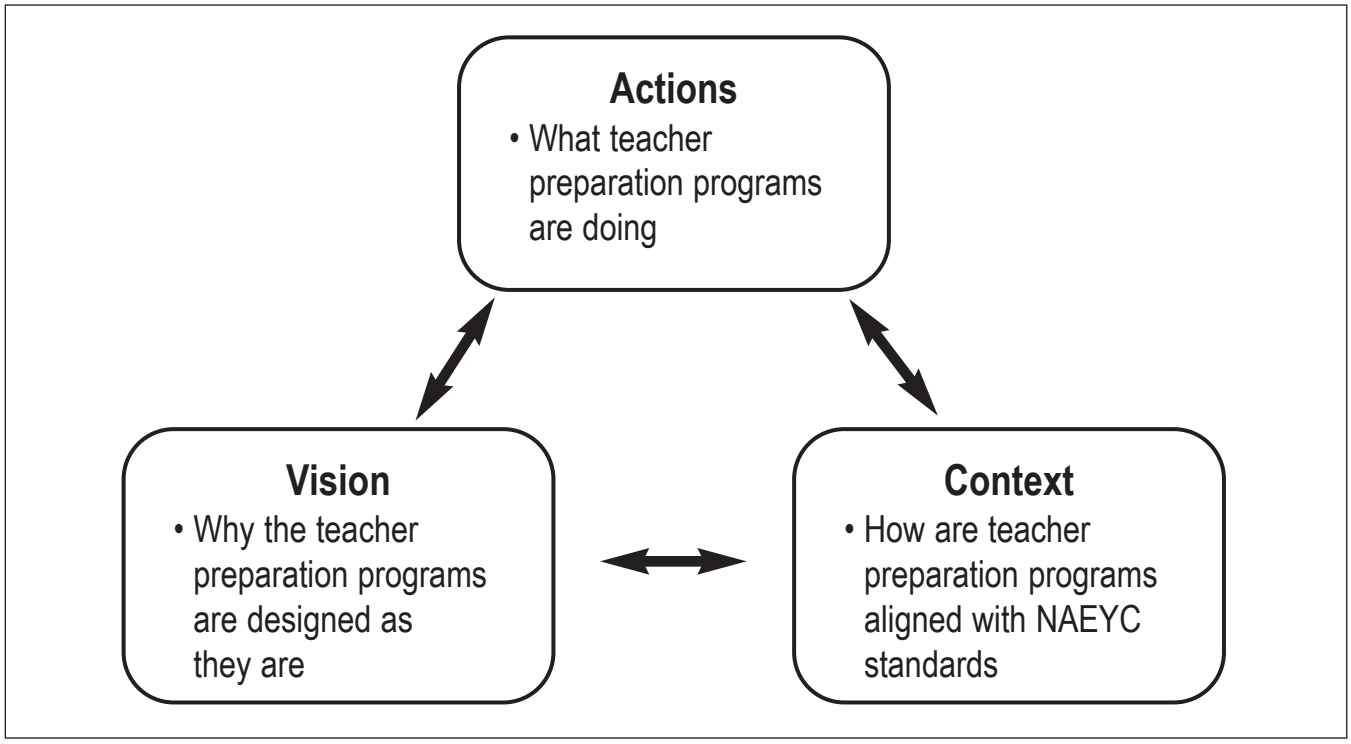

Figure 1. The Nature of Preschool Teacher Preparation Programs

multiple case study design will be employed. For the type of investigation described by the research questions, it seems warranted to collect data which is particularistic and naturalistic, and develop "thick description" (Lincoln & Guba, 1985, p.12). Figure 1 (previous page) describes the leading concepts of the nature of preschool teacher preparation programs, which include the vision, the actions, and the context of the programs will be considered. The vision will provide information regarding the coherence of the program's alignment with the NAEYC standards, the actions will provide information regarding what programs are doing, while the context will provide information on how the programs are operating.

Objects of Investigation

Several institutions of higher education in Massachusetts were selected based on the following reasons. Massachusetts created the nation's first independent Board and Department of Early Education and Care, in 2005. This allowed for the consolidation of all the commonwealth's early education and child care agencies. The creation of the department was critical to the commonwealth's efforts to develop an effective and accountable system of high-quality early education for all Massachusetts children (Strategies for Children, 2008). The establishment of the new department drew national attention:

> This innovative governance structure was created to have equal standing with the state's Department of Education (DOE) and Board of Higher Education (BHE). In Massachusetts and nationally, the new Department of Early Education and Care (EEC) was greeted with excitement, high expectations and a keen sense of watchfulness. The creation of the Department was viewed as an opportunity for Massachusetts "to lead the way in providing coordinated, cost-effective, high quality early education and care." (Strategies for Children, 2008, p. 3)

Also, Massachusetts has declared its commitment to, and support of, high-quality early education in preschool settings, including elementary-school based preschool education.

Data Collection and Analysis

Data collection will be completed through online surveys, face-to-face interviews, and public domain information on the IHE teacher preparation programs. Documents include course descriptions, undergraduate catalogs, and information from college/university websites, all relating to the preschool education preparation programs offered at the IHE. The documents analysis surveys will be administered to faculty teaching early childhood education majors in teacher preparation programs to gather data on teacher education faculty profiles and their perceptions of program characteristics. Surveys will be distributed to all part-time and full-time faculty teaching in early childhood education at the designated institutions of higher education. Teacher education faculty's information will include their academic background, and practical experience in the field of preschool education. Programmatic data will correspond to how the teacher preparation program aligns with the six NAEYC standards for early childhood professional preparation programs. Each of the survey questions aligns with specific NAEYC standards. The survey is comprised of three sections. The first section collects demographic data on the respondent. The second section of the survey collects data on program alignment with NAEYC standards for early childhood professional preparation programs. The third section of the survey addresses faculty's perceptions on the programmatic information on the teacher education programs.

Interviews with six teacher education faculty members will be semi-structured, allowing for questions to emerge in its course, and from the survey data. Interview questions will relate to three guiding research questions. Three institutions of higher education will be selected for interview sites. The selection will be based on alignment with NAEYC standards for early childhood professional preparation programs evidenced in the surveys (strong, medium, and low alignment). Should there not be faculty willing to participate at a selected institution of higher education, the next closest aligned institution will be selected. Should there not be enough faculty volunteers across the institutions, the alternative plan is to offer a focus group, involving faculty volunteers from all the institutions.

Analysis will take shape using quantitative and qualitative methods. The quantitative analysis will be focused on descriptive statistics, summarizing the data with measures of central tendency, frequency counts and percentages. The qualitative analysis will be descriptive in nature, and be derived from the coding in NVivo. As there is *a priori* and in vivo coding, there will be both inductive and deductive analysis.

The NVivo Qualitative Data Analysis Software, version 9.2, will be used to organize and aid in analyzing data from all the various sources. NVivo software will assist in efficient management of non-numerical, unstructured data with powerful processes of indexing,

Table 1
Alignment of Data Sources and Analysis to Method Type

Method	Data source	Description
Quantitative	Course descriptions, academic catalog narratives	The data were analyzed against the NAEYC standards, using the rubric. Queries for frequencies of terms found in the standards
Quantitative	Close-ended survey questions	Descriptive statistics used for demographic information
Qualitative	Open-ended survey questions, interviews	Understanding of teacher candidate preparation as it related to the NAEYC standards, depth of integration of the standards, other details of the teacher preparation program

searching, and theorizing. Data analysis will be developed in a manner that Johnson and Onwuegbuzie (2004) describe as the "within stage" mixed model. Quantitative and qualitative data will be considered simultaneously, to achieve consistency in analysis.

The documents analysis focuses on institutional practices, while the survey focuses on the teacher education faculty. The documents will be analyzed against the NAEYC standards. The alignment of the method with data collection and analysis is identified in Table 1.

The purpose of the quantitative component of the study is to explore the alignment of NAEYC standards with practices in the various preschool teacher preparation programs. The documents and demographic information collected will be examined directly against the six standards of promoting child development and learning, building family and community relations, observing, documenting, and assessing to support young children and families, using developmentally effective approaches to connect with children and families, using meaningful content knowledge to build meaningful curriculum, and becoming a professional.

The qualitative component of the study provides a richer and deeper understanding of the nature of the preschool teacher preparation programs at the eight institutions of higher education, by examining why and how the programs incorporate the NAEYC standards. Table 2 provides the quantitative analysis specifics of the data sources, analysis methodology, and the source(s) to which the data align.

Terms to be queried include promoting child development and learning, building family and community relations, observing, documenting, and assessing young children, developmentally effective approaches, meaningful curriculum, becoming a professional, and required field experiences.

Table 3 (next page) provides details of the qualitative analysis, including the data sources, analysis methodology, and the source(s) to which the data aligns.

Themes and patterns, as well as strengths and weaknesses, will be identified, discussed, and presented in terms of the context within which they were studied. Concept maps and dynamic modeling will be developed, based on the conceptual categories and relationships that emerge through analysis, and will be used as the basis for reporting results.

SIGNIFICANCE

The significance of this study is to contribute to the field of preschool teacher preparation programs, by providing baseline information on programs in Massachusetts, which will inform the field. The study is designed so that it may be replicated with other IHE.

Table 2
Quantitative Analysis

Data Source	Analysis Methodology	Source of Alignment
Course descriptions	Frequency of Terms	NAEYC Standards 1–6 Guiding Question 2
Academic Catalog narrative	Frequency of Terms	NAEYC Standards 1–6 Guiding Question 2
Close-ended survey questions	Descriptive Statistics	Guiding Question 3

Table 3
Qualitative Analysis

Data Source	Analysis Methodology	Source of Alignment
Course descriptions	Deductive themes	NAEYC Standards 1–6 Guiding Questions 1, 2
Academic Catalog narrative	Deductive themes	NAEYC Standards 1–6 Guiding Questions 1, 2
Open-ended survey questions	Deductive themes	NAEYC Standards 1–6 Guiding Questions 1, 2, 4
Interviews	Deductive themes	NAEYC Standards 1–6 Guiding Questions 1, 2, 4

The findings of the study will provide information for teacher education programs to support the development and use of best practices in curricula and instruction with regard to preschool education

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Teaching of Fiction with Louise Rosenblatt's Theory of Aesthetic Reading

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ABSTRACT

Newspapers, professional journal articles, and research document the continuing decline in both the amount of reading young people do and the scores they achieve on standardized tests. The over-arching goal of this study was to determine how exposure to Rosenblatt's theory of aesthetic reading will impact the manner in which elementary school teachers approach the teaching of literature. Following the course of professional development sessions, three of the teacher participants were observed in their classrooms to determine if their intention to alter their approach to teaching fiction had been transferred to their actual teaching. The data were gathered from the participants through written responses, class discussions and interviews. The analysis was centered around the issues related to teachers' beliefs about their approaches to the teaching of fiction after examining Rosenblatt's theories.

INTRODUCTION

More than six decades have passed since Louise Rosenblatt warned that teachers were failing to develop children's ability to respond aesthetically to literature. Rosenblatt felt that this ability was essential to achieving the goal of producing a literate population who could participate fully in a thriving democracy. This same warning remains relevant today. Two reports published by the National Endowment for the Arts, entitled *Reading at Risk: A Survey of Literary Reading in America* (2004) and *To Read or Not To Read: A Question of National Consequence* (2007) present a disturbing overview of national trends related to reading. These reports communicate the same finding: There is a serious decline in reading and the consequences of this decline in reading have civic, economic, social and educational implications. In her seminal work, *Literature as Exploration*, Rosenblatt suggests that, "literary experiences might be made the very core of the kind of educational process needed in a democracy" (Rosenblatt, 1995, p. 261).

Issues such as race, class, poverty, and equity are exceedingly complex and need to be addressed on many levels by those who govern our society. Yet, as educators we must understand that we will successfully meet the great challenges of helping those who need us most only if we realize that our instruction must have a dual focus: We must teach children the skills necessary to access the texts that we present, and we must simultaneously present works of literature in a way that engages students. Louise Rosenblatt's theories (1978,1994, 1995) link reading with the educational, civic, economic and social dimensions of life. Indeed, Rosenblatt believed that the development of the aesthetic response was critical to maintaining a democracy. In aesthetic reading, instead of focusing attention on facts and ideas that will be used after the reading, the reader's attention is focused on what is being lived through at the moment. From this mixture of "sensations, feelings, images and ideas, is structured the experience that constitutes the story or poem or play" (Rosenblatt, 1995, p. 33). The greater proportion of attention is given to the private emotions, associations, ideas and feelings that the text evokes rather than the factual information the text includes. This type of reading emphasizes personal response and the affective aspect of reading. Today's educational climate emphasizes standards and testing and often fails to acknowledge the power of the aesthetic response to help develop a society of thoughtful, articulate, and compassionate citizens. Given the current policies and the emphasis on testing, the need to embrace Rosenblatt's theories is critical.

This research study first examined Rosenblatt's theory of aesthetic reading and then presented five professional development sessions that were developed to explain Rosenblatt's theories. The over-arching goal of this study was to determine how exposure to Rosenblatt's theories would impact the manner in which elementary school teachers approach the teaching of literature. The primary research questions that guided this research study were: (a) What does it mean to read literature aesthetically? (b) In what ways will exposure to Rosenblatt's theories of reading impact the teaching practices of elementary classroom teachers?

RELEVANT LITERATURE

A review of literature related to the aesthetic dimension of reading provides evidence of a seemingly puzzling contradiction: Consideration of this body of research provides both evidence of the neglect of the aesthetic dimension of reading and an acknowledgement of the importance of the aesthetic dimension of

reading. While the research related to reading comprehension largely neglects the topic of aesthetic reading, the examination of several respected theories and perspectives offers support for Rosenblatt's theories. This research project reviews the literature on comprehension theories such as dual coding and schema as well as perspectives on motivation and relates these studies to Rosenblatt's work (Anderson, 2004; Asselin, 2004; Beach, 1993; Edmunds & Bauserman, 2006; Krashen, 2004; Pressley et. al., 1992; Sadoski & Paivio, 2004; Spiro, 1994; Squire, 1994; Winograd & Smith, 1987). These various theories and perspectives underscore the value and credibility of Rosenblatt's work. This body of research also provides evidence of the need to develop effective professional development in order to educate teachers concerning the importance of aesthetic reading and the powerful role it can have in the development of the intellectual, emotional and social growth of students.

What is Aesthetic Reading?

Rosenblatt (1978, 1995) emphasizes that the meaning of a text is not totally in the reader nor totally in the text, but rather in the transaction between the reader and the text. Rosenblatt (1995) contends that understanding how attention is focused illuminates whether the reading is aesthetic or efferent. In efferent reading, "our attention is primarily focused on selecting out and analytically abstracting the information or ideas or directions for action that will remain when the reading is over "(p. 32). Generally speaking, while one is reading a factual text, the reader's focus is on information that can be recalled after the reading. Rosenblatt chose the term efferent to embody the meaning of the Latin word *effere*: to carry away.

The focus of the attention is quite different in aesthetic reading. This type of reading is generally associated with the reading of fiction. In aesthetic reading, instead of focusing attention on facts and ideas that will be used after the reading, the reader's attention is focused on what is being lived through at the moment. The greater proportion of attention is given to the private emotions, associations, ideas and feelings that the text evokes. This type of reading focuses on the importance of nurturing personal response and developing the affective aspect of reading. Rosenblatt refers to this type of reading as aesthetic reading.

Rosenblatt's discussion of aesthetic and efferent reading illuminates the idea that not every text should be read in the same way. Clearly, reading a book of poetry offers the reader a potentially different experience from reading a book of facts. However, Rosenblatt did not intend these stances to be viewed as polarized stances. Rosenblatt (1978,1995) presents an argument for viewing the aesthetic stance and efferent stance as existing within a continuum. She believes that many readings occur with the proportion of attention towards the middle of the continuum. For example, Patrick Henry's essay, *Give Me Liberty or Give Me Death*, demands both a factual knowledge of the Revolutionary War period and an affective response from the reader. However, although Rosenblatt acknowledges that both stances are often employed in a single reading, she believes that the aesthetic stance is often neglected. Rosenblatt states that even when a text is a work of fiction, the tendency of teachers is often to emphasize the efferent dimension of reading. Teachers of literature often neglect the actual reading experience and focus on factual topics such as biographical information of the author or traditional interpretations or technical devices such as flashback, voice, or point of view. Rosenblatt (1995) believes that this tendency to ignore the aesthetic reading reflects an underlying theoretical base that reflects a belief that literature should be viewed as a body of knowledge rather than "possible experiences" (p. 71).

The actual reading experience is at the core of aesthetic reading. For Rosenblatt that actual reading experience is unique to each reader and each reading. Rosenblatt (1995) insists that the initial reading of a work of fiction should focus on the reader's personal experience with the text. Rosenblatt (1978,1995) employs the metaphor of the "live-circuit" to illustrate that the literary work exists in the live- circuit that exists between the text and the reader. The reader infuses "intellectual and emotional meanings into the pattern of verbal symbols and those symbols channel his thoughts and feelings" (Rosenblatt, 1995, p. 24). This process of the live-circuit represents the organic relationship between the reader and the text. This live-circuit is the aesthetic transaction. When reading becomes an aesthetic transaction, it is no longer an objective, mental occurrence; instead, reading becomes a form of personal experience.

Methodology

The over-arching goal of this study was to determine the ways that exposure to Rosenblatt's theories would impact the manner in which elementary school teachers approached the teaching of literature both conceptually and in terms of hypothetical and, in a narrow set of instances, actual concrete instructional practices. I developed a course of five one-hour sessions and presented these sessions to the participants in a graduate

level college classroom. As the participants engaged in this series of sessions focused on Rosenblatt's theories, I described and interpreted their experience. This college classroom setting fostered a learning climate where conversation, discussion and written responses were an integral part of the learning and my insights into the participants' comments were central in analyzing this data. I described the data as themes and patterns emerged.

The site for this study was a college in the Northeast. For the past several years, I have co-taught a graduate level summer course at this college to elementary school classroom teachers. A portion of the class explores methods of teaching reading in the elementary school. It is in this setting that I chose to conduct my study. The enrollment in this summer class was 15 students. All members of the class were working toward either a Master's Degree in Reading and Literacy, a Master's Degree in Special Education or a Master's Degree in Elementary Education. The teaching experience of the class members ranged from having completed Student Teaching to having taught for several years. The settings where class members taught included urban, suburban, private, and public schools. The grade level class members taught ranged from first grade to ninth grade. Thirteen participants were educators who teach in regular education elementary classrooms. Although two participants taught Language Arts at the ninth grade level, I included them in the study because I believed they could make valuable contributions through sharing their experiences of how ninth graders view the experience of reading. Because all of the teachers were involved in the teaching of Language Arts to children, each class member was able to contribute relevant information to the study. Table 1 summarizes the gender of each participant, the number of years each participant has been teaching, the current grade level each participant is teaching, and the type of school where each participant teaches.

