SOCIAL AND ORGANIZATIONAL INFLUENCES ON LITERACY DIFFERENTIATION: A MIXED METHODS STUDY

By

Kelly Puzio

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Approved:

Professor David Cordray

Professor Robert Jiménez

Professor Victoria Risko

Professor Bridget Dalton

Professor Georgine Pion

To Erin, my sun and stars,

For your abiding love and support

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CHAPTER I

INTRODUCTION

Students enter school with unique academic, social, and cultural histories. In the U.S. student population, 21% speak a language other than English at home, 12% have an individualized education plan (National Center for Education Statistics, 2009), and 7% meet the federal definition of gifted (NAGC, 2011). In addition, both national (U.S. Department of Education, 2009) and international (PISA, 2009) assessments show that U.S. students range widely in their reading achievement scores. Further, students in every setting have different interests, have participated in a multiplicity of different literacy practices (e.g., reading, translating, digital composition, negotiating), and have drastically diverse educational and career trajectories. Given the academic, social, and linguistic heterogeneity present in most classrooms, how can educators support the learning of *every* student? When fully appreciated, the complexity and depth of this question is daunting.

In response to student diversity, educational organizations have long advanced arguments supporting differentiated instruction, claiming that responsive and customized curriculum and instruction is both equitable and effective. The National Association for Gifted Children (1994a; 1994b) identified differentiation as a core competency for teachers, arguing that a differentiated approach is critical to ensure equity and excellence for all students. The Learning Disabilities Association stated that no single reading method is effective for teaching students to read. Therefore, they argued, it is critical for teachers to know how to support the reading development of students through a variety of methods (e.g., multisensory phonics, phonological awareness, meaning, and comprehension). According to the International Reading Association's position

statement *Making a Difference Means Making It Different* (2000), differentiated instruction is a way of honoring the fundamental right of children to excellent instruction. Importantly, this organization also contends that sound differentiation can occur only if the teacher deeply understands reading, attends carefully to the strengths and needs of students, and adapts instruction accordingly. For these organizations, differentiated instruction is viewed as a vision of high-quality instruction, one that recognizes and responds to diverse ways of knowing, learning, and reading.

Differentiated instruction has also made recent appearances in U.S. statutory, regulatory, and case law. In federal statutory law, the Higher Education Opportunity Act (2008) includes specific grant provisions to help general education teachers differentiate instruction. Likewise, many states, such as California (*Cal Ed Code § 99237.5*, 2009), Kentucky (*KRS § 156.095*, 2010), and Alabama (*Ala. Admin. Code r. 290-3-3-.03, 2010*), have written provisions related to differentiated instruction into their teacher quality and teacher development codes. Furthermore, courts in California, New Jersey, and New York have upheld decisions to rate a teacher unsatisfactory (*CTA/NEA, Roseland Educators Ass'n v. Roseland School District*, 2006), withhold a salary increase (*Paramus Board of Education v. Education Ass'n of Paramus*, 2003), and terminate an employment contract (*Shums v. N.Y. City Dep't of Educ.*, 2009) when it was argued that the teacher was not—among other things—differentiating instruction. While there are multiple ways to assess teacher quality, these laws, regulations, and court decisions provide evidence that some districts and schools are evaluating teacher quality with a vision of differentiated instruction.

Using an array of designs, data sources, and participants, studies have approached the topic of differentiated instruction with a variety of goals. Based on the assumption that differentiated

instruction is an exemplary instructional strategy, a large number of studies have documented ways that teachers can (and have) differentiated, such as individualized writing prompts (Tobin, 2005), tiered homework (Bellamy, 2005), and open-ended tasks (Hertzog, 1998). Another collection of studies surveyed whether and how teachers differentiated (e.g., Cajkler & Hall, 2009; Westberg et al., 1997) or documented the accommodations made for "gifted" students (e.g., Westberg & Archambault, 1997). In an effort to influence teacher practice and improve student achievement, a small collection of studies examined the impact of interventions employing differentiated curriculum (e.g., VanTassel-Baska et al., 2008) or professional development on differentiated instruction (e.g., Brighton, Hertberg, Moon, Tomlinson, & Callahan, 2005). Lastly, a small group of studies have examined social and organizational factors that influence differentiated instruction, such as principal support (Hertberg-Davis & Brighton, 2006), peer coaching (Latz, et al., 2009), pacing guides, and administrative edicts (Tomlinson, 1995).

These various approaches have investigated how teachers differentiate instruction, if interventions can influence this practice, and whether organizational factors may influence this practice. These studies consistently reported that teachers differentiate to some extent, that they differentiate in a wide range of ways, that long-term professional development (even with consultative support) does not influence teacher differentiation or student achievement, and that organizational factors, such as principal support and school policies about curriculum, seem to influence teacher differentiation.

Although a relative handful of studies have focused their investigation on the organizational factors that affect classroom differentiation, they have been limited in several ways. Using qualitative methods, researchers have observed, interviewed, and facilitated focus groups with

administrators and teachers about their support for differentiated instruction (Hertberg-Davis & Brighton, 2006; VanTassel-Baska et al., 2000), the difficulties of whole school reform (Tomlinson, 1995a), and the role of peer coaching (Latz et al., 2009). While these studies have identified an array of conjectured factors that seem to influence differentiated instruction, such as principal support and teacher autonomy, these factors have yet to be tested using advanced quantitative methods, such as multilevel modeling. While multiple quantitative studies have explored the relative influence of principal support (Mcgarvey, Marriott, Morgan, & Abbott, 1997b), school policies on inclusion (Houtveen & Van de Grift, 2001), and school enrollment criteria (Hausman & Brown, 2002), they have relied exclusively on teacher and administrator self-report (via questionnaire), which significantly limits the scope and generalizability of their claims.

The scarcity of information organizational influences have on differentiated instruction is regrettable. While educational organizations, legislatures, and courts have explicitly used differentiated instruction as a model of high-quality instruction, information on ways to support this practice in organizational settings is scarce. In part, this is due to the fact that teaching is seldom conceptualized within its social and organizational context. Too often, educational policy and research assumes that teachers are autonomous agents unaffected by their social and organizational context. Evidence on how to support ambitious instruction within an organizational setting is important for policy-makers, principals, and educators who earnestly desire to promote differentiated instruction in any district or school.

This mixed methods study investigated the practice of literacy differentiation in its organizational context. A mixed methods design was used, and it involved triangulating quantitative and qualitative data. In the first phase of the study, quantitative data on differentiated

instruction was analyzed using multilevel growth modeling. In the second phase, 15 elementary school teachers (and their principals) were interviewed to help understand how teachers were supported to differentiate their literacy instruction. The qualitative phase primarily used interview data and aimed to explore teacher (and principal) descriptions of literacy differentiation and the social and organizational factors that supported (or limited) this practice.

CHAPTER II

LITERATURE REVIEW & THEORETICAL PERSPECTIVE

The purpose of this chapter is to present and discuss relevant research and theory that guided and framed this study. The first section will introduce and explore the topic of differentiated instruction. Different forms and models of differentiated instruction will be presented and analyzed. Second, previous research that has considered differentiated instruction from an organizational perspective will be described and analyzed in depth. Third, the theoretical perspective of this study will be articulated, explaining central constructs and their connection to the practice of differentiation in school settings.

Differentiated Instruction

What is meant by the term differentiated instruction? The usage of differentiation in educational discourse is complex, varied, and historically situated. For example, the term differentiation has been used to describe schools for the gifted (Thorndike, 1941), pull-out programs (Ross, 1954), and even academic tracking (e.g., Gamoran, 1989; Gamoran & Weinstein, 1998). In this paper, I am using the term differentiated instruction to refer to the assessment, planning, and instructional practices of the classroom teacher. Other educational scholars have used the term with this focus (e.g., Baker, 1936; Betts, 1957; Bobbit, 1924; Traxler, 1954). With this emphasis in mind, Tomlinson (1995a) defined differentiated instruction as "the recognition and commitment to modify content, process, and/or products in response to individual student differences in readiness, learning profiles, and interests." Tomlinson's definition identifies three categories of differentiation (content, process, and product) and three

relevant forms of diversity (readiness, learning profile, and interest). It is important to note that there are many definitions of differentiated instruction; this one has been highlighted because it is cited widely by researchers and policy-makers.

Two reviews (Subban, 2006; Tomlinson et al., 2003) have been conducted on differentiated instruction. In one review, Tomlinson et al. (2003) argued that differentiated instruction is increasingly important because the shifting realities of school (e.g., less tracking, reduced programs for the gifted, mainstreaming of students with special education needs) leave the general classroom teachers responsible for responding to student diversity. After describing theories and constructs that support differentiation, such as Vygotsky's (1978) zone of proximal development, multiple intelligences (Gardner, 1993), and learning preferences (Sternberg, 1997), the review reports findings from empirical studies on differentiated instruction. The empirical studies are categorized by three forms of diversity (readiness, interest, learning profile). While this review does not synthesize or critique the empirical studies, the review does include a section on the six "hallmarks of effective differentiation" (p. 127). The authors argued that effective differentiation is proactive, uses flexible grouping, varies materials by group, uses variable pacing, and is knowledge- and learner-centered. In considering issues that require further study, the authors concluded that the following were particularly important topics to pursue:

- What is the range of students for whom differentiated, heterogeneous classrooms might be effective?
- What is the relative impact of differentiating instruction based on learner readiness needs versus interests, versus learning profiles? Is it important to address all of those elements simultaneously?

- What is the impact of such classroom elements (e.g., learning environment, affect) on the achievement of diverse populations?
- What teacher-development models might enable teachers to enter the profession with attention to student variance and to grow systematically in responsive teaching throughout their careers?
- What are the most fruitful roles for specialists (e.g., gifted education, special education, second language learning) to play in staff development?
- How can we determine the optimum amounts of time that students with special learning needs should spend in more heterogeneous versus more homogeneous settings?

The authors of this review also concluded that learner difference is often viewed as a problem by inservice and preservice teachers and that when teachers attempt differentiation, it is often done in limited and ineffective ways.

The second, shorter (less than 10 page) review was conducted by Subban (2006), an Australian who argued that differentiation is gaining popularity across the world. After stating that "all reports echo promising outcomes" (p. 936), Subban reviews the same theoretical constructs (e.g, interest, ZPD, multiple intelligences) mentioned in the Tomlinson et al. (2003) review. In a short review of empirical studies, Subban presented findings from seven articles, all of which reported a positive influence on classroom instruction and student learning. The theoretical and empirical studies were not synthesized or critiqued.

Review of Previous Research

Although two previous reviews have been conducted, a systematic review of research was conducted to guide the current study. This review focused exclusively on empirical literacy research (e.g., reading, writing, spelling) whereas previous reviews have included studies with any outcome. Thus, the central objective of this review was to gather, synthesize, and critically interpret the empirical research on differentiated instruction in order to help educational professionals understand what differentiated instruction is and how this instructional practice can be supported in diverse settings and classrooms.

Previous reviews argued that today's classrooms are typified by diversity and that the shifting realities of school (e.g., less tracking, reduced programs for the gifted, mainstreaming of students with special education needs) leave general classroom teachers responsible for responding to this diversity. Tomlinson et al. (2003) also pointed out that teachers and researchers have different conceptions of what it means to differentiate instruction. Building on these findings, this review asks two general questions:

1. What findings are consistently reported ub the empirical literature about differentiated instruction in literacy? What patterns can be derived from this research?
2. Are there different models of differentiated instruction? If so, what are the defining characteristics of these models?

Inclusion Criteria

Any published empirical report on differentiated instruction (provided by the general education classroom teacher) was eligible for inclusion. In order to be considered an empirical

research report, reports had to include at least a description of how data were gathered (e.g., observation, interview) and analyzed (e.g., constant comparative method). Studies could be published in a journal or on the websites of educational or research organizations. Studies could be qualitative or quantitative and could use any theoretical framework and analytic method. Students had to be of school age (PK-12), so all studies with college or adult students were excluded. After-school programs were not eligible. Studies had to investigate literacy (e.g., reading, writing, and grammar) instruction. Studies that focused on math or science outcomes entirely were excluded. Because the primary instructional agent had to be the general education classroom teacher, studies that primarily relied on reading specialists or special education personnel (e.g., Coyne, Pisha, Dalton, Zeph, & Cook, 2010) were excluded. Any qualifying school in any region or country was eligible. There was no date restriction on when studies were conducted.

Search Strategy

For this systematic review, studies on differentiated literacy instruction were identified using several methods. First, the reviewer searched Cambridge Scientific Abstracts (CSA) using the following databases: ERIC (Education Resources Information Center), IBBS (International Bibliography of the Social Sciences), PsycARTICLES, and PsycINFO. Because differentiated instruction is often called tiered instruction (e.g., McMackin & Witherell, 2005) or tailored instruction (e.g., van Kraayenoord, Miller, Moni, & Jobling, 2009), a wildcard version of these keywords was used (see Table 1). Second, bibliographies of relevant literature reviews (and included studies) were inspected for potential reports. Finally, an attempt was made to identify reports published by national educational organizations by searching the websites of national

organizations (e.g., Association for Supervision and Curriculum Development) known to support differentiated instruction.

Table 1: Review Search Sources, Terms, & Results

Search Source	Search Terms	Search Results
CSA (using ERIC, IBBS, PsycARTICLES, PsycINFO)	KW=(differentiat* or tailor* or tier*) and KW=instruction*.	5617
Prior reviews (Subban, 2006; Tomlinson et al., 2003)		190
NAGC, ACSD, Neag Center for Gifted Education and Talent Development, U.S. Department of Education	KW=(differentiat* or tailor* or tier*) and KW=instruction*.	22
Total		5829

The list of potential studies was generated from the search results. Abstracts were collected and read to determine whether the study met the inclusion/exclusion criteria. Of the 5829 studies returned above, the vast majority of these had nothing to do with differentiated instruction. In most cases, the words "differentiate" or "differentiated" was used in an abstract to mean distinguish rather than this specific instructional practice.

In order to identify studies on my focal topic, I first *excluded* studies based on reading abstracts carefully using the guidelines previously identified:

- The article was not on the topic of differentiated instruction
- The article did not report empirical findings.
- The article did not report findings about literacy.
- The study was not delivered by the regular classroom teacher (e.g., reading specialist).
- The study was not conducted in the regular classroom (e.g., pull-out setting).

For a study to be eliminated, the abstract had to include information clearly indicating that the study met one of the exclusion criteria described above. If enough information was not provided in the abstract, the study passed onto the next round for further analysis. The majority of articles during this round were excluded because they had nothing to do with differentiated instruction. The screening stage narrowed the pool of studies a great deal; only 418 of 5807 studies passed the initial screening of article abstracts.

Then, I put the remaining 418 articles through a full-text initial review. First, I investigated if the article was an empirical study rather than a review or opinion piece. Second, the "Methods" section was reviewed to ensure that the data gathering and analysis were described in sufficient detail to warrant further inclusion. Finally, I eliminated articles based on the general exclusion criteria described above. This stage also resulted in a substantial narrowing of the study pool. Only 117 articles passed this stage and were read fully. A full reading of 117 articles resulted in the exclusion of more than half of the remaining studies. In the end, 46 empirical studies were included in this review.

Data Management & Analysis

Of the 418 articles initially reviewed, 305 articles were collected from online sources, 56 articles were available in the library on microfiche, microfilm, or in bound periodicals, and 67 articles were requested by inter-library loan. An electronic or paper copy was collected for each article, and each study was read and coded. Here were the general categories of information coded:

- Study citation, type of publication, country
- Student characteristics (e.g., age, grade)
- Unit(s) of analysis (e.g., student, teacher, professional development)

- Research focus
- Study design, data sources, analytic procedure

Using the categories described above, each study was coded and the data were entered into a Microsoft Excel spreadsheet.

In this review, the spectrum of included studies was wide, so an important analytic decision was to sort the corpus into meaningful categories. Based on the conjecture that researchers, teachers, and principals may have different models of differentiation, the research unit(s) of analysis (e.g., student, teacher, pre-service teacher) was used to categorize studies. As a practical matter, coding the unit(s) of analysis was generally quite simple; most studies specifically foregrounded one social unit, such as the teacher or students. As studies were categorized using this framework, however, it became clear that some studies, especially larger, multi-year projects, had multiple foci (e.g., teachers, students, and principals). Whenever possible, the conclusions associated with each unit of analysis were separated.

Review Results

Overwhelmingly, differentiated instruction takes the form of additional support or more/less complex activities or texts. Although there is substantial discussion about differentiation in response to interest and learning style, this body of literature overwhelmingly differentiated for student ability/readiness. When authors did differentiate by interest or learning style/preference, it was typically enacted by providing students with choice (e.g., Hertzog, 1997; 1998). Perhaps the best way to understand what is meant by differentiated instruction is to present the forms of differentiation that were researched and reported on in the empirical literature. Although this list will not be exhaustive, it does provide a concrete illustration of what

is meant by differentiated instruction. Following the distinction of Tomlinson (1995), the forms of differentiation were divided into three categories: differentiation by content, process, and product.

Forms of Differentiated Instruction

Content differentiation. Differentiation by content means providing individuals or groups with diverse texts or material. Typically, content differentiation means offering students texts responsive to their assessed reading levels, interests, or language background. Examples of reading-level content differentiation include using leveled texts (Linn-Cohen & Hertzog, 2007; Kirkey, 2005; Tobin, 2007; Tobin, & McInnes, 2008) and child-specific book bundles (Tobin, & McInnes, 2008). Texts might be assigned by the teacher (e.g., Tobin, 2007) or selected by the student (van Kraayenoord et al., 2009). More recently, scholars have argued that multilingual (Santamaria, 2009) and multimodal (Freedman et al., 2005; van Kraayenoord et al., 2009) texts are differentiated. Further, digital texts that have customizable multilingual and multimodal features (Dalton et al., 2011) can also provide differentiated content. In addition to providing diverse texts, differentiated content can be achieved through the use of tiered spelling lists (Brown & Morris, 2005), different vocabulary lists (van Kraayenoord et al., 2009), curriculum compacting (Linn-Cohen & Hertzog, 2007), and copies of daily notes or highlighted texts or students with individualized education plans (Tobin, 2007).

Process differentiation. Differentiation by process means inviting and encouraging students to engage in different learning activities or to engage in the same activity using a different approach, technique, or strategy. Overwhelmingly, process differentiation is connected to teacher-student conferences and can take the form of guided reading (Tobin, & McInnes, 2008) or dialogue connecting oral and written language (Tobin, 2005; 2007). It can also take the

form of tiered homework (Bellamy, 2005), individualized written comments (Freedman et al., 2005; Hachem et al., 2008; Werderich, 2002; van Kraayenoord et al., 2009), explicit instructions on help-seeking (Tobin, 2005), and tasks prompt sheets (Tobin, 2005; Tobin, & McInnes, 2008). Specifically considering language diversity, bilingual students have been encouraged to use their first language as a pre-writing strategy (Santamaria, 2009) or text-to-speech software (Dalton et al., 2011; van Kraayenoord et al., 2009).

Product differentiation. Differentiation by product means allowing and encouraging students to demonstrate their knowledge in multiple modalities. Most forms of product differentiation involve the use of open-ended tasks, such as creative writing (Hachem et al., 2008; Hertzog, 1997, 1998), research projects (Kirkey, 2005; Tobin, 2007), reader response journals (Werderich, 2002), and multimodal projects (Freedman et al., 2005; Linn-Cohen & Hertzog, 2007). It can also take the form of tiered products (Tobin, & McInnes, 2008), dramatic performances (Bellamy, 2005), and accepting oral instead of written responses (Tobin, 2007). One distinguishing characteristic of product differentiation is that students (rather than the teacher) are often given choice (or constrained choice) about the way they can express their knowledge. Researchers who focused on product differentiation often argued that meanings are made (as well as distributed, interpreted, and remade) through many representational and communicational resources and knowledge can and should be assessed in a variety of ways.

Commentary. Although three forms of differentiation were presented and analyzed in this literature, differentiation by content was the most commonly researched approach. Although process and product differentiation were present, these approaches to differentiation were typically a secondary rather than a primary focus. Another pattern in these studies was the failure to discuss students in detail. As an instructional strategy, differentiation should be a consequence

of formative assessment. Only a few studies (e.g., Brown & Morris, 2005) discussed students (or student assessment data) in enough detail to understand why specific forms of differentiation were justifiable. In general, the instructional planning and thinking associated with differentiation were left completely unanalyzed.

Models of Differentiated Instruction

Within the literature that specifically attends to the planning, assessment, and instruction of the classroom teacher, the construct of differentiated instruction is used in multiple and varied ways. Although differentiated instruction is a vision of high-quality instruction, there seem to be at least three models within this larger vision. By using the term *vision*, I mean that differentiated instruction functions as a guiding concept, strategy, or horizon, suggesting what might be done in response to student diversity. Perhaps with this notion in mind, McGarvey et al. described differentiated instruction as a "distant star" (1997). By the term *model*, I mean patterned or structured activities or practices, ones that can be defined in more concrete and practical terms. The purpose of clarifying different models is to pull the "distant star" inward—to make the construct more comprehensible for educators and administrators. Within this literature, at least three models of differentiation seem to be functioning.

Individualized differentiation. Multiple studies presented an individualized model of differentiation (e.g., Tobin, & McInnes, 2008; Werderich, 2002; van Kraayenoord et al., 2009). These studies often attended to the needs and strengths of students identified as gifted or having special needs. For example, Tobin (2005) discussed how individualized scaffolds were critical to support the engagement, motivation, and learning of three students identified as learning disabled. In a strategic and pre-planned way, Tobin (as co-teacher) walked through the classroom with a purposeful traffic pattern, supported these students with individualized brainstorming

sessions, and practiced interactional inclusion discourse (Rex, 2000), whereby she verbally validated and positioned each student as a knowing and able classmate. In a study focused on the needs of one gifted student, Kirkey (2005) argued that differentiation involved assignments with higher-order thinking questions, open-ended research projects, and opportunities to use Accelerated Reader. She argued that these individualized forms of differentiation supported the quality and creativity of student writing, more accurate and reflective reading inferences, increased class participation, and positive social and emotional benefits. In both cases, individualized differentiation took the form of additional support or more complex work for specific students who benefited from one-on-one support.

Group differentiation. Multiple studies employed a group model of differentiation (e.g., Bellamy, 2005; Brown & Morris, 2005; Kirkey, 2005; Tomlinson, 1999). In these studies, teachers invited groups of students to participate in lessons, units, or activities designed specifically for them. In a good example of group differentiation, Brown & Morris (2005) documented the literacy practices of a teacher who assessed her students' spelling practices, grouped students into two categories, and implemented a responsive and tiered yearlong spelling program. Recognizing that many students failed to understand short vowels, she had her "lowest spellers" do 15 weeks of short vowel word study before having them work in their grade level spelling book. The study argued that low achieving spellers improved their spelling substantially. Manifesting a group model of differentiation, Tobin and McInnes (2008) described the guided reading practices of one teacher, Cynthia. Of Cynthia's 28 students, 21 were deemed to need additional reading support, so she divided these students into three groups of six, and one group of three. The group of three was made up of students who were in most need of support. Each group received four half hour sessions of guided reading every week, which consisted of the

teacher listening to students read and supporting their fluency, vocabulary, and comprehension with group-specific demonstrations, prompts, and activities. While one group received guided reading support, the rest of the class was engaged in small group literacy centers. Collectively, the authors argued that guided reading appropriately challenged students and increased their engagement and literacy achievement.

Open-ended differentiation. While the predominant models are group and individualized differentiation, a few studies employed an open-ended task model of differentiation (e.g., Linn-Cohen, & Hertzog, 2007; Hertzog, 1997, Hertzog, 1998). In this model, differentiation is characterized by *complex, open-ended activities with student choice*. Hertzog (1997; 1998) highlighted the writing and literacy practices of "gifted" students who participated in open-ended writing tasks. When choice was an integral feature, students worked in their preferred learning styles (process) and wrote about their interests (content). She argued that students produced qualitatively different texts that "match[ed] their ability level" (1998; p. 222). Affirming content choice, one "gifted" student, Terrance, began his stories with the same phrase for every narrative ("Once upon a time") until he decided—on his own—to change it midway through the year. When given the freedom to choose how to write, a pair of "gifted" students, Jennifer and Elaine, decided to write together about a "Baby Raisin and His Adventures in the Refrigerator" (1997; p. 71). When students are given an opportunity to make choices about content, process, and product, Hertzog argued that learning (and curriculum) is highly differentiated. This model of open-ended model of differentiation is also used by VanTassel-Baska et al. (2000), who designed and implemented a differentiated curriculum that schools and districts have purchased.

Commentary. It is important to note that these three models of differentiated instruction can and often do operate simultaneously. Researchers and teachers often use more than one model in a particular lesson or unit. For example, a teacher using guided reading as a general instructional model (group differentiation) might also provide pre-planned, one-on-one support for a student with an individualized education plan. It should also be noted that these models of differentiated instruction vary by unit of analysis. Individualized differentiation focuses on the needs of one student; group differentiation considers patterns and trends by small group (e.g., interest, readiness); open-ended differentiation considers the entire class and focuses on creating complex, integrated tasks with student choice.

Consistent findings

An important focus of this literature review was to seek out and identify patterns between and among the studies and their central findings about differentiated instruction. These studies consistently found that teachers and students support differentiated instruction, that teacher report sometimes differentiating instruction, and that interventions show limited effectiveness at influencing differentiation practices and no influence on student achievement.

Student and teacher support. Support for differentiated instruction is reported by most, but not all, students and teachers. When asked by researchers, most students favored receiving different forms of support, typically described as more complex tasks or as additional help to complete assignments (e.g., Bellamy, 2005; Hertzog, 1997; Tobin, 2005). However, there were instances where students rejected the idea of receiving additional help, perhaps because they were protecting their social status (Tobin, 2005). Both inservice and preservice teachers consistently reported that students need a wide variety of instructional supports (e.g., Baker & Fleming, 2005; Edwards, Carr, Siegel, 2006). Further, researchers and teachers argued that

differentiated instruction positively supported student spelling (Brown & Morris, 2005), vocabulary (Dalton et al., 2011), reading (Kirkey, 2005; Werderich, 2002), writing (Geisler, 2009; Hachem et al., 2008; Hertzog, 1998; Kirkey, 2005), and general literacy achievement (Freedman et al., 2005; Tobin, & McInnes, 2008). In addition, forms of differentiated instruction were argued to enhance motivation (e.g., Hachem et al., 2008; Linn-Cohen & Hertzog, 2007; Tobin, & McInnes, 2008), participation (Kirkey, 2005), and social inclusion (Bellamy, 2005; Santamaria, 2009; Tobin, 2007; van Kraayenoord et al., 2009). Although two studies reported that some students' writing did not improve by using forms of differentiation (Bellamy, 2005; Geisler, 2009), qualitative studies overwhelmingly reported that forms of differentiation enhanced achievement, cognitive, and social outcomes for students.

