

PRINCIPAL LEADERSHIP FOR QUALITY INTELLECTUAL WORK:
PROFESSIONAL DEVELOPMENT RELATED TO AUTHENTIC INSTRUCTION AND
STUDENT COGNITIVE ENGAGEMENT

By

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ABSTRACT

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As educational policy expectations increase the demands for both teachers and students, teachers are challenged to develop instructional practices that promote meaningful quality intellectual work for students. Although various reform efforts target improved instructional practices, a greater understanding is needed of the ways in which principal leadership in middle schools supports or hinders the development of teachers' instructional practices associated with increased student cognitive engagement. Using a mixed method design, this research examines the dimensions of principal leadership associated with teachers' professional development (PD) and instructional practices.

The purpose of this inquiry is to better understand the type of interventions and organizational conditions through which school principals can best support instructional improvement and student cognitive engagement in the classroom. Using interview, survey, and observation data of teachers and administrators at two middle schools, this study examines teachers' learning in the Authentic Intellectual Work PD initiative. The findings indicate that teachers demonstrated different levels of enactment of AIW instructional practices in the classroom, although the levels of student cognitive engagement among teachers were not clearly distinguishable in this study. Furthermore, high and low-level teachers, as measured by classroom observation of AIW instruction, held different conceptions of student engagement. In the next part of the study, three dimensions of principal leadership influenced teachers' PD

experiences and the development of their instructional practice: PD coherence; cultivation of shared goals, collaboration, and teacher input; and promotion of a growth mindset.

In addition, the greater degree of alignment between teachers' knowledge, values, and beliefs and AIW objectives, the more likely they were to demonstrate higher levels of AIW instructional practice. The findings provide insight into ways in which principals can enhance learning for both teachers and students through a comprehensive approach to instructional improvement. Implications from this study suggest that the principal is a critical agent in such a comprehensive approach. The principal has the potential to cultivate organizational conditions conducive to teacher and student learning. Specifically, the principal can orchestrate professional development to promote the teachers' complex understandings of engagement, alignment with the objectives of ambitious reform, and enhanced instructional practices. The principal is also responsible for providing structures of support and resources to foster the teacher professional community, which can serve as a conduit for teacher learning. In turn, a nuanced and in-depth understanding of the ways principal leadership is enacted in different school contexts is critical for policy makers, researchers, administrators, and educators who seek to promote ambitious instruction and student learning that fosters quality intellectual work for students.

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CHAPTER 1: INTRODUCTION

While there is widespread agreement about the need for educational reform, there is little consensus about how to achieve this goal. Beginning with the early common school movement, schooling held the promise of creating an educated citizenry that would contribute to democratic ideals. However, since that time there has been little consensus on the central educational goals for students and the kinds of changes in schooling required to achieve those ends. Furthermore, although numerous educational reforms have called for different strategies to achieve ambitious educational outcomes, the work of changing teaching practice and elevating student learning has proven to be a difficult task. Throughout this pursuit, there have been competing reform initiatives with different aims and histories to achieve various learning outcomes for students.

During this time, there has been some consistent pursuit of quality learning for valuable outcomes for students. For example, some aspects of schooling have prioritized functional citizenry so that individuals could demonstrate personal responsibility as well as participate in public service and decision making for the benefit of the common good. Other avenues have focused on instilling academic competence and still others have emphasized skills so students could be involved in productive labor. In this overall portrait of the pursuit of valuable outcomes of schooling, student engagement has had a checkered history. The premise of student engagement has been in the academic literature for more than 80 years, although the conception of engagement has evolved over time and it has received increasingly attention more recently (e.g. Fredericks et al., 2004; Kuh, 2009). Initially, engagement was studied as time on task (Merwin, 1969) and behavioral indicators of student participation; it was also interpreted to mean focused attention on any activity, with little attention to the quality of the task itself. In the 1970's, C. Robert Pace introduced the "quality of effort" concept. Pace's study on students' college experience found that students gained more from their studies when they invested

themselves in tasks with an educational purpose such as: studying, interacting with their peers and teachers, applying what they are learning to concrete situations and tasks, etc. (Pace, 1990). Thus, research emerged that emphasized engagement toward a valuable end, rather than the mere act of being occupied on engaged in tasks with little meaning or value to the student.