Data Collection Methods

The data for this study consisted of: written responses, interviews, classroom discussions, input from a peer debriefer, and follow-up classroom observations of teachers teaching in elementary classroom settings. Table 2 (next page) outlines the time frame in which the various components of the study occurred.

Each session was designed to explicate a central feature of Rosenblatt's theories in a way that reflected the general tenets of a constructivist theory of education (Steffe & Gale, 1995). This study explored the impact of these five sessions related to Louise Rosenblatt's theories on this group of fifteen classroom teachers. Each session was dedicated to both explaining and experiencing a

Table 1
Summary of Participants' Gender and Teaching Experience

Name	Gender	Total Number of Years Teaching	Grade Currently Teaching	Teaching Location	Type of School
Abe	M	Completed student teaching	2	urban	public
Barbara	F	Completed student teaching	2	urban	public
Caroline	F	4	5	suburban	public
Emily	F	3	1	urban	Catholic
Georgia	F	5	1	urban	Catholic
Holly	F	6	5	urban	public
Janice	F	12	9	urban	public
Kerry	F	7	2	urban	public
Leslie	F	3	5	suburban	public
Merrill	F	7	5	urban	public
Natalie	F	5	2	suburban	public
Patricia	F	2	2	urban	public
Rory	F	Completed student teaching	5	urban	public
Sarah	F	5	2	urban	Catholic
Thomas	M	3	9	suburban	public

dimension of Rosenblatt's theories. Session one explored the importance of encouraging an initial personal response to literature, session two discussed the difference between the aesthetic and efferent response to literature, session three presented the meaning of reading as transactional, session four probed Rosenblatt's idea that the personal response was meant as a beginning to more sophisticated responses, and session five invited participants to reflect on the ways the exposure to Rosenblatt's theories impacted them. Following each session, participants expressed their thoughts regarding Rosenblatt's theories through engaging in classroom discussions and completing written responses. Additionally, during the five-week span, four participants volunteered to participate in a series of three interviews. During the months following the sessions, three participants were observed twice within their own elementary level classrooms. The data for this study consisted of these written responses, interviews, classroom discussions, and follow-up classroom observations of teachers teaching in their elementary classroom settings. Input from the peer debriefer, the professor who co-taught the class with me, was also included to help insure validity.

Coding. This study focused on the responses of the participants to Rosenblatt's theories and the manner in which this knowledge of Rosenblatt's theories impacted the participants' intentions to alter their teaching practices. It was my intent, through this study, to describe both the responses of the participants to the theories of Louise Rosenblatt and the instructional strategies the participants intended to implement in order to incorporate Rosenblatt's theories into their teaching practices.

Following each session, participants wrote a written response in which they responded to the session. An analysis of the written responses revealed a pattern of responses that made it possible to differentiate specific groups within the whole group. The formation of these groups was based on the level of agreement that the members of each group had with the theories and instructional practices of Rosenblatt. The first written response was used to determine membership in a group. The statements in the first written response were coded to reflect the level of agreement each participant had with the theories and instructional practices of Rosenblatt. For example, if a participant's comments contained words and phrases that indicated doubt and

Table 2
Summary of Time Frame/Topics/Methods of Instruction/Types of Groups/Assignments

	Week 1	Week 2	Week 3	Week 4	Week 5
Topic	Selective Attention	Aesthetic and Efferent Stance	Transactional Theory	Moving From the Personal to a More Intellectual Response	Reflection on the Meaning of Rosenblatt's Theories
Method of Instruction	Read Aloud followed by Discussion	Read Aloud followed by Discussion Explanation and Discussion of Assigned Readings	Read Aloud followed by Discussion Explanation and Discussion of Assigned Readings	Independent Reading and Discussion of Poems Explanation and Discussion of Assigned Readings	Discussion of Rosenblatt's theories
Type of Group	Whole Group	Whole Group	Small Group and Whole Group	Small Group and Whole Group	Small Group and Whole Group
Assignments	Reading: "The Transactional Theory of Reading and Writing" Writing: Written Response #1	Reading: "The Literary Transaction: Evocation and Response" Writing: Written Response #2	Reading: "Literature—S.O.S!" Writing: Written Response #3	Reading: "What Fact Does This Poem Teach You?" Writing: Written Response #4	Writing: Written Response #5

Interviews took place during weeks 3, 4 and 5

skepticism these comments were coded S to reflect his or her skepticism. Similarly, if a participant's comments contained words and phrases that indicated confirmation and reinforcement these comments were coded C to reflect his or her agreement. Finally, if a participant's comments contained words and phrases that indicated that Rosenblatt's theories were different from the participant's literacy beliefs and practices these comments were coded D to reflect that Rosenblatt's ideas were different from his or hers. Within the whole group, three distinct sub-groups emerged. The first group shared a sense that Rosenblatt's theories confirmed and validated their teaching beliefs and practices. The second group perceived Rosenblatt's ideas as extremely different from the literacy concepts they encountered in their beginning teaching experiences. The third group viewed Rosenblatt's theories with skepticism and questioned whether Rosenblatt's theories were practical and relevant to all students. The coding process of the participants' comments made it possible to describe the participants' views of each session in terms of their level of agreement with the theories of Louise Rosenblatt. While analyzing the data through the perspective of the participants' level of agreement with Rosenblatt's theories, which I labeled as Confirming View, Differing View, Skeptical View and Deeper Understanding View, it became clear that each participant completed the sessions expressing both a deeper understanding of Rosenblatt's theories and a greater level of commitment to incorporate teaching practices reflective of Rosenblatt's view into their teaching practices.

Scoring. After the coding of the first written response, each participant was assigned a point value representative of the participant's initial view. The assigned point values followed the guidelines below:

- 0 points (views Rosenblatt's theories as lacking relevance)
- 1 point (views Rosenblatt's theories as different, new and valuable)
- 2 points (views Rosenblatt's theories as consistent with and confirming of current practices)

Following the coding and scoring of the first written response, each of the subsequent written responses were coded and scored in a similar manner. Because I was particularly interested in examining the data in terms of change over time, I paid close attention to whether the scoring gave evidence of growth or change over time. Since each score represented a level of agreement with Rosenblatt's theories and practices, the progression to higher numbers over time indicated a deeper understanding of Rosenblatt's theories and a greater level of commitment to teaching practices that reflect her view of reading as a transactional experience. While scoring written responses following the initial written response, I recognized the need for a higher score of 3 to reflect a deeper understanding of Rosenblatt's theories and an accompanying desire to incorporate instructional strategies that reflected Rosenblatt's theories. After the coding and scoring of scores was completed, I calculated the mean score of each session and the mean score across the five sessions. A comparison of the mean scores allowed me to analyze the data in terms of change and growth over time.

Peer Debriefer. The utilization of a peer debriefer reduced potential bias and assisted in maintaining credibility of findings. A peer debriefer is a "colleague who discusses the researcher's preliminary analysis and next strategies" (McMillan & Schumacher, 2006, p.328). The debriefer is my colleague with whom I co-teach the class. She has a Ph.D. from Harvard University, extensive experience teaching elementary school-aged children, and is very familiar with qualitative research methodology. Her ability to consult with me concerning the initial findings and the logical analysis of the data contributed to the objectivity of conducting the study and the validity in interpreting the findings.

Reconciliation process with peer debriefer. Dr. Kennedy, who served as the peer debriefer, and I scored the written responses separately and compared our scores to make certain they were identical. In most cases, our scores were the same. However, in the few instances when the scores were different we engaged in a reconciliation process. This process consisted of a two-part conversation. First, we each discussed our reasons for having assigned a specific score and considered each other's perspective. The need for the reconciliation process occurred under the following two conditions: First, when a written response contained phrases that indicated membership could be in one of two groups and second, when our interpretations of a participant's response were disparate. For example, I scored Holly's Third Written Response as a 0 (Skeptic View) based primarily on the sentence, " As a teacher in a public school, choosing texts that students can engage with in a transactional manner can be complicated and difficult to do." However, Dr. Kennedy scored this same written response as a 2 (Confirming View). She felt that, although the sentence had communicated skepticism, doubt was not the pervasive tone of the written response. She based her score on two factors: First, Dr. Kennedy pointed out that Holly communicated the idea of confirmation in the next sentence of her written response, "In my class I tend to encourage students to

transact with texts through choosing texts students can relate to." Second, she based her score not only on the language within this specific sentence, but also on the overall meaning of the entire written response. Dr. Kennedy pointed out that the overall meaning of the written response indicated a score of 2. After listening to her and rereading the written response, I agreed with Dr. Kennedy. We both agreed that the score should reflect the overall meaning of the written response as opposed to the meaning of a specific word, phrase or sentence. This process of discussion served to clarify our reasoning and also served as a model for reaching an agreement. Through this process we were able to reach agreement over disparate scores, and the need for a third scorer did not arise.

Discussion of methodology embedded in a few key findings. Regardless of their initial attitudes towards Rosenblatt, as the participants began to develop a more thorough understanding of Rosenblatt's theories, each participant indicated specific ways his or her teaching practices would change to reflect Rosenblatt's theories and beliefs. Across all groups that I defined based on the participants' initial responses to Rosenblatt's theories and within individual participants, change and growth was evident. These changes were observed both in the nature of the comments and in the numerical ratings that were assigned to those comments. Although participants in Group One (initially Confirming View) remained constant in their assertion that their teaching practices were generally aligned with Rosenblatt's theories, they did identify changes they planned to make to their teaching practices that indicated a more thorough and extensive utilization of Rosenblatt's theories. Quantitatively, Group One (initially Confirming View) began with a mean rating of 2 and ended with a rating of 3 on my four-point scale. Members of Group Two (initially Differing View) perceived Rosenblatt's theories as being different from the pedagogical ideas and practices they had encountered in their teaching experiences and they found Rosenblatt's ideas enlightening. Because their school systems advocated a skills-based approach to reading instruction with very little emphasis on nurturing students' personal aesthetic response, the changes these participants proposed represented a radical departure from the approach advocated by the school system. Quantitatively, Group Two began with a mean rating of 1 and ended with a rating of 3 on my four-point scale. Participants in Group Three (Initially Skeptical View) entered the instructional treatment expressing skepticism concerning the practicality and relevance of Rosenblatt's theories. Although this third group was initially resistant to acknowledging the potential worth of Rosenblatt's theories for teachers in urban settings or teachers of struggling readers, their written responses gave evidence of a shift in attitude. This group's initial rating was 0 and its final rating was 3.

The participants expressed their intentions to alter their teaching practices in specific ways: namely, greater focus on personal response, incorporation of the aesthetic and efferent continuum, and an awareness of personal response as a beginning point to more sophisticated response. The intentions of the participants to incorporate these specific ideas that are rooted in Rosenblatt's theories into their own teaching practice offers some insight into the impact this study of Rosenblatt's theories had on the participants' teaching practices.

In order to present evidence of change in a qualitative way, triangulation of multiple sources of data was utilized. This process helped insure consistency of findings by identifying patterns in multiple sources of data. Two of the fifteen teachers in the study participated in every aspect of this research project; i.e., written responses, classroom discussions, in-depth interviews, and classroom observations. Their responses were analyzed for consistent patterns within various forms of data. Both participants communicated the impact the sessions had on them in a way that reflected consistency within and across data sources. However, while the data sources reflected consistency within each individual, the impact of the sessions was different for each of these two participants. While the impact of the sessions on one participant (Emily) was primarily on her intent to implement specific instructional strategies in order to integrate Rosenblatt's theories into her current implementation of a balanced approach to reading, the impact on the other participant (Leslie) related primarily to her gaining confidence to change her approach to teaching fiction from a skills based approach to an approach that nurtured the aesthetic response. Consideration of the differences in their teaching situations offers possible reasons for this variation of responses. Emily teaches in a Catholic school that encourages a balanced approach to teaching reading. This approach is consistent with Emily's personal beliefs about the teaching of reading. Leslie, on the other hand, teaches in a public school that adheres to a stricter and more scripted approach to teaching reading. For Emily, although Rosenblatt's theories espouse a greater emphasis on the nurturing of the aesthetic response than she is currently providing, Rosenblatt's theories are generally consistent with her current teaching practices. On the other hand, Leslie, who previously taught in a school in Maine that embraced a constructivist approach, recent-

ly began teaching in Massachusetts in a system that mandates a narrow, scripted, skills-based approach to reading. Throughout the sessions, Leslie expressed her conflict in attempting to reconcile her personal beliefs that reading should be taught in a constructivist manner with her school administration's mandates to teach in a prescribed, scripted manner. The responses of these two participants who are contrasting exemplars reflected the variation within the responses of the fifteen participants: depending on how closely aligned the participant's personal beliefs about the teaching of reading were with the school's beliefs concerning the teaching of reading, the degree to which the participants intended to integrate Rosenblatt's theories into their classrooms varied.

FINDINGS

Results of this study revealed three major findings:

1. It was the nature of the experiential dimension of the sessions that fostered growth and change in participants.
2. The nature of the topic of aesthetic reading fostered growth and change in participants by engendering a sense of liberation in many participants that was related to the idea that participants found Rosenblatt's theories credible and valuable.
3. The participants' current teaching situations impacted the degree to which they intended to alter their teaching practices.

Although some participants had initial reservations and doubt regarding Rosenblatt's theories, these three findings each attest to the idea that over time participants came to view Rosenblatt's theories as valid theories that had the potential to transform their own reading instruction. These findings are described in more detail below.

FINDING 1

The over-arching goal of this study was to determine the ways that exposure to Rosenblatt's theories would impact the manner in which elementary school teachers approached the teaching of literature. Specifically, the study focused on the responses of the participants to Rosenblatt's theories and the manner in which this knowledge of Rosenblatt's theories impacted the participants' intentions to alter their teaching practices. This study found that regardless of their initial attitudes towards Rosenblatt's ideas, as the participants began to develop a more thorough understanding of Rosenblatt's theories, each participant indicated specific ways his or her teaching practices would change to reflect Rosenblatt's theories and beliefs. Within each participant, change and growth was evident. While examining this pattern of change and growth, consideration must be given to how the experiential dimension of the sessions supported this change and growth.

Each session was designed to explicate a central feature of Rosenblatt's theories in a way that reflected the general tenets of a constructivist theory of education (Steffe & Gale, 1995). The constructivist theory of learning embodies Rosenblatt's theories (1978,1995) and espouses the concept that our past experiences and beliefs influence how we learn new ideas and refine or alter previously held ideas. The sessions were designed with the goal of encouraging participants to explore their beliefs about the reading process and evaluate Rosenblatt's theories in that context.

Participants were given time to explore Rosenblatt's theories both from a theoretical viewpoint and a personal perspective. The goal of the sessions was for participants to examine the theories of Rosenblatt through discussion of assigned journal articles, and also to apply Rosenblatt's theories to their reading of selected texts. In many ways the sessions embodied Rosenblatt's theories: Participants were encouraged to experience Rosenblatt's theories rather than simply examine them. Participants were encouraged to "live-through" selected pieces of literature in order to understand and appreciate the power of aesthetic response. All fifteen participants commented that experiencing literature and "living-through" texts reawakened in them the pleasure of reading and rekindled in them their intuitive beliefs about the positive power of stories. Eleven of the fifteen participants also commented that nurturing this capacity to experience the pleasure of reading is neglected in schools and has been replaced with an emphasis on skills and strategies. The examination of Rosenblatt's theories provided participants with a theoretical framework that validated and justified many of their intuitive beliefs about reading. The structure of the sessions, through combining the examination of Rosenblatt's academic theories with opportunities to apply Rosenblatt's theories to their personal reading experiences, supported this process. I believe structuring the sessions so that participants were able to experience Rosenblatt's theories in their own reading as well as examine them from an academic point of view contributed to the growth and change in the participants. Louise Rosenblatt shared John Dewey's idea that experience is vital to learning. Rosenblatt applied this idea to education, purporting that the aim of literature instruction should be first the growth of experience and then the acquisition of knowledge. In

her seminal text *Literature as Exploration* (1995), Rosenblatt chose a title that embodies Dewey's belief that experience is synonymous with learning. For Rosenblatt, the study of literature should be an exploration. Her words emphasize her belief in the vital importance of experience. She states that literature should be valued "as a means of enlarging the world, because through literature students acquire not so much additional information as additional experience" (Rosenblatt, 1995, p. 38). These sessions focused on encouraging participants to explore literature by experiencing it. The change and growth evident in each participant supports the theories of Dewey and Rosenblatt that emphasize the vital role experience has in learning. One way to test my finding that the experiential structure of the sessions supported change and growth would be to present the sessions to a second group of participants in an efferent manner by only examining the academic theories of Rosenblatt rather than providing the opportunities to experience Rosenblatt's theories in personal reading. Although I did not conduct the study in this manner, such a study could provide an interesting direction for future research.

Finding 2

Literacy research since *The Report of the National Reading Panel: Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and its Implication for Reading Instruction* (NRP, 2000) as well as the *No Child Left Behind* (NCLB, 2001) legislation has focused on true experiments and quasi experiments related to specific topics in the field of reading. The attention to these specific topics, i.e., phonemic awareness, phonics, fluency, vocabulary, and comprehension has created a focus that has resulted in the exclusion of many other important topics including the importance of developing children's aesthetic appreciation of literature. The result of this focus on specific topics coupled with a mandate for true experiments has led to a national agenda favoring a narrow range of reading skills.

This narrow focus of research has created a need for research that focuses on broader topics such as the aesthetic dimension of reading. Although the importance of the aesthetic response continues to surface within research as an important dimension of reading, many authors and researchers such as Ken Goodman (1998), Richard Allington (2002), Nancie Atwell (2007) and Kelly Gallagher (2009) espouse the idea that the aesthetic dimension of reading remains overshadowed by this emphasis on skill and strategy instruction. Rosenblatt's theories purport that an emphasis on the aesthetic dimension of reading will benefit our educational system and our society. Rosenblatt's theories are vital to our educational system because they provide an alternative to this narrow focus by emphasizing the importance of creating opportunities for students to experience literature. Within an educational climate that emphasizes accountability and testing, Rosenblatt (1978, 1995) reminds us that we need to help students discover the personal, emotional and imaginative quality of reading that is the aesthetic experience in order to help them become thoughtful, articulate and compassionate citizens Part of the reason that this study relating to Rosenblatt fostered growth and change in participants may have been that Rosenblatt's theories provided a theoretical framework that validated many participants' views of reading that the current educational climate has not acknowledged. Specifically, this study found that the examination of Rosenblatt's theories provided the participants both with the confidence to alter their teaching practices in order to incorporate Rosenblatt's theories into their reading practices and also with a sense of liberation in the way they viewed and approached reading instruction. The participants found Rosenblatt's theories meaningful, relevant and inspiring.