Teachers sometimes differentiate. When asked via survey, preservice and inservice teachers consistently report that they sometimes differentiate instruction by altering content, process, or product (Adami, 2004; Al-Lawati & Hunsaker, 2007; Cordray, Pion, Dawson, Brandt, & Molefe, 2011; Lawati & Hunsaker, 2007; Brighton et al., 2005; Cho & Reich, 2008; Houtveen & Grift, 2001; Westberg et al., 1997). When teachers were asked to describe their differentiation practices, they reported using group work and visual aids (Adami, 2004), extra time (Cho & Reich 2008; Brighton et al., 2005) and varied assignment length (Brighton et al., 2005). Brighton et al. (2005) found that teachers rarely reported using student choice, flexible grouping, tiered assignments, or curriculum compacting. In addition, a few studies used structured observations to index the amount of differentiation provided by regular classroom teachers (Cordray et al., 2011; Westberg et al., 1993; Westberg & Archambault, 1997). These studies concluded that classroom teachers make some modifications to the regular curriculum (McGarvey et al., 1997; Tomlinson, 1995; Westberg et al., 1993). For example, Westberg et al.

(1993) observed 92 “gifted and talented” students over 92 days and found that 16% of their instructional activities were differentiated. With observations of 178 teachers over two years, Cordray et al. (2011) found some form of differentiation present in about 40% of classroom literacy instruction.

Interventions show limited impact. Eight studies investigated if professional development influenced teacher differentiation practices or student achievement. These studies consistently showed that interventions have little impact on either outcome. In one year-long study (Appelhof, 1984), 70% of the teachers implemented a differentiated curriculum with “adequate” fidelity, but the amount of time the teachers devoted to reading and reading instruction also dropped by 50%. In a two-year study (Johnsen et al., 2002), about half of the teachers (49%) showed some shift in their language arts curriculum, but half did not. Using trained but informal observations, Brighton et al. (2005) concluded that most teachers attempted only minor adjustments to the curriculum after receiving up to three years of professional development and consultative support. While these previous studies were limited in their inference because they only indexed differentiation in one group, two studies assessed the impact of professional development by using a contrast between the intervention and counterfactual group. In one study, there was no observed contrast between conditions in relation to differentiation practices after two years of professional development and consultative support (Cordray et al., 2011). In another study, there was a small contrast between conditions, but the contrast was not statistically significant until the third year (VanTassel-Baska et al., 2008). Of the studies designed to examine an impact on student achievement, none showed evidence that professional development of any kind of length improved student reading, writing, or critical

thinking (Appelhof, 1984; Brighton et al., 2005; Cordray et al., 2011; DeBaryshe et al., 2009; VanTassel-Baska et al., 2008).

Organizational Influences on Differentiated Instruction

Some research looked specifically at organizational features that influenced differentiated instruction. Some intervention research explored this topic as a secondary issue because the studies also explored how or why their intervention succeeded or failed in particular settings. Overall, this research looked at the role of principals, peer coaching, consultative support, and school-wide policies and organizational structure. This section will first discuss the theories that guided these studies and then present findings consistent throughout studies.

Theoretical perspectives. The theories that supported this body of research were varied and often implicit. Of the ten studies that investigated organizational factors, only four explicitly articulated a guiding theoretical perspective. The theoretical perspectives employed were systems theory (Johnsen et al., 2002), market theory (Houtveen & Van de Grift, 2001), interpretive sociology (Hertberg-Davis & Brighton, 2006), and socio-cognitivism (Brighton et al., 2005). While these theoretical perspectives were explicitly articulated, only one study (Brighton et al., 2005) discussed its central constructs in more than a few sentences. In no case was a coherent chain of reasoning presented that linked theoretical conjectures to research questions or study design. Because these studies did not explore their theoretical premises in depth, it is difficult to refute, elaborate, or extend any of the theories that guide and support more situated views of instruction.

A good deal of inference is required to classify the remaining studies, so these categorizations should be viewed as tentative. One study (Reis, & Purcell, 1993) appeared to employ a positivist/behavioral perspective. This can be seen in the guiding research question,

which asked “what strategies do teachers use to determine student mastery of the regular curriculum? (p. 151). I selected positivist/behavioral because the authors regularly used the term “mastery” and presented differentiated instruction as a set of behaviors (e.g., pre-assess students, eliminate mastered content, teach unknown content). I would categorize the remaining five studies (McGarvey et al., 1997b; Houtveen & Van de Grift, 2001; Latz, et al., 2009; Tomlinson, 1995a; VanTassel-Baska et al., 2000) as having overlaps between socio-cognitivism and organizational/management theory. Without explicitly referencing or articulating any guiding theories or perspectives, these studies discuss a wide range of mental (e.g., attitudes, perceptions, autonomy), social (e.g., help-seeking, peer-support), and organizational (e.g., school climate, school inclusion policies, principal’s leadership style) constructs.

Table 2. Studies that examined organizational influences on differentiated instruction

Author(s), year	Participants, setting, & country	Theory	Design	Data sources	Differentiation focus
Brighton et al., 2005	9 middle school, 76 teachers, 1940 students (gifted), US	Socio-cognitive	Quasi-experiment	Student achievement, interview, observation, focus groups, field notes, survey	PD and coaching on differentiated instruction, instructional change
Johnsen et al., 2002	6 schools, 8 principals, 91 teachers, (gifted), US	Systems theory	Quasi-experiment	Structured observation, questionnaire, interview, field notes	Differentiated PD, mentor support, instructional change
McGarvey et al., 1997b	150 subject coordinators in primary schools, 7 schools, Ireland	Socio-cognitive/ organization theory*	Mixed method case study	Questionnaire, interview, observation	Planning structures and subject coordinators role
Houtveen & Van de Grift, 2001	200 principals, 500 teachers, The Netherlands	Socio-cognitive/ organization theory*	Survey	Questionnaire	The relationship between regional/school policies and teacher practices related to inclusion and differentiation
Hausman & Brown, 2002	38 principals, 543 teachers, US	Market theory	Survey	Questionnaire	Magnet schools & differentiation
Hertberg-Davis & Brighton, 2006	3 principals, US	Interpretive sociology	Case study	Interviews, observation, field notes, focus groups	Principals & differentiation
Latz, et al., 2009	46 elementary teachers, 9 mentors, gifted focus, US	Socio-cognitive/ organization theory*	Case study	Observation, school documents, mentoring conversations	Peer coaching and differentiation
Reis, & Purcell, 1993	27 districts, 470 elementary teachers (gifted), US	Positivist/ behavioral*	Quasi-experiment	Questionnaire, curriculum compactor teacher log	PD on curriculum compacting, video-taped support, coaching and consultancy, instructional change
Tomlinson, 1995a	50 staff members, 550 students, US	Socio-cognitive/ organization theory*	Case study	Observation, interview, field notes, documents	Facilitators and impediments to differentiated instruction in one middle school
VanTassel-Baska et al., 2000	2 elementary schools, gifted focus, US	Socio-cognitive/ organization theory*	Case study	Interview, structured observation, documents, focus groups	Differentiation and whole school reform

Consistent findings. These studies consistently argued that classroom differentiation is strongly influenced by administrative and principal support (Brighton et al., 2005; Johnsen et al., 2002; Hausman & Brown, 2002; Hertberg-Davis & Brighton, 2006; Tomlinson, 1995a;

VanTassel-Baska et al., 2000). Brighton et al. (2005) argued that principals' participation and attitude toward professional development affected teacher participation in two ways: first, a principal's reaction to differentiation strongly influenced teachers' responses. Second, the nature of a principal's leadership style often shaped the dynamics of a school culture, affecting whether or not a teacher was open to changing their approach to differentiation. With a similar focus in mind, Hertberg-Davis & Brighton (2006) showed—with detailed evidence—how teacher responses to differentiation often mirrored their principals.

These studies also argued that mentors, coaches, and consultants are critical to support the development of instructional and curricular differentiation (Brighton et al., 2005; Johnsen et al., 2002; Latz, et al., 2009; Reis, & Purcell, 1993; Tomlinson, 1995a). One teacher stated, "We need somebody who can sit down with us and show us ways to do this" (Tomlinson, 1995, p. 84). With a specific focus on peer-coaching in differentiation, Latz et al. (2009) argued that non-evaluative communication should be used, mentoring should occur over long periods, and coaches should be differentiation experts. Brighton et al. (2005) provided long-term coaching for up to three years for teachers in multiple settings. With the goal of adapting to teacher needs, the coaches supported teachers in a wide variety of ways, such as modeling differentiation, goal setting, drafting assessments, and gathering resources. In addition, coaches played a wide variety of social roles, including cheerleader, buddy, and critical friend. In their report, Brighton et al. wondered if off-site coaching was perhaps a problem. Coaches may have had more success and influence on teacher practice if they were school personnel with authority through position or reputation.

Another consistent finding was that school-wide policies on inclusion and diversity influenced classroom-level differentiation (Brighton et al., 2005; Johnsen et al., 2002; Hertberg-

Davis & Brighton, 2006; McGarvey et al., 1997b; Tomlinson, 1995; Van de Grift, 2001; VanTassel-Baska et al., 2000). The school must support change by coordinating staff policies and staff development committed to the goal of differentiation. For example, support staff (e.g., gifted/reading specialists) need to interface regularly with the regular education teachers/program (VanTassel-Baska et al., 2000) and focused, long-term goals on differentiation need to be pursued (Brighton et al., 2005; Johnsen et al., 2002; Hertberg-Davis & Brighton, 2006; Tomlinson, 1995) by implementing policies and practices consistent with this vision of instruction. Expressing frustration and multiple mandates and conflicting policies, a teacher said this: "We're going in too many directions. We have to have a focus" (Tomlinson, 1995, p. 84). When a school is organized to support differentiation, school-wide policies support this practice as well, such as creating and preserving common time for teachers to jointly engage in sharing, planning, and discussing differentiated lessons and units (Brighton et al., 2005; McGarvey et al., 1997b).

While these studies found that principal support and coaching can positively influence classroom differentiation, a few researchers argued that differentiated instruction was being constrained by district- and school-level curriculum policies, which typically reduced teacher autonomy. In the middle of one intervention study (Brighton et al., 2005), one school was required to adopt a district-wide high stakes test. According to the researchers, high-stakes testing brought differentiation to a "screeching halt" in most classrooms (p. 286). Ideally, argued Brighton et al. (2005), teachers would be provided opportunities to take risks, make choices, and make mistakes within a "community of learners," where all school members are regarded as on-going learners and understand that mistakes are inherent to learning. One teacher noted that teacher autonomy is key to supporting the development of thoughtful and reflective practitioners:

"When these things get mandated, it's a problem" (Tomlinson, 1995, p. 82). From an organizational perspective, teachers consistently stated that differentiated instruction required additional time and planning (e.g., Brighton et al., 2005; Cho & Reich 2008) and principal support (e.g. Hertberg-Davis & Brighton, 2006).

Theoretical perspectives

This study takes the view that learning is a fundamentally social phenomenon that develops within a community of practice (Wenger, 1998). With the goal of viewing differentiated instruction as an ambitious practice that develops within a community, this study used communities of practice to theorize about the ways in which local practices (e.g., literacy differentiation) are shaped and influenced by organizational structures and features. This meso-level theory (Neuman, 2000) was chosen because it connects practice—that is typically cast as being individualistic—within its wider social and organizational context. In this section, communities of practice theory will be discussed and explored. Second, key constructs will be described in detail: *practice and community, mutual engagement and alignment, shared repertoire and brokering*. Third, theoretically grounded conjectures will be presented that articulate differentiated instruction as a social practice that develops within the organizational context of schools.

It is important to note that the communities of practice theory has been conceptualized in multiple ways. In a comparative essay, Cox (2004) analyzed how four articulations of this theory were different. He argued that Lave and Wenger's (1991) initial articulation is primarily about the socialization of newcomers, while the focus in Brown and Duguid (1991) is on improvising new knowledge in resistance to management. Cox argued that Wenger (1998) treats communities

of practice as the relations and understandings that develop in mutual engagement in the context of joint enterprise, but Wenger, McDermott and Snyder (2002) marks a shift towards a managerial stance—where the focus is on the creation and development of cross-functional teams brought together to enhance organizational performance. In addition, community of practice is related to a variety of other concepts, such as learning communities (e.g., Shapiro & Laufgraben,1999), professional learning communities (e.g., DuFour & Eaker,1998), teacher communities (e.g., Grossman, Wineburg, & Woolworth, 2001), and distributed communities of practice (e.g., Daniel, Schwier, & McCalla, 2003). Although this theoretical section has been informed by multiple texts, Wenger's (1998) vision of communities of practice will be the primary source for theory articulation. This version was chosen because it seemed most appropriate to help understand the practice of teaching and teacher learning within the organizational setting of a school.

Communities of Practice

According to Wenger (1998), a community of practice is a collection of people who engage on an ongoing basis in some common endeavor or shared interest, such as a bowling team, a book club, a crack house, or a church congregation (Cochran-Smith & Lytle, 2002). From a community of practice perspective, learning is increased participation in the practices of a community guided by a shared sense of value and meaning. Thus, learning occurs when more and less experienced people work together within communities of practice (Wenger, 1998). Communities of practice organized around a common goal are opportunities for participants' learning new roles, knowledge, and skills. From this perspective, it is not simply learning that takes place within communities of practice, but it is also identity formation itself insofar as

knowing and being are intimately connected to one another. Thus conceived, teaching can be conceptualized as a practice that is organized around a common goal (e.g., supporting the learning and development of children), one that specifically occurs within a specific local community with other educators and administrators in a school.

Central to a community of practice is the concept of *practice*. Members of a community of practice are practitioners. They "do" things (e.g., writing, bowling, teaching) and what they "do" is central to a community. As a community, they develop a *shared repertoire* of resources—experiences, stories, tools, words, and routines—which support, facilitate, and interpret their shared practice. Wenger (2006) argued that the development of shared practice takes time and sustained interaction, and it may be more or less self-conscious. For example, the "windshield wipers" engineers at an auto manufacturer systematically make a concerted effort to collect and document the tricks and lessons they have learned into a documented knowledge base. By contrast, nurses who meet regularly for lunch in a hospital cafeteria may not realize that their lunch discussions are one of their main sources of knowledge about how to care for patients. Still, in the course of all these conversations, they have developed a set of stories and cases—a shared repertoire—for their practice. From a communities of practice perspective, differentiated instruction is a practice that, if highly developed, would also have a shared repertoire of resources—experiences, stories, tools, words, routines, and stories—to support and interpret teacher activity.

In any community, there are three modes of belonging: engagement, imagination, and alignment. First and foremost, communities develop their practice through *mutual engagement* (Wenger, 2006) in joint activities. In pursuing their common practice or interest, community members discuss, help each other, and share information and expertise. In doing so, they build

relationships that enable them to learn from each other. A website in itself is not a community of practice, nor is having the same job or the same title. A community of practice happens when members mutually engage, interact, and learn together (Wenger, 2006). It does not, however, mean that there is always agreement and cooperation; mutual engagement constitutes the wide variety of ways that people interact, including disagreement, challenge, and competition (Wenger, 1998). Likewise, members of a community of practice do not necessarily meet or work together on a daily basis. The Impressionists, for instance, used to meet in cafes and studios to discuss the style of painting they were inventing together. These interactions were essential to making them a community of practice even though they typically painted alone (Wenger, 2006). A school trying to support ambitious instruction might provide multiple opportunities for mutual engagement such as time to plan lessons/units or opportunities to observe other teachers. Notably, these experiences of mutual engagement might be formal or informal.

A second mode of belonging is that of imagination. Imagination is an important component of our experience with the world and our sense of place in it. Imagination allows community members to stay connected and feel like they belong even though they are not physically (or virtually) in the same space. For both our identity and our learning, imagination makes a big difference in how we view our relationship to a particular community or practice. In order to support this point, Wenger (1998) related the story of two stone cutters who are asked what they are doing. One responds: "I am cutting this stone in a perfectly square shape." The other responds: "I am building a cathedral." Both answers are correct and meaningful, but they reflect different relations with the world and these relations have consequences for their sense of self and what they may be learning from the same activity. Through our imagination, we feel that we belong to and can participate in communities of practice.

According to Wenger (1998), the third way that people can belong to a community is through alignment. Alignment is the coordination of perspective and actions. When an organization is highly aligned, practitioners have a joint enterprise (i.e., a joint goal) and thus can effect change beyond their individual effort because the perspectives and actions of multiple participants are moving toward a common purpose. The concept of alignment does not connote a one-way process of submitting to external authority, but a mutual process of coordinating perspective, interpretations, and actions so that joint action and activity can achieve larger goals (Wenger, 2000). Characteristically, the work of alignment entails such things as creating a shared purpose or focus (e.g., pledge of allegiance), negotiating perspectives (e.g., faculty debate), and finding common rituals (e.g., faculty retreat) and routines (e.g., holiday party, rules for a sports league) to support a shared vision. Alignment can be supported by sharable artifacts—objects able to create fixed points around which to coordinate activities. When there is insufficient artifact sharing, coordination across time and space may depend too much on the partiality of specific participants, or it may simply be too vague, illusory, or contentious to create alignment. When a school is trying to support an ambitious vision of instruction, community of practice theory suggests that co-constructing alignment is critical and that opportunities to share artifacts can help develop alignment.

"Alignment also requires brokers" (Wenger, 1998, p. 187). When a new vision or practice is being developed, change is a non-trivial accomplishment, and the presence of *brokers* can facilitate this development (Wenger, 1998; Cobb & Smith, 2008). Brokers can support the development of organizational alignment by bridging between perspectives and agendas of different role groups. Brokers are people who participate at least peripherally in the activity of two or more groups, and thus have access to the perspectives and meanings of each group

(Wenger, 1998). Brokers can introduce elements of one practice into another. Wenger (2000) argued that brokering knowledge and practice is delicate business, though, and it requires enough legitimacy to be listened to and enough distance to bring something new. Because brokers do not fully belong in either community, the value they bring can be easily overlooked. Brokers often bring objects from another community—*boundary objects*—which support connections between different communities of practices. These boundary objects can take multiple forms. Three specific forms are artifacts (e.g., tools, documents, models), discourses (e.g., common language to communicate and negotiate meaning), and processes (e.g., routines and procedures that coordinate activity across boundaries). In and of themselves, boundary objects do not necessarily influence practice in another community because they can be misinterpreted, ignored, or interpreted blindly. In school settings, instructional coaches and professional development consultants might be viewed as brokers. They often bring objects and practices from another community (e.g., administration or university) into the school.

Summary

This inquiry began with classroom diversity as a challenge for the general education teacher and discussed how national organizations and scholars have—for years—advanced arguments promoting differentiated instruction as a response to this diversity. The empirical literature has consistently argued for at least three forms of instructional differentiation (content, process, and product) and I have argued that there are at least three different models of differentiated instruction (individualized, group, and open-ended). Further, I have argued that the empirical literature shows that, on average, teachers do differentiate to some extent and that interventions hoping to increase this practice have found this goal very difficult. Conceptualizing

teaching as a social practice, some researchers have considered the impact and influence that organizational factors (e.g., principal support, time for cooperative planning) have on this instructional practice. They have consistently argued that principal support, opportunities to cooperatively plan, and coaching in differentiation were critical to enacting differentiation in any setting. Building on these studies, this study contributes to the literature on differentiated instruction by exploring social and organizational factors that influence differentiated instruction. Along with identifying variables that reliably predict literacy differentiation (both final status and rate of change), this study interviews teachers and principals in settings that schools that showed positive differentiation growth.

Because this dissertation examines how a practice enacted by one person—seemingly functioning alone—is influenced by wider social and organizational factors, a theory that makes conjectures about the relationship between individual practice and wider social forces was used to guide and inform this study. The communities of practice theory (Wenger, 1998) conjectures that human practices are socially constructed, developed, and mediated. From this perspective, teaching is a social practice that occurs within a school community, and teachers are a networked collection of people who engage on an ongoing basis in a common endeavor with a shared interest. Likewise, differentiated instruction might be viewed as an ambitious instructional practice, one that has a shared repertoire of resources—experiences, stories, assessments, lessons, and routines—that support, develop, and interpret this shared practice.

The community of practice theory conjectures that teacher learning would occur through a variety of formal and informal experience of more- and less-experienced teachers coming together. Teachers have multiple opportunities for mutual engagement (e.g., lunch, planning time, meetings). In some settings, shared purposes, routines, and artifacts help co-create and

negotiate alignment that, in turn, supports a shared vision of how to support learning and development across the school. This theory conjectures that this alignment (i.e., the coordinated perspectives, actions, and interpretations) present in any school would influence the practice and impact of differentiated instruction. For example, if school administration did not value differentiated approaches to instruction, this setting would be poorly aligned for differentiated literacy instruction because school-level policies and practices may not be coordinated to facilitate and enhance this practice.

Likewise, professional development can be viewed as a new vision, practice, or knowledge that comes (at times) from another community. Professional development personnel can be viewed as brokers who carry boundary objects (e.g., computer adaptive assessment) and boundary processes (e.g., differentiated instruction) from one community into another. As stated earlier, knowledge and practice development from brokers is delicate business, and the knowledge and objects they bring are often dismissed. Typically, brokers try to create opportunities for learning through mutual engagement and they attempt to negotiate and construct alignment within the organization around their new object or process. In many ways, the success or failure of their effort depends heavily on their ability to effectively co-construct and negotiate alignment around this new practice or object. The theory conjectures that the task of creating alignment would be strongly influenced by leadership support. During professional development, mutual engagement and negotiating toward alignment are critical if the professional development will bring about teacher learning, teacher identity development, and changed practices.

The community of practice theory was selected for another important reason. As will be described in greater detail in the next section, the community of practice theory is consistent with

multiple features of the professional development program implemented to support differentiated instruction in the participating schools. The program, called Measures of Academic Program (MAP), begins by assessing students' literacy with a computer-adaptive software suite that, in turn, provides teachers with new resources (e.g., boundary objects) to make instructional decisions. Enacted within the context of whole-school reform, consultants (e.g., brokers) conduct professional development and provide individualized and group consultative support over two years. During consultative sessions, teachers are encouraged to collaboratively interpret MAP resources, co-construct differentiated lessons and units, and share instructional resources. MAP does *not* provide teacher with pre-made differentiated lessons or units. Instead, it is an assessment tool and a professional development program that supports teachers to collaboratively adapt and customize lessons (and units) around the unique needs of their students. More details about the MAP program will be provided in the next section.

CHAPTER III

RESEARCH METHODS

This section describes this study's inquiry methods. Because this study involves mixed methods research, both quantitative and qualitative data were collected and analyzed. After presenting an overview of the mixed methods design, this chapter will be divided into two parts, one for each method: quantitative and qualitative. In both sections, the proposed research questions, participants, data, research hypotheses/questions, and analyses will be presented and discussed.

Overall Design

The overall design of this study will be a mixed-methods triangulation design (Creswell, 2003; Creswell & Clark, 2007). This design is characterized by collecting and analyzing both quantitative and qualitative data on the same topic and then interpreting the findings based on both results. The intent of using this design is to bring together different strengths and weaknesses of quantitative methods (large sample size, trends, generalization) with those of qualitative methods (small N, details, in depth) to investigate the same topic (Patton, 1990). While the quantitative phase seeks to make generalizable claims about the literacy differentiation for every teacher (n=164), the qualitative phase will investigate how the differentiation of 15 teachers was supported in three different settings.

Theoretically, this design strategy assumes a deductive approach, one driven by an *a priori* theoretical framework. As discussed in the last chapter, the community of practice theory (Wenger, 1998) will be employed as a guiding perspective. In the quantitative portion of the

study, theory-driven conjectures interpreted in the context of previous research will be articulated and evaluated. During the qualitative phase, the community of practice theory will guide both the development research questions, data collection (e.g., interview questions) and the final analysis.

Quantitative Phase

This section introduces the quantitative phase of this study. First, it describes the overall context and source of the quantitative data used in this analysis. Second, it develops specific hypotheses connected to theory and empirical research. Third, it characterizes and defines the outcome and predictor variables. Lastly, it describes the analytic strategy of using multilevel growth modeling to analyze this data in order to test research hypotheses.

MAP Assessment System

Developed by Northwest Evaluation Association (NWEA), MAP is a benchmark assessment system used in over 20% of the districts across the United States (Northwest Evaluation Association, 2011). Generally speaking, MAP consists of student assessments, a sophisticated reporting program, professional development, and consultative support. First and foremost, MAP is a collection of computer adaptive assessments in English/language arts (exclusive of writing), mathematics, and science. Three times a year (e.g., fall, winter, spring), students take computer-based, multiple-choice tests. Using computer-adaptive technology, the MAP software program "remembers" prior responses and asks increasingly difficult questions as students demonstrate proficiency in a particular skill. In reporting results, the software uses an algorithm to place each student on a single continuum of learning from grade 2 to 10 by

disciplinary skills (e.g., reading comprehension, grammar) and it charts growth by specific skills. In addition, it provides a corresponding reading level (i.e., lexile level) for each student. On their website, NWEA contends that these assessment results predict achievement on state end-of-year assessments and that MAP reports help teachers make informed and responsive instructional decisions.

NWEA also provides professional development to help educators interpret and make instructional decisions with MAP results. Typically occurring through workshops and long-term consultative support over two years, this professional development covers technical aspects of generating and interpreting a wide variety of MAP reports. Throughout the professional development, teachers are encouraged to respond to the academic diversity in their classroom by differentiating instruction for small groups of students (e.g., Tomlinson, 1995). To accomplish this goal, grade level teams are given time to collaboratively design differentiated lessons for students (in their classroom or in their grade levels) based on the MAP assessment results and their own understanding of these students.

MAP Study

The data used in the quantitative portion of this dissertation came from a previous study (Cordray et al., 2011) on the efficacy of the MAP intervention, and I was a member of the research team that gathered and analyzed data for this evaluation study. Given's MAP's widespread use and the dearth of research on it, the evaluation study was designed to address questions about the extent to which MAP benchmark assessments, professional development, and consultative support influenced teachers' literacy differentiation and student reading achievement. The study was a two-year cluster-randomized field trial, where the randomization

unit was the grade level (within each school). For example, in School A, based on random assignment, 4th grade teachers received MAP and the 5th grade teachers served as the counterfactual. In School B, based on the same random assignment procedure, the 5th grade teachers received MAP and 4th grade teachers served as the counterfactual. In every school, administrators (e.g., principals and assistant principals) received professional development and consultative support along with the teachers in the program condition. Involvement of educational specialists (e.g., learning behavior specialists) was up to the school's discretion and the interest of these individuals.