Although I recognize students can be engaged in less desirable learning, I focus on cognitively engaging learning experiences that involve rigorous intellectual work on tasks that are relevant and meaningful to students' lives. These is the types of learning experiences promote the development of thinking capacities including metacognition and self-regulation to take responsibility for learning, they cultivate interpersonal interactions in substantive conversation, and they involve problem solving of relevant issues in the community beyond school. This focus is not only on the valuable student learning outcomes, but also on the process through which they develop lifelong learning competencies.

Student cognitive engagement is a critical educational aim that is essential for a wide range of learning outcomes. Currently, student disengagement contributes to a number of negative learning outcomes. Student cognitive engagement in particular is essential to meet the aims of the Common Core State Standards that seek to provide consistent learning expectations for parents and teachers. Teachers' ability to engage students is central for increased learning outcomes, yet many teachers are challenged to engage students in a variety of contexts. Teachers also report a lack of training and professional development in understanding how to best engage students. Furthermore, principals receive little indication or support in creating learning climates that are conducive for increased student engagement and scant research exists on effective professional development initiatives to promote teachers' ability to engage students. There is a growing need to understand how to promote instructional practice and increase students' cognitive engagement toward valuable learning outcomes.

My study on the Authentic Intellectual Work initiative fits into this larger impulse to increase both the cognitive demand of students' learning experiences in school as well as the value of their learning outcomes. First, research has shown that the central aspect of the Authentic Intellectual Work initiative, authentic instruction, is associated with increased cognitive engagement among elementary, middle, and high school students (Marks, 2000; Newmann et al., 1996). The AIW initiative focuses on meaningful and intellectually engaging experiences that involve students in authentic problem solving, dialogue, construction of knowledge, and critical inquiry. The founding scholars of the initiative based AIW on their research findings of instructional practices that fostered students' quality intellectual work. In turn, this study on AIW contributes to the understanding of educational reform focused on promoting this type of quality intellectual work with valuable outcomes for students. In particular, my inquiry highlights aspects of principal leadership and teacher learning that enhance or hinder ambitious instructional practice toward such student cognitive engagement in quality learning experiences for valuable outcomes.

Authentic instruction is one particular manifestation focused on aspects of student cognition and engagement in learning out of a variety of arguments and approaches to improve instruction. For example, several of the ideas to improve instruction consistent with how people learn are outlined in The National Research Council book, *How People Learn* (2000). The book presents research about the brain to make connections between what is known about learning behavior and effective instruction in the classroom. It includes several key aspects of improving instruction for increased cognitive engagement such as synthesizing information and transferring knowledge from one context to another, linking learning to major concepts in the discipline, and learning environments that are learner, knowledge, assessment, and community centered to help children learn most effectively. Many of these aspects are consistent with constructivist

approaches to teaching, which is the label given to the general ideas embedded in authentic instruction. Although broadly defined, the four agreed upon aspects of constructivist instruction include learners construct their own meaning, new learning builds on prior knowledge, learning is enhanced by social interaction, and meaningful learning develops through authentic tasks (Good & Brophy, 1994). In this study I will focus on the specific approach, Authentic Intellectual Work, which is a specific instance of the broader movement to improve instruction and promote the quality of student learning outcomes.

The purpose of my research is to examine the role of the school principal in promoting student cognitive engagement through instructional improvement. To understand aspects of principal leadership, teacher learning and enactment of ambitious instructional practices, and the influence on student cognitive engagement in the learning experiences, this study focuses on two middle schools involved in the AIW project in Iowa. Research is limited at the middle school level; most research on school leadership and student learning is focused at the elementary level. Therefore, this study contributes to the understanding of educational reform and principal leadership for ambitious instruction and student cognitive engagement at the middle school level.

Background

In pursuit of valuable outcomes of schooling, many reform efforts emerged out of a dominant perspective that there is a crisis in education. Since the mid-1980s, a number of reports have claimed that many U.S. students and adults did not have the skills and abilities to engage in the intellectual effort necessary for successful work, citizenship, and personal life (Carnegie Task Force on Teaching as a Profession, 1986; National Commission on Excellence, 1983; National Education Goals Panel, 1991;Sizer, 1984). The 1983 report issued by the National Commission of Excellence in Education, *A Nation at Risk*, warned the rising tide of mediocrity in education must be addressed to ensure the nation's security. At that time,

researchers also presented the issues of comprehensive high schools in which dispirited teachers and disengaged students negotiated their exchanges amidst an extensive and fragmented curriculum (Cusick, 1983; Powell, Farrar, & Cohen, 1985; Sedlak, Wheeler, Pullin, & Cusick, 1986;Sizer, 1984). Critics of common schooling practices of the time called for improvements in the content, structure, and delivery of education in order for students to be successful within and beyond school.