Rosenblatt's theories engendered a sense of liberation in participants. This study encouraged the participants to study, explore and experience Rosenblatt's theories. Regardless of their initial attitudes towards Rosenblatt's ideas, as the participants began to develop a more thorough understanding of Rosenblatt's theories, each participant indicated specific ways his or her teaching practices would change to reflect Rosenblatt's theories and beliefs. As participants in Group Two (Differing View) and Group Three (Skeptical View) studied Rosenblatt's theories and considered the potential impact the application of these theories would have for their students, they expressed a sense of liberation from school mandates that enforced an approach to reading instruction that focused predominantly on skills. In contrast to this skills-based approach, Rosenblatt's theories validated their intuitive beliefs about the reading process and also provided them with a theoretical framework that gave credibility to the importance of nurturing children's personal responses to literature. Throughout the sessions each participant expressed, to varying degrees, a sense that the incorporation of Rosenblatt's theories would result in more meaningful reading instruction. This was especially true of members of Group Two (Differing View) and Group Three (Skeptical View). The following quotation is representative of the sense of liberation

expressed by the participants in Group Two and Group Three. Patricia's journal response epitomizes the liberation many participants expressed as they articulated their belief that Rosenblatt's theories engage children in a way that their present approach fails to do:

> ...As I reflect on this class session I recall a few powerful realizations that I hope to carry into my teaching practice. First, I am forced to reflect on how I approached the new *Reading Street* curriculum that was introduced into the Boston Public Schools this past year. Because the curriculum was so foreign to me, I attempted to wade through it and sought to implement it. In doing so, not only did I drain the aesthetic experience and enjoyment out of the reading instruction for my students (and myself) but I also failed to validate my students' experiences and prior knowledge. I crusaded through the curriculum and was constantly discussing strategies while failing to engage students.
>
> After this session, I see how critical it is to use students' experiences of literature to develop a lesson instead of imposing lessons. Reading is never something that can be imposed on a classroom of students. Rosenblatt calls on teachers to recognize students and how their experiences impact their understanding. She calls teachers to encourage students to become engaged and "live-through" texts. She calls on teachers to encourage students to become entangled and grapple with text and then move on to develop future lessons. The process of understanding literature should begin with the experience of the text. I plan on approaching *Reading Street* very differently this year. (VWR/P-5)

The first part of Patricia's comment is reminiscent of Regie Routman's (Routman, 1996) request for teachers to learn more about the reading process rather than relying on published materials. Routman (1996) reminds teachers that, "programs don't teach; teachers do, but we have to be knowledgeable" (p.126). Patricia's response epitomizes the sense of liberation present in the entire group. The knowledge of Rosenblatt's theories led participants to give credence to the ideas they intuitively believed in, namely, the power of literature to transform lives and the importance of engaging students in the experience of reading fiction.

Finding 3

The final finding is that the instructional practices that each participant's school advocated impacted the degree to which the participants intended to alter their teaching practices in order to align them more closely to the theories of Rosenblatt. Participants who belonged to Group One, Confirming View, expressed the belief that Rosenblatt's theories confirmed and validated their teaching beliefs and practices. These participants were teaching in schools that embraced practices that generally reflected Rosenblatt's theories as well as their personal beliefs about reading instruction. Throughout the course of the classes, even though participants began to see differences between their current practices and Rosenblatt's theories, the intended changes were slight changes. This group remained constant in their assertion that their teaching practices were generally aligned with Rosenblatt's theories, and the intended changes enhanced existing practices.

However, members of Group Two (Differing View), and Group Three (Skeptical View) were teaching in situations where their personal beliefs about reading instruction conflicted with the reading instruction mandated by the school. These participants were in school systems that advocated a skills-based approach to reading instruction. Five of the six members of Group Two (Differing View) were relatively new teachers who had been teaching for three years or less and were struggling to reconcile their personal beliefs with mandated reading programs. Rosenblatt's theories provided them with a theoretical framework that gave credence to their personal beliefs about the reading process. Each member of Group Two (Differing View) articulated frustration with the school system's mandate to implement a specified curriculum, and the changes participants intended to adopt reflected a desire to replace a skills-based approach with an approach that fostered personal and aesthetic response.

Members of Group Three (Skeptical View) were also teaching in situations that advocated a skills-based approach. The members of this group were working with struggling readers in urban schools where the school systems espoused the belief that struggling urban readers need a skill-based approach to reading in order to achieve. Although the participants' personal beliefs regarding reading instruction was broader than the narrow view the school system mandated, these participants accepted the school system's view that struggling, urban students required a skills-based approach to reading in order to progress. These participants were initially skeptical that Rosenblatt's theories were applicable to struggling, urban students. However, following exposure to

Rosenblatt's theories members of Group Three (Skeptical View) began to consider the possibility that Rosenblatt's theories could benefit all students. Each member of Group Three questioned the mandate of this emphasis on a skills-based curriculum, and the changes these participants intended to implement were reflective of a desire to alter this skills-based approach by including strategies that fostered personal and aesthetic response.

All of the participants in the study indicated through written responses, classroom discussions and interviews that their instructional approach was inextricably linked to the school's mandated curriculum expectations. Members of Group One (Confirming View) taught in schools, Catholic schools and public schools that embraced a balanced approach to literacy instruction rather than a skills-based approach. For these participants their approach aligned with the ideas of Rosenblatt, and the changes these participants intended were intended to enhance their practices rather than alter their approach to teaching literature dramatically.

However, for members of Group Two and Group Three, the changes these participants intended to make were intended to alter their approach to teaching literature dramatically. The following response of Thomas' is representative of the more dramatic way the members of the second group and third planned to alter their teaching practices:

> … This experience and reflection period has forced me to rethink the way I approach all fiction based reading assignments. Last year, I was so focused on making sure my students understood the settings and distinct differences between the characters in stories, I did not focus on personal meaning. Although my plan was well intentioned, I now see the disservice I did my students. I inhibited them from making their own meaning of novels and poems. As I think back to how I interpreted *Love You Soldier* during our first session, I see the importance of allowing my students to use their imaginations to craft their own visions of a book or story line. I plan to change how I approach fiction with my students. (IWR/T-2)

These responses from Group Two (Differing View) and Group Three (Skeptical View) communicate a more radical change to the approach to teaching fiction than the responses of Group One (Confirming View). The changes expressed by Group One were meant to enhance current teaching practices. The changes expressed by Group Two and Group Three were meant to alter current teaching practices.

Results of this study indicate that participants believed their instructional decisions were linked to school mandated curriculum objectives. For participants in Group One (Confirming View), the school's approach embraced a balanced approach to reading instruction that was generally aligned with both the participants personal beliefs about the reading process and Rosenblatt's theories. However, for members of Group Two (Differing View) and Group Three (Skeptical View) the school system's expectations were inextricably linked to the standards movement, i.e., curriculum expectations, assessment demands, and greater demands for teacher accountability. These expectations seem to have become a constraint and essentially the theory behind instructional decisions. In fact, this narrow view of the standards seems to have become the motivating force behind the organization of teaching in many schools. Many participants indicated that curriculum requirements were extremely rigid and the goal was for students to perform well on testing. These insights are validated when one considers the value NCLB (2001) places on accountability of statewide accountability tests. The participants' insights are further validated by the many studies that suggest the pressure to succeed is so great that the focus of curriculum is narrowed and large amounts of time is spent on preparing to take the test (Borko, 2004; Haladyna, et al., 1991; Moore, 1994, Urdan & Paris, 1994). This course of study of Rosenblatt's theories provided many participants with a theoretical framework that contradicted the narrow focus of many school systems' curriculum, yet validated the personal beliefs many participants held concerning the reading process. The challenge participants face will be to incorporate Rosenblatt's theories into their current practices. This will be less of a challenge for members of Group One because their schools generally embrace Rosenblatt's beliefs. However, this will be a greater challenge for members of Group One and Group Two because their schools advocate a skills-based approach to reading instruction. Patterns and themes revealed in this study were also similar to those of Poulson et al. (2001) who concluded that attention should be focused on the practical issues of how teachers can apply their theoretical beliefs to their teaching practices within the constraints imposed by the complexities of schools.

Summary of Key Findings

The over-arching goal of this study was to determine the ways that exposure to Rosenblatt's theories would impact the manner in which elementary school teachers approach the teaching of literature. Throughout the study, each participant indicated

through his or her comments, both oral and written, that this study of Rosenblatt had impacted them in ways that they believed would lead to some changes in their approach to teaching literature. Three findings emerged that offered insight into the possible reasons for this change and growth. The first finding underscored the idea that the experiential nature of the sessions reawakened the participants' beliefs about the reading process. As participants applied Rosenblatt's theories to their own reading, they became more certain of the value of Rosenblatt's theories to engage readers. This finding is related to the second finding that the topic itself, aesthetic reading, was appealing to the participants. In this age of testing, many participants found that Rosenblatt's theories added the welcome, important, and often-neglected focus on personal response to the reading instruction espoused by many school systems. Part of the reason that this study fostered growth and change in participants may have been that Rosenblatt's theories provided a theoretical framework that validated many participants' views of reading that the current educational climate has not acknowledged. As participants studied Rosenblatt's theories and considered the potential impact the application of these theories would have for their students, they expressed a sense of liberation from school mandates that enforced an approach to reading instruction that focused predominantly on skills. In contrast to this skills-based approach, Rosenblatt's theories validated their intuitive beliefs about the reading process and also provided them with a theoretical framework that gave credibility to the importance of nurturing children's personal responses to literature. Throughout the sessions each participant expressed, to varying degrees, a sense that the incorporation of Rosenblatt's theories would result in more meaningful reading instruction.

These two findings are related to the final finding that the instructional practices that each participant's school advocated impacted the degree to which the participants intended to alter their teaching practices in order to align them more closely to the theories of Rosenblatt. For participants in Group One (initially Confirming View), the school's approach to literacy instruction embraced a balanced approach that was generally aligned with both the participants personal beliefs about the reading process and Rosenblatt's theories. However, for members of Group Two (initially Differing View) and Group Three (initially Skeptical View) the school systems advocated a skills-based approach to reading instruction with very little emphasis on nurturing students' personal aesthetic response.

Overall these findings illuminate the need for further research into theories of reading that, like Rosenblatt's theories, recognize the power of literature and the role of personal response to engage students in the learning process and to assist them in developing their intellects, imaginations and identities.

FINAL THOUGHTS

The significance of this study lies in the hope that exposure to Rosenblatt's theories will lead to a commitment by teachers to approach fiction as a way of engaging students in the experience of literature so that students can develop both personally and intellectually and become thoughtful, articulate, and compassionate members of our democratic society. Teachers must not lose sight of the important role literature plays in assisting children achieve this goal of becoming thoughtful and productive citizens. Rosenblatt first wrote her ideas more than sixty years ago. Yet, in this time of standards-based education and standardized testing, educators need to listen to her ideas more than ever before. Although we do need standards to insure that all our children are learning, we also need to recognize that Rosenblatt's theories allow educators to define reading and comprehension more broadly to focus not only on skills but also on the richness and joy of experiencing literature. Rosenblatt reminds us that nurturing children's capacity to respond aesthetically to literature will assist students in developing their ability to think critically and help them in nurturing their intellects and their imaginations so that they may become active, contributing members of our society. The hope of this study is that teachers acknowledge and embrace Louise Rosenblatt's belief that all children are entitled to this transformative gift of story.

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Examining the Factors that Affect Elementary Mathematics Coaching

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ABSTRACT

Mathematics coaching has become an increasingly utilized professional development strategy to improve mathematics instruction at the elementary level. However, little research has been conducted on the nature of mathematics coaching and its effects. This study employed a qualitative research design to examine factors that affected elementary teachers participating in a specific mathematics coaching model, focusing on the teachers' subject matter knowledge, pedagogical content knowledge, and self-efficacy.

INTRODUCTION

In the current educational climate, concerns about student achievement in mathematics continue. Even with the creation of mathematics standards and focal points by the National Council of Teachers of Mathematics [NCTM] throughout the last twenty years (1989, 1991, 1995, 2000, 2006) and the adoption of the Common Core mathematics standards (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010), students are performing at levels below many other industrialized countries as measured by the Trends in International Mathematics and Science Study (TIMSS) in 2007.

Further highlighting this achievement gap are the results of the No Child Left Behind (NCLB) Act of 2001. This legislation not only calls for increased student achievement in mathematics at all grade levels as measured by performance on state-wide tests, but holds districts accountable for continued student improvement (No Child Left Behind [NCLB], 2002). Hill, Rowan and Ball (2005) asserted that students' achievement scores are related to elementary teachers' mathematics knowledge. Thus, to advance mathematics achievement strengthening teachers' knowledge and their ability to analyze and respond to student achievement data is critical.

If a teacher does not have a detailed, in-depth understanding of mathematics, s/he may not be able to guide student thinking, manage class discourse, or assess the students' strategies. Another critical factor is a teacher's limited pedagogical content knowledge. If a teacher has limited pedagogical content knowledge, s/he may have difficulties identifying student confusion, and providing students with alternate representations of concepts (Shulman, 1986). These limitations in subject matter knowledge and pedagogical content knowledge may lead to weak self-efficacy in teachers, which then feeds into a cycle that includes inadequate feelings, low confidence, decreased effort, and poor teaching performance (Guskey, 1988; Mulholland & Wallace, 2001; Sanders & Morris, 2000).

If elementary teachers do not have the prerequisite knowledge and skills to teach mathematics effectively, then they must be provided with the necessary supports to learn them. Research indicates that there are several models of professional development that might support teachers while they are working toward improving their subject matter knowledge and pedagogical knowledge, which in turn will increase their self-efficacy (Borko & Putnam, 1996; Guskey, 2003; Hill & Ball, 2004; Wong, 1997). The Content Coaching Model, for example, is designed to focus on improving mathematics instruction by providing teachers with embedded professional development opportunities related to mathematics content and pedagogy (West & Staub, 2003). The findings regarding the impact of elementary mathematics coaches are preliminary at best, but some believe content coaching is a promising professional development model to improve instruction.

WHAT DO WE KNOW ABOUT COACHING?

Joyce and Showers (1982) introduced *coaching* as a professional development model, which is analogous to the practices of corporate and athletic coaches who provide support and guidance as their trainees incorporate their suggestions and continually practice the new strategies or approaches (Showers, 1985; Showers & Joyce, 1996). The teacher professional development coaching model focuses on the content and methods introduced to the teachers, and the coach provides support to the teachers as they try novel approaches in the context of their own classrooms. It is important to differentiate the concept of coaching from that of mentoring. Loucks-Horsley, Love, Stiles, Mundry, and Hewson (2003) define coaching as a form of professional development, where a coach, in a one-on-one setting, supports a teacher in the teaching context to "enhance the knowledge, learning, and practice" of the teacher who is trying to incorporate new learning into classroom practice (p. 204). Coaching is used to teach specific instructional

strategies to professional teachers and provide feedback and support while the teacher uses those strategies in her daily work. Mentoring, in turn, is a form of professional development that matches up an experienced teacher with a new teacher to tackle issues generally faced by the new teacher (Loucks-Horsley et al., 2003). Mentors typically provide assistance to new teachers in addressing more general challenges in one's first years of teaching that are school-specific, such as the procedures for emergencies, report cards, or dismissal.

In the educational arena, there are two basic types of coaches, each defined by the purpose of their work in schools. Change coaches, or capacity coaches, focus on analyzing large scale systems and procedures to drive reform from the top. They work primarily with administrators to identify areas of improvement on a more global scale, analyzing characteristics of the organization itself and offering suggestions to improve effectiveness. Content coaches, by contrast, focus on improving instruction by developing teachers' practices in specific content areas, usually literacy and mathematics (Neufeld & Roper, 2003; Poglinco, Bach, Hovde, Rosenblum, Saunders, & Supovitz, 2003). Neufeld and Roper (2003) state that coaching "at its best,…is grounded in inquiry, collaborative, sustained, connected to and derived from teachers' work with their students, and tied explicitly to improving practice" (p. 3).

Content coaching is a relatively new variation of the coaching model. The research in this area has focused on analyzing the role of the content coach, the implementation processes of content coaching models and program evaluations of specific implementation sites (Campbell, 2007; Center for Collaborative Education, 2002; Neufeld & Roper, 2003; Poglinco *et al*., 2003; The George Washington University School of Education & Human Development, 2001). These studies have identified some key activities performed regularly by mathematics content coaches. Some activities relate directly to building collaborative structures which include developing relationships with faculty, collaborating with faculty to build professional learning communities, and collaborating with administration to further reform efforts. Other key activities incorporate direct collaboration with teachers including demonstrating lessons, assisting teachers with planning, mentoring new teachers, leading lesson analysis, teaching mathematics content, promoting new teaching strategies, coaching teachers using the new strategies in the classroom context, and analyzing data and student work to support teacher decision-making.

In addition to investigating and evaluating the role of the content coach, some of the programs that incorporate content coaching have tried to provide evidence for the assumption that content coaching contributes to the improvement of student achievement by improving mathematics instruction. To date, there is little evidence of a positive correlation between content coaching and student achievement (Poglinco *et al*., 2003; The George Washington University School of Education & Human Development, 2001). However, none of these studies investigated what impact collaboration with a mathematics content coach may have on teachers' self-efficacy and beliefs concerning their ability to improve student achievement.

Because content coaching is a relatively new professional development model, there is no clear understanding of the nature of the role of a content coach. Studies conducted to this point focus on the analysis of the activities carried out by coaches, on the administration's view of the role of coaching, and on the effects of teacher professional development on student achievement. All the studies to this point have called for further investigation. What is known is that there is a lack of clarity about the role of mathematics content coaching and that attempts to study it have been limited to attempting to define and describe the role of coaching. Because there is already ample literature describing their role, it is now vital to begin investigating the effectiveness of specific strategies employed by mathematics coaches.

One particular coaching strategy is supporting teachers to use data to assess student strengths and weaknesses and to inquire about reasons for student weaknesses. Coaches can provide specific professional development opportunities tailored to the teachers' needs, such as improving teacher content knowledge in the areas where the students are weak or introducing a research-based instructional strategy for the teacher to implement in the classroom. Utilizing student data also allows mathematics coaches to model differentiated ways to assess students to diagnose gaps in learning for teachers.

MacLeod (2005) suggested that no matter what data analysis protocols schools implement or adopt most teachers have not embraced data-driven decision-making. There is limited research about how teachers use data and "about the conditions that support their ability to use the data to improve instruction" (Nabors Olah, Lawrence, & Riggan, 2010, p. 227). Wayman (2005) asserted that teachers encounter difficulties obtaining data in user-friendly formats and lack the knowledge to manipulate the data into preferable formats. Kerr, Marsh, Ikemoto, Darilek, and Barney (2006) stated that school administrators often lack the capacity

to serve as leaders in analyzing and using data to inform instruction. Young (2006) in her cross-case analysis of four schools identified key functions that promoted data-driven instructional decisions in literacy. The key functions include: a clear mechanism for data reporting, guiding teachers in the interpretation of data, providing instructional resources and professional development in issues gleaned from the data, facilitating teacher discussions of data, and following up with teachers as they implement interventions based on the data (p. 540). These key functions align closely with the role of mathematics coaches, warranting research in this area.