Over two years, the research team collected data from teachers and administrators in both conditions using a wide variety of instruments. Data pertinent to this dissertation are presented briefly. Students in the MAP condition were tested in the fall, winter, and spring. Using self-report logs, teachers reported on the differentiation that they provided for students in their classroom. Three times each year (e.g., fall, winter, spring), independent observers went into classrooms during literacy instruction to index the amount of literacy differentiation provided by the general education teacher. At the end of each year, teachers and principals filled out surveys on a variety of topics, including their support for differentiated instruction. During professional development and consultative support sessions, attendance was taken to identify who attended each session. For each year, student achievement (e.g., state reading test) and student demographics data (e.g., ELL status) was provided by each district.

The datasets analyzed in the quantitative phase of this study comes from multiple restricted use files from the prior MAP study (Cordray et al., 2010; 2011). In restricted use files, information specific to individual teachers, principals, and schools was re-coded to mask their

location and individual identities. The restricted use data were provided by year (e.g., Principal Survey 2009, Principal Survey 2010).

Research hypotheses

This study began with communities of practice as the theoretical perspective and was also informed by empirical research on differentiated instruction. Using these as twin guides, the primary goal of the quantitative phase was to identify variables reliably associated with change in literacy differentiation. Table 3 identifies connections between the theory, empirical research, and quantitative hypotheses:

Table 3: Directional hypotheses for quantitative study

Theoretical Construct	Community of practice theory	Empirical research	Hypotheses	Variable
Practice	Conjectures that a "practice" is at the center of any community of practice.	Differentiation is provided in response to student diversity.	Teachers with diverse classrooms will provide more differentiation. This includes language status (ELL), special education status (IEP), and reading achievement standard deviation (R_SD).	1, 2, 3
Mutual Engagement	Conjectures that learning is a highly social activity, one supported by participation and mutual engagement where participants develop a shared repertoire; learning often occurs when more and less experienced people work together within a community of practice.	Teachers need cooperative planning time and adequate resources to plan differentiated lessons and units; teachers need opportunities to establish clear definitions and visions of what differentiated instruction means and looks like.	Teachers with more resources (T_RES) (e.g., equipment, material, time to work with peers) will have higher levels and rates of change in differentiated instruction.	4
			Teachers with less experience (T_EXP) will have lower levels but a higher rate of change in differentiated instruction.	5
			Teachers who attended more of the PD will have a higher rate of change in differentiated instruction (T_PD).	6
			If a teachers' principal participated in more PD, the teacher will have a higher rate of change in differentiated instruction (P_PD).	7
Alignment	Conjectures that local practices are influenced by community alignment, that alignment is critical to support change in practice, and that leadership can be influential in supporting change.	Classroom differentiation is influenced by administrative and principal support; teacher's attitude to differentiation reflects their principal's attitude; classroom differentiation requires autonomy, which can be restricted by local and district policies.	Teachers who believe in the value of differentiated instruction will provide more differentiation and have a higher rate of change in differentiated instruction (T_BELIEFS).	8
			Teachers with principals who highly value differentiated instruction will have a higher rate of change in of differentiated instruction (P_BELIEFS).	9
Brokers	Conjectures that change to a community's practice can be brought about by brokers, who bring boundary objects and boundary practices from other communities	Teachers need models, coaches, and mentors who can support their differentiation practices	Teachers who extensively participated in consultative support will have a higher rate of change in differentiated instruction (T_CONSULT).	10
			If a principal extensively participated in consultative support, teachers in this school will have a higher rate of change in differentiated instruction (P_CONSULT).	11

The eleven hypotheses above relate to the *level* and *change* in differentiated literacy instruction. The null hypothesis for these eleven conjectures is that there is no relationship between the dependent variable (differentiated instruction) and any of the independent variables. Although the language in Table 3 stated the hypotheses in directional ways (e.g., teachers with more resources will differentiate more), hypotheses were test without assuming directionality. Because this study is a part of a larger randomized field trial, a program intervention variable (MAP) will also be modeled to see if participation in the MAP program was associated with higher levels or changes in literacy differentiation. Lastly, because the MAP professional development was provided over the course of two years, MAP was not expected to influence the outcome until the second year. To test if the MAP program had differential effects by year, a condition by year interaction was also modeled (MAP x YEAR).

Data Preparation and Exploration

The restricted use data provided first was prepared for analysis. In the case of survey items, some data needed to be recoded (e.g., if the survey item asked a reverse question) or combined (if multiple items were asked about the same construct). The data were explored using SPSS by examining the data with an eye to seeing broad trends and distributions and reading through the data, making memos and developing a preliminary understanding of the database. Among other things, this exploration resulted in identifying 5 cross-over teachers (i.e., teachers who changed from MAP to the counterfactual condition) and 20 teachers who changed schools between Year 1 and 2. In addition, teacher IDs needed to be recoded so that their ID's matched up correctly between the two years. Visual representations and descriptive statistics were used to understand broad trends, missing values, and identify potential outliers.

Missing data were imputed according to Rubin's (1987) model for multiple imputations. After five imputations were conducted, the data were converted into a person-period data set, in which each person has multiple records—one for each measurement occasion. This format is more suitable to conduct longitudinal growth modeling. Multiple imputation has implications for analysis as well; because five rounds of imputations were conducted, the parameter estimates were the average of the five estimates, and Rubin (1987) has explained how to calculate standard errors using this approach. As a practical matter, the HLM software accommodated the multiple imputations and calculated the parameter estimates and the standard errors.

Participants

The previous study describes district, school, principal, teacher, and student participants in great detail (Cordray et al., 2011, p.15-31). In total, 31 schools from 5 Illinois districts, 178 4th and 5th grade teachers, and 4016 students participated in the previous study. The analytic sample included in the quantitative portion of this dissertation study was a bit smaller (n = 164) than the full study (n=178) because only teachers whose literacy differentiation was measured at least 3 times (over 2 years) were included and analyzed. The descriptive and analytic statistics provided in this report are for the slightly smaller analytic sample. In the analytic sample, 87% of teachers were female and 95% were White. At the student level, 49% qualified for free/reduced lunch. The race/ethnicity of student-participants was as follows: 5% Hispanic, 24% Black, 63% White, and 9% Asian/Other. 20 of the 31 principals were female, 4 self-identified as minorities, and 24 of the 31 principals had less than 5 year of experience as a principal.

Data and Measures

Differentiated instruction. In the logic of the MAP intervention, the key mediating variable was differentiated literacy instruction, and a major challenge that the MAP study undertook was measuring differentiated instruction. Because NWEA explicitly utilized and cited Tomlinson's (1995) model of differentiated instruction, this group model of differentiated instruction guided the measurement of literacy differentiation. To reduce threats to construct validity, literacy differentiation was measured using multiple methods and sources: teacher self-report via end of year survey, teacher self-report via instructional logs, and independent ratings using a structured observation tool. To assess the reliability of the structured observations, between 15 percent and 20 percent of all observations were conducted by two observers simultaneously. The mean percentage agreement ranged from 87% to 99%. More details on the professional development of coders and observation protocols can be read in the Observation Reliability section of the final report (Cordray et al., 2011, p. 157).

In the quantitative portion of this dissertation, observed literacy differentiation was the dependent variable. Among the three choices, the observational index of differentiated instruction was selected for three reasons: first, it was indexed by an independent person; second, it had high reliability; and, third, it was a complex and broad vision of differentiated instruction. The following text will explain key features of how this variable was defined, operationalized, and measured. The observation protocol used to assess literacy differentiation was used on three occasions (fall, winter, spring) over two years (e.g., a maximum of 6 estimates in total). The instrument used to create this estimate was a modified version of the Center for the Improvement of Early Reading Achievement (CIERA) observation system (Taylor, Pearson, Petersen, & Rodriguez, 2003); this tool was augmented to reflect the core components of differentiated

instruction—diverse content, diverse instructional strategies, and the use of grouping. As stated previously, the operationalized model of differentiated instruction follows Tomlinson's (1995) group model of differentiated instruction. This model was chosen because NWEA explicitly encouraged teachers to enact this differentiation model in their professional development.

The following table identifies the descriptive statistics for observed differentiation in the fall of 2009:

Table 3: Observational Differentiation, Fall 2009

	N	Minimum	Maximum	Mean	Std. Deviation
Observational Segments	164	4	15	7.79	1.80
Grouping	164	0	1.00	0.39	0.30
Diverse Topics	164	0	1.00	0.16	0.26
Diverse Strategies	164	0	1.00	0.51	0.30
DI Composite	164	0	1.00	0.36	0.22

The data above shows that 164 teachers were observed on their differentiated instruction practices in the fall of 2009. The average teacher was observed for roughly 8 (7.79) segments, each of which were 10 minutes in length (i.e., each observation was about 80 minutes). During each ten minute segment, the observer looked for evidence of grouping, diverse learning topics, and diverse instructional strategies. In relation to grouping, observers recorded if pairs, literacy centers, or small groups were being used. Whole class and independent work did not count as grouping. In the fall of 2009, 39% of the observed instructional time utilized some form of grouping.

In relation to topic diversity, observers focused on what students were doing, learning, or reading. In the case of reading comprehension, observers recorded instances where students were reading different books, answering different questions, or completing different assignments.

Because literacy instruction was the focus (broadly construed), topic diversity covered six content areas: vocabulary, spelling, fluency, reading comprehension, writing, and speaking/listening. Topic diversity was measured with allowances for group differentiation (e.g., guided reading) and individualized differentiation (e.g., independent study). Adapted from the coding instrument, Table 4 shows the multiplicity of ways that topic diversity was coded for reading comprehension instruction:

Table 4. Diverse Topics, Comprehension Instruction

Content	Process	Product
☐ Varied readabilities	☐ Teacher modeling/ think aloud	☐ Tiered assignments
☐ Multiple texts	☐ Questioning	☐ Project options
☐ Varied audio or visual support	☐ Varied graphic organizers	☐ Independent study
☐ Student choice	☐ Peer support	☐ Other
☐ Other	☐ Learning logs	
	☐ Tiered activities	
	☐ Guided reading	
	☐ Literature circles	
	☐ Varied time allotments	
	☐ Marking text	
	☐ Other	

Further, observers recorded whether instructional processes or products were differentiated within each of these areas, and so, there are 18 possible types of differentiated instruction—3 types of differentiation (content, process, and product) for 6 topical areas. The presence of *any* form of topic differentiation was counted as an instance of differentiated instruction. For the fall of 2010, 16% of the observed instructional time utilized some form of topic diversity.

In an effort to code diverse instructional strategies, observers coded if the teacher's instruction focused on using more than one strategy or if student activity (e.g., worksheets, reading logs) asked students to employ more than one strategic approach to learning, reading, or thinking. As in the case of topic diversity, six literacy domains were covered; only reading

comprehension is discussed and presented here. In coding diverse instructional strategies, observers recorded instances when the teacher's focus of instruction invited students to access prior knowledge, make predictions, or use meta-cognitive strategies during reading. In addition, observers coded if the students learning focus were on these same topics/practices. In total, twenty strategies for reading comprehension were recorded: 10 for teachers and 10 for students within each 10 minute observation segment. Adapted from the coding instrument, Table 5 shows the ways that diverse instructional strategies were coded for reading comprehension:

Table 5. Diverse Instructional Strategies, Comprehension Instruction

Teacher	Students
☐ Conveys goals of the lesson	☐ Understanding the purpose for reading
☐ Uses strategies to access prior knowledge of topic	☐ Making connections between what they already know and topic at hand
☐ Shows anticipation of events in narrative text	☐ Making predictions based on their own knowledge and insight
☐ Uses metacognitive strategies to monitor and gain meaning from text	☐ Using prior knowledge, questioning, visualizing, summarizing, and inferring to construct meaning beyond literal recall of text
☐ Uses fix-up strategies when comprehension breaks down	☐ Rereading, using context, using pictures, and asking for help in order to monitor comprehension
☐ Uses literary devices to develop understanding of texts	☐ Recognizing literary devices in text in order to improve understanding
☐ Uses text structure to understand content	☐ Using heading, chapters, and text organization to improve comprehension
☐ Uses strategies for organizing information from text	☐ Using graphic organizers
☐ Uses strategies for active reading	☐ Taking notes, using notation systems, and marking text while reading
☐ Directs students to write in response to what was read to them or what they read	☐ Writing in response to what was read

If more than one strategy was observed (for teachers or students) over the course of an entire observation segment, it was analyzed as an instance of differentiated instruction. For the fall of 2009, 51% of the observed instructional time utilized diverse instructional strategies.

In their professional development, NWEA explicitly cited and utilized Tomlinson's group-model of differentiated instruction. Because Tomlinson's vision of differentiated

instruction assumed the use of grouping, diverse topics, and diverse instructional strategies, a composite index was constructed for each teacher. From a measurement perspective, the composite index is an average of each of the three subcomponents (e.g., grouping, diverse topics, diverse instructional strategies), and the composite variable is a continuous variable ranging from 0 to 1. As shown in Table 3, for the fall of 2009, 36% of the observed instructional time utilized some form of differentiated instruction.

Student Data. Student level data were also provided in restricted use files. Forms of student diversity (e.g., % ELL, % IEP, standard deviation of student reading achievement) that prior research conjectured relevant to differentiated instruction were included and analyzed. Table 6 identifies Year 2 student level descriptive statistics.

Table 6: Year 2 Student-level descriptive statistics, by grade

Grade		**IEP/504 Plan**	**ELL**	**Reading 2010**
4	Mean	0.15	0.05	219.79
	Std. Dev.	0.35	0.22	26.88
5	Mean	0.15	0.06	231.45
	Std. Dev.	0.35	0.23	25.47
Total	Mean	0.15	0.05	225.46
	Std. Dev.	0.35	0.22	26.84

In this sample, 5% to 6% of the students were identified as English language learners (ELLs) for 4^{th} and 5^{th} grade respectively. In addition, 15% of the students had an IEP or 504 plan. As assessed by the Illinois Standards Achievement Test (ISAT), the average reading achievement was 220 and 231 for 4^{th} and 5^{th} grade students respectively. It should be noted that these variables are included because the construct of diversity is central to differentiated instruction

(e.g., teachers differentiate because of the academic diversity present in classrooms), not because it is central to the communities of practice theory.

Teacher data. A wide variety of teacher-level data were provided in restricted use files and analyzed. These data were collected from three sources: end of year surveys (Year 1 & Year 2), attendance at professional development (4 sessions that possibly occurred in both years), and participation in consultative sessions with NWEA professional support staff (the number varied by school over both years). Based on theoretical conjectures and the empirical research, teacher beliefs about differentiation, their years of experience teaching teaching language arts, and their participation in professional development were analyzed. Table 7 identified Year 2 teacher level descriptive statistics (prior to imputation).

Table 7. Year 2 Teacher-level descriptive statistics, by condition

		Beliefs about PD in Differentiated Instruction	**Years Teaching Lang. Arts**	**MAP PD Attendance**
Counter-factual	N	83	83	83
	Mean	2.56	9.16	.02
	Std. Dev.	0.90	7.14	.22
MAP	N	81	81	81
	Mean	2.69	10.68	2.93
	Std. Dev.	0.55	8.98	1.49
Total	N	164	164	164
	Mean	2.63	9.88	1.46
	Std. Dev.	0.75	8.07	1.80

On average, teachers reported having just less than 10 years of experience teaching language arts. In this analysis, the Teacher Experience variable was transformed into a dummy code with three levels (less than 5 years=0; 5-9 years = 1; more than 10 years =2). Although not reported in the table above, 88% self-identified as female and 78% reported having a graduate degree. In

both the MAP and the counterfactual condition, teachers valued the professional development in differentiated instruction and reported that the PD supported student learning (see Appendix L for actual survey items). Although the MAP professional development had four professional development sessions followed by consultative support, the data show that the average teacher in the MAP condition received about 3 of the 4 scheduled days (mean = 2.93). It also shows that a few teachers in the counterfactual received some of the MAP professional development as well. Although not reported in the table above, Year 2 MAP teachers, on average, received 1.5 days of consultative support (SD = 1.27). See Appendix D for complete descriptive statistics, by Year.

Principal Data. In this study, principal data were used to estimate the level of support that the principals had for differentiated instruction and the extent to which principals participated in professional development and consultative support. Insofar as the professional development attempted to support teacher learning and change in practice, both theory and empirical research argued that principal support for differentiated instruction was critical for its success in any setting. Based on this, data from principal participation in professional development and their survey responses were used. Table 8 identifies level descriptive statistics (prior to imputation):

Table 8. Year 2 Principal-level descriptive statistics

	Beliefs about PD in Differentiated Instruction	**Participation in MAP Professional Development**	**Participation in MAP Consultative Support**
N	31	31	31
Mean	2.92	2.60	0.56
St. Dev.	0.51	1.49	0.67
Min	1.56	0	0
Max	3.89	3	2

The data shows that principals generally believed that differentiated instruction was valuable, yet some principals showed strong support (max = 3.89) and others showed very low support for differentiation (min = 1.56). See Appendix L for the actual survey items. In addition, the data show that the typical principal attended 2.60 (out of 4) days of professional development and 0.56 days of consultative support. Importantly, however, there were a few outlier principals who continued to attend the professional development (max = 3) and participated in the consultative sessions (max = 2). It is conjectured that these principals, who showed continued support for and continued participation in professional development, would be able to foster alignment in their communities and support teacher learning around this practice.

Data Analysis

Given the multiple estimates (between 3 and 6) on the dependent variable over two years and the hypotheses previously outlined, this study used multilevel growth model analysis to test the hypotheses stated above in Table 3. Mutlilevel growth modeling is a framework for simultaneously studying within-individual change and interindividual differences in change over time (Singer & Willett, 2003). Statistical models are mathematical representations of population activity. When a statistical model is used to analyze a particular dataset, this implicitly declares that this population model gave rise to these sample data. Statistical models are not statements about sample behavior or activity; they are statements about the population process that generated the data.

In this framework, Level 1 is repeated observations over time, where multiple observations of differentiated instruction are viewed as being nested within a teacher (Raudenbush & Bryk, 2002). In Level 2, social and organizational variables hypothesized to

influence differentiated instruction were included. The central analysis analyzed data for Year 1 and Year 2 at the same time. In this analysis, variables that changed between Year 1 and Year 2 (e.g., survey data, student demographic data) were structured as time-varying. To augment this analysis, the data were analyzed separately for each year. Three variables did not change between Year 1 and 2—teacher experience, MAP condition, and teacher professional development.

The multilevel model analysis went through a variety of steps, beginning with the unconditional means model (is the outcome reliably different from zero?) and the unconditional growth model (is there reliable growth over time?), and then introducing each variable into the model one at a time (i.e., does this variable reliably predict the outcome?) to estimate their individual contribution to explaining variance in the intercept and slope. The following model illustrates how the variables would have been modeled and tested if every variable was included at the same time.

Level 1 Submodel:

$$Y_{ij} = \pi_{0i} + \pi_{1i}TIME + \varepsilon_{ij}$$

Level 2 Submodel:

$$\pi_{0i} = \gamma_{00} + \gamma_{01}ELL + \gamma_{02}IEP + \gamma_{03}R\_SD + \gamma_{04}T\_RES + \gamma_{05}\ T\_EXP + \gamma_{06}T\_PD + \gamma_{07}P\_PD + \gamma_{08}T\_BELIEFS + \gamma_{09}P\_BELIEFS + \gamma_{010}T\_CONSULT + \gamma_{011}P\_CONSULT + \gamma_{012}MAP + \zeta_{0i}$$

$$\pi_{1i} = \gamma_{10} + \gamma_{11}ELL + \gamma_{12}IEP + \gamma_{13}R\_SD + \gamma_{14}T\_RES + \gamma_{15}\ T\_EXP + \gamma_{16}T\_PD + \gamma_{17}P\_PD + \gamma_{18}T\_BELIEFS + \gamma_{19}P\_BELIEFS + \gamma_{110}T\_CONSULT + \gamma_{111}P\_CONSULT + \gamma_{112}MAP + \zeta_{1i}$$

where

Y_{ij} = differentiated instruction provided by teacher *i*, on occasion *j* as measured by the composite observational measurement of differentiation;

π_{0i} = is intercept of the change trajectory for teacher *i* in the population, the value of the outcome when TIME = 0;

π_{1i} = is the slope of the change trajectory for teacher *i* in the population during the period under study;

ε_{ij} = the level-1 residuals across all occasions of measurement for teacher *i;* this is that portion of individual *i's* outcome that is unpredicted on occasion *j*. these residuals are assumed to be independently and identically distributed as $\varepsilon_{ij} \sim N(0, \sigma_{\varepsilon}^2)$;

γ_{00} = the population average of the level-1 intercepts (e.g., the population average of observed differentiated instruction);

$\gamma_{01}, \gamma_{02}, \gamma_{03}, etc$ ... = the population average differences in level-1 intercepts for a 1-unit difference in each level-2 predictors;

ζ_{0i} = the level-2 residuals across all teachers in the population;

γ_{10} = the population average of the level-1 slopes;

$\gamma_{11}, \gamma_{12}, \gamma_{13}, etc$ ... = the population average differences in level-1 slope for a 1-unit difference in the level-2 predictor;

ζ_{1i} = the level-2 residuals in true slope across all individuals in the population;

With the assumption that the two level-2 residuals, ζ0i and ζ1i, are bivariate normal with mean 0, unknown variances, σ_0^2 and σ_1^2, and unknown covariance, σ_{01}.

In this model, level-1 represents change over time. Time was coded such that the first observation was identified as t = -5, the second observation t = -4, etc., and the final observation will be t = 0. By coding time this way, the intercept (π_{0i}) estimated the amount of differentiated instruction provided at the end of the second year (i.e., final status). In this model, level-2 variables predict intercepts and slopes, and the gamma parameters are of greatest interests. These parameters and their respective standard errors describe how well these variables predict intercepts and slopes and how precise these estimates are. Throughout this analysis, multivariate normality was assumed. Maximum likelihood estimates with robust standard errors were used to fit the multilevel growth models using the HLM Software program.

A step-wise procedure was followed to identify variables that reliably predicted either the amount of literacy differentiation (intercept) or the change in literacy differentiation (slope). Step 1 of the procedure was to test whether there was reliable difference from zero (Means model) and reliable change over time (Growth model). In Step 2, the MAP variable was introduced to test if the intervention predicted the outcome and if MAP x Year interaction was significant. In

no analysis was the MAP variable (or its interaction) significant. In Step 3, each predictor variable was added into the growth model separately to test if the predictor was associated with the intercept or the slope. The results from Step 3 provide answers to the hypotheses stated above in Table 3.

To further analyze these data, significant variables were included in the growth model atg the same time using a step-wise procedure. In Step 4, I included variables with significance values of $p < 0.20$ from Step 3 into the growth model. In Step 5, I retained only variables with significance values of $p < 0.10$ from Step 4. In Step 6, I retained only variables with significance values of $p < 0.05$ from Step 5. This analytic strategy ascertains the effects of each variable while simultaneously controlling for other significant predictors.

Summary

Overall, the goal of the quantitative phase is to identify variables that reliably predicted the level or growth of differentiated literacy instruction. In order to test specific hypotheses linked to theoretical and empirical claims, a multilevel growth modeling framework was used. This framework allowed us to test specific hypotheses and attempted to make statements about the population process that generated the data.

Qualitative Phase

This section describes the proposed inquiry methods for the qualitative phase of this study. The following text will describe the proposed logic of inquiry, guiding research questions, participants, data, and analyses. While the quantitative analysis will indicate if a particular variable reliably predicts the literacy differentiation provided by teachers, a more situated and

nuanced method was needed to understand *how* particular social and organizational factors may (or may not) have influenced literacy differentiation.

Overall Design

The goal of this phase is to study literacy differentiation in its social and organizational context. In order to achieve a more nuanced understanding of the way that social and organizational factors support or inhibit this ambitious instructional practice, this study purposefully sampled 3 schools and interviewed 15 teachers (5 teachers at each school) and the principals of these same teachers. Analyses of interviews focused on producing detailed descriptions, perspectives, opinions, and experiences. This qualitative phase employed the four constructs in the communities of practice theoretical perspective: practice, mutual engagement, alignment, and brokering. These constructs guided the development of research questions and interview question; it also served as a guiding framework for the data analysis.

Research Questions

This qualitative inquiry asked the following descriptive questions: (a) How do elementary teachers describe the practice of differentiated literacy instruction? (b) How do elementary teachers describe opportunities for *mutual engagement* about differentiated instruction? (c) How do elementary teachers describe the ways in which *alignment* (e.g., shared vision, common goals) is constructed around differentiated literacy instruction? (d) How do elementary teachers describe brokers and artifacts that have supported differentiated literacy instruction?

Participants

The focal participants were teachers who had previously participated in the MAP study (Cordray et al., 2011) and in the quantitative portion of this dissertation study. Teachers were employed at three different schools and in two different districts. Seven 4th grade teachers and eight 5th grade teachers were interviewed. Eight received the MAP professional development and seven participated in the counterfactual group. As the quantitative results section indicates (in the next chapter), teachers who served in the counterfactual were indistinguishable from MAP participants in relation to their literacy differentiation. In addition, three principals were interviewed. By interviewing teachers and principals whose data were analyzed in the quantitative phase, inferences and conclusions drawn from the quantitative phase hold without additional external validity concerns (e.g., the statistical finding might not apply to different participants).

Sampling strategy. The goal of purposeful sampling is to select information rich cases whose study will illuminate the questions under investigation (Patton, 2002, p. 230). Because the overall goal of this study was to understand differentiated instruction within its organizational context, school-level (rather than teacher-level) purposeful sampling was employed to identify extraordinary organizational contexts.[1] First, schools were indexed and ranked by growth in the observed literacy differentiation. Schools that were in the top quartile of differentiation growth were eligible for inclusion. Second, schools were ranked on categories of student diversity (e.g., IEP and ELL). The goal of using these two criteria was to interview teachers who increased their literacy differentiation while teaching in diverse settings. Two of the three schools had

[1] I had intended to conduct purposive sample at the teacher level (rather than the school level), but this was not possible due to Internal Review Board restrictions. Specifically, the consent forms that teachers had signed previously did not allow me to re-contact them based on individual results. However, sampling at the school level was more consistent with the communities of practice theoretical perspective.

significant ELL populations (See Appendix A). One of the schools was not as linguistically diverse, but the amount of observed literacy differentiation growth was extremely high. Using these two criteria, teachers from diverse schools that showed evidence of positive differentiation growth were identified and recruited.