In response to the perceived educational crisis, state governments, foundations, professional organizations, and universities advocated different reforms such as new curriculum standards, changes in teacher preparation and evaluation, new forms of student assessment, and changes in school governance structures, to name a few. The various reports and reform activities set the stage for a climate of school improvement in which there was widespread agreement that schools could do a better job of preparing students in the necessary skills to be successful beyond high school. In response, policy efforts targeted many different aspects of teaching and learning in an effort to improve instructional practice and educational outcomes. Some reformers advocated for structural changes to the school day, length of instructional time, and teaching schedules. Others pressed for learning experiences that feature high cognitive demand. However, the ideals of the reforms have not been easily implemented amidst the reality of schools, classrooms, and teachers' prevailing instructional practices (Kennedy, 2005; McLaughlin, 1991). Not only have ongoing efforts to improve student outcomes and increase the incidence of high-leverage teaching practices changed in form and feature, they have also encountered various challenges of implementation.

Most recently, the new federal and state policy agenda in the U.S., announced as Race to the Top, has focused on a number of different approaches to entice schools to improve student outcomes. Rather than high school completion, the new goal of *College for All* focuses on

student graduation from baccalaureate institutions, community colleges, and career-technical institutions. In order to reach these goals, schools and teachers are placed under increased levels of accountability through teacher evaluation and student assessment. In addition, over 45 states have adopted the Common Core State Standards (CCSS) to provide teachers and students with clear goals for instruction. In contrast with Goals 2000 and No Child Left Behind which set goals for learning outcomes with high expectations, emphasized high stakes testing and accountability, and allowed each state to develop its own standards, the Common Core establishes a single set of consistent and coherent educational standards across states for kindergarten through 12th grade in reading and math. Although the intention is to provide high standards that are consistent across states so that teachers, parents, and students have a clear set of expectations that are aligned with the expectations of college and careers, the adoption process is still relatively new. The extent to which the Common Core State Standards will be effectively implemented is not yet clear.

Schools will have to address the potential challenges principals may face associated with the implementation of the Common Core. First, the Common Core sets expectations for teaching students *how* to think with increasing levels of complexity in developing their comprehension, problem solving, and their ability to articulate their knowledge. These expectations surpass changes in textbooks and content alone; the CCSS require a change for many teachers in how they teach and view student learning. While some teachers are teaching in ways that are consistent with the Common Core, the depth of the standards and the significant difference between the CCSS and the previously existing standards in most states require new and different ways of teaching. Teachers at different points in their teaching careers will need to make significant changes and will require support in the process. Professional development (PD) that promotes teacher learning as well as structures of support throughout the school will need to be developed. In addition, principals will be responsible for sustained schoolwide structures that

promote teacher learning regarding these types of ambitious instructional practice. It is yet to be determined whether the supports associated with the implementation of these standards will provide necessary and sufficient indication for principals and teachers to improve instructional quality and student performance. Furthermore, regardless of how the standards are implemented, engaging students in the intellectual work required by the standards will need to be addressed. The types of learning outcomes emphasized by the AIW initiative are consistent with the aims of the CCSS.

A Challenge for Principal Leadership

As U.S. educational policy increases expectations for student outcomes, teachers and students are both responsible for the success of these reforms. Such large-scale policy efforts to improve student achievement ultimately depend upon the capacity¹ of teachers to improve their instruction and students' engagement in learning (Fredricks, Blumenfeld, Friedel, & Paris, 2004; National Research Council & Institute of Medicine, 2004). There is also some evidence that the nature of professional development teachers receive can influence their learning. For instance, Desimone, Porter, Garet, Yoon, & Birman, (2002) surveyed teachers about PD and found that there were key features of high-quality PD associated with changes in teaching practice. In many ways, realization of such policy goals will ultimately depend upon the resources and support provided to support learning opportunities for both teachers and students within the schools (Cohen & Ball, 1990).