As discussed previously, teachers can respond in different ways when encouraged to reflect upon their instruction by collecting and analyzing data. Confronting those aspects of the mathematics content that need improvement can either encourage teachers to learn the necessary mathematics content or cause them to give up completely (Bibby, 2002; Quinn, 1997). Ingram, Louis, and Schroeder (2004) found that teachers with weak self-efficacy were less likely to embrace data-driven decision-making due to their beliefs regarding their ability to impact student achievement.

STATEMENT OF THE PROBLEM

With the increased calls for data-driven decision-making by legislation [NCLB, 2001] and by educational reformers (Elmore, 2000; Schmoker, 2006), it is clear that teachers must be able to engage in meaningful data analysis to improve mathematics instruction. There is limited understanding of the conditions that promote the effective use of data by classroom teachers (Nabors Olah *et al.*, 2010) and little evaluation of the practices currently in place in schools (Wayman & Stringfield, 2006). Research does indicate that teachers with weak self-efficacy are not willing to engage in data-driven decision-making (Ingram *et al.*, 2004) and need support. Kerr *et al.* (2006) advocate the use of coaches as a way to both promote data use for instructional improvements and as a way of helping teachers integrate student needs with other district demands, such as curriculum mandates or pacing guides. This study focused on whether the support of a mathematics coach in analyzing student data impacts a teacher's subject matter knowledge, pedagogical content knowledge, and self-efficacy and what aspects of the coaching role are deemed most effective by teachers and which are deemed most effective by their coach.

RESEARCH QUESTIONS

The study examined the following research questions:

1. How does analyzing student data with the support of a mathematics coach affect a teacher's subject matter knowledge, pedagogical content knowledge and self-efficacy?
2. What specific aspects of the role of the mathematics coach are most effective as reported by the teachers?
3. What specific aspects of the role of the mathematics coach are most effective as reported by the mathematics coach?

METHOD

RATIONALE

The research questions guided the design of the research study. Because the field has limited research regarding impacts on teachers' self-efficacy after working with a mathematics coach or of relationships between the teacher and the mathematics coach's perceptions of the coaching model, it was necessary to carefully collect, observe, and analyze data in the context of a coaching model as implemented within a school. Therefore, it was appropriate to design a case study, which according to Yin (1989) is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (p. 23). Mathematics coaching is a professional development model currently implemented in many districts (National Mathematics Advisory Panel, 2008). Although the tenets of coaching or a specific coaching model may be defined and adopted in a district, the actual implementation in each school in the district varies due to the coach herself, the specific needs of the coached teachers, and/or the professional culture of the school itself. It is extremely difficult to distinguish and isolate with certain precision the variables surrounding the effects of the coaching model from the context in which it is implemented; and more importantly, these variables are detrimental to producing quality research about coaching's impact on teachers. However, it is essential to provide quality descriptions of the coaching process and its impact. To answer the research questions, while also isolating any variables, multiple sources of information, such as observations, interviews, coaching logs and artifacts were utilized. These instruments were vital to developing a full description of the impact of a mathematics coaching

model on individual teachers within their grade-level team. They also allowed for the triangulation of evidence to support, refute, or develop theories regarding the impact of mathematics coaching (Lincoln & Guba, 1985). Also, because a teacher's sense of efficacy is the belief about his/her ability to "successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998, p. 233), it was crucial to study each aspect of the coaching cycle in order to capture any information regarding the participating teacher's beliefs about her ability to implement the lesson or instructional strategy as planned cooperatively with the coach.

Context of the Site

I conducted this research study in an urban public school system located in a mid-sized, culturally and linguistically diverse city in northeastern Massachusetts.

District: The district has committed to improving mathematics instruction for all students and has seen some increases in student achievement in mathematics as measured by state-mandated tests. However, there remain large achievement gaps, and the district is identified as an underperforming district by the state's department of education. Only 49% of third graders and 36% of fourth graders in the district scored in the proficient or advanced categories on the state's 2011 mathematics test and 17% of all third and fourth graders scored in the warning category.

The district has been using TERC's *Investigations in Number, Data, and Space*, an elementary standards-based mathematics program for the last eight years, and subsequently developed district curriculum guides to align the program with the state standards.

Six years ago, the district started to shift the professional development in mathematics instruction from program implementation in day-long workshops to a job-embedded, instructionally-based model. In Spring 2006, all mathematics coaches began to work with a consultant on a mathematics content coaching model that would be adopted in all schools. The following year, the district started allocating professional development funds to ensure a half-time mathematics coach in every building. Mathematics coaches in this district are categorized as teachers and have no supervisory or evaluative responsibilities. Because they are categorized as elementary mathematics teachers, elementary mathematics coaches in this district must hold a valid teaching license in elementary math, which means that they have earned an adequate score on the state's teacher subject matter test.

The district has also invested professional development funds to support data-driven decision-making. A team from each school attended a district-wide training on school improvement in August 2008. One module focused on how to use data to continuously improve student learning. At that training, the teams were introduced to the Focused Conversation Model for data analysis, which is often referred to in the district as the ORID, an acronym for the protocol's four levels. The district continues to offer a series of "data summits" where vertical mathematics teams from each school receive school and district support to analyze school mathematics data and develop school-wide goals to improve student mathematics achievement.

The district is part of its state's Race to the Top grant. One of the focus areas selected by the district is to implement the new Common Core Standards. The district formed a Common Core Committee (CCC) for mathematics which is comprised of teachers and mathematics coaches from various grade levels. The district provided every teacher with the year's curriculum map and at least the first module's curriculum guide for the year. Some grade levels had more modules completed than other grade levels, but all curriculum guides and assessments are considered works-in-progress as the district works through its Common Core implementation.

School: The study was conducted at one of the district's elementary schools. To ensure confidentiality, the school will be referred to as the Flynn Elementary School.

The Flynn is located in a middle-class, residential neighborhood and draws its students from the west side of the city. During the 2010-2011 school year there were 483 students enrolled at the school. The school's student population is diverse, but is less diverse than the district as a whole. Of the enrolled students, roughly 40% are white, 17% Hispanic, and 35% Asian. African-Americans comprise 5% of the overall population and roughly 3% are multi-racial. The school receives Title I funding and provides free or reduced school lunches to 65% of its population. Roughly 37% of the students primarily speak a language other than English at home and 30% of students demonstrate limited English proficiency. Special education services are provided to 15% of the student population and the services are provided in the general education setting and in self-contained classrooms that service students on the autism spectrum.

During the 2010-2011 school year, the school reported that 100% of the 30 teachers were licensed to teach in their teaching assignments and 100% of the

Table 1
Flynn School State-Mandated Mathematics Test Scores, Spring 2010

	Advanced/ Above Proficient	Proficient	Needs Improvement	Warning/ Failing
Grade 3	13%	56%	27%	4%
Grade 4	5%	26%	47%	21%

Table 2
Flynn School State-Mandated Mathematics Test Scores, Spring 2011

	Advanced/ Above Proficient	Proficient	Needs Improvement	Warning/ Failing
Grade 3	8%	60%	22%	10%
Grade 4	16%	31%	43%	9%

core instruction was taught by highly qualified teachers as defined by the No Child Left Behind Act.

The school has made significant progress in improving student achievement in mathematics over the last 5 years. The school was in year two of restructuring, but for the last three years has made Annual Yearly Progress according to NCLB guidelines. The school now has no status in terms of its NCLB accountability status. The student performance in mathematics is considered "moderate." The student growth percentile for the fourth graders in 2010 was at the 42nd percentile and in 2011 was at the 55th percentile, which means that that in addition to moderate performance, the fourth graders also exhibit moderate growth between third and fourth grade as compared to peers throughout the state. Tables 1 and 2 chart the school's test scores on the Spring 2010 and Spring 2011 state mathematics tests.

The administrative team at the Flynn has undergone many changes in the last few years. There have been three different principals in the last three years. The current principal was formally appointed in January 2011 from within the district, and has demonstrated a commitment to professional learning, including allocating school funds for teams of teachers to meet to analyze data and for teachers to attend workshops to learn new instructional strategies. He has also started to work with teachers on setting professional goals and on action plans to achieve those goals.

Rationale for Site Selection

I selected this site purposively for many reasons. I am a half-time mathematics coach, and split my time equally between the Flynn and another elementary school in the district, going between the two schools with an alternating weekly schedule. Another specific reason for selecting the site is that at the root of a quality naturalistic inquiry is willingness of the participants to be open and authentic in dealing with the researcher (Lincoln & Guba, 1985). I have been the mathematics coach at the Flynn full-time for five years and the past two years, due to budget cuts, I have been the math coach half-time at both the Flynn and the other school. Another reason for selecting the site is that the faculty has consistently demonstrated a genuine willingness to make their teaching practices open to inquiry. At both schools, every classroom teacher participated in the district's version of action research, called Cycles of Inquiry. Each school had a vertical mathematics team, convened by the mathematics coach that analyzed data from district benchmarks and state-mandated tests and developed school-wide goals based on student need. Each grade level team developed a grade-level goal that stemmed from the school-wide goal and cooperatively researched instructional strategies and planned units of study to work towards their goal with the support of the mathematics coach. Teachers developed inquiry questions after analyzing student data to identify struggling students and continually examined student progress. This willingness to engage in inquiry and open dialogue about practice is crucial to collecting data that are valid and reliable throughout the study.

Crucial to qualitative research is the research relationship built between the researcher and the participants. Because I am already the mathematics coach at the research site, I have developed a strong rapport with the faculty. The two sites also make an interesting comparison when considering the relationships between the math coach and the faculty. At the Flynn School, as a math coach I have had five years to build working relationships

with the teachers, and at the Hoover School (second site), I have had only one year in a half-time capacity to build relationships. At both sites, my relationship with the faculty is professional and collegial, yet cordial. Regardless, the focus on improving student learning through improving mathematics instruction has always been the center of the relationships. Another reason for selecting this site is that it allows for an in-depth case study into how the coaching model effects the coached teachers, rather than a case study on the process of implementing the mathematics coaching model, as recommended by Campbell (2007). Also, because I am a doctoral student in a mathematics and science education program when hired for the position, I did not experience the same challenges of teacher leadership as described by Mangin and Stoelinga (2011). Teachers at both sites recognized the mathematics coach as an authority in mathematics education due to the differences in educational background and as a result, regularly tap into my expertise as needed.

Participant Selection Procedure

Thirty-nine classroom teachers in two of the district's elementary schools, including the Flynn, were invited to participate in the study. Each teacher received an introductory letter and consent form that were approved by the University's Institutional Review Board in August 2011. I also sent an email to each teacher to inform them that these documents were placed in their school mailboxes. The teachers were reminded to read all of the documents carefully prior to consenting to participate and assured that there would be no issues should they decline to participate. Because the nature of this inquiry is naturalistic, it was important for the prospective participants to understand that the study sought to probe the changes that may occur as a result of their work with a mathematics coach. Although their names are not used in the study, absolute confidentiality could not be guaranteed. In order to adequately describe the background of each participating teacher, it is probable that others in the school community who read the results of the research will be able to identify the study's participants. This was stated explicitly in the teacher letter and the informed consent form disseminated to teachers. Also included in the teacher letter was a section that informed the teachers that they could have opted out of the study at any time without repercussions.

Eleven teachers (28% of invited teachers) agreed to sign the contract of participation. Those eleven teachers completed the Mathematics Teaching and Coaching Survey which provided information necessary to purposively select the teachers to participate in the study. The first section of the survey asked grade level taught, years of teaching service, number of years at the school, teaching licenses held, educational background, and college credits in mathematics content and pedagogy. The second section asked teachers to describe their understanding of the purpose of mathematics coaching. The last section of the initial survey was the Teachers' Sense of Efficacy Scale—Short Form (TSES). Each survey was coded with a number and teachers were asked to create a pseudonym to be used throughout the study. The original list with the teachers' real names was destroyed after the surveys were analyzed and ten participants were selected.

While selecting the participants, I focused my efforts on specific grade levels and levels of teaching experience. The rationale was that such focus would provide the best to opportunity to collect multiple sources and larger quantities of data, which would lead to a richer analysis. Another anticipated reason for selection to participate in the study was whether any potential participant was new to her position, either through transfer or new appointment. Usually teachers in a new context need support from coaches, especially teachers who have transferred to a new school or another grade level, because they do not receive mentors. The coach typically spends as much time as possible with these teachers, providing more opportunities to collect data. Also, teachers who are working in a novel context may feel less confident and may have weaker self-efficacy, which would have provided additional important information to the study. Another important criterion was the desire of all of the teachers on a grade level team to participate. Since many of the interactions between the mathematics coach and the teachers happen with the grade-level team in common planning sessions or other professional development forums, I could collect data from those sessions if all of the teachers on a team participated. The data collected in team sessions would augment the analysis of the data collected during individual coaching sessions. This scenario was not considered likely because only nine full teams were invited to participate out of the original pool of thirty-nine teachers. However, four out of the ten preliminary teachers were members of the same team at the subject school, the Flynn School. They were selected because their participation would provide data from grade-level team coaching sessions

Participants

The participants are four female teachers of a primary grade at the Flynn School. The teachers all have master's degrees in education and are licensed to teach

in their current assignments, holding either an Elementary (1-6) license or an Early Childhood (PreK-2) license. Three of the teachers have been teaching for seven to ten years and one is in her thirty-third year of service. The veteran teacher on the team served as the mentor to two of the teachers when they started at the Flynn six years ago. The remaining teacher is in her second year on the team, having transferred from another grade level. Three of the teachers have limited mathematics courses in their background, mainly just the required mathematics content and pedagogy courses for degrees in education. One of the teachers minored in business as an undergraduate and had five mathematics content courses in addition to the mathematics content and pedagogy course for her master's degree.

Limitations

The fact that the participants' own mathematics coach is conducting the research is both a benefit to the design and a limitation. Collecting quality qualitative data requires the researcher to be a natural part of the culture that is being researched (Lincoln & Guba, 1985). Being the school's mathematics coach, I have already developed relationships with the research subjects within the research context and are in a position to gather meaningful data and interpret it within the context. There are limitations, however, stemming from the proximity of the researcher to the research context. My familiarity with the research context and the teachers can create bias. The fact that teachers are volunteering to participate in the study is a special consideration. It is quite possible that only teachers who have had positive experiences with me as the mathematics coach or who like me and would want to help me complete my study will volunteer to participate. Other specifics steps taken to minimize bias will be described throughout the procedures section.

Another major limitation comes with the case study design. Although the case study methodology was vital to answering the research questions, the methodology has its limits. The results and conclusions of this study are not generalizable due to the small sample size and the specific context of the research site. It is up to the readers to decide if the conclusions are transferable to the school environments in which they are familiar.

Sources of Data

Throughout the semester-long study, the participants provided me with their perceptions of and dispositions toward the mathematics coaching model as they experienced it. These data came from a variety of sources, including semi-structured interviews, audiotapes of coaching sessions, and artifacts. Each participant was interviewed individually at the commencement, midpoint, and end of the study and transcribed audiotapes of the interviews were created. The interviews were conducted by a doctoral student from the same university in order to minimize bias during the interviews. The interviewer had an experience being a research assistant and fully understood the ethical considerations and methodology of collecting data. The interviewer also had experience teaching elementary mathematics preservice teachers and is well versed in the subject matter knowledge and the pedagogical content knowledge required of elementary mathematics instruction. Because the interviewer was a neutral party, but yet a mathematics educator, the teachers seemingly were provided with an environment conducive to candid responses to the interview questions.

The interview questions were designed to elicit each teacher's perspective on the professional development opportunities available, experiences with the mathematics coaching model, sources of student data and how the data are used, and student progress towards grade-level standards.

All planned coaching sessions with the grade-level team were audiotaped and I took extensive notes of the conversations and the interactions. These sessions included four common planning sessions focused on mathematics, two planning sessions using for the purposes of aligning curriculum to the Common Core as part of the district's Race to the Top grant initiative, and two in-service half-days for mathematics-related professional development. Participants shared artifacts, such as lesson plans/resources, student work, data reports, and teacher notes, with the interviewer and with me as well.

I also documented individual coaching work in on a coaching log form that was developed for the study. The coaching log included factual information about who was involved, the time, and the actual focus for the interaction. The coaching log also included a narrative section for the coach to describe the nature of the coaching, outline the next steps from the coaching perspective, and to reflect on how data from this particular coaching session connected to other data collected.

Data Analysis

In this qualitative study, the data analysis was bounded by the factors outlined in the research questions, namely teacher subject matter knowledge, pedagogical content knowledge and teaching self-efficacy. I developed an initial list of codes from the review of literature, identified the main categories of mathematical

subject matter knowledge, pedagogical content knowledge, teacher self-efficacy, and coaching roles. Within these categories, an initial list of characteristics was generated and a code ascribed to each one. Separate codes were designed for which aspects of the coaching role that teachers identified as opposed to coaching moves identified by the coach.

All information collected was analyzed using Lincoln and Guba's guidelines for naturalistic inquiry. Collected data was "reconstructed" throughout the entire study through an induction process (Lincoln & Guba, 1985, p. 333). Each week, collected data was organized, broken into units, and coded so that I could continually build plausible relationships between category properties. Each unit collected was entered into an electronic spreadsheet. Each unit was coded by the particular source and the citation of where the unit was collected with as much specificity as possible. Additionally, the units were coded by the respondent's pseudonym and the data collection episode, such as the first interview or the audiotaped coaching session of a particular date. The codes were continually refined to accommodate the information collected and the new connections being made throughout the study.

RESULTS

Many common themes emerged as the study progressed. This paper focuses on the most prevalent theme of fully implementing the Common Core standards at the primary level and how that change impacted teacher subject matter knowledge, pedagogical content knowledge, self-efficacy, and defined the coaching model throughout the study.

The process of learning the new standards, aligning the curriculum to the new standards, and teaching and assessing students with reference to the new standards was present in every interaction between the teachers and the coach, during both individual coaching interactions or grade-level team interactions.