School and teacher recruitment. In accordance with Institutional Review Board procedures, the principal was contacted and asked if s/he would support the research project. When I contacted each principal, I ensured that the same principal had been at the school for at least three years. I provided her/him with information about the study, and specifically indicated that I was conducting a follow-up study. After s/he verbally agreed to participate, I asked him/her to sign a letter of cooperation that invited me to the school. Then, I asked the principal to provide me with a list of teachers who had previously participated in the MAP study. The principal discussed the research with each teacher and arranged for that teacher's class to be covered by a substitute during the interview session. At the beginning of every interview, I explained the purpose of the research and emphasized that their participation was voluntary and completely confidential. Every principal that I contacted (n=3) and every teacher that I met (n=15) volunteered to be interviewed.

Data

The primary data for the qualitative phase were interview responses. The purpose of an interview is to enter into the other person's perspective (Patton, 2002). Qualitative interviewing begins with the assumption that the perspective of others is meaningful, knowable, and able to be made explicit. For this study, a standardized open-ended interview was constructed. This kind of interview seems appropriate (rather than informal or guided interviews) because it provides

transparency, focus, and is an efficient use of teacher time. The central purpose of the interview was to explore teacher opinions, insights, and experiences relevant to differentiated literacy instruction and how social and organizational factors influence this classroom practice.

Interview protocol. Based on the communities of practice theory, an interview protocol (see Appendix B for the full protocol) was designed around four constructs: practice, mutual engagement, alignment, and brokers. While these terms were not used in the interview, these constructs guided the development of focused questions and prompts. In each question or prompt, the goal was to create a clear and singular focus (Patton, 2002). Throughout the interview, a variety of prompt types were used, including descriptive questions, role-simulation questions, and presupposition questions.

In relation to sequencing an interview, Patton (2002) suggested beginning an interview with noncontroversial prompts about behavior, activities, and experiences that solicit straightforward description with minimal recall and interpretation. Once an experience has been described, Patton argued, opinions and feelings can be solicited, building on and probing for interpretations of the experience. He also suggested that experiences about the present tend to be easier for respondents than questions about the past (or the future). Patton also suggested not to begin with routine, closed questions; he suggested to space them strategically or to save these inquiries for the end of the interview. Table 9 identifies this study's central constructs and the main interview question.

Table 9: Study Constructs, Research Questions, and Interview Questions

Construct	Research Questions	Interview Questions
Practice Differentiated instruction: responsively adapting content, process, and product for students	How do elementary teachers describe the practice of differentiated literacy instruction?	• If you were asked to observe another teacher's instruction for one or more lessons, what would you look for to decide whether differentiated literacy instruction was present? • If you were going to judge the quality of differentiation occurring in another teacher's lesson, how would you determine if the differentiation was of very high quality? How would you determine if differentiation of low quality? • When you think about your history as an educator, how did you learn to differentiate instruction?
Mutual engagement Learning is a social activity supported by participation and mutual engagement, where practitioners develop a shared repertoire; learning occurs when more and less experienced people work together	How do elementary teachers describe opportunities for mutual engagement around differentiated instruction?	• Is there any particular teacher or person—at this school or perhaps elsewhere—who has really shaped your thinking about differentiated instruction? • What formal opportunities, if any, do teachers have in this school to meet with one another to discuss literacy differentiation? • How, if at all, have your observation(s) of other teachers influenced your literacy differentiation?
Alignment Local practices are influenced by community alignment (e.g., shared vision, common goals); alignment is critical to support change in practice; leadership can be influential in supporting change; reification is also critical in supporting alignment	How do elementary teachers describe the ways in which alignment (e.g., shared vision, common goals) is constructed around differentiated literacy instruction?	• Suppose your principal was here. How would s/he describe differentiated instruction? • In this school, are there any important policies or documents related to differentiated instruction? If so, can you please describe what they are in how they affect you? • Has your principal come to your classroom to observe your literacy instruction during this school year? Is the feedback written and/or oral? Has the principal given you any feedback about your differentiated instruction practices? If so, can you describe the feedback? Probe on the content of feedback.
Brokers Conjectures that change to a community's practice can be brought about by brokers, who bring boundary objects and boundary practices from other communities	How do elementary teachers describe brokers and artifacts that have supported differentiated literacy instruction?	• What was the most important professional development experience that you've had about differentiated instruction? How were you able to incorporate into your instruction? • Does your school have a dedicated coach or literacy coach? Can you please describe what your coach expects from you in relation to differentiated instruction? Who coordinates the activity and the agenda of the literacy coach (e.g., district, principals, self-guided)?

After I interviewed all the teachers in each school, I interviewed their principal. For the principal interviews, a shortened and customized version of the teacher interview was used. In addition, I

developed questions/prompts based on teacher reports. For example, if teachers consistently reported that the principal always observed them during time when they should be enacting guided reading, I followed up on this topic with the principal and asked him/her to explain their rationale for this practice.

Interview strategy. A key component of good interviewing is establishing rapport while remaining neutral (Patton, 2002). By neutrality, Patton means creating a space where the person being interviewed can tell me anything (in relation to content) without engendering either my favor or disfavor with regard to the content of her or his response. By rapport, Patton means the relationship or connection established between the interviewer and interviewee. In order to establish rapport and solicit good information on your target topic, Patton suggested that the interviewer *should* provide feedback and reinforcement that the purpose of the interview is being fulfilled (e.g., your comments are particularly helpful, that's a really clear statement, I really appreciate your willingness to express your feelings about that). In follow-up and clarification questions, the asking of "why" questions is generally discouraged because it can co-create defensiveness (Patton, 2002). With this in mind, I attempted to articulate follow-up probes in other ways (e.g., can you say more about that? can you please elaborate on ____?).

Before conducting field interviews, the interview protocol was tested with 3 local elementary school teachers. During every interview, I took notes on the interviewee's responses. Along with helping me detail and consider the interviewee's responses, this provided non-verbal cues to the interviewee about the kind of information that I considered important.

Study database. After the interviews with teachers and principals were conducted, I transcribed the interview data (243 pages of single spaced text) and entered the transcribed documents into the HyperResearch software program. In HyperResearch, a researcher can enter

multiple forms of data (e.g., audio, text, video), create data groups (e.g., schools), and code data within and between groups with a variety of user-defined codes. The database is also an archive of information so that other researchers can review the evidence directly and not be limited to the written case study report.

Analytic strategy

Qualitative data analysis is the process of transforming data (e.g., interview responses, field notes) into evidenced-based interpretations and findings. The goal of this section is to outline the analysis that was used to "construct informed, vivid, and nuanced reports" that reflect the data (Rubin & Rubin, 2005, p. 201) and to outline the general strategy used to analyze and interpret the data. Viewed widely, the analysis involved classifying, comparing, weighting, and combining data to show patterns and themes (where and if they exist), stitching together vivid descriptions into a coherent narrative, yet also keeping an eye out for instances where this constructed narrative did not hold.

As I made trips into the school and conducted interviews, data analysis began with the creation of research memos (e.g., theoretical and empirical notes, descriptions, and questions) and interview notes. These memos and notes were ongoing and were included in the study database. By documenting, noting, and analyzing data as I experienced it, future school experiences and interactions were potentially richer and more meaningful insofar as I became further attuned to some of the difficulties, questions, and complexities of this topic. The analysis has three sections: exploring the data, developing codes, and coding the data, drafting the analysis, and member checking.

Patton's (2002) notion of sensitizing concepts was an important analytic guide. Four constructs (practice, mutual engagement, alignment, and brokers) within Wenger's community of practice theory have directed this study's design and data collection. Throughout the analysis phase, these constructs were used to classify data, and a specific analytic goal was to understand how these concepts helped explain the multiple ways that teachers' differentiation practices were affected by social and organizational factors.

Data exploration. After all of the data were collected and put into HyperResearch, the data were read one teacher—and one school—at a time. The goal of reading the data in this way was to explore, view, and develop a preliminary understanding. As I read the interviews again, I jotted down notes and questions, some specific to the teacher, others to the school organization or principal, and others related to practice, mutual engagement, alignment, and brokering. These memos served as short phrases and ideas, not elaborate coding. While this exploration phase had an eye toward patterns and themes, the primary purpose was to get acquainted with the wide spectrum of data and to chart preliminary thoughts, conjectures, and questions.

Code development. The goal of this analytic phase was to describe teacher perceptions, experiences, and opinions about social and organizational factors that supported (or inhibited) literacy differentiation. In general, the aim was to detect and identify *prototypical* descriptions, experiences, and opinions that teachers reported as critical supports for differentiated instruction. While the constructs of mutual engagement, alignment, and brokering guided this inquiry and the data collection, these constructs are not specified in enough detail to analyze this data in a nuanced way. To further refine, understand, and describe literacy differentiation in its organizational context, I attempted to identify patterns and themes within and across the data. I followed Patton's (2002) distinction between patterns and themes, who argued that patterns are

descriptive findings (e.g., almost all teachers reported being verbally encouraged to differentiate by the principal) whereas themes take on a more categorical or general form (e.g., encouragement). Thus, the data were coded both deductively (e.g., mutual engagement) and inductively (i.e., patterns and themes generated by me).

The inductive development of codes is often called open coding (Strauss & Cobin, 1997) to emphasize the importance of remaining open to the data, and this occurred over multiple readings of the data. Before developing codes, I read the entire corpus to help me distinguish between patterns and one-time descriptions, opinions, or concepts. In order to identify patterns and themes, codes and sub-codes for these patterns or themes were developed with preliminary descriptions. During the code-development phase, the constant comparative procedure was used (Glaser and Strauss, 1967). This procedure—comparing incident with incident for similarities and differences—is critical to classify, define, and compare data. In addition, the constant comparative strategy helped me distinguish one category from another and further helped me identify properties and dimensions of each category.

Data coding. After developing codes, the next analytic phase was to code the data with the previously developed coding scheme. This process is primarily deductive, except in cases where the coding scheme does not seem to work or an important counterexample was identified. During the coding, I repeatedly checked the defined coding scheme to prevent coding drift (Miles & Huberman, 1994). See Appendix K for the final coding instrument. By the end of this phase, a refined list of patterns, themes, and properties was constructed.

An important additional step during coding was the search for counterexamples and "rival explanations" (Yin, 2003, p. 112). For example, based on the theory and empirical research, a straightforward explanation for the principal's influence on teacher differentiation

was that principals who valued differentiated instruction created structured opportunities for teachers to specifically enhance this practice (e.g., shared planning time). A direct rival would be that the district required this structured meeting on differentiated instruction and the principal had very little to do with this structured opportunity for mutual engagement. In addition to rival explanations, another important consideration was attending carefully to deviant events or data that did not fit the coding scheme. When coding the data, rival explanations were specifically sought out and deviant cases were noted carefully.

Draft findings. In this final analytic step, patterns and themes were further defined and identified, along with their properties and boundaries. Because the goal of this qualitative phase was rich descriptions rather than theory, the focus was to create *prototypical descriptions* of how teachers were supported to differentiate their instruction. Thus, the qualitative findings were organized around the theoretically structured research questions because these questions provided a meaningful framework for interpreting this data.

Member checking. After the data were coded and the conclusions were drafted, I summarized the findings (see Appendix C) and went back to the field to check the validity of the findings with participants. Lincoln and Guba (1985) described member checks as "the most crucial technique for establishing credibility" (p. 314) in a study. By conducting these follow-up interviews, participants had a chance to react to the findings and the final narrative. In each school, I conducted a focus group with all of the teachers and then conducted a separate session with each principal. Participants were asked if the patterns and themes made sense, if anything was missing, and whether the overall account was realistic and accurate. Generally speaking, both teachers and principals agreed with the findings. When appropriate, participants' comments made during member checking were incorporated into the final narrative.

Summary

This qualitative inquiry investigated how teachers described the practice of literacy differentiation and what social and organizational factors supported this practice. Guided by communities of practice theory, the constructs of practice, mutual engagement, alignment, brokers, and boundary objects guided this inquiry. This methods section outlined how schools and participants were selected and recruited, what interview questions were asked, how the data were managed and analyzed, and how member checking was conducted. This qualitative inquiry complemented the quantitative phase by exploring teacher descriptions, opinions, insights, and experiences.

CHAPTER IV

QUANTITATIVE RESULTS

This section presents findings from the quantitative portion of the study, which hypothesized that community of practice variables would influence the final level (and rate of change) of literacy differentiation provided by classroom teachers. Using multilevel growth modeling and a stepwise analysis, the quantitative results show that the MAP program had no influence on literacy differentiation. Eight variables were identified as significant predictors when modeled alone. When modeled with other significant predictors, only teacher beliefs about differentiated instruction was a statically reliable predictor ($p< 0.05$) of literacy differentiation.

Descriptive Statistics

The descriptive statistics indicated that, over the course of two years, there was a small increase in the quantity of differentiated instruction provided by the 164 teachers in the final analytic sample (Appendix D). The average amount of class time that had some form of differentiation increased from 33% (Fall 2008) to 41% (Spring 2010) over the 2 study years. This percentage difference translates into an effect size of approximately 0.17 (for both conditions). Based on student demographics data, less than 1% of the students had individualized education plans (IEPs) and this was stable across years. The percentage of students identified as English language learners rose from 2% (Year 1) to 6% (Year 2). Based on professional development attendance data, the descriptive statistics show that consultative support substantially dropped off in the second year for both teachers and principals. In Year 1, the average MAP teacher attended 2.55 consultative sessions over the year and this dropped to 0.51 in Year 2. Likewise, principals

(all of whom had the opportunity to participate in the professional development) attended 2.13 consultative sessions in the first year, but only 0.49 in Year 2. This substantial decline in consultative attendance indicates that the NWEA professional development staff did not continue to support teachers with ongoing consultative sessions as originally intended. From Year 1 to Year 2, principal support for differentiated instruction increased slightly (from 2.72 to 3.0) and teacher support decreased slightly (from 2.89 to 2.63).

Correlations

As expected, teachers in the MAP group showed high and positive correlations with MAP professional development (MAP; $r = 0.88$, $p < 0.001$) and MAP consultative support (T_Consult; $r = 0.66$, $p < 0.001$) in both years (see Appendix E and F for the full correlation matrix, by year). Because of these high correlations, the MAP variable was only used in the multilevel growth model to test if the MAP program affected the level or rate of the outcome. This variable was left out of further analyses. While there was some evidence of multicollinearity among predictor variables, the correlations were moderate ($|r| < 0.6$) or low. Thus, I proceeded with the assumption that the predictor variables were not so highly correlated to each other that they indexed the same construct. In relation to the outcome variable, the Year 1 data showed weak correlations between differentiated instruction (DI) and four predictor variables: ELL% (ELL; $r = 0.22$, $p = 0.008$), principal consultative support (P_Consult; $r = -0.19$, $p = 0.02$), teacher resources (T_Res; $r = 0.18$, $p = 0.027$), and teacher support (T_Beliefs; $r = 0.21$, $p = 0.009$). In the Year 2 data, principal consultative attendance was significantly correlated with the outcome (P_Consult; $r = 0.25$, $p = 0.002$). While these correlations provided information about the data year by year, the primary dataset for this study was a composite Year

1 and Year 2 data, where most predictor variables were modeled as time-varying. Three predictor variables were not structured in a time-varying way (MAP condition, teacher experience, and teacher PD).

Graphing Literacy Differentiation

To better understand the data and to inform model specification, Appendix J presents empirical change plots with superimposed ordinary least square (OLS) estimated linear trajectories for 15 teachers randomly selected from the larger sample. These plots show a lot of variability in individual change trajectory over two years. In relation to literacy differentiation, some teachers steadily increased (e.g., 3, 134), other teachers steadily decreased (e.g., 61, 41), and a few teachers remained the same over time (e.g., 99). In relation to the functional form of change, the relationship between TIME and literacy differentiation appears linear for some teachers (e.g., 3, 71, 82) but not for others (e.g., 13, 197). Based on these plots, a linear trajectory appears to be a reasonable approximation for the data. The plots did not support other functional forms (e.g., quadratic or curvilinear).

Unconditional Means Model

First, the data were fitted to an unconditional means model, which estimated the outcome's grand mean ($\gamma_{00} = 0.39$) across all occasions and individuals (see Appendix G). The rejection of its associated null hypothesis ($p < 0.001$) confirms that the average amount of differentiated instruction for teachers in this sample is non-zero. Thus, the data show that, during literacy instruction, the average teacher has some form of literacy differentiation present in 39% of his/her literacy block. The estimated within-person variance, σ_{ε}^2, is 0.04; the estimated

between-person variance, σ_0^2, is 0.01, and both variance components were significantly non-zero ($p<0.001$), indicating that the average teacher's literacy differentiation varies over time and that teachers differ from each other in literacy differentiation. The intraclass correlation coefficient, the proportion of outcome variation that lies between people, was 0.23, indicating that about one quarter of the variation in differentiated instruction is attributable to differences among teachers. Collectively, results from this model indicated that there was significant variation in the outcome to explore predictors in subsequent analyses.

Growth Model

The data were then fitted to a growth model, where time was added into the multilevel model for change. The fixed effects, γ_{00} and γ_{10}, estimate the final status and slope of the population average change trajectory. The rejection of the null hypothesis for each ($p < 0.001$) confirms that the average true change trajectory for the outcome has a non-zero intercept of 0.42 and a small but non-zero slope of +0.01. The level-1 residual variance, σ_ε^2, summarizes the average scatter of a teacher's observed outcome values around his or her own true change trajectory. Comparing σ_ε^2 in the growth model to the means model, the level-1 residual variance was stable, suggesting that the inclusion of time as a variable did not reduce level-1 variance (which is what we would expect if the true relationship was linear with time). For the level-2 variances, σ_0^2 and σ_1^2, the null hypothesis is rejected for the final status ($p < 0.001$) but only marginally for the final rate of change ($p < 0.20$). These results suggest that it is worth trying to use level-2 predictors (e.g., teachers experience and MAP condition) to further explain heterogeneity. Because the rate of change variance is only marginally significant, the chances of identifying a time-varying predictor are, however, unlikely. These level-1 and level-2 variance

statistics provide benchmarks for quantifying predictor effects in future models. Assuming an unstructured variance-covariance structure, the parameter (0.003, $p < 0.05$) for the population covariance of the level-2 residuals, σ_{01}, indicates that the relationship between the true rate of change in the outcome and time is positive and small but non-zero. In this model, the intraclass correlation coefficient increased to 0.36 (from 0.23), indicating that, using a linear growth model with time, about one third of the variation is attributable to differences among teachers.

MAP Model

The data were then fitted to a growth model that included MAP as a predictor of both final status and change. This model tests the conjecture that teachers who were randomly assigned to participate in the MAP program (which included resources, consultative support, and professional development) varied systematically from teachers in the counterfactual condition. The estimated differential in final literacy differentiation for teachers who participated in the MAP program was indistinguishable from zero (0.03, *ns*). The estimated differential in the rate of change for teachers in the MAP program was also indistinguishable from zero (0.01, *ns*). Because the MAP professional development was administered over an entire year, the research team conjectured that there would be no difference in literacy differentiation until Year 2. To test if the MAP teachers varied significantly in Year 2, a MAP x Year interaction was included to the growth model as a predictor of both final status (0.03, *ns*) and change (0.02, *ns*), but neither predictor was distinguishable from zero. Overall, the data suggest that participation in the MAP program had no statistically reliable impact on the quantity of literacy differentiation provided by teachers.

Individual Predictor Variables

After demonstrating the MAP intervention had no influence of literacy differentiation, each variable was included with the growth model as a predictor of both final status and change (e.g., IEP and IEP x Time). This approach indicated if any of the predictors—modeled alone—would reliably estimate the final status or rate of change in the outcome. In total, 11 different models were fitted (one for each potential predictor) in step 1. The results of this analysis provide answers to the hypotheses articulated in Table 3. The null hypothesis was rejected (at the $p < 0.05$ level) for three variables: Teacher Consultative Support, Teacher Beliefs, and Principal Beliefs x Time (see Appendix G for complete results). Teachers believed in the value of the professional development on differentiated instruction and those who attended more consultative support sessions provided more differentiated instruction. In addition, when a principal reported that they believed in the value of the professional development on differentiated instruction, the rate of change for teachers in their school was higher.

Stepwise Model Analyses

To identify significant and reliable predictors of differentiated literacy instruction, a stepwise analysis was conducted. The logic of this approach is to identify significant predictors and then to include significant predictors in the multilevel growth model *at the same time* in order to assess the predictor's effects while controlling for other significant predictors.

After variables were included in the growth model individually, a subsequent analysis was conducted to identify variables that would be reliable while controlling for other significant variable. This step-wise analysis is a more robust test of a variable's influence. Table 10 outlines a simplified version of the subsequent step-wise analysis. When added separately, five predictors

significantly ($p < 0.20$) estimated the final status (IEP, Teacher Consult, Principal PD, Principal Support, and Teacher Support) and three estimated change significantly (IEP x Time, Teacher Consult x Time, Principal Support x Time). While these eight predictors were statistically significant at varying levels (from $p < 0.2$ to $p < 0.05$), further analyses were conducted to test if any predictor would be significant while simultaneously controlling for other significant predictors.

Table 10: Stepwise Model Analysis

Step 1	**Each predictor with growth model**		
	Predictor	**Coefficient**	**Significance**
1	IEP	0.20 (0.14)	~~
2	Teacher Consultative Support	0.04 (0.02)	*
3	Principal PD	-0.01 (0.007)	~~
4	Principal Beliefs	0.06 (0.04)	~~
5	Teacher Beliefs	0.04 (0.02)	*
6	IEP x Time	0.07 (0.05)	~~
7	Teacher Consult x Time	0.007 (0.004)	~~
8	Principal Beliefs x Time	0.02 (0.01)	*
Step 2	**Model A (retain effects at p < 0.20)**		
1	Teacher Consultative Support	0.04 (0.02)	*
2	Principal Beliefs	0.06 (0.04)	~~
3	Teacher Beliefs	0.03 (0.01)	*
4	Teacher Consult x Time	0.006 (0.004)	~~
5	Principal Beliefs x Time	0.02 (0.01)	~~
Step 3	**Model B (retain effects at p < 0.10)**		
1	Teacher Consultative Support	0.01 (0.06)	
2	Teacher Beliefs	0.03 (0.01)	*
Step 4	**Model C (retain effects at p < 0.05)**		
1	Teacher Beliefs	0.03 (0.01)	*

** p < 0.01; * p < 0.05; ~ p < 0.10; ~~ p , 0.20

In step 2, Model A was constructed with the eight predictors that individually had significance values of $p < 0.20$. When the data were fitted to Model A, only 5 predictors showed evidence of statistical significance while simultaneously controlling for each of the other predictors. Of the five significant predictors, only two (Teacher Beliefs and Teacher Consultative Support) had significance values of $p < 0.10$. In step 3, Model B was constructed with these two predictors (Teacher Beliefs and Teacher Consultative Support). When both of these predictors were fitted with the growth model to predict the final status, only one—Teacher Beliefs—was a statistically reliable predictor of differentiated literacy instruction ($p < 0.05$).

In step 4, the final model, Model C, was constructed, with only Teacher Beliefs as a predictor of the final status. The estimated differential in literacy differentiation for teachers who reported believing in the value of their professional development was 0.03 (0.033, $p < 0.05$), indicating that teachers who supported differentiated instruction provided about 10% more literacy differentiation for students in their classroom. The effect of this predictor was stable regardless of the presence of other significant predictors. When compared to the unconditional growth model, Model C's level-1 (σ_ε^2), and level-2 (σ_0^2, σ_1^2) variances remained stable, indicating that the inclusion of teacher support in the model did not result in the explanation of additional level-1 or level-2 variance. In addition, the rate of change variance, σ_1^2, was not statistically significant in Model C, indicating that—after controlling for teacher support—there was not reliable growth in differentiated instruction. While not discussed in detail, this analysis was also conducted by year (see Appendix H and I for these results).

Central Findings

This analysis used the community of practice theory to help identify variables that might predict the final status or rate of change in literacy differentiation. The results indicated that teachers who believed in the value of the professional development on differentiated instruction and those who attended more consultative support sessions differentiated their instruction to a higher degree. In addition, when principals believed in the value of the professional development on differentiated instruction, teachers in their associated school had higher growth rates in literacy differentiation. Consistent with previous studies that argued that teacher responses to differentiation often mirrored their principals (e.g., Brighton et al., 2005; Hertberg-Davis & Brighton, 2006), these results suggest that beliefs (of teachers and principals) are critical to instructional practice. In addition, these results provide further evidence that teachers need continued professional development and consultative support to implement an instructional practice in their classroom. Of these three variables, Teacher Beliefs remained significant while controlling for other significant variables, suggesting that this variable is a robust predictor even in the presence of other variables.

CHAPTER V

QUALITATIVE RESULTS

The qualitative portion of this study investigated the practice of literacy differentiation in the context of 4th and 5th grade teachers. Specifically, it investigated the practice of literacy differentiation and explored the social and organizational factors that supported (or inhibited) its growth. With these goals in mind, I purposively identified and recruited diverse schools that increased in literacy differentiation over the prior two years. In total, I interviewed 15 teachers and their respective principals (n=3). All educators participated in the MAP study (Cordray et al., 2010) and their data were analyzed in the quantitative portion of this dissertation.

Before presenting the findings, a few reporting conventions will be presented. To protect the confidentiality of participants, table 11 identifies the pseudonyms used for teachers, principals, and schools.

Table 11: Pseudonyms for participants and schools

School	Teachers	Principals	Schools
1	Annie, Alice, Alex, Abbey, Adrianna	Principal Allyson	Arthur Elementary
2	Barb, Bella, Brandy, Bree, Britney	Principal Blanch	Buchanan Elementary
3	Camille, Caren, Carmen, Casey, Cathy	Principal Charlotte	Cleveland Elementary

By using these naming conventions, it was hoped that readers would find it easier to associate educators with their local counterparts (both teachers and principals). In addition, when describing trends and patterns, the following table identifies descriptors used:

Table 12: Descriptors used to index consensus

Descriptor	Number of teachers
Universally	15 teachers
Consistently	8-14 teachers
Sometimes	4-7 teachers

For example, teachers *universally* reported that they needed more time to differentiate, *consistently* reported that their principal supported literacy differentiation, and *sometimes* reported that MAP results helped them differentiate their literacy instruction. While the importance of information is not always a function of *how many* people made a particular claim, this convention provides a simple way for readers to index the degree of consensus about particular claims.