Although PD has been an important factor in mediating the effectiveness of policy for teaching practice (Desimone, Smith, Hayes, & Frisvold, 2005), many efforts to promote teacher

¹ Teacher capacity can be defined as (1) knowledge, including subject matter, pedagogical content knowledge, and knowledge of other aspects relating to schooling, (2) craft skills, including planning, organizing, and orchestrating instructional practice, (3) dispositions, including beliefs, attitudes, values, and commitments (McDiarmid & Clevenger-Bright, 2008).

learning have been ineffective (Coburn, 2001; Odden 1991). Teacher PD has been linked to improving the quality of schools (Borko & Putnam, 1995; Talbert & McLaughlin, 1993) and student achievement (Desimone, Smith, Hayes, & Frisvold, 2005), yet reforms often fall short of providing meaningful PD that promotes lasting change (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). Even when schools and teachers provide high-quality PD, the extent to which teachers participate in PD remains primarily the decision of individual teachers (Desimone et al., 2002). Teacher learning is an ongoing process in which teachers integrate the knowledge, skills, values, and beliefs they need to teach students challenging curricula and develop expertise. Providing comprehensive and meaningful learning opportunities for teachers that lead to instructional quality has proven to be a challenge within educational reform.

Specifically, there is a need to foster teachers' ability to develop ambitious instructional practices associated with student engagement. Despite various efforts to improve schooling, numerous educators in a variety of settings are challenged to keep students engaged in classroom learning (Marks, 2000). Although the value and benefit of student engagement to student achievement and later life outcomes is evident (Fredricks, et al., 2004), school leaders and teachers typically receive little direction or incentive regarding ways to increase students' engagement in learning. Several forms of engagement have been identified in the research literature; however, a high level of cognitive engagement in particular is required to meet the increasing expectations for academic competence.

Furthermore, there is a growing need to understand dimensions of principal leadership that contribute to enhanced student engagement. Currently, there are low levels of student engagement in a variety of contexts. Student engagement varies greatly within some schools, as some teachers are more effective at promoting engagement than others. Among efforts to increase student engagement and support teachers' instructional practices associated with student

engagement, interventions have varying levels of success. In a review of quantitative and qualitative research literature on school leadership, Leithwood, Louis, Anderson, and Wahlstrom (2004) found that principals were second greatest influence, after classroom instruction, on student learning among school-related factors. Research also indicates that principal influences on student learning is largely indirect, and operate through school organizational factors (see, e.g., Hallinger & Heck, 1996; Witziers, Bosker, & Kruger, 2003). However, there are gaps in our knowledge about the ways in which principals operate through various organizational factors, and how they are most effective. There is a need to examine the different mechanisms through which principals may affect classroom instruction and student engagement.

Overview of the Dissertation

I present a conceptual framework to guide this inquiry in which instructional leadership, teacher professional community, and professional development are central in efforts to promote instructional practice associated with student engagement. I indicate some of the ways in which principals effectively develop and sustain these three aspects based on my findings. This study addresses gaps in the existing literature by examining ways principal leadership in middle schools is related to instruction and student cognitive engagement. I examine the mechanisms that seem to be most important for principals to support the development of ambitious instructional practice.

In terms of the findings, in chapter 4 I present teachers' levels of AIW instructional practices and compare them to levels of student cognitive engagement in teachers' classrooms. I then detail the way in which focal teachers in this study conceptualize student engagement according to two categories: Student Thinking and Understanding, and Student Activity, Excitement, and Interest. In chapter 5, I explore dimensions of principal leadership and mechanisms through which principals may enhance or hinder teachers' development of AIW

instructional practices. The three dimensions through include: PD coherence, Aspects of Teacher Professional Community, and Risk Taking and Growth Mindset. I propose that these principal leadership dimensions can help to provide the necessary structures for teachers' acquisition and use of new knowledge and skills. Then, in chapter 6, I argue that alignment (the extent to which teachers' beliefs and values, knowledge, and behavior align with the objectives of the PD initiative) is essential for teacher learning and enactment of new instructional practices. Chapter 7 includes a discussion of the research findings.