Teachers consistently reported concern about aligning the curriculum to the new standards. The teachers utilized and liked the *Investigations* program which provided the core of the curriculum for their entire tenures at the Flynn School. Until this school year, the district's curriculum guides had always used the *Investigations* units as the core of the curriculum, providing teachers with notes for which lessons were considered enrichment or which lessons needed to be expanded upon to meet standards. This year, the district curriculum guides became Common Core standards-based guides. Eight modules were defined by the district Common Core Committee. Each module was defined by the focus standards for the module and did not necessarily correlate to *Investigations* units. Suggested resources for teaching those standards were listed, including some *Investigations* lessons. The teachers in the study expressed frustration with this change. Although each teacher expressed understanding that the move to the new standards was mandated, each teacher felt that they didn't have the necessary resources and supports to do a full implementation. They reported that the district curriculum guides and the district pre-tests and post-tests were often received too late to have enough time to thoroughly plan modules and that the district-provided math program did not align to the new standards. The teachers felt that they had limited instructional resources, other than *Investigations*. Both the teachers and the coach stated that the coach's accessibility also impeded the full implementation because the coaching position had been cut to a half-time job. All teachers found the team coaching sessions that focused on analyzing the new standards and planning new modules as highly beneficial activities, as together with the coach they could brainstorm instructional strategies and develop lessons to compensate for the perceived lack of instructional materials. Teachers reported that they felt more effective when they were well planned and had meaningful lessons laid out in a sequence that allowed concepts and skills to be built over the course of the module.

Teachers engaged in analyzing the content of the new standards. Often concerns about the developmental appropriateness of standards arose, especially when discussing the nine types of story problem structures required in the Common Core standards. Teachers reported that their students continually struggled with initial quantity and change unknown structures for both joining and separating problem structures. Such student difficulty also extended to solving missing addend equations. Teachers ascribed some of the student difficulty to the district's curriculum map, which they perceived to be too disjointed to allow students develop a full understanding of the concepts and calculations of addition before teaching that of subtraction, as had been the sequence in previous years. Some of the teachers also ascribed some of the student difficulty to students not having the prerequisite skills to learn the new concepts because of gaps in knowledge or English language issues.

Most of the coaching sessions integrated the subject matter knowledge and the pedagogical content knowledge required to teach the new standards. The team, including myself, discussed the new content, including

each joining, separating, and comparison problem structures and contexts for the unknown in each position, such as the initial quantity, the change, or the result. The team wrote story problems for students that reflected the structures outlined in the new standards. They created student recording sheets that included graphic organizers to help students comprehend the story problems. Together, the team discussed invented algorithms for addition and subtraction and placed those algorithms on a continuum of least efficient to most efficient, which provided the teachers with a way of defining next steps for students.

In the context of analyzing student data, teachers often identified areas where they felt they needed varied instructional strategies. For example, when analyzing student scores to the open-response items of post-tests in conjunction with student classroom work on solving story problems, teachers that students were struggling with how to represent their strategy in writing. Many students were using their fingers or a number line to count on or back to solve problems, but did not have a way to record their thinking on paper. Together with the team, I generated possible ways to represent those strategies and modeled introducing the representations to students in the classrooms. Teachers reported that more of their students made progress in this area and used the representations the team had worked on independently. When interviewed, teachers ascribed student progress to continued practice and instruction that utilized the novel strategies, representations, and manipulatives discussed with the team, including the coach.

Another concept that the team struggled with was the concept of equality and how to help students understand what the equal sign actually means. The team analyzed student data and believed that the students thought their answer was supposed to follow the equal sign, not that the equal sign means that the quantities on each side of the symbol are the same. Some teachers reflected that in the past they may have reinforced that misconception and that it was not until they had to teach initial quantity and change unknown problem structures that they recognized it. Even with a team focus on explicitly teaching students what the equal sign meant with in-class modeling by the coach, the students were still struggling as evidenced by two types of data. In the team's analysis, most students could write a semantic equation that reflected the given story problem, could solve the problem, and could represent their strategy in writing, but when those same students recorded their answer in the answer box, the students recorded the result (the number that came after the equal sign in the equation) even though it was an initial quantity or a change unknown problem. Even when the story problem's question was reread to them, the students struggled with which number in their equation was the answer. Their confusion about the equal sign also manifested in student data collected regarding the new standard that requires students solve equations with unknowns in all positions. The teachers reported that many students were struggling with solving "missing addend" equations and were especially struggling with deciding if equations were true or false when there were multiple addends on both sides of the equal sign. The teachers shared different games and worksheets with each other, and when students were still struggling, I suggested that a number balance might help students concretely see how quantities are equal or unequal. All teachers reported that most students have made progress toward mastery of the standard because of the concrete representation of equality that the number balances afforded.

The teachers in this case study valued the opportunity to analyze student data with mathematics coach and to subsequently brainstorm instructional next steps. This was especially true in specific cases of struggling students. The teachers reported that it was important to have the coach to consult with to help diagnose student difficulty and generate plans to intervene with those students. With my instruction and in-class modeling, they began to incorporate new tools, such as blocks that model the base 10 number system, to help struggling students. I also modeled how to use student interviews to assess student understanding and use the interview data to plan for small group intervention lessons. The in-class modeling from the coach moved from having just a focus on instructional techniques to having a focus on student learning. When I taught the lesson, it allowed the teacher the opportunity to closely observe the struggling students and try to glean more information about the students' conceptions. The in-class modeling was also beneficial to me because I could develop a more holistic view of each struggling student, as opposed to just seeing data in a report. Teachers stated that it was important for me to see students in the classroom context instead of just analyzing data reports generated from student data.

CONCLUSIONS

It is clear that the implementation of the Common Core standards presents challenges. As the district and the teachers in this case study found, the elementary mathematics curriculum programs do not fully align to the new standards and even with the attempts to retrofit

them to meet the standards, teachers must have the time and the supports necessary to create curriculum maps that accommodate the new standards and most importantly, to plan lessons that address the new standards. This is especially true for elementary teachers who must implement the Common Core standards in more than one content area simultaneously.

The Common Core standards increase the rigor of the number sense required of primary-aged students as seen in the Number in Base Ten and the Operations and Algebra domains. Teachers are now required to teach concepts that they may not have taught before because those concepts were taught in upper grades. Teachers would benefit from consistent support in comprehending the new standards, learning the mathematics content required of the new standards, incorporating new instructional strategies for the new content, and developing a repertoire of representations and models to help students master the new standards.

The literature has defined the challenges in helping teachers make data-driven decisions. Because so much of educational policy focuses on data for accountability purposes, studies have found that teachers are adverse to using data. What this study found is when teachers are authentically supported to use data, teachers can and will use data to reflect on their students' progress and their own teaching. In this particular case, the teachers consistently consulted with each other and the mathematics coach to try to diagnose why students were struggling with specific concepts and to decide upon instructional courses of action. Schools should invest in mechanisms, like common planning times and data reporting technology, and personnel, such as coaches, to support teachers as they collaboratively analyze data and use data to inform instructional decisions. The process of analyzing data in terms of continually improving student outcomes in collaboration with teammates and coaches can empower teachers to continually problem solve for the benefit of their students.

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Educational Resources

Incorporating History of Mathematics into the Classroom: Some Suggestions for Teachers

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ABSTRACT

Teachers who are interested in incorporating history of mathematics into their classes may be unsure of where to look for resources, and how best to utilize them. This article makes some suggestions regarding the importance of using history of mathematics in the classroom, where to find materials, and how to integrate the historical component into a mathematics lesson.

INTRODUCTION

Two years ago, I attended an Annual XV Colloquium session where Leslie Horton presented her proposal focused on investigation of high school teachers' attitudes toward the History of Mathematics (HOM). I had been a history major in college, and believe that the integration of HOM into the mathematics classroom is valuable, but I had not been including HOM in my lessons. Horton's (2010) review of research on teacher attitudes toward HOM noted that I was not alone—the research seemed to indicate that even when teachers thought HOM would be useful, they still did not use it often enough in their lessons.

As I read Horton's proposal, and reflected on my own teaching practice I noticed that I am more likely to include HOM in lessons focused on a mathematical concept I know very well. Additionally, I needed to already know some of the history of this concept. I noticed that both conditions had to be met before I could determine a clear purpose for using HOM of this particular concept within the lesson. Horton (2010) has also noted the potential importance of both concept knowledge and HOM knowledge for teachers to consider inclusion of HOM in lessons. Even when I felt confident in both types of knowledge, I found myself having difficulties creating quality lesson plans and communicating the value of HOM to students. In this paper, I share some of my experiences using HOM in the math classroom, and offer some tips for other teachers who are interested.

PLANNING LESSONS

I believe it is critical to carefully plan incorporation of HOM into the mathematics classroom. There are several aspects that need to be considered, e.g., the purpose of the inclusion of the HOM topic, the audience, and the available material.

The Audience

First, the teacher must consider the audience to which a particular HOM topic is being addressed, specifically considering the students knowledge of mathematics, reading and writing. Early on in the year, I usually include HOM as a quick vignette, such as telling students about a famous mathematician, or as a single motivating problem that requires students to observe and recognize patterns in the real world, describe the pattern and test it. This allows my students to exercise inductive reasoning, and provides me with data about the interests and abilities of my students. Once I used the Fibonacci sequence (Enzensberger, 2000) as the introductory problem in my first lesson in geometry. I soon found out that my students were not enthusiastic readers, and that the long text passage, rather than putting the concept of pattern recognition in a historical light, confused them. I have learned that historical facts and other materials must be included but be simple in content and small in portions.

In a study which integrated HOM into a series of lessons, Jankvist (2009b) utilized a survey to determine the interest that a high school mathematics class had in both mathematics and HOM. Jankvist's questions asked the students to share what they liked most and least about mathematics, as well as their attitudes toward mathematics, e.g., was it important in everyday life, is mathematics discovered or invented, and how did the material included in mathematics textbooks come to be there. Such a survey served two purposes for the classroom instructor, first shedding light on student attitudes towards both mathematics and HOM and second,

indicating where students may have gaps in knowledge of mathematics. Jankvist (2009b) used the survey results to group students for research work, for discussion of HOM topics, and for focus group interviews. I find it is reasonable to administer such a survey at the beginning of the year, when teachers are typically collecting other information from students, and then utilize the information for strategic planning later on.

Rationale for Inclusion of HOM

Second, the teacher must have a clear vision of why he or she is including HOM in a particular lesson. Jankvist (2009b, p. 54) differentiates between "history as a tool" and "history as a goal." In the first case, HOM is included in a lesson to improve student attitudes towards the study of mathematics or improve understanding of mathematical concepts and procedures. In the second case, HOM is used to give students an idea of why mathematics is important in society, or how mathematics was developed. Each of these cases, Jankvist (2009a, 2009b) asserts, requires a different method of instruction. If HOM is used as a motivational tool, or to improve understanding, then short vignettes and single problems can be appropriate, but if the intent is for students to understand the manner in which mathematical concepts are developed over time, Jankvist (2009a) asserts that the module, consisting of multiple lessons, is appropriate. I believe that the vignette and single problem approach can be suitable in both cases; however, my goals for student learning are generally more limited than the ones that Jankvist (2009b) expressed in his study.

Available Materials for Including HOM in Lessons

A third consideration is the materials that are available to teach HOM. One convenient starting point for many instructors is their current textbook. The textbook may contain sidebars within lessons that talk about a famous mathematician, or how a specific formula or proof was developed. Ancillary materials that come with the text may provide additional options. If the teacher is lucky enough to have *older* textbooks available, this can provide an opportunity to show students how "historical mathematics" actually is being used. Finally, both libraries and the Internet can provide valuable material, including photographs and interactive tools to incorporate history of mathematics. Teachers can even find syllabi and activities from other teachers who have taught a specific topic through the use of online search tools.

VIGNETTES AND OTHER BRIEF HOM PIECES

Teachers may choose to include HOM in their classes as a quick enhancement to the topic currently being taught. Unlike Jankvist (2009a, 2009b), I assert that this approach may be suitable when the goal is to show students that mathematics has developed throughout history. However, a teacher who presents a five-minute vignette on Newton, Liebniz, and the development of the calculus should expect that most students will be able to recall that two persons may be credited with development of calculus, and not expect that students will be prepared to discuss the issue of who should be given credit, and why. I have frequently used brief historical vignettes in my class, and my Pre-calculus students recall that the Gauss after whom Gaussian elimination is named is the same Gauss who worked with complex integers.

Brief vignettes or single problems can also be used when a specific mathematician or problem is to be linked with the topic. There are many options that exist aside from sidebars included with a textbook, or preprinted "Math and History" worksheets. An algebra teacher might begin the class year with a quote from the start of Diophantus' *Arithmetika*, "Perhaps the subject will appear rather difficult…; but you, with the impulse of your enthusiasm and the benefit of my teaching, will find it easy to master; for eagerness to learn, when seconded by instruction, ensures rapid progress," (Heath, 1910, p. 129). Middle school math teachers could inform their students at the start of a unit on integers that, even as late as the seventeenth century, many mathematicians viewed negative numbers as absurd (Eves, 1990). A geometry teacher may choose to introduce Goldbach's conjecture as part of a lesson on inductive reasoning (Larson, Boswell, Kanold, & Smith, 2001b).

In the lower grades, there are also many options to use brief vignettes and single problems. Students learning multiplication by the lattice method may be informed that the method was used as far back as the 15th century (Smeltzer, 2003). Teachers can even improve slightly on the standard algorithm for multiplication by using an older variation that was printed in 1494 as the "chessboard" method (Smeltzer, 2003, p. 94). In the chessboard representation, small squares are used to help align the digits; therefore, teachers could choose to use this method to help students with handwriting problems better organize their work. This is a clear example of using history as a tool. Another example of using history as a tool to improve student attitude toward mathematics, a student struggling with long

division may take some heart in knowing that division was once considered to be so challenging that only specially trained people would use the operation (Smelzer, 2003, Horton, 2010).

Finally, HOM can be introduced quickly in a class to help improve student habits of mind. The teacher can mention that Hindu mathematicians wrote their work on sand-covered tablets, and thus had to erase their intermediary steps. On the other hand Arab mathematicians wrote their answers on paper and did not need to erase; therefore the Arab mathematicians were better able to check their work (Smeltzer, 2003). The teacher can then tell students that it is important to be sure one has enough space to complete a problem and to use already completed steps as part of checking one's work. When using historical examples to develop habits of mind, I believe it is important to state explicitly the habit of mind that is being taught, rather than assuming that students will be able to draw conclusions on their own.

WORKING WITH OTHER TEACHERS: CROSS CURRICULAR CONNECTIONS

In some situations, HOM may be used to enhance or reinforce topics that are being studied in other classes. This approach is similar to the module approach discussed by Jankvist (2009a, 2009b), in that it can include multiple lessons and opportunities for both in class discussion and written assignments. Teachers of fifth grade students may choose to include different historical number systems, consulting with a social studies teacher to plan a lesson that looks at Mayan numerals and compares them with the Hindo-Arabic system. Such a lesson could enhance studies of Pre-Columbian peoples while at the same time reinforcing students' understanding of place value. In upper middle school, when the Pythagorean Theorem is typically introduced, and students also study Greek and Roman societies, a social studies teacher and a math teacher could work together. Mathematics lessons on the Pythagorean Theorem could discuss attribution of the theorem to Pythagoras, and the importance of Pythagorean Triples. Social studies lessons could inform students about the historical Pythagoras and his school, and discuss the important role that mathematics played in the philosophical schools of Greece.

Horton states that, "learning the history of mathematics enables the student to place mathematics within the larger cultural context" (2010, p. 31). In contrast, Jankvist (2009a) notes that applied mathematics can frequently better illustrate both how mathematics has shaped society, and how cultural developments have influenced mathematics. In high school, as students and teachers are increasingly separated into math, science, and history departments, the opportunities for students to learn HOM are still present, but careful planning and coordination is even more important. Newer textbooks tend to emphasize applications that students might relate to rather than problems that illustrate the historical need for a specific skill. For example, practice problems for systems of equations might involve which car rental agency to choose based on initial cost and cost per mile, rather than a more historical problem such as one involving the price of different qualities of corn given in the Nine Chapters on the Mathematical Art (Joyce, 1996). Such a problem could be accessed using the Internet, and used to demonstrate how, long before the use of Cartesian coordinates, mathematicians still solved problems using tools similar to systems of equations.

The math instructor who wishes to include HOM in lessons might need to have a professional relationship with instructors or department chairs in other academic or technical areas. As well, the mathematics teacher may need to be able to balance the interests of students who are enrolled in the same math class, but different history or science classes. If students are enrolled in physics or physical science classes, math teachers can choose to address Kepler's Laws, which involve conic sections, exponents, and proportions (Larson, et al., 2001). Additionally, Newton's equation relating gravitational force and distance can be used in lessons about inverse variation. Teachers of statistics may choose to team up with teachers of psychology or current events to develop lessons that address how certain statistical formulas were developed. Math teachers may even choose to work with English or other language teachers to explore the etymology and history of words in mathematics.

SAMPLE LESSON ON RULES OF LOGARITHMS

I recently had the opportunity to include HOM in a series of lessons I was teaching on Rules of Logarithms. In prior lessons, the class had studied the definition of a logarithm, the relationship between logarithms and exponents, and the graphs of both of these functions. From the textbook and in-class lectures, they were aware that John Napier was credited with the invention of the logarithm. However, a review worksheet which noted that Oughtred had invented the slide rule in 1618 inspired me to develop more fully my use of HOM within a lesson.

My motivation for developing the lesson and including HOM was twofold. I wanted students to improve their ability to simplify expressions of the type $\log_b b^a$ and $\log_b c(b^a)$ without resorting to the change-of-base formula. Additionally, I wanted students to know why the development of the rules of logarithms was important historically and how these rules were used to simplify mathematics problems. It is my belief that the use of calculators in the mathematics classroom has obscured the value of these properties, leading to students who do not understand why a mathematician would need to expand a logarithmic expression. I used multiple resources in developing the lesson, including Wikipedia and other websites, Eli Maor's book on the number *e*, and an activity from an Algebra II text (Larson, Boswell, Kanold, & Smith, 2001). The HOM component of the lesson was the first 20 minutes of an 88 minute block format class.

The lesson began with an expression to simplify similar to one proposed by Maor (2009), including multiplication, division, and square roots. All numbers used were between 0 and 10. Students were asked to read the problem, and then imagine that they had to solve it without the use of a calculator. Students agreed that this would take a long time, and one asked if we could "just guess" the square root of a number, or if there was method for calculating the square root by hand. Students were then told that the lesson would discuss one method for computing a square root, and would discuss the historical motivation for developing rules of logarithms. Students were also told we would be working with simple slide rules, similar to the ones mentioned on their homework, and which had been used by math students as late as the 1970s.

Following this problem, students were given paper slide rules and a worksheet (Larson, Boswell, Kanold, & Smith, 2001). Students were shown how the slide rules worked and two sample problems, $\ln 2 + \ln 3 = \ln 6$ and $\ln 3 + \ln 3 = \ln 9$, were done together. Students then worked in teams of two to derive the rule $\ln a + \ln b = \ln (ab)$. Students worked in a similar manner to derive $\ln a - \ln b = \ln (a/b)$. The rule $\ln a^b = b (\ln a)$ was derived through a whole class discussion.