Overall, the qualitative results show that teachers consistently held a group model of differentiated instruction and, for most educators, differentiated literacy instruction was synonymous with guided reading. In addition, teachers consistently reported that differentiated instruction was supported by opportunities for mutual engagement (e.g., sharing resources and observing other teachers), principal support (e.g., observation during guided reading), district support (e.g., purchasing classroom resources and professional development from district staff), and specific boundary objects (e.g., MAP reports, leveled readers). A reader who would like a more detailed but concise overview of the finding should read Appendix C.

The Practice of Literacy Differentiation

Overall, teachers had complex and multi-dimensional descriptions of differentiated literacy instruction. General education teachers described using many different instructional strategies and methods to differentiate for students. This included guided reading, literacy

centers, literature circles, books clubs, individualized instruction, between-classroom grouping, and even the strategic use of aides and specialists. Although many different instructional methods were mentioned, the use of small groups and guided reading was—by far—the most common way to describe differentiated literacy instruction.

Small groups and guided reading. Almost every teacher described differentiated instruction using a group model of differentiation. In particular, teachers consistently described differentiated instruction as guided reading (e.g., Fountas and Pinnell, 1996) or the use of small groups with group-specific texts. The following responses were typical:

> Annie: For me, it would mean various guided reading groups. Groups would be assigned a certain text. All of the skills that are taught and strategies that are taught in shared reading are reinforced in guided reading only at texts that are appropriate for each group level. (Arthur Elementary)

> Brandy: Small group work and then different ability groups; when I differentiate you are doing ability groups, your lower ones and your higher ones separately. And then looking at the materials they are using isn't all the same. That it's different and at their level and challenging…. just small groups with different materials, but the same topic. Because we have a lot of resources. If you are doing something on the presidents, but different levels. (Buchanan Elementary)

> Casey: In the sense of group work. Having the teacher work with small groups. Those small groups might be the same lesson–on cause and effect–but leveled and guided for their ability. Some kids get cause and effect and so we might have a harder task and other kids will need more guidance and think-alouds to help and guided practice. (Cleveland Elementary)

In these responses, teachers described differentiated instruction as having small groups of students at similar "reading levels" read texts matched to their previously assessed reading levels. While detailed descriptions of guided reading varied widely, one teacher described the activity as students reading or working independently most of the time while the teacher conducted guided reading conferences with 2 or 3 groups over 60 minutes (Alex, Arthur Elementary). Another teacher said that she sometimes combined guided reading with literacy

centers, where students worked on skills, games, and tasks while the teacher conducted conferences with another group (Carmen, Cleveland Elementary).

When asked why it was important to use texts suited to students' reading levels, teachers responded in a wide variety of ways: it was necessary for students to learn, to avoid frustration, to challenge students, to support the development of particular reading skills, and to meet students where they are. In all three schools, teachers consistently reported using multiple measures and assessments to identify students' reading levels, including formal measures (e.g., ISAT or MAP), informal reading inventories (e.g., DRA or running records), and teacher recommendations and observations. In relation to literacy measurements, multiple teachers reported that MAP was one of the most reliable ways to identify students' reading levels.

As can be seen from the responses above, teachers reported organizing their instruction around reading skills and strategies. When asked to describe how she would differentiate a skill, one teacher had a particularly lucid response:

> Caren: Okay, let's go back to teaching the skill of main idea and details. Let me just use the social studies textbook for an example. There is a page of information, a picture, a caption, maybe there are 6 to 8 paragraph on the page, so my high readers I can give them a reading purpose for the page that would lead to uncovering the main idea and details. So, a group of them might be working on that. I prepare that guided reading sheet for them. They can do that on their own. The group over here, they cannot read the text on their own. I know that, but I do want them to be able to at least give me feedback that they can uncover main idea, so either I've re-written the page at a level they can read at, or I've found a similar material that gives the same information but far easier for them with shorter paragraphs to uncover the main idea, and they have to be guided through it. You know, remember main idea is, and here is how we find it, and now let's read it together. For another group, they might be able to read it on their own and I would direct uncovering the idea. Another group, it might be more effective if I read it out loud to them and followed along with their finger. It just depends ... you just have to know the learner before you teach the lesson. (Cleveland Elementary)

In this vignette, the teacher reported differentiating the content (e.g., different texts), process (read on their own or I will read it to them), and products (writing answers to questions or talking

to the teacher). While teachers reported designing units around ideas or concepts (e.g., animals, chocolate, or non-fiction), they consistently reported that reading skills were the focus of their instruction.

Although the logic of differentiation might lead a teacher to have groups study different skills at the same time, this was almost never reported. When I detected this pattern during data collection, I pressed a few teachers to explain their reasoning why every group would be working on the same reading skill or strategy, even if some students had shown proficiency on it. During the initial interview, one forthright teacher stated that she had the entire class focus on the same skill "so that she didn't go crazy" (Carmen, Cleveland Elementary). From this teacher's perspective, the idea of having groups focus on different skills and different texts was not feasible. Likewise, another teacher reported that sometimes guided reading "gets disjointed because you have one group reading about a princess, another group reading a mystery, and then another group doing something else because you don't have the texts necessary to do the same kind of thing, the same concept" (Abbey, Arthur Elementary). During member checking, one teacher added the point that—ideally—she wanted students reading similar texts, but "we just don't have the resources for that now" (Annie, Arthur Elementary).

Alternative differentiation models. Although the majority of teachers said that differentiated instruction was primarily guided reading and/or small group instruction, a few teachers described the practice in other ways. One teacher had a highly individualized vision of differentiated instruction. Despite strong encouragement by the principal and district personnel, she did not do guided reading but instead preferred to conduct individual reading conferences. When I asked her what she thought about guided reading groups, she reported the following:

> Alice: And I don't think there is anything wrong with groups. That's fine. That's fine. But I also know that when I pull a group of kids over that know that they are the lowest

> readers in the class and everybody else knows that they are the lowest readers in the class, you know, there is a place for that, but to do that daily, I think it damages self-esteem and I think it, um, it sort of makes it okay to be at that level, you know, this is where I am. And it's not okay. You know. And if they are put out there in the bigger group and they see these other kids doing things. This young man went from below meets to exceeds because he got thrown in the mix with kids who were readers, who talked about books, who talked about higher level books, and he wanted to be a part of that, and that motivated him, where if I had kept him over here in this little group with the 5 page stories, I don't think that we would have seen the growth that we saw. (Arthur Elementary)

Even though Alice mentioned that the principal and district staff were not happy with her approach, she said that she was able to do it because she had been around longer than just about anyone. Perhaps ironically, Alice's individualized approach to reading instruction was sometimes mentioned as a goal by teachers who reported doing small group guided reading. They said that they would become more expert at differentiated instruction if they found a way to have more individual reading conferences. At the same time, two teachers reported that they were not sure that meeting with one student alone was fair: "when I meet with one student alone, 24 aren't getting any attention from me" (Alex, Arthur Elementary).

In addition to group and individualized instruction, a few teachers mentioned that choice can and should be a central feature of classroom differentiation. One teacher, Britney, mentioned that she learned about differentiating a "different way" in a master's levels course, where the focus was on differentiating by choice:

> Britney: I came up all these lists of activities based on concepts geared to their level, it's might be for your low ones draw a picture, whereas your high, an activity might be for them to design their own book cover, for this story and write a summary on it and what you think would happen next. It was a list of activities and they would pick from what they wanted to do…. And we kind of came up with something like this in our last year professional development day, kind of like a menu, or a menu choice, where your average students pick from this column and your high students pick from this column, and I created this menu of things to do. But when it came to implement it, it was really hard to keep track of what everyone was doing, so I ended up stopping it and trying something different, but I liked how it was all about giving students more choice in how they applied the knowledge that they've learned (Buchanan Elementary).

When asked why choice was important, teachers reported that "it gives the child the power to show what they know" (Caren), that students can choose to do "what they are interested in" (Carmen), and that students can "demonstrate their knowledge in different ways" (Camille).

In addition to choice differentiation, teachers consistently reported that differentiation was provided to students through the strategic use of aides and specialists. When asked to describe the role that specialists play in providing differentiation to students in the classroom, teachers mentioned that a variety of specialists (e.g., ELL specialists, learning behavior specialist, reading specialist) and aides provided support for students' learning—in and out of their classroom.

> Kelly: What role to specialists play in relation to providing differentiation for students in your classroom?
>
> Alice: Well, they get a lot of extra help. One young lady in my room gets extra reading help at lunch and again in the last thirty minutes of the day. So she gets a lot of extra help. The noontime thing is one on one and there is a small group (maybe 6) during the afternoon session. Our principal, if she can find 20 minutes when somebody can work with a kid, they are going to do that, to get that one on one. She is very good at that, finding a way to manipulate time and schedules so that kids get extra help if they need it beyond what I can actually do in the classroom (Arthur Elementary).

Teachers in this particular school, Arthur Elementary, regularly conveyed that students often received tutoring and small group instruction before the day officially started, during lunch, and after school. Although not a focus of this dissertation, teachers and principals spoke at length about how important the support of educational specialists was.

Although there seemed to be at least four different models of differentiation, the group oriented model was by far the predominant model reported by these teachers and guided reading was the most common way that literacy instruction was differentiated. When asked to describe what "high quality" differentiation looked like, teachers mentioned that it would be important to know how groups were formed and how texts were chosen. In particular, teachers consistently

mentioned that high quality differentiation would "engage students" and would use high quality texts and tasks, not short basal stories and worksheets. A few teachers mentioned that high quality differentiation would challenge the students and engage them in higher level thinking, such as critical reading and inference making.

In discussing their instruction, teachers' consistently talked about the construct of "ability." For many teachers, differentiated instruction seemed to be a new way to describe the historically persistent (and much criticized) practice of within-classroom ability grouping. As shown in many quotations above, teachers consistently used ability grouping language (e.g., high group, low students), which suggests that sorting and categorizing students in this way was a normal part of their daily discourse. In addition, the primary way that teachers reported enacting literacy differentiation was content differentiation (e.g., different texts) rather than through process (e.g., learn different reading strategies) or product (e.g., produce different learning products) differentiation. As will be discussed more below, the emphasis on content differentiation makes teachers more reliant on instructional resources, which are often provided by third party vendors (e.g., Pearson, Heinemann).

Among these teachers, there was wide consensus that differentiated instruction was valued and important. For most general education teachers, differentiated instruction meant guided reading or the strategic use of aides and specialists to provide one-on-one support or small group instruction. For a few teachers, differentiated instruction meant highly individualized instruction or creating a menu of options so that students could choose what they wanted to do. For all these teachers, differentiated instruction meant "meeting children's needs" (Alice) "suiting the needs of children" (Abbey), and "supporting the needs of students" (Camille). While there was disagreement and negotiation about the best way to meet students'

needs, this was the joint enterprise that differentiation served. While this section attempted to clarify the practices that teachers used to differentiate their literacy instruction, the next will look at how teacher collaborations and opportunities for mutual engagement supported the practice of differentiated instruction.

Mutual Engagement and Differentiation

Teachers consistently reported that opportunities for mutual engagement supported the practice of differentiated instruction. During formal and informal collaborations, teachers reported sharing resources, expertise, and narratives of practice. Newer teachers consistently identified more experienced teachers as differentiation mentors and more experienced teachers frequently said that their grade level collaboration team helped them differentiate. Lastly, teachers consistently reported that observing other teachers was a valuable way for them to learn more about how to differentiate.

Sharing resources, expertise, and narratives of practice. Teachers consistently reported that formal and informal opportunities to collaborate positively supported their literacy differentiation, particularly when they had time to share resources and expertise or investigate important issues of practice. Teachers reported having about one hour of grade level collaboration time scheduled each week, and specialists were often involved in these meetings. Along with finding out "where everyone was" in the curriculum, teachers shared modifications including modified tests, vocabulary, and spelling lists. In addition, teachers reported sharing a host of other resources, including multi-leveled texts, literacy center activities, study guides, websites, books, teacher manuals, crosswords, rebus puzzles, slide shows, and open-ended unit projects. One teacher described how the material sharing typically occurred:

> Alex: Well, we share a lot of materials. If one of us finds a great website, we'll talk about it there [grade level meetings]. Depending on what we are doing in any subject. If one of us finds something really good, we'll bring it in a show it and share it. I've always found this true here, and I'm thankful for that. I've talked to other teachers in other districts that don't share. Everyone here is always willing to share. It's not about competition. We all want to succeed. (Arthur Elementary)

This teacher described the practice of sharing materials as a natural and important part of supporting the success of other teachers. While most teachers reported valuing collaboration time, one teacher did not. When pressed about this, she said that she preferred to work alone and named one other person in the district with whom she was comfortable collaborating. While most teachers valued formal collaboration, they also consistently reported that they planned their weekly lessons alone.

Because most teachers held a group model of differentiated instruction, the sharing of resources was particularly critical because it helped teachers (especially novice ones) collect, organize, and think about classroom resources and materials. A few teachers stated that they needed resources and materials for four of five different "levels" in order to differentiate for three groups because one resource might be too low and another might be too high. When I asked one teacher what the sharing of resources would actually look like, she responded with a summary of one team's basic sharing strategy:

> Kelly: If there weren't administrative things to do and you used the time to prepare differentiated units or lessons, what would that actually look like? Or, what would be a product of that time?
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> Brandy: Well, we would agree upon what we would do, like the revolutionary war or something. Everyone would bring any extra materials they have, bring your books, your teacher manuals, or anything else from the internet. A lot of us have tons of different books from teacher stores to bring and share and maybe not just xerox this worksheet and have them do that instead. Have that be a springboard of other ideas to do. When you are differentiating, you are coming up with 3 or 4 lessons, instead of one. Sometimes, we will divide and conquer that type of thing, where okay you guys think of a lower lesson activity, we'll think of a medium, you think of a high. And, then the end product would

> be those lessons. With that said, that process would take probably take two meetings or about three hours. (Buchanan Elementary)

This description supports the idea that the joint planning of a differentiated lesson can take a long time (up to three hours), even for professional educators (and this does not include teacher time outside the formal meeting). While it would be possible that one teacher could plan a differentiated lesson or unit on his or her own, the joint product was typically perceived as superior because teachers pooled their multiple and varied resources and materials. Teachers also consistently reported that they did a lot of informal sharing and collaboration with educators who were friends of theirs—in their school or elsewhere. One, more experienced teacher (Alice, Arthur Elementary) reported that formal collaboration did not influence her differentiation much, but she said that it probably supported the differentiation of newer teachers.

In grade level collaborations, teachers reported sharing more than just resources; they shared expertise and narratives about teaching. This included instructional suggestions, stories about teaching and students, and general advice about things to read and workshops or conferences to attend.

> Kelly: Generally speaking, how did you learn to differentiate instruction?
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> Britney: I've taken online classes on differentiation a couple years ago; it gave me some ideas on how to meet the different need in the classroom. Talking with other teachers – just collaborations – seeing what they do and how they meet the different levels in their class. And the district has workshops and they've done a couple here and there on differentiation. A lot of times, it's just talking and seeing what other people are doing and what works for them. You can read a book and it'll tell you what to do, but the practical side of it is how you implement it in the classroom is different from what they tell you. That's the beneficial, just seeing what other people have done. (Buchanan Elementary)

Along with attending classes and district workshops, this teacher said that talking with teachers and seeing "what they have done" has been really important. Another teacher said that her differentiated instruction was most influenced by collaborating with others, where she "could see

how they approached things…. It was nice to for somebody to say I don't think this will work, or I've had success with this" (Annie, Arthur Elementary). Another teacher mentioned the importance of sharing narrative about successes and failures: "there are four 4th grade teachers in this building and we do network really closely together and we've been a good support for each other…. We share our successes and sometimes our failures and we learn from each other" (Alex, Arthur Elementary). These stories, suggestion, and advice seem to serve as important narratives of practice that helped teachers define and negotiate this complex practice.

Although teachers valued time and opportunities to collaborate, general education teachers consistently reported knowing very little about the literacy instruction provided to students when they were pulled out by specialists. At times, teachers tried to obscure this fact, but they typically acknowledged it when I asked them describe the instruction provided in detail (e.g., so what are those pull-out students learning this week?). In the following interaction, a teacher quickly confessed that she knew very little:

> Kelly: And, to what extent do you know what those students are learning and doing when they are pulled out for instruction?
>
> Caren: Um, this information remains private right?
>
> Kelly: Yeah.
>
> Caren: Zero extent. (Cleveland Elementary)

This response, and the teacher's request for confidentiality, suggests a break-down in collaboration and knowledge sharing. Although specialists are invited to grade level meetings, they often rotated between several different meetings (e.g., 2nd, 3rd, and 4th grade). When asked how this situation could be made better, one teacher said that she could read the specialist's lesson plan each week. Out of the fifteen teachers interviewed, only one teacher could describe

the reading instruction provided to students pulled out of her classroom by a specialist. When I asked her how she knew this in such detail, she told me that she was good friends with the learning behavior specialist and that they planned their lessons together every week.

If absent, a culture of instructional collaboration needs to be established, developed, and nurtured. When she first became principal seven years ago, Principal Allyson said that teachers would talk about students, but not about instruction during their formal collaboration time.

> Principal Allyson: When I first came when it was a K-1 building and you looked at the collaboration. Teachers didn't collaborate. They didn't talk about what they were doing in the classroom. It wasn't really thought of. So we started to have collaboration. When we first started, it was just bringing materials, activities, and ideas. I found that they didn't know what each other were doing, and we didn't have a common language for kids. So ... if you were in this room, you might say this, but if you were in this room, you might say something else. And, if you think about the strategies and things that you are giving kids and you're talking about … the vocabulary wasn't always the same for all these kids. (Arthur Elementary)

From a community of practice perspective, Principal Allyson's description shows how interlocked collaboration and alignment can be in any setting. By focusing teachers on their instructional practice, teachers developed a common language for their instructional methods, shared artifacts, and shared stories of practice with each other.

Although teachers valued collaboration time, they universally reported that they needed more time to plan and organize differentiated lessons and units. Instead of receiving more time, however, teachers consistently reported that the agenda for formal collaboration opportunities (e.g., grade level meetings, whole faculty meetings) have most recently been set by local and district administrators. Because of this, less of their formal collaboration time was devoted to discussing and investigating issues of practice. Teachers in all three schools reported that they were currently doing a variety of activities (e.g., designing common assessments) around the common core standards.

> Carmen: we have not shared as much recently, not because we are not sharing people but just because a lot of time has been focused on moving to common core. Also, we've had a lot of things that we've had to do for the state because we didn't pass our ISATs so once a month we had to talk about word work and once a quarter we have to bring in essays and math and compare them. And we have really scheduled times. (Cleveland Elementary)

In addition, this same teacher reported that, after failing AYP, the state required each teacher to differentiate instruction every day. On a weekly basis, teachers had to submit their lesson plans and highlight when they were differentiating so that a state auditor could review it and possibly audit their classroom during this instructional block.

Local mentors and learning communities. While the community of practice theory conjectures that learning any practice is fundamentally social, it is easy to view learning in asocial ways. Over time, people often forget that they learned something by watching someone, listening to a colleague's story, or even overhearing something at the coffee machine. In these interviews, newcomers were much better at remembering and identifying people that had shaped their thinking about differentiated instruction. When asked if any person shaped their thinking about differentiation, teachers with less than 10 years of experience consistently identified particular individuals:

> Kelly: When you look back on your history of teaching, was there any particular teacher or person—at this school or perhaps elsewhere—who has really shaped your thinking about differentiated instruction?
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> Camille (3 years): I would say Carmen.
>
> Abbey (4 years): I would say definitely. Adrianna who is next door.
>
> Barb (5 years): Oh yeah, the person you just saw, Brandy, I love Brandy, she is amazing.
>
> Cathy (5 years): She's a retired teacher from this school. Does that count? Crystal Smith.

> Carmen (5 years): That's a really good question. I'm not sure where it all came from. My team, I was in 4th grade. So I would say Casey and Cathy. We are all on the same page, but I'm not sure how we got there.

In almost every case, newer teachers reported that a local teacher with more experience shaped their thinking about differentiated instruction. In many cases, teachers elaborated on this and described how those teachers were important or meaningful to them as a mentor.

Although two experienced teachers identified retired teachers as significantly shaping their thinking about differentiation, teachers with more experience typically reported that "no one" had shaped their thinking or that their "grade level team" was instrumental in how they thought about differentiation:

> Kelly: When you look back on your history of teaching, was there any particular teacher or person—at this school or perhaps elsewhere—who has really shaped your thinking about differentiated instruction?
>
> Britney (10 years): Um, you know, not really. I think that as a grade level, hearing what my grade level does has always been a huge benefit to me.
>
> Brandy (13 years): You know, I think just being a part of the team that I'm on.
>
> Alex (16 years): Well, um, I don't know if I would say shaped my thinking. I do feel that there are four 4th grade teachers in this building and we do network really closely together and we've been a good support for each other.
>
> Caren (19 years): No.
>
> Adrianna (20 years): Well, I've been doing this for so long. I don't know that there is anybody particularly at this school but it was through the conferences and workshops that I've gone to where I really got my ideas the way that I think about differentiation and how I do it.
>
> Annie (22 years): No, not that I can think of.

In these responses, teachers reported that no one, their entire team, or the collective experience of conferences and workshops shaped their thinking on differentiated instruction. The contrast

between this and what novice reported suggests a multitude of possibilities. It could be that more experienced teachers have forgotten that they learned this practice from a particular person, or it could be that these teachers conceptualize themselves as experts and are less likely to acknowledge the expertise of others. Alternatively, it could be that while their vision of this practice has continued to evolve through interactions and negotiations with fellow practitioners. During member checking, one teacher specifically said that, "regardless of how we learned it, peer collaboration and mentoring really helped create a stronger staff where people learn[ed] from each other" (Casey, Cleveland Elementary).

Observing other teachers. Teachers consistently reported that opportunities to observe the instruction of other educators positively supported their learning about how to enact and orchestrate differentiated lessons. Teachers reported that observations gave them practical knowledge about what works, how to differentiate, and how to manage the classroom. One teacher, with four years of experience, reported that she valued both peer observations and instructional coaching.

> Kelly: Do you have any opportunities to observe the instruction of other teachers?
>
> Abbey: Yes, especially when I – our principal is good about that. She encourages it greatly especially for teachers who are new. It was right when the money came from the federal government to help encourage jobs and so we had two reading instructional coaches who are now teachers and an assistant principal who were serving as our instructional coaches and they came in and would model lessons and would also set up and organize visits [to other schools] for people who wanted to go and observe and that was for anybody and my principal encouraged new teachers to do that. Like I said, I've only done one reading curriculum and some teachers here have done three or four, so seeing other teachers teach not only helps you see how to implement the curriculum that we have but also seeing how they are modifying and adapting the curriculum because students in every room are different.
>
> Kelly: Did you see examples of differentiation?
>
> Abbey: Yes, because I usually went during guided reading time. District wide, every school has an hour that is set aside for guided reading. (Arthur Elementary)

Above, Abbey indicated that instructional coaching and observing her peers helped her implement the curriculum and differentiate instruction. In her first two years of teaching, another novice teacher said that she found observations so valuable that she regularly gave up her free periods to watch a veteran during guided reading. During lunches and after school, she and the teacher would "talk and collaborate about how I could apply how she was teaching in my classroom" (Cathy, Cleveland Elementary).

Another teacher specifically indicated that she valued observation over professional development and reading books.

> Kelly: When you think about your history as teacher, how are you able to continue learning and become more expert at differentiation?
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> Bella: Collaboration. I guess if I were to actually research it and go through and study books and websites and maybe even saw it. Yes, observing other teachers. Seeing what their vision of differentiation would be, that would probably be the most helpful out of everything that I just listed. Because you can read books and go through the research but I want to actually see what it looks like and what the students are doing. (Buchanan Elementary).

While novice teachers consistently reported that they valued peer observations, three experienced teachers stated that they learned a lot from watching "good teachers." It should be noted not every teacher showed enthusiasm for peer observations. One teacher, for example, stated that she would probably not observe another teacher "unless it was mandatory" (Bella, Buchanan Elementary). During member checking, a newer teacher was excited about the possibility of doing peer evaluation: "which school can you go and observe other teachers? I would really like that" (Carmen, Cleveland Elementary). A more senior teacher at the same school added, "sometimes you can pair up with someone who has a strength that you don't, and you can learn from them and they can learn from you" (Casey, Cleveland Elementary).

When asked why it would be valuable to observe another teacher, one teacher said that it helped her see beyond a big obstacle: "On paper, it [differentiated instruction] sounds like a circus. You have this group doing something, and these kids are meeting with me, and those these kids are supposed to be doing something else" (Abbey, Arthur Elementary). Given this challenge, teachers consistently stated that observations of good differentiation helped them "see how to do it, showed them that they "were doing it wrong" (Barb, Buchanan Elementary) or validated that "that I was doing the right thing" (Casey, Cleveland Elementary).

In order to explicitly support teacher learning through collaboration, two of the three principals described strategically encouraging teacher collaboration through a variety of techniques. Both Principal Allyson and Principal Blanch claimed that they regularly encouraged teachers to observe teachers with particular expertise and provided teachers with coverage for their class during these observations. This claim was consistently supported by teachers in both settings. One of the principals noted that an environment of collaboration does not happen "overnight." According to Principal Allyson, the development and support of collaboration requires time, mutual trust, and positive social encouragement.

> Principal Allyson: They were not used to going in each other's room—to be open to that—and to gain trust to do that. They were like, 'I don't know if I want someone coming in my room,' and now they are more open. At first, I would put it out there and say, 'who wants to use so and so because she's been to all this writing stuff and she scores high on ISAT on writing,' and then some teachers were more open. Once she started going into a couple rooms and then those teachers were talking, 'Oh my gosh! You should have seen what she did!' And then other teachers were saying, 'Do you think that she can come in my room?' (Arthur Elementary)

In this retelling, Principal Allyson described how she attempted to help foster and develop a community of practice by validating a particular teacher's instructional expertise and by networking teachers to strategically learn from this local expertise.

Perhaps recognizing that teacher learning can be supported though observation, peer evaluations were supported by district policies and by some local administrators. In one district, tenured teachers could conduct peer evaluations instead of being formally evaluated by their principal. One teacher described peer evaluation in this way: "It's nice. It's nice to have time to get into another classroom. You see things differently about what they use, because you can't share everything that you do throughout the day. That's been beneficial. I've done that for the last couple of years instead of the regular principal evaluation" (Britney, Buchanan Elementary). One teacher moved from a school that supported this peer evaluation into another school (in the same district) where the practice was not supported: "In our old building, we were allowed to do peer coaching, and we would go into other teacher's classrooms and see what they were doing and they would come into our classroom and see what we were doing and talk to us and say here is something that you could work on, why don't you try this? That was a big help. That was a big help" (Cathy, Cleveland Elementary). Although many teachers positively described peer evaluation opportunities, one teacher argued that the policy could be improved to provide them with class coverage: "I don't have time to observe during my free time…. Even if we do it for our alternative evaluation, it's during your planning time. They don't give you a sub" (Bree, Buchanan Elementary).

Principal Blanch noted that the alternative evaluation policy is at the discretion of the local administrator and was intended for "high performing teachers." Generally speaking, he supported this approach because he thought it supported teacher collaboration and learning. Another principal in the district, Principal Charlotte, was not an active supporter of the alternative peer evaluation program. When asked specifically about this, she said that alternative evaluations were "easier" from an administrative perspective. She also reported that these

alternative evaluations "don't tell you too much" (Principal Charlotte, Cleveland Elementary). Instead, Principal Charlotte appeared to use bi-yearly teacher evaluations as a way to support, recognize, and provide feedback to teacher individually—at a great cost of time to herself. When teachers at Cleveland Elementary consistently reported that they did not have many opportunities to observe the instruction of other teachers, I asked them if they would like more opportunities to do so. They said yes, but the teachers also expressed reservations that the observations might "make other teachers feel uncomfortable" (Carmen, Cleveland Elementary). In addition, a senior teacher reported that while she would like observe other teachers, she was not sure that it was fair: "We've always said that we could, but I find it difficult though. The guilt to say I want to visit someone else's classroom. What aide am I pulling from another teacher? How is that fair? (Casey, Cleveland Elementary). During member checking, teachers from the district that did not have the peer evaluation program in place showed interest in the idea. One teacher said that "it held good potential to learn from each other, but it might be difficult to be critical because we are friends" (Annie, Arthur Elementary).

Perhaps ironically, teachers consistently reported that they were encouraged to differentiate by district and local staff but were not given the time necessary to do so. One teacher reported that "if they really want me to differentiate every lesson, I need one day to plan for every day that I teach" (Caren, Cleveland Elementary). During member checking, a teacher said the following: "we 'smiled' when we saw that finding that we needed more time, but were given less time" and added that "it takes a lot of time to figure out the groups and what you are going to teach them and different levels" (Buchanan Elementary). During member checking, a principal also recognized that collaboration time is becoming "more structured" because two times a month, teacher collaboration time was being used to disseminate information about the

common core (Principal Allyson, Arthur Elementary). While schools and districts can claim that teachers have collaboration time, the interview data suggests that administrators are often usurping this time so that it is no longer a way for teachers to collaborate around self-guided issues of practice.

From a community of practice perspective, mutual engagement is an important way of belonging and demonstrating community membership. Through practice oriented mutual engagement, communities develop trust, friendship, community, and the sharing the personal and professional narratives of human life. Overall, teachers described multiple opportunities for mutual engagement that supported their differentiation. This included informal and formal meetings, talking about useful resources and materials, sharing narratives of practice, being able to observe the instruction of other teachers, having local mentors, and using online resources. These opportunities seemed to help newcomers join the community and provided a way for individuals to do their work without having to know and remember everything. In addition, they reported both that more time is needed to differentiate well and that the agenda for their collaboration time had recently been set by administrators, essentially reducing their capacity to collaboratively share resources and plan differentiated lesson. Although mutual engagement and collaboration conjure up images of peace and harmony, disagreement, tension, and conflict have an important place in any community of practice because they are all different forms of participation. An important disagreement—what is the official literacy curriculum—is discussed later. While mutual engagement does not entail homogeneity, it does create relationships among people, and many teachers shared the connections and friendship that developed over time with people from their grade collaboration teams.

Co-constructing Alignment around Differentiation

Alignment is a mode of belonging that is not confined to mutual engagement, where participant energies, actions, and practices are connected and coordinated. Alignment is a critical component of socially organized activity. Through alignment, practitioners become part of structures and enterprises larger than themselves (e.g., teams, nations, religions). When an employee aligns with an employer's expectations, he or she reaffirms membership in that community and the broader social system of that industry. Insofar as alignment concerns directing and coordination the activities of multiple actors, it concerns power, particularly the power of administrators and influential people to inspire or demand alignment or compliance. Thus, alignment also concerns areas of misalignment, dispute, and conflict (Wenger, 1998, p. 179-181).

Principal support. Principals acted as agents that co-constructed alignment around differentiated instruction in multiple ways. First, teachers universally reported that their principal helped them get important resources needed to differentiate. Among others, these resources included texts outside the official district curriculum, access to websites, and money to attend workshops or conferences. Second, teachers consistently reported that the principal conducted evaluations during their guided reading block. Third, teachers and principals reported that the class day was organized to support guided reading. Fourth, two of the schools used a cluster approach to class composition, considering the future practice of guided reading.

Teachers universally reported that their principal supported differentiated instruction by helping them get access to an array of important resources, such as texts, materials, money, time, and information. Teachers specifically mentioned that principals provided materials for the guided reading library, guided reading tables, substantive feedback about differentiation, articles

about differentiation, speakers from the district, and support (e.g., money and class coverage) to attend state conferences. The most consistent resource mentioned was access to additional texts.

> Kelly: What does your principal do to support differentiated instruction for you in particular or for others in this school?
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> Alice: She will do anything that she can do. She works way too hard. She will do anything within her power to get you what you need. She is really really good with that.
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> Kelly: Can you give me an example of something in particular, for a particular student, or for a particular teacher?
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> Alice: As the 5th grade, we had certain books that we wanted and she said, 'give me a list.' If there are materials that we want, she said, 'give me a list,' 'where is it on Amazon.' And, she has done that for us many times. (Arthur Elementary)

Many teachers mentioned that the principal helped them expand the schools guided reading library. Although all three principals were described as supporting differentiation by expanding the guided reading library, it was also commonly mentioned that there was not as much money now as there had been in the past.

Along with providing teachers with resources and materials, principals co-constructed alignment around differentiated instruction by recruiting new teachers who had similar beliefs. When interviewing potential faculty members, principals universally reported soliciting and considering the candidate's opinions about guided reading:

> Kelly: I'm thinking about guided reading and teacher preparation. Do you talk with potential teachers about guided reading?
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> Principal Blanch: Absolutely. When we are doing interviews.
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> Kelly: What would you ask them in order to get a sense for what they think?
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> Principal Blanch: I would ask them if they have experience with it, and to describe what a good guided reading lesson looks like. And you get a whole variety of answers. And some of them are not best practice when it comes to guided reading and it pretty much

> sinks it for me right there. They would not be on the top of my list for hire. (Buchanan Elementary)

Teachers hired in the last five years remembered being specifically asked about this topic. One teacher said, "I was asked how I use it [guided reading], why I think it's important, and different ways that I would bring it into the classroom" (Barb, Buchanan Elementary). Principals deliberately attempted to recruit teachers with beliefs about differentiated instruction that were consistent with their own.

In addition to teacher recruitment practices, principals strategically conducted formal and informal teacher observations during guided reading blocks. In two of the three schools, teachers consistently reported that they were formally *and* informally observed by the principal during their guided reading block.

> Kelly: Has your principal come to your classroom to observe your literacy instruction during this school year?
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> Annie: Yes.
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> Kelly: What time does she come to observe you?
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> Annie: During shared reading and during guided reading. (Arthur Elementary)
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> ***
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> Barb: I know that Mr. Blanch wants to be sure that you have guided reading.
>
> Kelly: How does he do that?
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> Barb: He said twice in my 2nd or 3rd year that he wanted to watch everyone do a guided reading lesson. (Buchanan Elementary)

When I asked principals why they observed teachers during guided reading, one specifically said that this was done to "help drive it" so that "we are all on the same page" (Principal Allyson, Arthur Elementary). While these principals also observed teachers during other instructional

blocks, they made it clear to teachers that they wanted to see at least one guided reading lesson during each year. Teachers in the third school (Cleveland Elementary) said that they chose the time their principal came for observations.

Principals in these settings strategically supported differentiated instruction by providing teachers with needed resources, recruiting new teachers with similar beliefs, and by observing teachers during their guided reading block. All of these activities supported alignment around differentiation. It connected and coordinated the socially organized practice of differentiation – it helped get and keep teachers "on the same page" (Principal Allyson, Arthur Elementary). Through these activities, newcomers with similar perspectives were recruited, observed, and supplied feedback around what it means to differentiate in their particular setting. Through these activities, more experienced teachers were supported, encouraged, and sometimes sanctioned about what is expected around differentiation.

Structural organization of the school. Alignment is constructed in multiple and varied ways. In any organization, decisions are made and policies established that support particular practices, activities, and enterprises. These decisions often get embedded into the structure of the institution itself and, in subtle and often invisible ways, these policies support particular practices. In addition to resources, recruitment, and observations, teachers consistently reported that school structural features supported differentiation. First, in all three schools, teachers reported that the daily instructional schedule was organized to support guided reading. Second, teachers reported that a cluster-approach to class composition facilitated differentiation.

Teachers consistently mentioned that their literacy differentiation was supported by having a daily, common time for guided reading. In this way of structuring time and instruction, every student (in each grade) received guided reading during the same block of time. When I

asked teachers how this supported their instruction, they typically reported that having this time protected helped them focus on reading instruction:

> Kelly: In this school, are there any important policies or documents related to differentiated instruction?
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> Annie: Well, we have the block.
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> Kelly: What is the block?
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> Annie: All of 4th grade has guided reading time from 1:20 until 2:20.
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> Kelly: So everyone in the whole school is doing guided reading during that time?
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> Annie: No, just fourth grade and I think one of the lower grade levels. Each grade level has guided reading at a different time during the day. And so we have no specials during that time—nothing else going on. So that helps.
>
> Kelly: That's really interesting. How does it help?
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> Annie: Well, there is no PE, Music, or Art—nothing scheduled during that time except for guided reading. And, we have that same reading block at the same time during the day. That varies year to year. The first two years we had it in the morning, from 9 to 10, which we didn't like because we couldn't fit shared reading in. It made much more sense to do shared reading first and then do guided reading. We expressed that concern and now we have it in the afternoon.

When I asked other teachers why this time-block supported differentiated instruction, they replied in similar ways, saying that "having a block without specials … where kids aren't being pulled out for OT or PT or anything" was nice because you can "just focus on teaching" (Brandy, Buchanan Elementary). When I discussed this scheduling approach with one of the principals, she reported that the 60 minute block had always been there, but that, in days prior, it could be interrupted.

> Kelly: So, the teachers have said that, in this school, there is an hour dedicated to guided reading? Is that a district policy?

> Principal Allyson: District, but it used to not be that way. It was 60 minutes, but it could be interrupted. And what we try to do is schedule so that it's not interrupted anymore, and we wish it was 90 but unfortunately, our specialists travel.

While the district supported teachers to have 60 minute reading blocks, the principal reported protecting this time from interruptions based on teacher feedback and her beliefs about good reading instruction. During member checking, one teacher reported that the block scheduling approach also came with some drawbacks: "Because we are on this block schedule, for example, 1:15 to 2:10 is math, and we have to end at 2:10 … because I have a different group [of students] for math, I can't go back and reteach even if I wanted to. I'm bound to teaching math during that time" (Buchanan Elementary).

In addition to this dedicated block of time, teachers and principals in two schools (in the same district) universally reported that classes were designed by clusters. Teachers reported having ELL clusters, regular education initiative (REI) clusters, and gifted clusters, with each class having a different small group of students that would receive regular specialist services. For example, an ELL cluster might have 4 to 8 students identified as English language learners, and there might be one or two ELL clusters in at a grade level. When I asked one principal if this was a district policy, the response was particularly cogent:

> Principal Blanch: It's a district practice. Not a board policy. I've never been directed that this is how we are going to do this, but it's a practice. But there are some practical reasons too. We have resource teachers for special ed [*sic*] kids, for ELL students, and students with academic concern. For practical reasons, it's easier for these teachers to work with them if they are clustered. Also, when we are making class lists, we spend a lot of time really looking at the kids—tracking wouldn't be the word—so that we place like abilities as best as we can. We maybe have three different groups of students, with like abilities, as opposed to having 5 or 6 in any particular class. It's very difficult for teachers to have six reading groups with three students in each group. The teachers really bought into the idea when we are making class lists, 'I don't care if I teach the lower or the higher, but just don't give me six different ability groups because it makes it more difficult for me to do things.' (Buchanan Elementary)

As stated by the principal, most teachers spoke positively about this approach to designing classes; teachers wanted variation within manageable constraints. The principal stated that the cluster approach had two goals: first, to reduce classroom heterogeneity to (about) three reading groups, and, second, to help coordinate specialist services. Although not a focus of the interviews, the scheduling, coordination, and instruction of specialists was a highly complex (and research-worthy) endeavor and intimately connected to the differentiation provided to students in each school.

During member checking, some teachers voiced differing opinions about designing classes with clusters: "It's tracking. I have the gifted cluster and I find that when they are tracked together from the 4th grade, there is a lot of fighting and competition. I have only had one year where there wasn't a lot of competition." Two teachers said that it was done because it was a "scheduling issue" and another reported that "I'm adamantly against it, but I just couldn't meet student needs if I had the whole range in my classroom" (Bella, Buchanan Elementary). At the other school that employs this cluster approach to designing classes, teachers voiced similar concerns, and they added that "another weakness of the cluster is that they have been together for three or four years, and they need to see that there are other kids to be friends with" (Cleveland Elementary). During member checking, a teacher reported that class size also has an important influence on a teacher's ability to differentiate. "As the class sizes get bigger, it's harder to meet the goals that you're expected to meet. Even though we have help in our rooms with aides and specialist, these are the first to get pulled if something is happening" (Britney, Buchanan Elementary).

Based on my interviews with teachers in the two schools that utilized cluster classroom design, it appears that *most* classes were academically heterogeneous on academic achievement.

Most teachers reported that they had a very mixed group of students—both high achieving and low achieving in relation to state and MAP testing. This did not, however, seem to be the case when I talked to teachers of the gifted clusters. These teachers consistently reported that they had the highest achieving students in the entire grade level along with a few students who had "behavior problems" and "could not be placed in other classes." During member checking, the principal of Cleveland Elementary specifically told me that the school was going to "experiment with" full-fledged tracking by reading achievement in the following year. When I asked for the rationale, this principal reiterated the claim that most teachers supported tracking because they could not differentiate if the full spectrum of students were in every classroom. There is some irony to the fact that the historically debated practice of tracking is being rationalized in the name of differentiated instruction.

Brokers and Artifacts support Differentiation

The co-construction of alignment often requires brokers and boundary objects. Brokers can support the development of organizational alignment by bridging perspectives and agendas of different role groups (e.g., teachers and administrators). Brokers participate at least peripherally in the activity of two or more groups, and thus have access to the perspectives and meanings of each group, and they are ideally situated to help negotiate alignment in a community of practice. Brokering knowledge and practice is delicate business, though, and it requires enough legitimacy to be listened to and enough distance to bring something new. Because brokers do not fully belong in either community, the value they bring can be easily overlooked. Brokers often bring objects from another community—boundary objects—which support connections between different communities of practices (Wenger, 1998; Cobb & Smith, 2008).

District brokers. In these three schools, multiple brokers facilitated the development of differentiated instruction, including district staff, local administrators, and staff from NWEA. Each of these brokers played a different but important role in supporting teacher learning about differentiated instruction. Although the role and importance of principals has been emphasized above, the role of district staff and the MAP professional development will be emphasized here. Likewise, teachers consistently reported that a wide variety of artifacts, which can be conceptualized as boundary objects, supported differentiation. In all three schools, 4th and 5th grade teachers consistently reported a major disagreement about one boundary object – the official literacy curriculum.

Teachers and principals in all three schools consistently reported that an instructional leader from the district supported teacher learning about differentiated instruction. In one district, this staff member was the Literacy Director. In the second district, the staff member was the Associate Superintendent of Curriculum and Instruction. In both cases, teachers consistently reported that this person possessed deep knowledge about differentiated instruction and supported differentiation using a wide variety of strategies and techniques.

> Kelly: If you think over your personal history, how did you learn to differentiate instruction?
>
> Alex: I've only really done it the last four years. This is the fourth year. A lot of it has been jumping in. We did have a few in-services but basically it's kind of sink or swim, trial and error. I remember feeling very threated by it at first, but I feel comfortable with it now.
>
> Kelly: Was there anything that supported you in making that transition?
>
> Alex: Well, you know, our literacy director did provide us with lots of materials.
>
> Kelly: Which literacy director is that?

> Alex: The one that I talked about that is over the whole district—Kathy Jones [pseudonym]. And she arranged some in-services for us and I had the opportunity to go to another district to observe it, which was helpful. But still, getting in there getting your feet wet. It takes a lot of planning time.

During monthly meetings, quarterly in-services, and whole faculty study groups, these district brokers facilitated book studies on differentiated instruction, supplied teachers with access to additional resources and supplemental on-line texts, provided in-service training on guided reading, and helped teachers interpret the MAP reports. Simply put, she acted as instructional leaders. Through these interactions and many others, the principals reported that the school developed a common language about differentiated instruction.

> Principal Charlotte: We have been doing this for years, … but now what I really loved was that we could name it all. Before, we didn't have a name for it. And, then ... Lisa Johnson [pseudonym for district support staff] has been really strong about *helping us speak the same language, and that became a part of it*. We recognize that we had been doing this, but now we all knew what it was. Because we would always try to support the kids that struggled more using different materials, but now we had a name for it. (Cleveland Elementary)

The importance of creating a common language is critical to support a shared understanding of any practice—a social practice. Along with other things, this common language and terminology can support dialogue, disagreement, and negotiations about how to improve, develop, and evaluate any practice.

Along with providing in-services on a variety of topics, teachers and principals in the Cleveland district reported that their Associate Superintendent of Curriculum and Instruction pulled committees of teachers together for important decisions, such as curriculum decision-making. In addition, she held an annual event called "literacy in bloom." During this half-day, district-wide in-service, teachers across the district presented their literacy practices and resources to other teachers. When I asked the principals how these collaboration opportunities supported differentiated instruction, one principal mentioned that it helped "build community"

within and between schools. Along with supporting teacher learning about differentiated instruction, this particular district administrator seemed to co-construct a network of expertise.

While most teachers and principals reported learning a lot from these particular district staff members, a few teachers disagreed with them about how to differentiate literacy instruction. One teacher reported that the district supported guided reading, but she preferred a more individualized approach to differentiation. This teacher reported that this disagreement was, at times, a topic of multiple discussions:

> Kelly: Would she be looking for groups?
>
> Alice: Yes, she's looking for guided reading.
>
> Kelly: And, have you had any conversations? Has she observed you? Have you had any conversations about your individualized instruction versus guided reading?
>
> Alice: Oh yes! I believe that she respects me as a teacher. I believe that she knows what I do and don't do, but I don't think that she approves of it. She leaves me alone because I'm old. She figures that I won't be around here much longer. We've had lots of discussions about it. (Arthur Elementary)

Although this teacher disagreed with the small group, guided reading approach to differentiated instruction, she earnestly believed in the importance of differentiation. She chose to individualize her reading instruction rather than using small groups. In addition, one teacher disagreed with the district about how to manage guided reading. She reported that she was told not to meet with the "high kids" as much during guided reading:

> Kelly: When you say you are getting messages to not spend as much time with students in the high groups, is that coming from administration here, the district, or both?
>
> Alex: The district. My principal has never told me that. Never!
>
> Kelly: Is there a particular person there who suggested that?

> Alex: Yes, we have a literacy specialist who is over the whole reading curriculum. (Arthur Elementary)

At the same school, another teacher reported that she was instructed to "see the low group everyday" and then go from there (Alice, Arthur Elementary). While all of these educators believed in the importance of differentiation, they disagreed about how to enact it. Rather than interpret disagreement as negative and something to be avoided, communities of practice theory recognizes that disagreements are a natural and critical component of practice and community development.

Boundary objects. In addition the professional development and networking supported by district staff, MAP and its associated professional development supported teacher learning and decision-making about differentiation. From a communities of practice perspective, the MAP assessment system can be viewed as boundary object brought in by brokers (professional development staff). Although I interviewed 15 teachers, 7 of them were in the counterfactual condition and had only been using the MAP reports in the last year. Although the full professional development (including consultative support) was promised to these teachers, the counterfactual teachers consistently reported that they received only a half day of instruction (instead of 4 full days) and no consultative support whatsoever. A few teachers were upset about the reduced professional development and interpreted this lack of professional development as a broken promise.

Generally speaking, teachers reported that MAP was useful to determine students' reading levels, which helped teachers form skill-based and reading level groups. For reading comprehension at the 4th grade, MAP assesses students on different reading skills (e.g., main idea, context clues, metaphor) and creates reports that summarize this at the class level. Teachers

found both of these reports useful to help them when planning what skills/strategies to teach individuals, groups, or the whole class.

> Kelly: Earlier you said that MAP was helpful. Can you describe how it's helpful for your instruction or your differentiation?
>
> Adrianna: Well, I think for one it helps to verify some of the observations and things that I've decided when I'm grouping and what the kids need in different subject areas and what I need to teach more with some than others. (Arthur Elementary)
>
> Kelly: Is it good for anything? Can you use it [MAP] at all?
>
> Casey: Like I said, after MAP testing, you try to move that low group and move them ahead. And you look at your higher kids. What's something that they still need? And like Jasmine, she was so mad, "why am I not getting context clues?" And so you know you work with that person because you know that context clues are going to be there all the time. (Cleveland Elementary)

Some teachers reported using the individual student reports for other purposes, including having individual student learning conferences or mailing the results to parents. In order to support differentiation, one principal reported having individual principal-teacher conferences about their students' MAP results – a practice suggested in the MAP professional development and something that he said encouraged "accountability" around differentiation (Principal Blanch, Buchanan Elementary). During member checking, teachers at Arthur Elementary resoundingly agreed that MAP was the most accurate way to determine students' reading levels. In addition, they reported that MAP is really good at showing *growth* rather than just *achievement*: "it is really exciting because low achieving students always make the most growth and we celebrate that. Their final score may not be at grade level, but it's exciting because one of my special education students made the most growth in the last test" (Annie, Arthur Elementary).

In relation to constraints, teachers reported that there was not enough time to make the instructional ladders suggested in the MAP professional development session. Some teachers

also reported that it was not practical to do individual goal setting with each child. A few teachers reported that they had to ignore some test results because they knew that some students did not try their hardest during the computer assessments. The most consistent critique was that MAP did not provide enough practical resources:

> Casey: What things or tools are you going to give me, what ideas, or options can you give me that I can bring back. I have a neighbor who was a teacher as well, and she gave me this huge book of words, activities, and things that correlate with MAP. That was more helpful to me than anybody else ever gave me.
>
> Kelly: When you say neighbor, you mean physical from your home?
>
> Casey: Yeah. She got it from her school and she said, hey you gotta try this and we'll sit and talk.
>
> Kelly: I see. What you're saying is that the way the MAP professional development is set up doesn't provide you with enough practical choices or resources to take the next step?
>
> Casey: Yes, and maybe I haven't looked far enough or been taught how to look and I've gotten frustrated and said, I'll do my own thing. (Casey, Cleveland Elementary).

In the collaboration section above, teachers consistently reported that formal collaboration was important—in part—because it provided an opportunity for teachers to share materials and resources. Teachers who participated in the MAP profession development expressed frustration that MAP did not provide them with any portable resources, such as texts or activities that could be used with students. Casey mentioned she was given a helpful booklet of resources from another teacher, but it's unclear why the teachers in this study were not provided this same booklet.

In addition to the MAP assessment results and reports, a few teachers reported that the reading series itself supported differentiated instruction by providing leveled texts and tasks. Each of the three schools used a reading textbook created by Pearson (Good Habits; Great Readers and Reading Street).

> Kelly: When you think about your history and experience, how did you learn to differentiate instruction?
>
> Brandy: I've been teaching 13 years, and when I first started it wasn't a big push. But, as we adopted new curriculum, it was more conducive. When I first started, our basal was like, this was the story. We didn't have little guided reading books. We didn't have A to Z, which is an online source where you can print out many levels of fiction and non-fiction books. That wasn't around. It was kind of like here is the vocab, here is the story, here is the test. Now, with new adoptions, you've got the main or mentor story, but then you have the guided reading books provided. And, some are good, but some aren't. And that's when you have to go and look at your A to Z and the internet and things like that.

The presence of guided reading books supported Brandy's literacy differentiation. She also mentioned that, when the received the new reading series, the district provided multiple in-services to help teachers understand how to use and implement it. One principal reported that "all of our series, language arts and science, have leveled readers" (Principal Blanch, Buchanan). Although many teachers criticized the quality and appropriateness of the reading textbook and its associated leveled readers, teachers consistently reported that were told by administrators that they were supposed to use these materials to teach reading. During member checking, one teacher said adamantly that "Scott Foresman does not meet a really high student's needs" (Bree, Buchanan Elementary).

While some teachers reported that the textbook and leveled readers supported differentiation, a few teachers indicated that they rarely used the reading series. As one teacher argued, "you cannot create readers using those short stories…. They've spent a lot of money for all those little books that are in my closet" (Alice, Arthur Elementary). Instead, this teacher argued that students need a chapter book to develop literacy.

> Alice: They need a book that takes a little bit more time to develop the plot and they need a little more intricacies in character and how they relate to each other. When children read novels, they invest themselves in the characters, become a part of the setting, and really get into all the twists and turns of the plot. These nuances don't come up in a two day story. (Arthur Elementary)

Without the support of local administrators, another teacher reported designing her literacy curriculum using novel studies and MAP assessment results. In the subsequent year, when her students' showed the most reading growth in the entire school, the principal asked to describe her literacy instruction in a full faculty meeting: "I said that I didn't base my instruction on Scott Foresman; I used Descartes and novel studies…. Now, a lot of people are coming to me and asking, 'how did I do this?' ... now I think it's [novel studies] okay because of the MAP results, but before it wasn't okay." In this particular school, district administrators had discouraged teachers from using novels. This teacher's act of defiance—combined with her strong MAP results—paved the way for new possibilities of practice.

Because there seemed to be conflicting information about the texts teachers can use for reading instruction (e.g., chapter books or the basal series), I followed up specifically on this issue with each focus group during member checking. At Arthur Elementary, teachers reported that they were supported to make professional decisions. "Use your professional judgment about what kids need and want" (Alice, Arthur Elementary). In the other two schools, teachers reported that there was conflicting direction about whether and how chapter books could be used.