I asked students which operations they thought were easier to perform—addition and subtraction, or multiplication and division. The class agreed that when working by hand, addition and subtraction were easier. Once students had arrived at this conclusion, I was able to link the relative ease of computation to the historical motivation for formalizing the rules of logarithms. The class also discussed Oughtred's contribution, comparing the slide rule to a modern day calculator. Finally, I demonstrated how a student might have done the opening problem using the rules of logarithms and a table of logarithms from an older textbook. While doing a later application problem and using a formula that involved taking the logarithm of a quotient, one student asked me if we could use the rules of logarithms to solve the problem, rather than use the formula as written.

STUDENT RESPONSE TO LESSONS AND IMPLICATIONS FOR FUTURE PLANNING

Teachers should note that there is limited evidence linking inclusion of HOM with improved student achievement (Horton, 2010). Additionally, as Horton notes, State mandated testing and other factors weigh heavily on teachers decisions of what to include or exclude from the curriculum. One way to measure the value of HOM, and the effectiveness of lessons including it, is in the affective domain. To do this, I have engaged students in conversation about lessons including HOM as well as about independent student projects on HOM. My goal was to find out whether students felt the HOM component of a lesson or project was valuable to their mathematics education.

Students' responses varied widely, although no student reported a completely negative attitude toward including HOM in lessons. Students seemed to have the strongest negative responses to out-of-class assignments that involved HOM, in particular those that involved researching and writing an essay about a mathematician or a topic in mathematics. Based on my readings of student papers that were produced, it seems that students are able to understand and report basic biographical details of a mathematician, but lack the mathematical knowledge needed to describe what his or her mathematical achievements were. It was especially worrisome that students also could not link the concepts they had studied in class with what they had learned through research.

Jankvist's study (2009b) also noted this problem, especially in written assignments related to HOM. Students would have rich classroom discussion around the topic of Hamming codes and attribution of the discovery of different types of codes, but these discussions would often be reduced to short declarative statements in the written assignments that groups submitted. The written assignments concealed, rather than revealed, the knowledge that students had gained during the lessons.

In order to lower the chance of this problem recurring, I would suggest the following: teachers would assign a choice of only a few mathematicians, and

would also make clear how the mathematician's work relates to what has been studied, perhaps by selecting certain theorems or sections of the textbook. Teachers may also wish to consider scheduling time in class or outside of class for students to present their findings, or for students to discuss the topic they have researched with the teacher or with other students.

Following the lessons on logarithms that integrated HOM, students were asked to respond in writing to the questions, "Do you think the history of mathematics material has helped you to learn the mathematics we have studied? Should more or less history of mathematics be included in our lessons?" Students responded anonymously to the questions. Student responses were varied, but most reflected a change in the affective domain, as one student reported, "knowing how math used to be done makes me thankful for my calculator!" Many students reported enjoying the HOM component of the lessons, but the less positive responses were especially striking. One student stated, "I don't think anyone really pays attention to the history part of the class." Another student commented, "While the history is interesting, I don't think it helps too much in learning the mathematics, and we could do with fewer of these mini-history lessons."

Students may also respond that, while the history of mathematics is interesting, it is not important to include it in lessons because, as one female student stated "we will just have to go on and learn something boring anyway." The student did not appear to see a connection between HOM and his or her own learning, and perhaps saw HOM as separate from mathematics itself. The lack of connection that students made between HOM and the mathematical concept studied appeared to be a common theme through the neutral and negative responses, and led me to consider revising the lessons in order to more clearly point out the linkage between the two.

The teacher who chooses to include HOM in lessons may have to overcome the attitude, held by students and mathematicians alike, that HOM is not a valuable component of the study of mathematics. Teachers should also not, according to research cited by Horton (2010), be surprised if their more able students are those who seem less interested in HOM.

As Horton (2010) notes, it has been challenging to include HOM in lessons in such a way that both constraints of time and the needs of students are met. In part, I believe that this is due to curriculum frameworks that do not explicitly include HOM. However, I experienced the benefits to teachers that Horton (2010) discusses, including a better realization of why certain concepts may be so difficult for students to grasp, and an increase in my own knowledge of mathematics and its development.

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Perspectives on Equity of Access to Curriculum for English Language Learners

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ABSTRACT

This paper describes an interview with an English language lead teacher for the public schools in two towns in Central Massachusetts, and offers her perspectives on equity of access to curriculum for English language learners. The teacher provides her vision on the outcomes of the 2002 initiative that dismantled Transitional Bilingual Education (TBE) for ELL students in Massachusetts. Since the elimination of the TBE, low incidence districts have little funding to train classroom teachers to differentiate instruction for ELL students. Because there is a lack of ESL staff, beginning English learners spend most of the time in the classroom where they are not receiving intensive English language instruction. The teacher explains the inequities in instructional practices and the narrowing of curriculum for ELL students as teachers are faced with pressures related to mandated curriculum and high-stakes testing. She shares her vision for transformative changes in curriculum and instructional practices that will help to ensure success for ELL students in Massachusetts.

INTRODUCTION

Equity of access to curriculum remains a major problem for many students in public schools in the United States. Historically disenfranchised groups including ethnic minorities and students from low socioeconomic backgrounds often do not receive the same content-rich, constructivist curriculum as more privileged students. Access to curriculum is often narrowed for these populations of students as teachers are faced with pressures related to mandated curriculum and high-stakes testing. Limited financial resources and low social capital are also limiting factors for student success. I have been interested in investigating issues related to equity in curriculum and instruction in low socioeconomic communities that serve historically disadvantaged youth. In particular, I have been studying the choices of teachers and school administrators to emphasize certain aspects of the curriculum at the exclusion of others to meet AYP goals. To find out more about equity issues related to English language learners (ELL), I interviewed Victoria Torres de Acosta (pseudonym), the English language lead teacher for the public schools in two towns in central Massachusetts.

PROFESSIONAL BACKGROUND

I began my interview by asking the English language lead teacher about her background and how she came to her current position. In her native Argentina, Torres de Acosta said that she always knew that she wanted to be a teacher of English as a second language (ESL). She was inspired by her visionary principal who later became Torres de Acosta's mentor in her first job as a coordinator of the English language component of a bilingual school. In this position, Torres de Acosta had experience teaching both at the elementary and secondary levels. After teaching many years at the private school, Torres de Acosta moved to the United States and volunteered and later became a substitute teacher in her children's elementary school. Later, she took a job at the school as a Title I reading tutor.

Knowing that one of her challenges in Argentina was teaching reading, Torres de Acosta considered getting her master's degree and certification as a reading specialist. However, she experienced culture shock with her move to the United States and felt that she was missing some critical link to her passion for teaching students who were learning English. After discussing her goals with a professor at the University of Massachusetts Boston, Torres de Acosta was encouraged to pursue her master's in applied linguistics. In this program, Torres de Acosta learned about the sociocultural context and the politics of education. She also became more aware of the impact of socioeconomic status on a child's education. Torres de Acosta realized the impact she could make on a student's life and noted that education is a gateway where teachers are empowered to make choices about opening or closing doors for their students.

Torres de Acosta witnessed the increasing number of ELL students who were moving into the district where she taught. Since she was interested in a full time teaching job with ELL students, Torres de Acosta spoke to the Superintendent about creating a position. Two years later, the district named Torres de Acosta English language lead teacher for the two towns that she services. Even though her district is considered low incidence, Torres de Acosta has reported a steady increase in ELL students. In the elementary school where she began teaching, the ELL population began at one student in 2004 to 21 students in 2011.

OUTCOMES OF DISMANTLING TRANSITIONAL BILINGUAL EDUCATION

Torres de Acosta commented on equity issues when she noted that while the population of ELL students continues to grow in Massachusetts schools, there is no increase in staffing for these students. She said that this was not due to lack of legislation. In 2002, Massachusetts passed Question 2, a petition initiative that amended the Transitional Bilingual Education statute, G.L.c.71A. The amended law dismantled Transitional Bilingual Education (TBE). Unless a waiver was granted or the students were placed in a two-way bilingual program, the ELLs were placed in a structured English immersion program. This model consists of two parts. English language learners receive sheltered English instruction from the classroom teacher who provides support with instructional materials in English. The content is sheltered so that the curriculum and presentation is designed for children learning the language. The second component involves an ESL teacher who provides intensive English language instruction. Depending on the student's level of language proficiency, ESL instruction could be 2.5 hours to a full school day for beginning learners. (Massachusetts Department of Education, 2003). Torres de Acosta said that the passing of Question 2 was problematic for low incidence districts since it was an unfunded mandate. There is little funding to train classroom teachers how to differentiate instruction for ELL students. Because there is a lack of ESL staff, beginning learners spend most of the time in the classroom where they are not receiving intensive English language instruction. Unfortunately, Torres de Acosta noted that 275 districts were cited for not being in compliance with this legislation.

Torres de Acosta has had many conversations about the level of support ELL students receive through her contacts in the Massachusetts English Learner Leadership Council (MELLC). Torres de Acosta has concurred with other ELL directors and teachers who believe that even when districts provide support for ELL students, the administration may hire instructors as tutors rather than allocating the funding for professional status teachers. A tutor has more responsibilities than a paraprofessional, but does not have the status of a teacher. She remarked that there are inherent inequities in this system since there are many demanding responsibilities for this teaching position. Torres de Acosta believed the tutor position fits the description of a professional teacher because tutors have many responsibilities including planning with the classroom teacher, contacting and supporting parents, administering the state mandated Massachusetts English Proficiency Assessment (MEPA), making decisions about language proficiency levels in consultation with the lead teacher, and writing reports. Torres de Acosta said that it was a disservice to pay competent professionals as tutors when they are performing the job of a teacher. She believed that there is an unfair perception that anyone can work with ELL students. She also noted that in times of financial constraint, cutting the position of a professional status ELL teacher is often first on the chopping block. She recalled that a retiring ELL teacher in another district was replaced with someone who was hired for tutor's pay. Torres de Acosta quipped that it would be unthinkable to replace a classroom teacher with an instructional aide. She believed that these inequities exist primarily because laws are not adequately enforced. She also noted that immigrant parents are often not aware of the laws, do not complain to the Superintendent, and are not questioning the quality or amount of ESL instruction. In his interviews with Mexican immigrant families, Stanton-Salazar (1997) shed light on why some parents remain uninvolved in their children's schooling despite strong commitment to education. Parents cited lack of education, illiteracy, or limited proficiency in English as possible roadblocks for actively advocating for their child's needs.

INEQUITIES IN INSTRUCTIONAL PRACTICES

Assessments

Now that I had sufficient background knowledge about Torres de Acosta's background and her perspectives on instruction for English language learners, I asked her about her thoughts on how the ELL students are accessing the MCAS exam. Torres de Acosta explained that all ELL students take the MEPA test to determine their proficiency level in English. Students can be classified as one of five levels. She remarked that in general, the higher the student scores on the MEPA, the more likely the student will attain proficiency on the MCAS. She said that by definition, the ELL subpopulation does not do well. When ELL students score at the proficiency level on the MCAS and demonstrate that they adequately access the classroom curriculum, they have been exited from the program. In Torres de Acosta's experience, ELL students at the first three levels of the MEPA often score poorly on MCAS and have a frustrating experience. She believed that the MCAS test is designed primarily for monolingual students and is a waste of time for ELL students before they reach level five on the MEPA. Torres de Acosta seriously questions "construct-irrelevant components of MCAS in that

it is testing an ELL's ability to access the linguistic load of the test rather than the student's content knowledge" (personal communication, October 21, 2011). She noted that for many ELL students that she services, the MCAS is a source of great frustration and stress as they attempt to take a test that is not designed for their level of English.

Torres de Acosta said that she is an advocate of Lev Vygotsky's model of the zone of proximal development, which is defined as the distance between the actual developmental level of the student and his or her potential for learning through guided instruction (Vygotsky, 1997). Torres de Acosta would no doubt agree with Vygotsky's observations that the actual developmental level of students could be determined by academic tasks that they could accomplish on their own. Traditional testing like the MCAS usually considers these defined skill sets to be the end result of development and the terminus of a child's mental capacity. Vygotsky (1997) challenged this notion by suggesting that a true test of a child's mental abilities involved investigating potential by modeling problem solving. For example, a teacher might begin a problem solving process and determine whether or not a student was able to complete it. Alternatively, a teacher might ask leading questions or ask a student to repeat a demonstration. The level of potential development was determined by what the child could do with assistance. The MCAS exam does not fall within the zone of proximal development for ELL students before they reach level five on the MEPA.

Currently there is no alternative to test the ELL student's potential development. For Torres de Acosta, the MCAS exam is a waste of time since it is not a valid measure of a beginning ELL student's knowledge. Hoffa (1990) notes that the face validity of a standardized test should be evaluated by experts in the field to make sure the test items are a reasonable measure of a student's abilities. Because of the increasing numbers of ELL students in Massachusetts, ELL educators should have an opportunity to voice opinions about the validity of the test and come up with reasonable alternatives.

Narrowing the Curriculum

I then asked Torres de Acosta if she has seen evidence in the district of narrowing the curriculum in order to meet the demands of the MCAS exam. I wondered if she felt that the subpopulation of ELL students was not receiving critical instruction in English language acquisition in favor of preparation for the mandated state test. Torres de Acosta noted that there was one school in the two towns that she services that sends home MCAS preparation packets with all students including English language learners. She reiterated her stance that it was a "waste of precious time" to prepare this subpopulation of ELL students who have historically fared poorly on a test that was not designed to fairly test their abilities.

TRANSFORMATIVE CHANGES

Curriculum Standards

Torres de Acosta believed that time would be better spent helping ELL students progress on standards focusing on language, reading, and writing. She felt that ELL students needed more time spent on developing comprehension and language acquisition through content areas. She felt that these changes may be realized for ELL students since Massachusetts has joined the World-Class Instructional Design and Assessment (WIDA) Consortium which is aligned to the national Common Core curriculum standards. The WIDA Consortium emphasizes teaching topical vocabulary to ELL students so that they understand key grade-level concepts through kinesthetic, visual, and auditory supports. WIDA also supports contextualizing language in an authentic instructional setting (Board of Regents of the University of Wisconsin System, 2011). According to Torres de Acosta, the curriculum for ELL students is going to be delivered more through the language of the content standards.

Efforts by the WIDA Consortium could help to diminish the effects of linguistic segregation. Cohen (2000) noted that some public schools in the United States segregated ELL students depriving them of developing natural conversations with native English speaking peers. The researcher noted that these students fell behind in their academics because their language instruction was not connected to content standards. Because the ELL students were also more likely to be from low socioeconomic backgrounds, they were faced with seemingly insurmountable difficulties in accessing content. In Massachusetts, supporting the reforms of the WIDA Consortium to support language acquisition through content standards can help to avoid the inequities described above.

Curriculum Design

Torres de Acosta noted that in many classrooms there is minimal instruction in English language acquisition for ELL students. She believed that teachers felt a great deal of pressure to cover standards in order to meet the requirements for state mandated testing. She felt that teachers needed to take the time to determine

the essential ideas in their units so that they could successfully meet the needs of the ELL students in their classrooms. Torres de Acosta believed that more time should be spent considering the "student's funds of knowledge" for the units of study and the essential components of reading and writing. She strongly supports the backwards design model of curriculum planning. In this model, the teacher identifies the essential question and priorities learnings based on curriculum standards before planning effective classroom instruction (Wiggins & McTighe, 2005). She was worried that the consequences of the state mandated tests included a curriculum that was watered down to a list of vocabulary or a group of chapters that a teacher covered in each content area. According to Torres de Acosta, it was important to provide a rich curriculum with direct instruction in reading and writing, hands-on constructive activities, and opportunities to connect content to real life experiences. She believed that these objectives are solid teaching practices for not only English language learners, but for all students in the classroom.

Teacher Empathy

Even though professional development is provided for teachers of ELL students, Torres de Acosta said that there is no guarantee that these strategies will be carried out in the classroom. The professional development opportunities vary greatly with respect to quality. In some cases she has witnessed no changes in classroom practice. Regardless of the reasons for why these strategies are not implemented, Torres de Acosta believed that teachers have empathy for ELL students. She was confident that teachers have an open mind for transformative change. In an ethnographic study of bilingual elementary teachers in Texas, Palmer and Rangel (2011) also found empathy for the challenges of ELL students. Even though the teachers in Texas were reported to have made pedagogical decisions based on test taking strategies, they strongly supported critical thinking and authentic learning as best classroom practices for ELL students. The Texas teachers struggled with the need to cover state mandated curriculum and provide authentic learning experiences that would boost the language acquisition of their ELL students.

Opportunities for Collaboration

Torres de Acosta also believed that it would be beneficial for the district to hire more staff members to collaborate with classroom teachers so that they can effectively design units that met the requirements for sheltering content for ELL students. Additionally, she believed that effective strategies for sheltering content need to be part of the professional goals of teachers and principals' evaluations. Torres de Acosta was hopeful that each principal is dedicated to making these transformative changes for the steadily growing population of students in the public schools. Torres de Acosta's vision for school organization and student learning closely follows a dynamic, multidirectional model proposed by Gamoran, Secada, and Marrett (2000). In this model, the organizational resources of the school such as an investment in more teaching staff can affect both professional development opportunities and teaching practices. In turn, effective teaching practices can boost collaboration among teachers and contribute to the social resources of the school. For Torres de Acosta, the winners of this approach would be the ELL student population that she oversees.

Connections with Parents

Torres de Acosta felt that the schools need to work just as hard with parents to ensure that their ELL students are accessing the curriculum. She noted that there is a marked disadvantage of parents who cannot speak English. Because of the communication barrier, these limited English speaking parents have difficulty helping their children with homework, school projects, and other assignments. Torres de Acosta remarked that too often teachers make assumptions about parents and what they understand about American schooling. Despite their education level, cultural and linguistic differences inhibit parents from understanding the expectations for a particular assignment. Additionally teachers need to be aware that parents from different cultures may approach literacy in ways that differ from the dominant American expectation. For example, an ELL family may explore literacy through games and conversations rather than reading a story. Conchas (2006) also noted that the amount of information, support, and supervision that families contribute is often dependent on their cultural background. Because of these differences, Torres de Acosta said that parents of ELL students could definitely benefit from more guidance from the school in helping their children to succeed.

Torres de Acosta's observations about miscommunications with parents are echoed in a report by the Gaston Institute for Latino Community Development and Public Policy. The report noted that parents of ELL students in the Boston Public Schools were not well informed of the law regarding English as a second language instruction. Miscommunications with the school resulted in many parents failing to enroll their children in English language learning programs even though the school identified the students as needing help. The

report identified a tripling of the dropout rate for students who did not take advantage of such services (Vaznis, 2009). Torres de Acosta noted that this alarming report of dropouts is a wake-up call to public schools to attend to the needs of the family when trying to address the challenges of its ELL population.