> Britney: First, we were flat out told not to use chapter books. And then, we were told that you needed to use the basal and you can use novels, but only these specific novels. Then, finally, we were told that if you are going to do a novel and you are going to replace the reading series, you need to cover those particular skills with novels. (Buchanan Elementary)

Due to this confusion, two teachers reported that they were secretly teaching with novels: "we've been doing novels all year and we don't say anything to anyone. When we discuss this in our meetings, we don't send minutes to the uppers on this because we don't want them to say no" (Carmen, Cleveland Elementary). When the district administrator comes to the school, one teacher reported that no one brings the topic up anymore because they are afraid to ask about it.

During member checking, teachers generally critiqued the basal series but also agreed that the series was of some value: "a brand new teacher coming into a district will be guided into knowing what skills and strategies they need to teach.… as a veteran teacher, we already know that, and we rely more on novels and embedded skill instruction in that, but I can see the benefit to have this for a newer teacher" (Carmen, Cleveland Elementary).

While one district supported and trusted teacher decision making in relation to the curriculum, administrators at the other districted provided—at best—conflicting guidance and direction about what texts were officially sanctioned. In member checking, one teacher reported that when the district made the last major curriculum purchase, "they really pushed it" to the exclusion of other good resources (Brandy, Buchanan Elemtentary). When teachers are not trusted to make good educational decisions, communication lines seem to break down. Interestingly, edicts about "what texts to teach" did not stop teachers from doing what they thought was right and best for students. Teachers continued to use novels and chapter books even though they had—in the recent past—been directly instructed against the practice. Knowing this might stir controversy, some teachers deliberately misinformed local administrators about the topics they discussed during their collaboration time (via meeting minutes).

In these schools, alignment around differentiated instruction occurred in multiple and varied ways. As reported above, district staff and MAP resources helped support a common language and orientation to what differentiated instruction meant. In addition, the reading series itself supplied teachers with leveled readers and activities, which reified differentiation in local artifacts. Lastly, the presence of disagreement and conflict (about the official literacy curriculum) provided evidence that, even in settings with differentiation growth, educators and administrators disagree about what high quality instruction is.

Collectively, the practice of differentiating instruction was described as a highly social endeavor, where collaboration, observations, and a wide variety of resources and boundary objects supported teacher learning. Along with telling narratives of practice, teachers shared and distributed materials, activities, and resources (print and online) to help each other meet the needs of students in their classroom. A wide variety of local materials and boundary objects were important to support teacher differentiation. In addition, principals and key district staff helped co-construct a common language for talking about differentiation and a common view of how to differentiate. While district staff supported teacher learning and thinking about differentiation, principals recruited new participants who shared this vision, observed teachers enact differentiation, and supported teacher collaboration in a variety of ways. Overall, these three schools, which increased their literacy differentiation over the course of two years, showed key features of communities of practice and can help us learn how to support literacy differentiation in other educational settings.

CHAPTER VI

LIMITATIONS AND DISCUSSION

Limitations

This study had a variety of noteworthy boundaries and limiting factors. First, while robust, the communities of practice theory dramatically shaped the research questions, the variables chosen to index constructs, and even the teacher interview questions. The use of a different guiding theory would result in different methods of inquiry and different findings. While all research is theoretically driven, this theoretical influence should be acknowledged as an important lens and boundary.

In the quantitative phase, variable measurement was an important limitation. Typically, measurement decisions are made at the outset of study, and constructs are carefully indexed based on theoretical conjectures *a priori*. In this particular case, I adapted and identified variables *a posteriori* that would best index community of practice constructs. From the outset, it was clear that these constructs were only partially represented by the data. For example, while differentiation *quantity* was measured using three indexes (diverse content, diverse process, and diverse grouping), the *quality* was not measured whatsoever. While there are no known instruments to measure differentiation quality, a more sensitive measure would have indexed quality along with quantity. While there are many ways to critique construct measurement, the prior evaluation study (Cordray et al., 2011) indexed variables in accordance with NWEA's theory of change and their model of differentiated instruction.

Another limiting factor in the quantitative analysis was the clear and consistent support for differentiation in *both* groups (e.g., the program intervention group and the counterfactual

group). The qualitative findings showed clearly that principals and district staff consistently supported differentiated instruction over a long period of time. Because the amount of differentiation growth was marginal, the possibility of analyzing variation (or covariation) was restricted. In addition, another limitation was the use of multilevel growth modeling, which modeled data assuming a single linear trajectory for all teachers. A different quantitative analysis (e.g., latent class analysis) might have been more sensitive at modeling classes of trajectories at the same time.

In the qualitative phase, a major limitation was the use of interview data only. While I do not think that teachers deliberately misled me, at times, it seemed that teachers told me what *they thought I wanted to hear* (e.g., is that what you are looking for?). The collection and analysis of more qualitative data over a longer timeframe would have greatly enhanced the possibility of investigating *how* teachers differentiated instruction and what social and organizational factors influenced this practice. As I asked teachers about their principal, teachers in two schools seemed open and spoke candidly, but—at one school—some teachers expressed hesitation when the topic of their principal came up. In order to more deeply explore the interaction between teachers and administrators—both local and district—more trust, history, and rapport would have to be established with participants. Second, given the emphasis teachers placed on the importance of resources, the recent growth of accessibility to online resources, and the debate (and misinformation) that ensued over the official reading series (e.g., basal readers), more emphasis might have been placed on analyzing the multiple ways in which local artifacts and boundary objects functioned to support differentiation. A third limitation was the interviewing of only 15 teachers at 3 schools (rather than a larger sample), which was due to limited resources (e.g., money).

Discussion

In one sense, the quantitative findings are straightforward. On average, teachers who believed that the professional development on differentiated instruction was valuable enacted more literacy differentiation. In addition, teachers who attended more consultative sessions also enacted more literacy differentiation. In addition, the quantitative results provide some evidence about how to support *growth* of literacy differentiation. The only significant predictor of differentiation change was principal beliefs. When principals reported believing, supporting, and valuing the professional development on differentiated instruction, teachers in their school had higher rates of change. This finding is consistent with a wide range of research (e.g., Riehl, 2000) on the critical role that principals play in supporting learning and instruction for diverse students.

This study also produced knowledge about what does not appear to influence differentiation, one that counteracts claims commonly made about the practice. A wide variety of researchers (e.g., Tomlinson, 1995) claim that differentiated instruction is a *responsive* form of pedagogy and that teachers differentiate because of the academic diversity present in their classroom. For an ambitious, knowledgeable, and highly flexible teacher, this may be the case. On average, the multilevel growth analysis does not support this claim. For 164 teachers, the *quantity* of differentiated instruction provided was not influenced by the presence of student language diversity (ELL), individualized education plans (IEP), or having a wide spectrum of reading achievement in the classroom (R_SD). If differentiation was *responsive* to diversity, there would be *more* differentiation in the presence of diverse students. On average, however, this was not the case. The fact that these predictors were not statistically reliable suggests that the quantity of differentiation that teachers provided may have little to with classroom diversity (at

least these forms of it). Perhaps differentiation (on average) is a social and cultural activity—something that teachers have been socialized into doing—but the quantity of differentiation they provide is not responsive to student diversity.

This study has some implications for future research, particularly in its articulation and exploration of differentiation models. Currently, the educational field uses the term "differentiated instruction" to mean an array of different things, including both instruction and curriculum. Using prior research, the literature review identified three differentiation models (group differentiation, individualized differentiation, and open-ended differentiation). When teachers were asked to describe differentiated instruction, they overwhelmingly reported that differentiated instruction was group differentiation (e.g., guided reading). But, a few teachers described highly individualized instruction or the use of complex, open-ended tasks. In addition, teachers consistently used the term "differentiation" to describe the strategic use of aides and specialists to provide *either* individualized or small group instruction. Thus, future researchers (particularly those interested in measurement) need to carefully consider these different models when they investigate the multiple and varied ways that schools, teachers, and specialist customize and adapt the curriculum for different students. The use of more precise terms (as suggested in the three models above) may help the field move forward in its exploration of this topic.

Furthermore, researchers need to carefully consider the appropriate unit of analysis when investigating this topic. In prior research, most researchers used the teacher (or classroom) as their focal unit of analysis. Insofar as low-achieving and high-achieving students often receive pull-out services, this decision can be problematic because the full range of differentiation being provided (e.g., by specialists or other teachers) may not be adequately captured. In addition to

pull-out services, teachers and principals reported (in interviews) that some students received supplementary individualized instruction before school, during lunch, or after school (by state-approved vendors). Rather than following the teacher, future studies on differentiated instruction might consider following students, particularly those who would be strong candidates for differentiation.

This research may have implications for educational policy-makers. As reported in the introduction, states and districts are legislating support for differentiated instruction. In the qualitative results, teachers in one school (that was failing AYP) reported that their state mandated differentiated instruction. But, what model of differentiation is being legislated and mandated? Are states and districts supporting individualized instruction, small group instruction, or the use of complex, open-ended curriculum (or all three)? Likewise, how are districts evaluating this practice or supporting teachers *and* principals to enact it? The quantitative portion of this study identified one reliable predictor of differentiation growth (principal beliefs). Given the critical role of a principal, how can policy-makers support principal learning about differentiated instruction? And, perhaps equally important, how might a principal support and encourage his or her teachers to enact this practice?

Although the questions articulated above are complex, some fruitful directions can be gleaned from the qualitative study. In settings where differentiation did increase, teachers and principals reported that this practice was supported through a variety of social, organizational, and resource supports. First and foremost, differentiation was a long-term focus in their school and district, one actively supported by local, district, *and* external brokers, where teachers were given common planning time to share resources and narratives. In these settings, principals recruited teachers based on their beliefs about differentiation, evaluated teachers during periods

of the day when teachers should be differentiating, and strategically networked teachers so that they could observe other educators enacting differentiated lessons. Teachers reported sharing a wide range of important resources during their collaborative planning time, yet these teachers also reported that the agenda for this time was most recently being set by administrators.

One striking narrative produced by this study was the rationalization of grade-level tracking in the name of differentiated instruction. In two schools, it was a district practice (not a formal board policy) to create "cluster groups" at each grade level. As a practical matter, this meant that students identified for particular specialist services were in the same class (e.g., ELL students with Ms. Parker, gifted students with Mrs. Smalley) with the rationale being that a specialist can maximize his/her time if students needing these services are in the same classroom. As a practical matter, however, cluster grouping created a "gifted" or high-achieving class in two schools. While some teachers called this practice tracking and critiqued it, others said that they could not imagine teaching the *full* range of students in one classroom. Instead, teachers seemed to want constrained heterogeneity. During member checking, one principal reported that they were planning to do "more tracking next year" because it "made it easier for teachers to differentiate" (Principal Charlotte, Cleveland Elementary). The idea that tracking was being rationalized in the name of differentiation provides a small indication of how complex, historically situated, and nuanced the coordination of instruction is when you consider the instruction provided by generalists and specialists simultaneously. While this study did not focus on the coordination between generalists and specialists, this topic is important for future research, particularly with the emphasis on Response to Intervention today.

Appendix A: Purposive Sampling Data

School ID	# Teachers (N)	Median change in literacy differentiation (Slope)	Median literacy differentiation (Intercept)	% ELL	% IEP
27	8	0.08	0.73	0.01	0.01
8	4	0.05	0.42	0.00	0.00
13	4	0.05	0.45	0.00	0.00
7	6	0.05	0.48	0.01	0.01
3	7	0.05	0.53	0.30	0.30
17	4	0.04	0.41	0.02	0.02
24	5	0.04	0.32	0.02	0.02
2	10	0.04	0.44	0.15	0.15
30	3	0.02	0.59	0.00	0.00
1	10	0.02	0.41	0.17	0.17
33	17	0.02	0.41	0.03	0.03
16	8	0.01	0.44	0.05	0.05
32	7	0.01	0.58	0.04	0.04
21	5	0.01	0.38	0.01	0.01
29	8	0.01	0.55	0.00	0.00
23	4	0.00	0.32	0.00	0.00
26	6	0.00	0.33	0.09	0.09
22	4	0.00	0.33	0.01	0.01
25	7	0.00	0.18	0.02	0.02
9	4	-0.01	0.33	0.01	0.01
15	2	-0.01	0.27	0.00	0.00
18	3	-0.01	0.23	0.00	0.00
19	4	-0.02	0.28	0.00	0.00
31	8	-0.02	0.41	0.07	0.07
28	2	-0.03	0.53	0.00	0.00
14	3	-0.03	0.44	0.01	0.01
12	4	-0.04	0.28	0.01	0.01
10	6	-0.04	0.20	0.00	0.00
5	5	-0.04	0.28	0.01	0.01
20	5	-0.04	0.21	0.00	0.00
6	4	-0.06	0.11	0.00	0.00

Note: The table is sorted by median change in literacy differentiation (at the school level). Teachers and principals from the highlighted schools (27, 3, 2) participated in the qualitative study.

Appendix B: Teacher Interview Protocol

Before turning the tape recorder on:

1. Explain the purpose of the interview.
Thank you for taking the time to meet with me today. As you know, I am interested in understanding what it means to differentiate literacy instruction.

I am going to be asking you questions about your teaching responsibilities, how you interact with your teacher colleagues, your views on differentiated instruction, how you work with you principal, and other supports and resources that have been provided to you as a teacher.

2. Consent Process: Please be sure to consent the participant if s/he has not consented before (see Interview Process document). In all cases, tell the participant:

Before we begin the interview, I want to remind you that participating in this study is voluntary and your responses are completely confidential. At any point during the interview, if you would like me to turn off the recorder, just tell me to do so. Do you have any questions about the study before we begin?

Note: Turn the video-recorder on (*Ensure you have the mic in the mic jack!):

It is (date) *at* (time). *This is* (interviewer's name) *and I am interviewing* (teacher's first name) *at School _____.*

I would like to begin by clarifying a term. In this interview, I will use the term language arts to refer to a wide variety of topics, such as reading, writing, fluency, and grammar. Does that make sense?

<u>Differentiated Instruction</u>
Now, I'm going to ask a few questions about what differentiated literacy instruction looks like.

**Notes to interviewer:*
- *Probe on **depth/specificity** of response until you understand what the participant describes (e.g., If a teacher says "student engagement," ask "Engaged in what?").*
- *Keep the **form/function** distinction in mind. Ask participants* why *they think ____ is important (e.g., Why do you think it's important for kids to read level-appropriate texts? Why do you think it's important for students to work in groups?).*

1. If you were asked to observe **another teacher's instruction** for one or more lessons, what would you look for to decide **whether differentiated instruction was present**?
***Note:** Pick up on the labels and the names that the interviewee uses. Probe for what s/he means by the words s/he uses. For example, "I hear you saying that the 'advanced*

group' would be doing _____. Why do you think that is?"

a. In a differentiated lesson, what would expect to **see the teacher doing**?
b. In a differentiated lesson, what would you expect to **see the students doing**?

2. If you were going to judge **the quality of differentiation occurring**, how would you determine if the differentiation was of **very high quality**?
    a. How would you determine if differentiation of **low quality was occurring**?

3. Can you give me a sense of the students in your classroom and what you consider about them when you approach differentiation?

4. Tell me about a student for whom differentiation really matters?

5. When you think about your history as an educator, how did you learn to differentiate instruction?

Mutual Engagement

I'm going to ask a few questions about the opportunities you have to collaborate with other teachers in your school.

6. Is there any particular teacher or person—at this school or perhaps elsewhere—who has really shaped your thinking about differentiated instruction?
    a. Can you give me a specific example of an important conversation you had with that person?

7. What formal opportunities, if any, do teachers have in this school to meet with one another **to discuss literacy instruction**?

    Anticipated responses*: whole school meetings, grade level, reading team meetings, committees, leadership teams, etc.*

    Note to Interviewer: Ask this series of questions for each type of meeting in which **literacy instruction is a meeting focus.*

a. Who leads these meetings?
b. Who attends these meetings?
c. Do any administrators attend these meetings?
d. What do you typically do in these meetings?
    a. Ask teacher to explain what they do in the activity (e.g., lesson planning—Can you describe to me how you actually go about lesson planning? What does it look like?).
e. During these meetings, does the topic of **differentiated instruction** ever come up?
    a. If yes, under what circumstances does the topic become important?
    b. If no, why do you think that it doesn't come up?
    c. Are there any particular materials, such as student assessments, that are used (or referred to) when the topic of differentiated instruction is discussed?

8. How, if at all, does **participation in this meeting/activity influence your literacy differentiation?**

9. How often do you **observe the literacy instruction** of other teachers?
    a. If observation occurs:
        a. Are you expected to observe others or do you do this on your own accord?
        b. If expected, who expects you to do this?
    b. What do you focus on when observing?
        a. What guidance are you given about what to focus on when you observe others teach or what to talk about afterwards?
        b. Do you use any materials or tools, such as an observation protocol, during your observation?
            i. How helpful are these observations to you?
                1. In what ways?

    a. How, if at all, have your observation(s) of other teachers influenced your literacy differentiation?

10. What role do **specialists**, such as reading specialists, play in providing differentiation to students in your classroom.

Alignment

Now I'm going to ask you about your relationship with your principal, his/her expectations for your job, and specifically how s/he supports differentiated literacy instruction. Before I ask those questions, I want to clarify which administrator, or administrators, is responsible for supporting and evaluating your literacy instruction. Besides the principal, is there anyone else?

[***Note to Interviewer*:** However, if the interviewee tells you another teacher/coach/administrator is responsible for literacy instruction, ask about that person too (e.g., assistant principal, head teacher).]

11. Suppose your **principal** was here. How would s/he describe differentiated instruction?

12. Have there been any situations where you did not agree with what your principal expected you to do in relation to differentiated instruction in your school? If so, can you please describe one of these situations?

13. What does your principal do to support differentiated instruction for you in particular or for others in this school?

14. In this school, are there any important **policies or documents** related to differentiated instruction? If so, can you please describe what they are in how they affect you?

15. Has your principal come to your classroom to observe your literacy instruction during

this school year?

i. Is the feedback written and/or oral?

b. *Has the principal given you any feedback about your differentiated instruction practices*? If so, can you describe the feedback? *Probe on the **content** of feedback.*

Brokers in the school

Now, I'm going to ask you some questions about people in your school who support differentiated instruction and professional development opportunities that you've had.

16. Have you participated in any **professional development** related to differentiated instruction?
    a. Did the principal actively and fully support this professional development?
    b. How do you know this?

    c. What parts of the professional development were you able to incorporate into your instruction?
        i. Overall, was the professional development useful to your differentiation practices?
        ii. How did it influence your planning or teaching?

17. What was the **most important professional development** experience that you've had about differentiated instruction? How were you able to incorporate this into your teaching?

18. Does your school have a dedicated coach or a literacy coach?

If no, skip section …

If yes … I'm going to ask you a few questions about the role of the literacy coach in your school, his/her expectations around differentiated instruction, and how you typically interact with your coach.

19. Can you **describe a typical interaction** with your literacy coach?
    a. Does your literacy coach every come to your classroom?
    b. Does s/he every model instruction or co-teach in your classroom?
        i. If so, how do you decide what the coach will model or co-teach?
    c. Are you working on anything in particular with your literacy coach?

20. How often do you **seek advice from your literacy coach** about issues related to literacy instruction?
    a. If no, can you tell me why you don't typically ask your literacy coach for assistance?
    b. If yes, what kind of things do you typically discuss with your coach?

21. Can you please describe what your **literacy coach expects** from you in relation to

differentiated instruction?

22. Can you give me an example of a recent conversation you had with your coach about differentiated instruction?

23. Has your literacy coached influenced your literacy differentiation at all?
    a. If so, how?

Final Question (and closed questions):

24. How are you able to continue learning and become more expert at differentiation?

25. That covers things that I wanted to ask. Anything that you care to add? Or, what should I have asked you that I didn't think to ask?

Closed questions:

26. How long have you been **teaching language arts**?
    a. How long have you been teaching language arts **at this school**?

27. What grade are you teaching this year? (e.g., 4th grade)?
    a. To your knowledge, has the class you are teaching been **grouped by achievement or skill** in any way (e.g., honors, enrichment, inclusion, etc.)?

        i. If so, ask *teacher to explain how students are assigned to the classes (e.g., honors, inclusion).*

    b. Is there a specific **curriculum or textbook** that you use to teach language arts?

        i. If so, ask teacher to identify the series or curriculum?
        ii. If not, ask how the language arts curriculum is organized?

28. On average, how much **time per day** do you dedicate to teaching language arts?

Appendix C: Member Checking Document

Supporting Literacy Differentiation

Note: The following document was distributed to teachers and principals during member checking. After providing time for participants to read this silently, I invited comments, questions, and suggestions, particularly if anyone disagreed with any conclusion below.

1. What is literacy differentiation?

General education teachers described using many different instructional strategies and methods to enact literacy differentiation. By far, guided reading was the most common way to describe differentiated literacy instruction. Although guided reading was described in many ways, teachers typically reported that small groups worked on the same reading skill (or strategy) with different texts (appropriate for students' reading levels). In addition, teachers consistently said that the strategic use of aides and specialists was another way that students received differentiated instruction. Although less common, a few teachers described differentiated instruction as individualized instruction (e.g., individual reading conferences), literacy centers (e.g., Debbie Diller), or student choice with complex, open-ended tasks.

2. What forms of teacher collaboration supported differentiated instruction?

Teachers consistently reported that opportunities to observe other teachers supported their learning about how to enact differentiated lessons. Teachers said that observations gave them practical knowledge about what works, how to do it, and how to manage the entire classroom. Newer teachers (< 5 years) consistently identified one important mentor that shaped their thinking about differentiated instruction, and that person was almost always a more experienced teacher at the same school. In contrast, teachers with more experience (> 5 years) typically reported that their "grade level team" was instrumental in how they thought about differentiation or that "no one" had shaped their thinking about it. To support teacher learning, two out of three principals said that they strategically encouraged teacher collaboration (e.g., you should go and observe this teacher). In one district, tenured teachers are allowed to conduct peer observations instead of being formally observed by an administrator.

Teachers consistently reported that formal and informal opportunities to collaborate positively supported their literacy differentiation, particularly when they had time to share resources. Because most teachers held a group model of differentiated instruction (e.g., guided reading), the sharing of resources was critical because it helped teachers (especially newer ones) collect, organize, and match resources with student learning needs. Although teachers valued collaboration time, they consistently reported that they needed more time to plan differentiated lessons and units. Instead of receiving more time, however, teachers said that they had less time now than in previous years. Especially in the last year, the agenda for formal collaboration opportunities (e.g., grade level meetings, whole faculty meetings) have increasingly been set by

local and district administrators (not teachers). Lastly, general education teachers consistently reported knowing very little about the instruction provided to students during pull-out sessions.

3. What other people or tools supported literacy differentiation?

Teachers and principals in all three schools consistently reported that an instructional leader from the district supported teacher learning about differentiation. During monthly meetings, quarterly in-services, and whole faculty study groups, these individuals facilitated book studies, supplied teachers with access to resources and supplemental on-line texts, provided in-service training on guided reading, and—at times—helped teachers interpret the MAP reports. Generally speaking, this person helped develop a common language about differentiated instruction.

While most educators reported learning a lot from this particular administrator, some teachers disagreed with her/him about how to differentiate literacy instruction. For example, one teacher reported not following a particular piece of guided reading advice (e.g., don't meet with your "high group" as much). Teachers also voiced disagreement about the reading series. Although some teachers said that the series supported literacy differentiation by providing leveled texts and activities, several criticized the quality and appropriateness of the texts. Instead of using the leveled readers, they preferred to base their instruction around chapter books and novels, which they thought were critical to support student literacy development at Grade 4/5.

A little over half of the teachers reported that MAP reports were useful to determine students' reading levels. Teacher also said that MAP reports helped them plan what reading skills (or strategies) to teach. Some teachers reported using the individual student reports for other purposes, including having individual student learning conferences or mailing the results home to parents. In order to support differentiation, one principal reported having individual principal-teacher conferences about MAP results.

4. How did principals create alignment around differentiated instruction in their schools?

Teachers reported that their principals helped everyone get "on the same page" about differentiated instruction in a variety of ways. First, principals helped provide access to important resources, such as supplementary texts, access to websites, or literature about differentiation. Second, principals strategically conducted teacher evaluations during guided reading (in 2 out of 3 schools). Third, principals recruited new teachers with similar beliefs about differentiated instruction. Fourth, when planning the daily schedule, principals tried to protect the literacy block from specials, which allowed teachers "to just teach" during this time of the day. Fifth, two (out of three) schools used a cluster approach to class composition (e.g., ELL cluster, REI cluster), with the intended goal of creating 3 or 4 guided reading groups per class (rather than 6 or 7). This cluster approach to class design also made it easier to coordinate and concentrate specialist services.

Appendix D: Descriptive Statistics

		Counterfactual			MAP Condition			Total		
		Differentation Composite			Differentation Composite			Differentation Composite		
		Total N	Mean	Standard Deviation	Total N	Mean	Standard Deviation	Total N	Mean	Standard Deviation
Differentiation Composite	Fall 2008	58	.33	.20	56	.32	.19	114	.33	.20
	Winter 2008	69	.40	.22	65	.41	.22	134	.41	.22
	Spring 2009	77	.40	.27	73	.39	.23	150	.39	.25
	Fall 2009	83	.37	.24	81	.34	.20	164	.36	.22
	Winter 2009	79	.44	.23	79	.44	.26	158	.44	.24
	Spring 2010	81	.41	.22	78	.41	.23	159	.41	.23

		Counterfactual			MAP Condition			Total		
		Total N	Mean	Standard Deviation	Total N	Mean	Standard Deviation	Total N	Mean	Standard Deviation
ELL%	Year 1	77	.02	.05	73	.03	.07	150	.02	.06
	Year 2	83	.07	.14	81	.05	.08	164	.06	.11
ISAT SD	Year 1	77	22.71	4.79	73	23.16	4.90	150	22.93	4.84
	Year 2	83	22.44	4.28	81	22.68	4.55	164	22.56	4.40
Disability %	Year 1	77	.15	.10	73	.15	.10	150	.15	.10
	Year 2	83	.14	.10	81	.15	.10	164	.15	.10
Teacher PD	Year 1	77	.00	.00	73	3.25	1.21	150	1.58	1.83
	Year 2	83	.02	.22	81	2.93	1.49	164	1.46	1.80
Teacher Consult	Year 1	77	.00	.00	73	2.55	2.08	150	1.24	1.93
	Year 2	83	.05	.27	81	.51	.76	164	.27	.61
Principal PD	Year 1	77	2.26	1.30	73	2.22	1.34	150	2.24	1.31
	Year 2	83	2.60	1.53	81	2.59	1.46	164	2.60	1.49
Principal Consult	Year 1	77	2.01	1.61	73	2.25	1.81	150	2.13	1.71
	Year 2	83	.53	.77	81	.44	.72	164	.49	.75
Principal Beliefs	Year 1	77	2.72	.42	73	2.72	.43	150	2.72	.42
	Year 2	83	2.98	.38	81	3.02	.35	164	3.00	.36
Teacher Resources	Year 1	77	2.82	.62	73	2.74	.60	150	2.78	.61
	Year 2	83	2.83	.61	81	2.83	.62	164	2.83	.61
Teacher Beliefs	Year 1	77	2.96	.42	73	2.82	.40	150	2.89	.42
	Year 2	83	2.56	.90	81	2.69	.55	164	2.63	.75
Teacher Experience	Year 1	77	1.05	.83	73	1.03	.88	150	1.04	.85
	Year 2	83	.96	.83	81	1.01	.89	164	.99	.86

Note: The analytic sample included only teachers who were observed at least 3 times over 2 years. Mean Teacher PD goes down from Year 1 to Year 2 because 14 MAP condition teachers—who received no PD—were observed three times in Year 2.