Connecting the needs of the family and student is an important way that schools can help develop social capital for ELL students. In his study of Mexican American youth, Stanton-Salazar (2001) found that adolescents sometimes were left with the choice of facing challenges by themselves because they perceived their immigrant parents to have limited power or influence. These adolescents often became defensive and missed opportunities to support their academics because their coping strategies were too individualistic. By supporting the family in the educational process, schools have the opportunity to build social capital and ensure success for ELL students. These integrated networks can help to build trust between families and the school to ensure that ELL students have more equitable access to curriculum.

Sustainable Change

After considering the equity of access for ELL students, I wondered what Torres de Acosta believed would be essential for sustainable change in public schools. She commented that it takes a great deal of persistence to ensure that reforms occur that will not only benefit ELL students, but all of the diverse learners in a class. Torres de Acosta suggested that too often there are a multitude of initiatives that demand the time and effort of teachers. She believed that sustaining the change that is necessary to ensure equity of access to curriculum is the biggest problem. She noted that changes need to become part of the goals of the faculty and endemic of school culture. She maintained that certain school reforms are not options. School leaders need to step up to the plate and demand that this is the way that their school functions.

CONCLUSION

My interview with Victoria Torres de Acosta provided important insights into the inequities that ELL students face when accessing curriculum. It appears that these challenges are not insurmountable if Torres de Acosta's vision is realized. As more and more immigrant children enter the public schools in Massachusetts, school leaders need to work diligently to ensure equitable access of curriculum for all the diverse learners in the school. This will require following established recommendations from the Department of Elementary and Secondary Education, devoting adequate resources to curriculum, instruction, and staffing, and involving families to build adequate social capital for students. Transformative changes may require more stringent recommendations and radical program choices. Above all else, it appears that narrowing the curriculum to fulfill short term goals will not ensure the future success of traditionally disadvantaged populations.

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The Nature of Teaching in an Alternative High School

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ABSTRACT

Dropping out of high school is costly not only to the student but also to society as well (Lessard et al., 2008). In an attempt to reduce dropout rates and prevent the associated detrimental outcomes, schools employ a variety of dropout prevention strategies (Smink & Schargel, 2004). This ethnographic study intends to examine one particular strategy called alternative schooling. The adjective "alternative" has been used for over 40 years to describe a vast array of school settings (i.e., charter schools, magnets, Montessori, Waldorf, homeschooling), however, it has become more commonly associated with educational settings that serve youth who are at risk of school failure (Lehr, Tan, & Ysseldyke, 2009). Therefore, the working definition of alternative for this study will be: a school, housed in its own facility that specifically focuses on "engaging students at risk of dropping out of school and reconnecting those who have already left" (Martin & Brand, 2006, p. 8).

The number of at-risk students attending alternative schools has continued to rise, and alternative schools and programs have continued to proliferate as a result (Foley & Pang, 2006; Kochhar-Bryant & Lacey, 2005; Menendez, 2007; Powell, 2003; Quinn & Poirier, 2007). As the number of at-risk students attending alternative settings increases, so does the need for teachers who are prepared and willing to work in such settings with this population (Lehr et al., 2009). Research indicates that teachers who intend to work in alternative programs with at-risk youth need to receive specialized training that prepares them for the specific challenges they will face (Ashcroft, 1999; Hosley, 2003), and develops their capacity to use practices that have been empirically proven to be effective with at-risk youth (Barr & Parrett, 2001). And yet, many alternative educators have not been specifically trained or certified to work in alternative settings and instead have learned the skills they need through trial and error, their own experiences, and practice (Ashcroft, 1999; Ashcroft et al., 1992; Hosley, 2003; Morley, 1991). In order to create effective and relevant training and professional development programs for alternative educators, a good understanding of the nature of teaching in an alternative setting is needed (Kochhar-Bryant & Lacey, 2005). Therefore, I intend to conduct an in-depth ethnographic investigation guided by the following research question: What is the nature of teaching as it is experienced by teachers in an alternative school for at-risk youth?

This study will also be guided by the literature on alternative education as well as Johnson's (1990) concept of the workplace. The proposed research site is a NEASC accredited alternative high school that has been operational for 17 years and located in an urban community. This non-graded college preparatory alternative high school was selected as the potential site because it was designed specifically for students, ages 16-21 years old, who have either left their district high school prior to graduation or are significantly at risk of dropping out of these schools. This study will focus on the perspectives and experiences of the educators in the alternative high school. The potential site currently has 14 teachers. The educators will be selected based on their willingness to participate and it is anticipated that 5-6 will take part in the study. Data collection methods will be guided by Spradley (1979) and Fetterman (2010) and include participant observations, focus groups, in-depth interviews, and a document review. Data will be organized and analyzed using QSR International's qualitative software, NVivo 9. Other topics discussed include subjectivity, validity and trustworthiness, ethnographic limitations, and the significance of the study.

THE NATURE OF TEACHING IN AN ALTERNATIVE HIGH SCHOOL

Dropping out of school has been called a silent epidemic (Bridgeland, DiIulio, & Morison, 2006), a crisis (Rumberger & Lim, 2008), and a challenge (Steinberg, Johnson, & Pennington, 2006). In 2007, approximately 6.2 million people between the ages of 16 and 24 years old were high school dropouts. "Among these dropouts, 60.1% were men, 18.8% were Black, and 30.1% were Hispanic" (Center for Labor Market Studies, 2009, p. 2). Dropping out is costly not only to the student but also to society as well (Lessard et al., 2008). In comparison to students who graduate from high school, dropouts are more likely to have higher rates of unemployment. For example, in October 2005 high school dropouts had an estimated unemployment rate of 32.9% whereas high school graduates not attending college had a rate of 20.6% and graduates who were attending college had a rate of 8.4% (Bureau of Labor Statistics, 2006). If a dropout does obtain employment, it is estimated that they will have lower

earnings than graduates. For example, the U.S. Census Bureau (2006) estimated that high school dropouts have an average annual income of $17,299 while high school graduates and those who have obtained their equivalency earn an average of $26,933 annually (as cited in Alliance for Excellent Education, n.d.). Additionally, dropouts are more likely than their counterparts to have poorer health and higher rates of mortality. "On average, a high school graduate lives nine years longer than a dropout and is less likely to suffer from cardiovascular disease, cancer, lung disease, diabetes, and other infections" (Alliance for Excellent Education, n.d., ¶ 8). Thus, high school dropouts have the potential to cost the country, over the course of their lifetimes, more than $319 billion in lost wages and $17 billion in Medicaid and uninsured health care expenses (Alliance for Excellent Education, 2009).

The social costs of dropping out are also significant. High school dropouts are less likely to vote (Rumberger & Lim, 2008). A recent report found that only 31% of dropouts voted in 2004. This percentage is much lower than the 61% of college graduates who also voted that same year (Goldstein, 2006). They are also more likely to distrust the government and disengage socially and civically from their communities (Goldstein, 2006). Consequently, schools employ an array of dropout prevention strategies in an attempt to reduce dropout rates and prevent the detrimental outcomes previously mentioned.

DROPOUT PREVENTION

Smink and Schargel (2004) identify 15 effective dropout prevention strategies that schools use. Their findings are based on over two decades of research conducted by the National Dropout Prevention Center/Network. The 15 research-based strategies as follows: systemic renewal, school-community collaboration, safe learning environments, family engagement, early childhood education, early literacy development, mentoring and tutoring, service-learning, alternative schooling, after-school opportunities, professional development, active learning, educational technology, individualized instruction, and career and technical education. This ethnographic study intends to examine the nature of teaching in one of the aforementioned dropout prevention strategies, alternative schooling.

ALTERNATIVE EDUCATION

Although the adjective "alternative" has been used for over 40 years to describe a vast array of school settings (i.e., charter schools, magnets, Montessori, Waldorf, homeschooling), it has become more commonly associated with educational settings that serve youth who are at risk of school failure (Lehr, Tan, & Ysseldyke, 2009). For example, the most recent survey report from the National Center for Education Statistics (NCES) defines alternative schools and programs as follows:

> Alternative schools and programs are designed to address the needs of students that typically cannot be met in regular schools. The students who attend alternative schools and programs are typically at risk of educational failure (as indicated by poor grades, truancy, disruptive behavior, pregnancy, or similar factors associated with temporary or permanent withdrawal from school). Alternative schools are usually housed in a separate facility where students are removed from regular schools. Alternative programs are usually housed within regular schools. (Carver & Lewis, 2010, p. 2)

However, limited agreement still exists on a clear definition for alternative education (Lange & Sletten, 2002; Lehr et al., 2009; Quinn & Poirer, 2007; Raywid, 1990). Raywid (1990) states that this disagreement exists because alternative educators have "extensively different conceptions of what alternative education is about, what it is for, and how it is best conducted" (p. 32). Nevertheless, Raywid's (1994) typology is commonly cited within the literature (Aron, 2003; Aron, 2006; Foley & Pang, 2006; Hosley, 2003; Lange & Sletten, 2002; Powell, 2003; Ruzzi & Kraemer, 2006).

Raywid's (1994) typology of alternative education consists of three types. Type I alternatives are popular innovations or schools of choice that are programmatically innovative. They provide curriculum flexibility and depart from traditional practices because they believe in fixing the school to meet the needs of the students. On the other hand, Type II and Type III alternatives focus on fixing the student. For instance, Type II alternatives are last-chance programs or "soft jails" that focus on behavior modification and teaching the basics. Type III alternatives focus on the remediation of academic skills and/or social and emotional rehabilitation. Though Raywid's typology is widely cited, some researchers purport that many alternatives are actually blended or hybridized versions of the abovementioned types (Aron, 2003; Powell, 2003).

Despite the lack of definitional and typological agreement, several common characteristics are associated with alternative schools in the literature. Lange and

Sletten (2002) provide the following as a summary of the generally agreed upon characteristics of alternative schools:

- maintaining a small size;
- emphasizing one-on-one interaction between teachers and students;
- creating a supportive environment;
- allowing for opportunities for student success relevant to the students' future;
- allowing for flexibility in structure and emphasis on student decision-making (p. 6).

For this study, the working definition of alternative will be: a school, housed in its own facility that specifically focuses on "engaging students at risk of dropping out of school and reconnecting those who have already left" (Martin & Brand, 2006, p. 8).

ALTERNATIVE EDUCATION STUDENTS

Alternative education students have been called disengaged (Kelly, 1993), disinterested (Loutzenheiser, 2002), vulnerable (Ruiz de Velasco, 2008) and at-risk (Kochhar-Bryant & Lacey, 2005; Lehr et al., 2009; Worrell & Hale, 2001). According to Kochhar-Bryant and Lacey (2005),

> Youth included under the 'at-risk' umbrella include those who have been chronically academically unsuccessful, suspended from, expelled or dropped out of their community school, abused, neglected, exploited, abducted, runaway and homeless youth, migrant youth, victims of crimes, offenders, and those who abuse drug and alcohol. (p. 1)

These students may also lack appropriate adult role models and depend upon representatives from institutions such as foster care, the juvenile justice system, and child protective services to serve as their primary caretakers (Perez & Johnson, 2008). They are commonly between the ages of 12 and 21 years old and a good portion have been identified as learning disabled, or emotionally and behaviorally disordered (Foley & Pang, 2006). Some cited reasons for referring or transferring students to alternative settings include: fighting or physically attacking someone; possessing, distributing, and/or using drugs and alcohol; inappropriate or disruptive behavior; academic failure; chronic truancy; and possession or use of a weapon (Carver & Lewis, 2010; Kochhar-Bryant & Lacey, 2005; Williams, 1999). Clearly, the characteristics attributed to these students vary as much as their reasons for attending alternative schools.

JUSTIFICATION AND PURPOSE FOR THE STUDY

The number of students attending alternative schools has continued to rise, and alternative schools and programs have continued to proliferate as a result (Foley & Pang, 2006; Kochhar-Bryant & Lacey, 2005; Menendez, 2007; Powell, 2003; Quinn & Poirier, 2007). Barr and Parrett (2001) estimate there are approximately 20,000 alternatives in the United States. More recent data obtained by NCES during the 2007-2008 school year estimates that 645,000 at-risk youth attended an alternative setting, and 64 percent of public school districts indicated that they provided at least one alternative setting that was operated by either the district or another entity (Carver & Lewis, 2010).

As the number of at-risk students attending alternative settings increases, so does the need for teachers who are prepared and willing to work in such settings with this population (Lehr et al., 2009). Research suggests that the successful outcomes of at-risk students, particularly those who attend alternative schooling, may be contingent upon the quality of instruction they receive from their teachers (Kochhar-Bryant & Lacey, 2005). Barr and Parrett (2001) assert that students are more successful when their teachers are well-prepared and willing to differentiate instruction in addition to having high expectations, caring deeply, and believing in their students' success. Furthermore, research indicates that teachers who work in alternative settings need unique skill sets, beyond those related to content knowledge, that are specific to the population of students they serve (Ashcroft, 1999; Ashcroft, McNair, & Price, 1992; Brewer et al., 2000; Hosley, 2003; Quinn & Poirier, 2007; Wolford, McGee, & Ritchey, 1996). Therefore, teachers who intend to work in alternative programs for at-risk youth need to receive specialized training that prepares them for the specific challenges they will face (Ashcroft, 1999; Hosley, 2003) and develops their capacity to use practices that have been empirically proven to be effective with at-risk youth (Barr & Parrett, 2001). And yet, many alternative educators have not been specifically trained or certified to work in alternative settings and instead have learned the skills they need through trial and error, their own experiences, and practice (Ashcroft, 1999; Ashcroft et al., 1992; Hosley, 2003; Morley, 1991). According to Ashcroft (1999), most of the teachers in his study reported that "they were not adequately prepared during their preservice training" for the "legal, social, and psychological problems" of their students (p. 82). Moreover, alternative educators are "missing opportunities for professional development and collaboration"

because the schools and programs they work within "often operate in relative isolation" (Martin & Brand, 2006, p. 29). Therefore, in order to further their development, alternative educators must seek out relevant professional development opportunities. However, even today such "focused training opportunities for educators and other program specialists are limited or nonexistent in many agencies" (Wolford et al., 1996, p. 175). Moreover, few colleges or universities offer courses or certifications related to teaching in alternative settings (Ashcroft, 1999; Ashcroft et al., 1992; Morley, 1991). Currently, only four universities are listed on The National At-Risk Education Network's website as providers of graduate-level programs related to alternative education for at-risk youth; they include: Marian University, University of Wisconsin-Whitewater, University of West Florida, and Lock Haven University of Pennsylvania.[1] This lack of university level programming limits alternative educators' training and professional development options. It also gives the impression that this line of work is not "recognized as a legitimate career path for educators with its own training paradigm and licensure" (Ashcroft, 1999, p. 85).

Another avenue for development that alternative educators may take is attending conferences related to alternative education or at-risk youth (Ashcroft, 1999). According to a post by Jennings (2011) on the International Association for Learning Alternatives website, there will be 10 national and state alternative conferences held next year.[2] However, such conferences are most likely not held locally for many alternative teachers, requiring them to have to take time off for travel. Moreover, conference and travel expenses can become costly, especially if such expenses are not reimbursed. Therefore, more opportunities for relevant training and professional development for this type of educator need to be made available.

In order to create these opportunities for development, a good understanding of the nature of teaching in an alternative setting is needed (Kochhar-Bryant & Lacey, 2005). However, "very little attention is paid to different conditions faced by different teachers in different contexts" (Berry, Smylie, & Fuller, 2008, p. 6). Therefore, more research that focuses on the conditions of teaching in an alternative school for at-risk youth is needed. Correspondingly, the call for this type of research can be found throughout the alternative education literature (Aron, 2006; Ruzzi & Kraemer, 2006; Kochhar-Bryant & Lacey, 2005; Lehr et al., 2009). Therefore, I intend to answer this call by conducting an in-depth ethnographic investigation of the nature of teaching in an alternative high school.

In order to conduct such an examination, I intend to work in partnership with alternative educators because teachers have a wealth of knowledge, and ways "of legitimizing it, codifying it, and making it public" need to be found (Hargreaves, 1996, p. 105). In order to make a fundamental step towards initiating lasting improvements in education, change must come "from the inside out rather than the top down" (Tyack & Cuban, 1995, p. 134). In other words, "unless practitioners are also enlisted in defining problems and devising solutions adapted to their own varied circumstances and local knowledge …" (p. 137), improvements will not last. Therefore, I intend to welcome the voices of alternative educators beyond their school walls using an ethnographic approach because it is well positioned to capture the voices, perceptions, experiences, and perceived needs of these teachers. The following section will provide the theoretical framework that will guide my investigation, my qualitative research orientation, and the methodology I intend to employ in this study.

THEORETICAL FRAMEWORK

"Theory is a guide to practice; no study, ethnographic or otherwise, can be conducted without an underlying theory or model… [because] the researcher's theoretical approach helps define the problem and how to tackle it" (Fetterman, 2010, p. 5). Therefore, this ethnographic study will be guided by the literature on alternative education as well as Johnson's (1990) concept of the workplace. Though other researchers have examined school as a workplace (McLaughlin, Talbert, & Bascia, 1990; Rosenholtz, 1991) as well as teacher's work (Lortie, 1975; Waller, 1961), I decided to use Johnson's model as my guide because it will complement rather than restrict the inductive nature of my methodology. Johnson's model is depicted as a constellation of the following workplace features: physical, organizational, sociological, economic, political, cultural, and psychological (Figure 1, next page).

The physical features, according to Johnson, are workplace elements that are associated with the safety and comfort of an environment as well as the physical space and its resources. Organizational features, on the other hand, are related to the structural characteristics of an organization. They determine whether or not

1. For more information, please see http://www.atriskeducation.net/resources/studies.html
2. For more information, please see http://learningalternatives.net/weblog/post/429/

authority is centralized, whether or not workloads are demanding, and whether or not workers can exercise autonomy. They further decide how closely work is monitored by supervisors, how much interaction and interdependence workers experience, and whether workers are expected to serve as generalists or specialists.

The sociological features in Johnson's model include the work roles that employees assume, the social statuses associated with their positions, and the characteristics of their coworkers and the clients they serve whereas the economic features of the model speak to how employees are reimbursed for their services. More specifically, how much are employees paid? What types of benefits, incentives, and rewards are they provided? Is there job security for this position?

Political features of an organization are also addressed in Johnson's model. These organizational features determine whether workers have a voice in the governance of the organization, whether a union negotiates on behalf of the workers' interests, or whether workers experience equity and fairness. Johnson also describes the cultural features of work environments as "the norms, traditions, and rituals of their workplaces, factors that shape an understanding of, and commitment to, their tasks" (p. 18).