Appendix E: Correlation Matrix, Year 1

Correlation Matrix, Year 1

		DI	MAP	ELL	R_SD	IEP	T_PD	T_Consult	P_PD	P_Consult	P_Beliefs	T_Res	T_Beliefs	T_Exp
DI	R	1	-.026	.215**	-.064	.043	.007	.048	-.090	-.185*	.102	.181*	.212**	.021
	Sig. (2-tailed)		.749	.008	.438	.598	.929	.560	.271	.023	.214	.027	.009	.796
MAP	R	-.026	1	.053	.046	.011	.888**	.662**	-.015	.069	.008	-.069	-.173*	-.014
	Sig. (2-tailed)	.749		.516	.573	.893	.000	.000	.851	.404	.926	.398	.034	.860
ELL	R	.215**	.053	1	-.011	-.077	.121	.068	-.015	.125	.097	.141	.152	-.009
	Sig. (2-tailed)	.008	.516		.892	.350	.140	.406	.851	.128	.236	.086	.063	.915
R_SD	R	-.064	.046	-.011	1	.306**	.091	.044	.201*	.078	.015	-.206*	-.030	-.066
	Sig. (2-tailed)	.438	.573	.892		.000	.267	.590	.014	.343	.859	.011	.715	.425
IEP	R	.043	.011	-.077	.306**	1	.051	.173*	.112	-.014	.067	-.171*	.134	.035
	Sig. (2-tailed)	.598	.893	.350	.000		.537	.034	.174	.863	.417	.037	.102	.674
T_PD	R	.007	.888**	.121	.091	.051	1	.573**	.023	-.019	-.016	-.050	-.133	.019
	Sig. (2-tailed)	.929	.000	.140	.267	.537		.000	.783	.814	.842	.545	.105	.813
T_Consult	R	.048	.662**	.068	.044	.173*	.573**	1	-.039	.145	-.055	-.081	.075	.002
	Sig. (2-tailed)	.560	.000	.406	.590	.034	.000		.638	.076	.500	.323	.363	.978
P_PD	R	-.090	-.015	-.015	.201*	.112	.023	-.039	1	.513**	.033	.039	.209*	-.117
	Sig. (2-tailed)	.271	.851	.851	.014	.174	.783	.638		.000	.687	.637	.010	.155
P_Consult	R	-.185*	.069	.125	.078	-.014	-.019	.145	.513**	1	.197*	.051	.142	-.341**
	Sig. (2-tailed)	.023	.404	.128	.343	.863	.814	.076	.000		.015	.536	.083	.000
P_Beliefs	R	.102	.008	.097	.015	.067	-.016	-.055	.033	.197*	1	-.054	-.152	-.062
	Sig. (2-tailed)	.214	.926	.236	.859	.417	.842	.500	.687	.015		.513	.063	.453
T_Res	R	.181*	-.069	.141	-.206*	-.171*	-.050	-.081	.039	.051	-.054	1	.225**	-.083
	Sig. (2-tailed)	.027	.398	.086	.011	.037	.545	.323	.637	.536	.513		.006	.310
T_Beliefs	R	.212**	-.173*	.152	-.030	.134	-.133	.075	.209*	.142	-.152	.225**	1	-.121
	Sig. (2-tailed)	.009	.034	.063	.715	.102	.105	.363	.010	.083	.063	.006		.141
T_Exp	R	.021	-.014	-.009	-.066	.035	.019	.002	-.117	-.341**	-.062	-.083	-.121	1
	Sig. (2-tailed)	.796	.860	.915	.425	.674	.813	.978	.155	.000	.453	.310	.141	

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

n = 150 for all variables

Appendix F: Correlation Matrix, Year 2

Correlation Matrix, Year 2

		DI	MAP	ELL	R_SD	IEP	T_PD	T_Consult	P_PD	P_Consult	P_Beliefs	T_Res	T_Beliefs	T_Exp
DI	R	1	.000	.104	.053	-.043	-.050	.106	.013	.245**	.078	-.077	.054	-.037
	Sig. (2-tailed)		.997	.185	.499	.588	.525	.177	.873	.002	.320	.328	.492	.637
MAP	R	.000	1	.050	.030	-.029	.786**	.442**	-.015	-.017	.004	.054	.043	.000
	Sig. (2-tailed)	.997		.525	.702	.710	.000	.000	.851	.831	.962	.493	.586	.996
ELL	R	.104	.050	1	-.021	-.244**	-.108	-.024	.068	.025	.149	-.088	.131	-.211**
	Sig. (2-tailed)	.185	.525		.791	.002	.170	.757	.388	.752	.057	.260	.093	.007
R_SD	R	.053	.030	-.021	1	.181*	.063	-.027	-.017	-.005	-.094	.037	-.043	-.047
	Sig. (2-tailed)	.499	.702	.791		.020	.423	.730	.833	.951	.233	.640	.589	.552
IEP	R	-.043	-.029	-.244**	.181*	1	-.072	-.122	.008	-.116	-.015	.035	-.156*	-.027
	Sig. (2-tailed)	.588	.710	.002	.020		.360	.119	.922	.139	.853	.652	.046	.729
T_PD	R	-.050	.786**	-.108	.063	-.072	1	.472**	-.054	.034	.010	.053	.055	.063
	Sig. (2-tailed)	.525	.000	.170	.423	.360		.000	.489	.667	.902	.504	.486	.421
T_Consult	R	.106	.442**	-.024	-.027	-.122	.472**	1	-.067	.081	.107	.091	.036	-.017
	Sig. (2-tailed)	.177	.000	.757	.730	.119	.000		.397	.300	.171	.247	.651	.829
P_PD	R	.013	-.015	.068	-.017	.008	-.054	-.067	1	.353**	.127	.124	-.025	-.301**
	Sig. (2-tailed)	.873	.851	.388	.833	.922	.489	.397		.000	.106	.115	.752	.000
P_Consult	R	.245**	-.017	.025	-.005	-.116	.034	.081	.353**	1	-.142	.090	.084	-.067
	Sig. (2-tailed)	.002	.831	.752	.951	.139	.667	.300	.000		.070	.250	.285	.392
P_Beliefs	R	.078	.004	.149	-.094	-.015	.010	.107	.127	-.142	1	-.173*	.136	-.071
	Sig. (2-tailed)	.320	.962	.057	.233	.853	.902	.171	.106	.070		.027	.082	.367
T_Res	R	-.077	.054	-.088	.037	.035	.053	.091	.124	.090	-.173*	1	.098	-.030
	Sig. (2-tailed)	.328	.493	.260	.640	.652	.504	.247	.115	.250	.027		.210	.706
T_Beliefs	R	.054	.043	.131	-.043	-.156*	.055	.036	-.025	.084	.136	.098	1	.020
	Sig. (2-tailed)	.492	.586	.093	.589	.046	.486	.651	.752	.285	.082	.210		.801
T_Exp	R	-.037	.000	-.211**	-.047	-.027	.063	-.017	-.301**	-.067	-.071	-.030	.020	1
	Sig. (2-tailed)	.637	.996	.007	.552	.729	.421	.829	.000	.392	.367	.706	.801	

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

n = 164 for all variables

Appendix G: Multilevel Models, Years 1 & 2

		Parameter	Means Model	Growth Model	MAP Model	Each Variable Alone with Growth Model	Model A (Variables p < 0.2)	Model B (Variables p < 0.1)	Model C (Variables p < 0.05)
Fixed Effects, π_{0i}	Intercept	γ_{00}	0.39*** (0.01)	0.42*** (0.02)	0.40*** (0.02)		0.16 (0.12)	0.33*** (0.04)	0.33*** (0.04)
	MAP	γ_{01}			0.03 (.03)				
	T Experience	γ_{02}				-0.001 (0.02)			
	IEP	γ_{03}				0.12 (0.14)			
	ELL	γ_{04}				0.20~~ (0.14)	0.10 (0.09)		
	Reading SD	γ_{05}				0.002 (0.003)			
	T PD	γ_{06}				0.008 (0.01)			
	T Consult	γ_{07}				0.04* (0.02)	0.04* (0.02)	.01 (0.06)	
	P PD	γ_{08}				-0.01~~ (0.007)	-0.007 (0.01)		
	P Consult	γ_{09}				0.08 (0.13)			
	P Beliefs	γ_{010}				0.06~~ (0.04)	0.06~~ (0.04)		
	T Resources	γ_{011}				-0.01 (0.02)			
	T Beliefs	γ_{012}				0.04* (0.02)	0.03* (0.01)	0.03* (0.01)	0.03* (0.01)
Rate of Change, π_{1i}	Time	γ_{10}		0.01** (0.005)	0.007 (0.006)		-.05 (0.03)	0.02*** (0.05)	0.01*** (0.004)
	MAP x Time	γ_{11}			0.009 (0.009)				
	T Experience x Time	γ_{12}				0.001 (0.006)			
	IEP x Time	γ_{13}				0.07* (0.05)~~	0.03 (0.03)		
	ELL x Time	γ_{14}				0.05 (0.05)			
	Reading SD x Time	γ_{15}				0.0008 (0.00)			
	T PD x Time	γ_{16}				0.002 (0.002)			
	T Consult x Time	γ_{17}				0.007~~ (0.004)	0.006~~ (0.004)		
	P PD x Time	γ_{18}				-0.002 (0.002)			
	P Consult x Time	γ_{19}				0.000 (0.003)			
	P Beliefs x Time	γ_{120}				0.02* (0.01)	0.02~~ (0.01)		
	T Resources x Time	γ_{121}				-0.01 (0.01)			
	T Beliefs x Time	γ_{122}				0.003 (0.008)			
Variance	Level 1, Within person	σ^2_ε	0.04*** (0.002)	0.04*** (0.002)	.04*** (0.002)		0.04*** (0.002)	0.04*** (0.002)	0.04*** (0.002)
	Level 2, In final status	σ^2_0	0.01*** (0.002)	0.02*** (0.005)	0.02*** (0.005)		0.02*** (0.005)	0.02*** (0.005)	0.02*** (0.005)
	Level 2, In rate of change	σ^2_1		0.00~~ (0.00)	0.00~~ (0.00)		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Level 2, Covariance	σ^0_1		0.003* (0.001)	0.003* (0.001)		0.002~~ (0.001)	0.002~ (0.001)	0.002~ (0.001)
	ICC	ρ	0.23	0.36	0.35		0.32	0.34	0.34
	Deviance		-154.26	-168.86	-169.302		-185.737	-175.77	-173.382
	AIC		-148.26	-156.86	-155.302		-156.737	-159.77	-159.382
	BIC		-133.93	-128.19	-115.718		-89.834	-121.54	-125.931

~~ p < 0.2; ~ p < 0.1; * p < .05; ** p < 0.01; *** p < .001

Note: Final estimation of fixed effects (with robust standard errors). Multiple Imputation (n=5) and Full Maximum Likelihood estimation

Appendix H: Multilevel Models, Year 1

		Parameter	Means Model	Growth Model	MAP Model	Each Variable Alone with Growth Model	Model A (Variables p < 0.2)	Model B (Variables p < 0.1)	Model C (Variables p < 0.05)
Fixed Effects, π_{0i}	Intercept	γ_{00}	0.38*** (0.01)	0.40*** (0.02)	0.41*** (0.03)		0.07 (0.12)	0.06 (0.14)	0.26*** (0.06)
	MAP	γ_{01}			-0.004 (0.04)				
	T Experience	γ_{02}				-0.003 (0.02)			
	IEP	γ_{03}				0.23 (0.21)			
	ELL	γ_{04}				0.67* (0.28)	0.59* (0.29)	0.56~ (0.32)	
	Reading SD	γ_{05}				-0.002 (0.00)			
	T PD	γ_{06}				0.0009 (0.01)			
	T Consult	γ_{07}				0.008 (0.009)			
	P PD	γ_{08}				-0.015 (0.01)			
	P Consult	γ_{09}				-0.02** (0.01)	-0.01 (0.008)		
	P Beliefs	γ_{010}				0.08~ (0.04)	0.08~ (0.04)	0.07 (0.05)	
	T Resources	γ_{011}				0.07* (0.03)	0.05* (0.02)	0.05* (0.02)	0.05* (0.02)
	T Beliefs	γ_{012}				0.11 (0.07)			
Rate of Change, π_{1i}	Time	γ_{10}		0.03** (0.01)	0.033~ (0.02)		-0.15~ (0.08)	-0.14~ (0.08)	0.02~ (0.01)
	MAP x Time	γ_{11}			-0.004 (0.03)				
	T Experience x Time	γ_{12}				-0.002 (0.02)			
	IEP x Time	γ_{13}				0.26* (0.13)	0.15~~ (0.10)		
	ELL x Time	γ_{14}				0.49** (0.16)	0.49** (0.17)	0.46* (0.20)	0.20* (0.09)
	Reading SD x Time	γ_{15}				0.0008 (0.00)			
	T PD x Time	γ_{16}				0.002 (0.01)			
	T Consult x Time	γ_{17}				0.004 (0.006)			
	P PD x Time	γ_{18}				0.003 (0.01)			
	P Consult x Time	γ_{19}				-0.01 (0.007)			
	P Beliefs x Time	γ_{120}				0.06* (0.03)	0.05~ (0.03)	0.06~ (0.03)	
	T Resources x Time	γ_{121}				0.02 (0.02)			
	T Beliefs x Time	γ_{122}				0.06 (0.04)			
Variance	Level 1, Within person	σ^2_ε	0.04*** (0.004)	0.04*** (0.005)	0.04*** (0.005)		0.04*** (0.005)	0.04*** (0.005)	0.04*** (0.005)
	Level 2, In final status	σ^2_0	0.009** (0.003)	0.027*** (0.008)	0.027*** (0.008)		0.021** (0.008)	0.024** (0.007)	0.024*** (0.008)
	Level 2, In rate of change	σ^2_1		0.005 (0.004)	0.005 (0.004)		0.003 (0.004)	0.003 (0.004)	0.005 (0.004)
	Level 2, Covariance	σ^0_1		0.01** (0.003)	0.01** (0.003)		0.007* (0.003)	0.009* (0.004)	0.010* (0.004)
	ICC	ρ	0.17	0.43	0.43		0.37	0.40	0.41
	Deviance		-59.58	-75.65	-75.67		-95.79	-90.55	-83.93
	AIC		-53.57	-63.65	-59.67		-67.79	-68.55	-67.93
	BIC		-41.64	-39.77	-27.83		-12.08	-24.78	-36.10

~~ p < 0.2; ~ p < 0.1; * p < .05; ** p < 0.01; *** p < .001

Note: Final estimation of fixed effects (with robust standard errors). Multiple Imputation (n=5) and Full Maximum Likelihood estimation

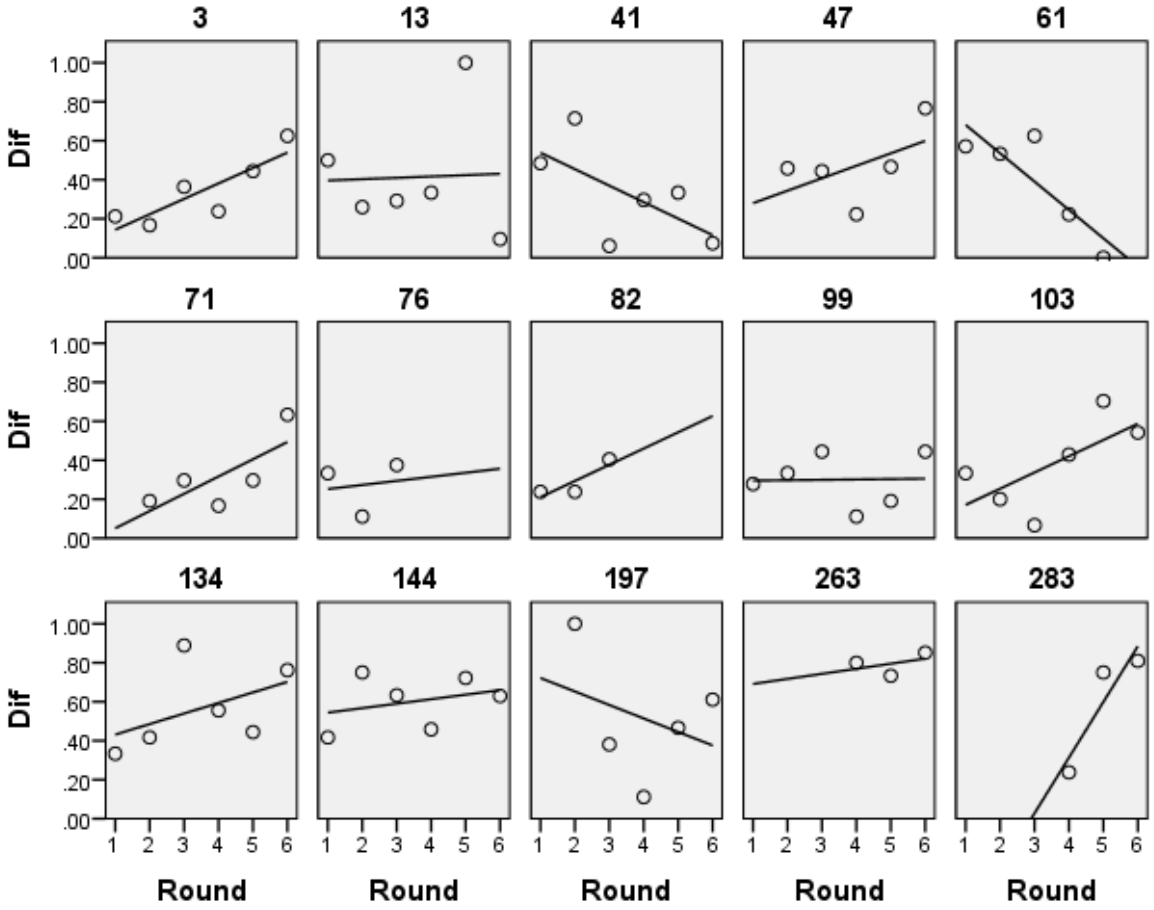
Appendix I: Multilevel Models, Year 2

		Parameter	Means Model	Growth Model	MAP Model	Each Variable Alone with Growth Model	Model A (Variables p < 0.2)	Model B (Variables p < 0.1)	Model C (Variables p < 0.05)
	Intercept	γ_{00}	0.40*** (0.01)	0.43*** (0.02)	0.41*** (0.02)		0.32*** (0.05)	0.34*** (0.05)	0.43*** (0.02)
Fixed Effects, π_{0i}	MAP	γ_{01}			0.03 (0.03)				
	T Experience	γ_{02}				-0.002 (0.02)			
	IEP	γ_{03}				-0.006 (0.17)			
	ELL	γ_{04}				0.15 (0.15)			
	Reading SD	γ_{05}				-0.003 (0.004)			
	T PD	γ_{06}				0.01~~ (0.01)	0.01~~ (0.009)		
	T Consult	γ_{07}				0.03 (0.03)			
	P PD	γ_{08}				-0.01 (0.009)			
	P Consult	γ_{09}				0.03 (0.02)			
	P Beliefs	γ_{010}				0.05 (0.04)			
	T Resources	γ_{011}				-0.003 (0.03)			
	T Beliefs	γ_{012}				0.05* (0.02)	0.03~ (0.02)	0.03~ (0.02)	
Rate of Change, π_{1i}	Time	γ_{10}		0.03** (0.01)	0.02~ (0.02)		0.03~ (0.015)	0.03* (0.01)	0.04*** (0.01)
	MAP x Time	γ_{11}			0.008 (0.02)				
	T Experience x Time	γ_{12}				-0.0009 (0.01)			
	IEP x Time	γ_{13}				0.047 (0.10)			
	ELL x Time	γ_{14}				-0.03 (0.10)			
	Reading SD x Time	γ_{15}				-0.002 (0.003)			
	T PD x Time	γ_{16}				0.01~~ (0.006)	0.01~ (0.006)	0.004 (0.004)	
	T Consult x Time	γ_{17}				-0.02 (0.02)			
	P PD x Time	γ_{18}				-0.02~ (0.01)	0.01 (0.02)		
	P Consult x Time	γ_{19}				-0.02~~ (0.01)	-0.03* (0.02)	-0.03* (0.01)	-0.03** (0.01)
	P Beliefs x Time	γ_{120}				-0.01 (0.03)			
	T Resources x Time	γ_{121}				0.02 (0.02)			
	T Beliefs x Time	γ_{122}				0.02 (0.01)			
Variance	Level 1, Within person	σ^2_ε	0.04*** (0.003)	0.04*** (0.004)	0.04*** (0.004)		0.04*** (0.004)	0.04*** (0.004)	0.04*** (0.004)
	Level 2, In final status	σ^2_0	0.01*** (0.003)	0.02* (0.007)	0.02* (0.007)		0.01* (0.006)	0.01* (0.006)	0.02* (0.007)
	Level 2, In rate of change	σ^2_1		0.00 (0.00)	0.00 (0.00)		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Level 2, Covariance	σ^0_1		0.00 (0.00)	0.00 (0.00)		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	ICC	ρ	0.26	0.29	0.29		0.27	0.27	0.29
	Deviance		-63.24	-68.83	-69.68		-81.74	-79.56	-76.73
	AIC		-57.24	-56.83	-53.68		-59.74	-61.56	-62.73
	BIC		-44.71	-31.79	-20.29		-13.83	-24.00	-33.51

~~ p < 0.2; ~ p < 0.1; * p < .05; ** p < 0.01; *** p < .001

Note: Final estimation of fixed effects (with robust standard errors). Multiple Imputation (n=5) and Full Maximum Likelihood estimation

Appendix J: Graphing Individual Teacher Trajectories



Note: Plots above represent empirical estimates of literacy differentiation (DIF) with superimposed ordinary least square estimated linear trajectories for 15 teachers randomly selected from the larger sample. Numbers above each plot (e.g., 3, 13) represent individual teacher IDs. Estimates of literacy differentiation were independently measured (up to) six times over two years (Round 1 = Fall 2008; Round 2 = Winter 2008; Round 3 = Spring 2009, etc.).

Appendix K: Qualitative Codes

Code	Keyword(s)
Practice	
1 Differentiation with Chapter books / novels	Novels
1 Differentiation Affordances / Constraints	+ -
1 Differentiation based on knowing students	Know students
1 Differentiation by Interest	Interest
1 Differentiation by Reading / Text Level	Reading levels
1 Differentiation by Skills/Strategies	Skills
1 Differentiation for ELLs	ELLs
1 Differentiation for High Low Students	High low
1 Differentiation is centers	Centers
1 Differentiation is choice	Choice
1 Differentiation is guided reading / groups	Guided reading / groups
1 Differentiation is individualized support / conferencing o	Individualized support
1 Differentiation is specialists	Specialists
1 Differentiation Quality	DI Quality
Collaboration	
2 Collaboration – Lack of with specialists	No collaboration
2 Collaboration – newer teachers identified local DI mentors	Mentors
2 Collaboration – senior teachers mention retired teachers	Retired mentors
2 Collaboration – Sharing resources and resource expertise	Resources
2 Collaboration – sharing stories	Stories
2 Collaboration formal – constraints time admin	Constraints
2 Collaboration formal – grade level meetings	Grade Level Meetings
2 Collaboration formal – peer observations and evaluations	Peer observations
2 Collaboration formal – whole faculty study groups	Whole faculty study groups
2 Collaboration general	General
2 Collaboration informal	Informal
Alignment	
3 Alignment Clustering Class by Ability Skill	Class Ability Grouping
3 Alignment Common Reading Block	Reading Block
3 Alignment Coordinating Specialists	Coordinate Specialists
3 Alignment coursework / conferences	Coursework / Conferences
3 Alignment General	General
3 Alignment Principal Observation during guided reading	Pr. Observation
3 Alignment Principal Recruit teachers	Pr. Recruit
3 Alignment Principal Support for DI	Pr. Support
3 Alignment – State	State
Artifacts and Brokers	
4 Artifacts – Curriculum uses leveled texts	Leveled texts
4 Artifacts – Dispute over novels resistance	Novels
4 Artifacts – MAP as differentiation tool	MAP
4 Artifacts – Use of outside curriculum	Outside curriculum
4 Brokers – District	District support
4 Brokers – Other PD on Differentiation	Other PD
4 Brokers and Artifacts - General	General

Appendix L: Principal and Teacher Survey Items

In Year 1 and 2, participants respond to survey prompts in the following ways:

1. Completely disagree
2. Mostly disagree
3. Mostly agree
4. Completely agree

Teacher Beliefs Survey Items

1. I am capable of making the kinds of changes called for by the MAP Program.
2. The kinds of changes called for by the MAP Program are helping my students reach higher levels of achievement
3. The MAP Program requires me to make major changes in my classroom practice (REVERSE)
4. I strongly value the kinds of changes called for by the MAP program

Teacher Resources Survey Items

1. I have adequate time during the regular school week to work with my peers on reading/language arts curriculum or instruction for my students
2. I have adequate curriculum materials for teaching reading/language arts
3. I have adequate equipment (e.g., computers) for teaching reading/language arts to my students)

Principals Beliefs Survey Items

1. I am capable of making the kinds of changes called for by the MAP Program.
2. The kinds of changes called for by the MAP Program are helping students in the participating classrooms reach higher levels of achievement.
3. The MAP Program requires me to make major changes in my instructional or administrative practices (REVERSE)
4. I strongly value the kinds of changes called for by the MAP program.

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