According to Johnson, workplace cultures can be either strong or weak, in addition to exhibiting various levels of supportiveness. For example, "some encourage workers to compete mercilessly rather than attend to each other's needs. Some promote compliance and drudgery rather than play and celebration. Some engender humiliation rather than pride" (p. 19). Lastly, Johnson describes the psychological features present in the workplace. Particularly those related to how meaningful someone's work is perceived to be, how much opportunity for learning, growth, and improvement exists, and how much stress the work environment presents.

All in all, these aforementioned features are apparent in most workplace settings. However, Johnson

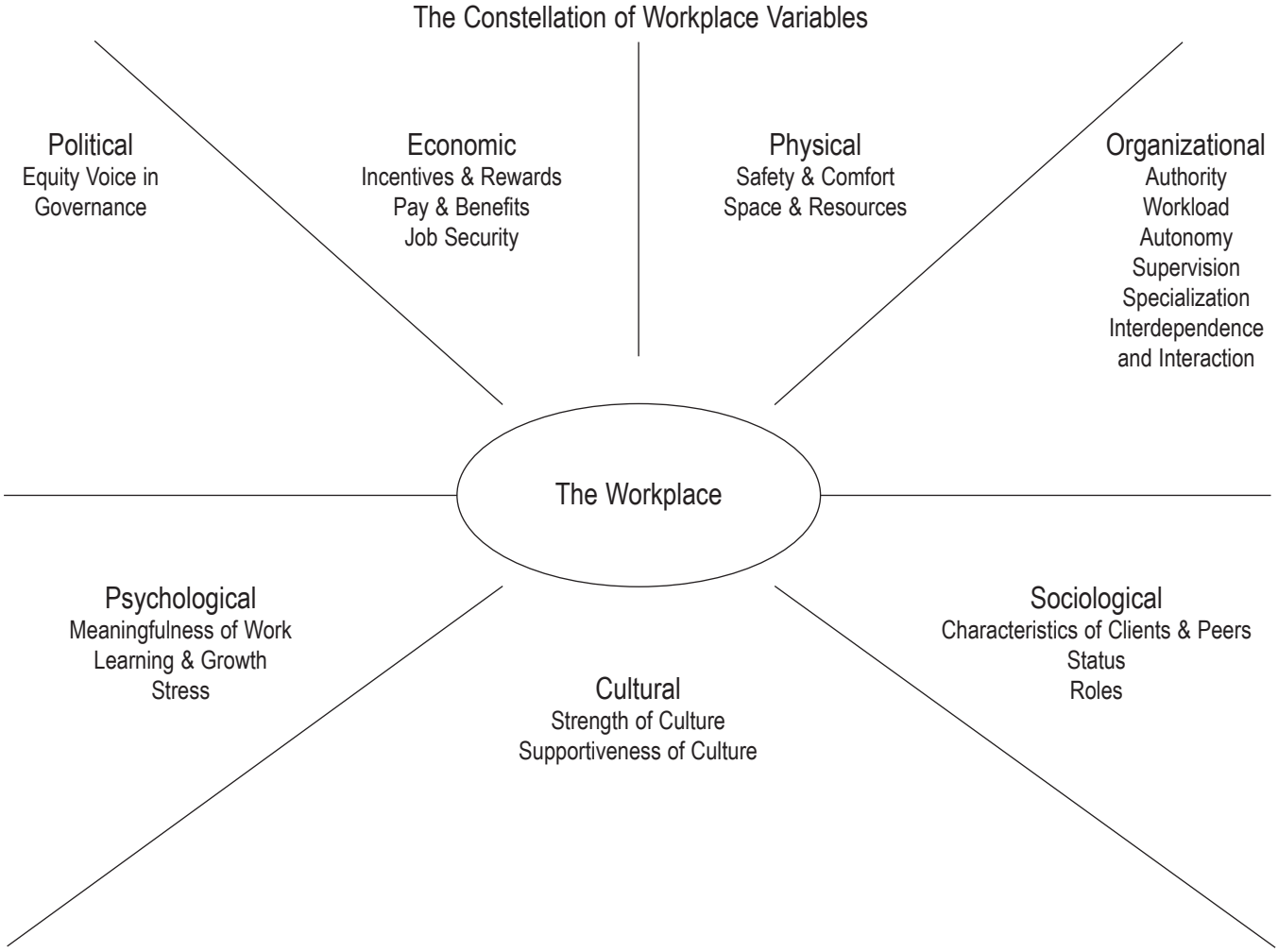

Figure 1. The Constellation of Workplace Variables. Adapted from "Teachers at Work: Achieving Success in Our Schools," by S.M. Johnson, 1990, p. 22. Copyright 1990 by Basic Books.

remarks that some variables are more salient in certain forms of work than others. She further states that the aforesaid features do not occur in isolation but rather interact in complex ways and "considering each of these variables from multiple perspectives can be illuminating" (p. 23). Therefore, this study will attempt to capture the array of contextual features as well as the working conditions experienced by a group of teachers in an alternative school for at-risk youth. The research question that will guide this ethnographic inquiry will be: What is the nature of teaching as it is experienced by teachers in an alternative school for at-risk youth?

QUALITATIVE RESEARCH ORIENTATION

In order to answer the abovementioned research question from the perspective of the alternative teachers, I am approaching this ethnographic study with a phenomenological orientation. "Phenomenology is the study of people's perception of the world …" and its "focus is thus on understanding from perspective of the person or persons being studied" (Willis, 2007, p. 107). I plan to gather in-depth information from the alternative teachers on how they interpret their daily work. I hope to learn about the teachers' subjective meanings and psychological understandings of the nature of their work by using the methodology described below.

METHODOLOGY

This section will provide a description of the proposed research site, the potential participants, the various forms of data I plan to gather, the organizational approach I will take, and the process I intend to use for analyzing the data. It will also describe issues related to subjectivity, validity, and trustworthiness, and ethnographic limitations. I will then conclude with a brief statement about the significance of the study.

Research Site

This ethnographic study will be conducted in a NEASC accredited alternative high school that has been operational for 17 years and located in an urban community in the northeast. The executive director has been with the school for the last seven years and she stated that she would be very supportive of my studies (personal communication, October 8, 2011). I have selected this non-graded college preparatory alternative high school as my potential site because it was designed specifically for students, ages 16-21 years old, who have either left their district high school prior to graduation or are significantly at risk of dropping out of these schools. This alternative school serves about 150 students per year from the city it is located within as well as over six neighboring towns. During the 2010-2011 school year, 108 students were enrolled on October 1, 2010 and another 43 students enrolled sometime after this point in the school year. The number of students enrolled at the end of the school year (on June 30th) was 96 students, and 16 of those 96 students graduated. The total number of students who left during this school year was 55 students. According to the annual report, the reasons for student departure included: expulsion (2), transferred to another in-state public school (7), transferred to another in-state private school (1), transferred to an out-of-state (public or private) school (2), withdrew to pursue GED (43), withdrew to enter Job Corps (2), withdrew due to employment (2), and withdrew but plans were unknown (24).

Participants

This ethnographic study will focus on the perspectives and experiences of the educators in the alternative high school. The potential site currently has 14 teachers. The educators will be selected based on their willingness to participate and I anticipate around 5-6 will take part in the study. The potential participants will be informed that this study is voluntary, and they may decide to withdraw from the study at any time. If the teachers agree to participate in the study they will need to sign a consent form. I will discuss the potential risks participants may encounter during this study such as the discomfort participants might feel in regards to being observed and audio recorded. I will attempt to minimize such risks or discomforts by allowing participants to withdraw if the involvement becomes too painful or uncomfortable. In addition to the potential risks, I will also inform the potential participants of the benefits of participating in this study such as having the opportunity to voice their experiences and perceptions of working in an alternative school.

Data Sources

The data will be collected over the course of the 2012-2013 school year in order to capture the nature of teachers' work in an alternative high school. In order to build redundancy into my study I will collect multiple sources of data. Data will be collected through participant observation, focus groups, and in-depth interviews with the alternative teachers. School-related documents will also be collected and analyzed. The major sources of data collection are described in more detail below.

Participant observation. I want to participate as a volunteer in the teachers' work environment in order to observe their interactions, social dialogues, and shared

norms (LeCompte & Schensul, 1999). I hope to provide support during the school year in order to give something back to the school while serving as a participant observer. I will keep written field notes in order to capture and record situations as they happen. Through this method, I hope to capture the teachers' interaction patterns, beliefs, emotions, and actions as well as the meanings they attribute to these concepts. Pending permission, I will attend faculty meetings and any other meetings that are held during the school year. I am anticipating that the participant observations will help me to develop a positive rapport with the teachers more quickly; however, I understand that rapport does not develop instantly but rather through a sequence of stages (Spradley, 1979).

Focus groups with teachers. For approximately 60-90 minutes once a month, the researcher and teachers will meet within the school to informally talk as a group about the nature of working in an alternative high school. Teachers will be offered dinner during the focus group sessions as an incentive for attending the meetings. The conversations during the focus groups will be audio recorded. This form of data collection will be used as a way to obtain information about the social norms, behaviors, and attitudes present among this particular group of teachers. It will also be used to identify potential participants with rich sources of data for the individual, in-depth interviews. The researcher will lead the group discussions. Group elicitation techniques such as vignettes or dilemmas related to teaching in an alternative school might be read to elicit responses from the teachers (LeCompte & Schensul, 1999). During these sessions, teachers may also be asked to role play the typical interactions teachers have on a daily basis with other teachers, students, administrators, and parents. I will ask participants to engage in this type of activity so that I can discover questions and answers typical in this culture (Spradley, 1979). I will use the information gathered during these sessions to develop further questions for subsequent focus group meetings as well as the one-on-one interviews.

In-depth interviews with teachers. In order to get more in-depth data, teachers will be invited during the focus group meetings to have three one-on-one semi-structured interviews with the researcher. The in-depth interviews will be conducted during the beginning, middle, and end of the school year. Each interview will last approximately 60-90 minutes. The interviews will be audio recorded and take place on the teacher's turf in their classrooms.

Using Spradley's (1979) *The Ethnographic Interview* as a guide, I propose to use the following types of interview questions. The first types of questions will focus on just keeping the informants talking. These descriptive questions will include what Spradley refers to as grand tour questions, mini-tour questions, example questions, experience questions, and native-language questions.

The first grand tour question I will most likely start with is: It's been several years since I worked in an alternative school, and I am sure things may have changed and your school in particular may be different from the one I worked in. Could you take me through the school and tell me what it is like, what I would see if I walked around during a typical school day? In addition to this spatial question, I will ask my participants the following grand tour question related to time: "Could you describe the main things that happen during the school year" (p. 86) from the beginning in August until the end of the year in June? I will also ask the participants to explain the sequence of events a teacher goes through on a daily basis, weekly basis, monthly basis, or yearly basis. I will ask the teachers to give me a grand tour of the people involved in the school community in addition to the significant school events and activities. I will also ask about the different objects used during the course of their work, such as forms and technologies. I will photograph or electronically scan any objects they describe. Other grand tour questions may include but are not limited to:

1. Could you describe a typical day at this alternative school?
2. Could you describe a typical day within your classroom?
3. Could you describe what happened yesterday from the moment you arrived at work until you left?
4. Could you show me around the school?

By asking the aforementioned grand tour questions, I hope to gain "a verbal description of significant features of the cultural scene" (p. 87).

In addition to grand tour questions, Spradley (1979) proposes that an ethnographer use mini-tour questions also. After asking the aforesaid questions, I may find that a recurrent activity that I may want the teachers to describe further. I would then ask them to describe this specific activity. Other types of mini-tour questions that I could use during this study are:

1. Could you describe what you do during your lunch break at school?
2. Could you describe what you do during your off period?

3. Could you describe what you do in your homeroom on a daily basis?
4. Could you describe some of the positive aspects of your work?
5. Could you describe some of the challenges you face at work?
6. Could you describe the types of emotions you have experienced while working here?

Other types of questions I will ask are what Spradley (1979) refers to as example questions, experience questions, and native-language questions. When I use example questions, I will focus on obtaining an example of a single event identified by the teacher I am interviewing. For example, if a teacher expressed that they experience stress during their school day, I may ask them to give me examples of what they mean by stress. I may also ask them to give me an example of a stressful situation they have encountered within the school.

Experience questions will focus on obtaining information about encounters the teachers have had in the alternative school. Some possible types of experience questions for this study are: Could you tell me about some experiences you have had working as an educator in an alternative setting? You've probably had some important experiences while working in this school, can you recall any of them? When using this type of question, I will need to be cognizant that the types of responses may be atypical rather than recurrent and that the best time to ask them is after I have asked many grand tour and mini-tour questions (Spradley, 1979).

I also plan to use native-language questions in order to minimize the teacher's need to translate. I will ask the teachers to use common terms and phrases of the alternative school. For instance, I may ask the teachers direct-language questions such as: How would you refer to this school? How would you talk about teaching at this school? What are some phrases or words that I would hear said in this school that I might not hear in others? Then I may ask more meaningful questions based on the teachers' responses.

In addition to descriptive questions, I intend to ask structural questions. Alternating between structural questions and descriptive questions provides variety within an interview protocol (Spradley, 1979). An example of a structural question I may ask is: What are some different kinds of challenges you face at work? I may also ask the teachers to provide explanations through probes such as: I'm interested in the way you and other teachers deal with work-related stress, how do you deal with it? or What are the names you would use for all the different kinds of challenges you encounter as an educator at an alternative school for at-risk youth? It is important to note that the types of questions I will ask may evolve or change based on preliminary findings from my observations, initial interviews, or focus groups.

Other forms of data. In addition to the previously mentioned data, school-related documents such as demographic information, school annual reports, the student and parent handbook, newspaper articles, website content, school memos and announcements will also be collected.

Data Organization and Analysis

Data organization and analysis will begin on the first day and continue throughout the course of the project (Fetterman, 2010). During this process, I hope to learn about the cultural meanings the alternative teachers use to describe their working conditions (Spradley, 1979). In order to be transparent, organized, and efficient during my analysis (Fetterman, 2010), I will use QSR International's qualitative software NVivo 9 to store, organize, code, and analyze the different forms of data I will collect. I will import the following types of documents into the internal folders: relevant literature (pdfs), observations (researcher's field notes), semi-structured interviews (transcripts), focus group interactions (transcripts), and school documents (pdfs).

I will immerse myself in the data in order to look for patterns that emerge over time. I acknowledge there is more than one way to analyze a phenomenon and that I need to capture as best as I can the emic perspective of my informants in regard to how they conceptualize their experiences in their workplace (Fetterman, 2010). I can do this by testing out with my participants any preliminary domains and hypotheses I identify (Spradley, 1979). In addition, I will also need to step back and situate the data in an etic or external perspective as well (Fetterman, 2010).

Cases. The unit of analysis for this project will be the teachers. Each of the teachers will be a case within the NVivo e-project. By using cases, I will be able to code and link various documents directly to each case. I will also create the following attributes for each teacher: years of teaching experience, years spent working with at-risk youth, gender, age, title, race, ethnicity, marital status, subjects taught, number and credit level of homeroom advisees.

Coding. I will use tree nodes to organize my coding. Using Johnson's (1990) concept of the workplace as my initial guide, I will construct the following as preliminary codes that may emerge: physical, organizational, sociological, economic, political, cultural, and psychological.

In addition to using a priori codes from literature, I will also look inductively for codes that emerge from the data.

Memos. I will continuously write reflective memos throughout the analysis phase. Memos provide a place to voice my thoughts as well as a method for saving them from being lost (Glesne, 2011). Within my NVivo e-project, I will create the following types of memos: start here memo, methodological log, source memos, code memos, model memos, and memos about emergent themes. The start here memo provides a road map for others who may view my NVivo e-project. The methodological log will be used for keeping track of when I log in and what I complete each time I work in the project. The other memos will be a place for me to work out my thoughts about my sources of data, the codes I will be inductively and deductively deriving, the models I will use to visually work out my thoughts, and the themes I see emerging during the analysis.

Subjectivity

I am a former teacher of an alternative school, but it has been almost four years since I worked in such a capacity. Nevertheless, I have been preoccupied during the last four years with researching and reading about the following topics: continuation high schools, alternative education, high school dropouts, youth placed at-risk, and resiliency. I have conducted various forms of case study research with my former colleagues as well as survey research with my former students. I have also been serving as a tutor for a local alternative program for almost a year now. I find that I am deeply passionate about working with at-risk youth and programs that have been established to educate and support them. Therefore, it is important to acknowledge that my past experiences may cloud or color my interpretations. However, I also feel my ability to empathize with alternative teachers will help me to understand and relate to where they are coming from and facilitate the ease of rapport building between myself and them. I will need to stay vigilant and aware of my own thoughts as I partake in this study. I plan to do this by continuously reflecting upon and recording my thoughts and feelings in memos that will be shared with the participants.

Validity and Trustworthiness

In order to ensure the validity and trustworthiness of this study, I will conduct member checks, have an expert panel review my inferences, and methodologically triangulate my data. In order to conduct member checks, I will transcribe the audio recordings of the focus group conversations and the interviews. I will provide a copy of the transcripts as well as my memos to the participants so they may check the authenticity of my work. I will also provide them with the opportunity to comment on or add anything that might be missing from the transcripts or memos.

I will also have an expert panel, such as the professors on my dissertation committee, review my inferences. Peer review can increase the reliability and validity of the inferences I make about the data (Glesne, 2011). I will make my work transparent to my professors by sharing my NVivo e-project with them so they may critically inspect and examine my analysis. Lastly, I will triangulate my multiple sources of data to further improve the validity and reliability of my ethnographic research by cross examining the four types of data collected: focus group transcripts, interview transcripts, ethnographer's field notes, and school documents.

Limitations

Like all research methods, ethnographies have limitations. Comparing ethnographies to other settings can be problematic and they are also difficult to replicate because they usually focus on only one specific entity; therefore, they usually do not lead to generalizable findings. For instance, this study will be limited to the alternative teachers who are willing to participate from my proposed site in the Northeast. However, the true purpose of ethnography is not generalizability but instead an in-depth and intensive understanding, gathered over a period of time, that questions widely held assumptions as well as ordinary behaviors and routines that are taken for granted. Additionally, it is very useful in identifying questions or hypotheses for future research.

SIGNIFICANCE OF THE STUDY

According to Morley (1991), "the heart of alternative education is the teacher" (p. 12). And yet, the educators in such schools have taken somewhat of a back seat in the literature. Therefore, this ethnographic study will provide an avenue for some alternative teachers' voices, thoughts, perceptions, and experiences to be shared and heard. It will also provide a strong foundation for understanding the nature of teaching in an alternative high school in addition to illustrating how these teachers experience and internalize their daily work. This study will contribute to both the growing body of literature on alternative education and the extant literature on teacher working conditions. The information obtained from this study will provide a foundation for the development of teacher professional development programs that focus on preparing teachers to work in alternative school settings with at-risk youth.

It will also identify questions or hypotheses for future research on alternative educators and their working conditions.

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