CHAPTER 2: LITERATURE REVIEW

Student Engagement

An understanding of relevant literature serves to situate the study within the context of previous research. The following review outlines pertinent literature on student cognitive engagement and relevant organizational factors such as teacher professional development, teacher professional community, and principal leadership.

Although engagement has been viewed as especially important for uninterested and discouraged learners (Brophy, 2004), engagement is relevant for all students. According to the High School Student Survey of Engagement aggregate response, almost half of the high school students reported being bored in class every day (2009). In total, 81.3 percent of students reported they were bored in class because the material was not interesting and 41.6 percent of students surveyed reported the material was not relevant to them. Information on students' perception of school has informed some reform efforts that seek to improve student-learning outcomes (Marks, 2000; National Research Council & Institute of Medicine, 2004). A prominent theoretical model of engagement has also been used in the design of interventions to prevent school dropout (Reschly & Christenson, 2006), and underscores many high school reform efforts (NRCIM, 2004). Essentially, student engagement underlies many efforts to promote quality learning experiences through the school environment, instruction, and curriculum.

Student engagement is also a fundamental aspect of ambitious instructional practice because learning is essentially a voluntary activity. Cohen (2011) argues that work with students that is intellectually demanding, attentive to students' work, and conducive to thoughtful conversation has been difficult to achieve and attain in the United States because teachers essentially depend upon the students they strive to educate. The predicament lies in the fact that

teachers cannot cause learning by themselves, and they cannot make a student learn. Students are fundamentally responsible for bringing their attention and effort to the learning experience. In that sense, teachers' are dependent on their students for their own success. Thus, any effort focused on education reform and ambitious instruction must also address the fundamental aspect of student engagement in learning.

The extant literature includes many different definitions and conceptions of student engagement (Reschly & Christenson, 2012). The current social-psychological conception of engagement has been defined in three primary ways in the literature. Behavioral engagement includes aspects of participation such as involvement in social and academic activities. Behavioral engagement is most often cited as playing a central role in academic achievement and preventing dropping out (Finn, 1993; Fredericks, Blumenfeld, & Paris, 2004). Emotional engagement is composed of the reactions students have to teachers, peers, learning experiences, and the school. This aspect of engagement is important to the students' sense of belonging, connection to the school, and willingness to complete the tasks (Connell & Wellborn, 1991; Furrer & Skinner, 2003). Cognitive engagement encompasses students' thought processes and willingness to exert effort to try to learn new ideas and skills. Several studies have explored task characteristics and their connection to cognitive engagement (Helme & Clarke, 2001; Lee & Anderson, 1993). These various forms or indicators of engagement have been used to study both academic engagement at the school (Appleton, Christenson, & Furlong, 2008; Finn & Zimmer, 2012), as well as classroom engagement in particular classroom activities (Skinner & Pitzer, 2012).

Some researchers advocate combining the three components into one meta-construct (Appleton et al., 2008; Fredericks et al., 2004). Others have emphasized the importance of engagement in learning outside of school (Lawson & Lawson, 2013; Resnick, 1987) and the

influence of factors beyond school, such as family and peers (Steinberg, 1996; Woolley & Bowen, 2007). Recently, Lawson and Lawson draw on social-ecological analyses and social-cultural theory to conceptualize engagement as a dynamic system of social and psychological constructs and interdependent processes that include family, peer, and neighborhood ecologies (2013). Cognizant of the multidimensional nature of student engagement, this study will primarily focus on students' cognitive engagement in the classroom. While other aspects of the multidimensional construct will be considered, cognitive engagement will be the central engagement construct.

This inquiry draws on several foundational understandings of student engagement from the literature. First, engagement is a fundamental pathway to student learning (Skinner & Pitzer, 2012). Once students are engaged, they are more likely to demonstrate improved achievement and enhanced learning outcomes (National Research Council & Institute of Medicine, 2004). Second, student disengagement is not isolated to a specific group or demographic; it affects a broad spectrum of students across a variety of different backgrounds and settings (Glanville & Wildhagen, 2007; Marks, 2000), although how it affects groups differently is a topic for further study. Third, student engagement is seen as malleable, with the potential to change and develop over time for all individuals. From perceptions of support and organizational conditions to leadership and self-regulated learning, the results of various studies have identified many malleable factors in the school environment that can shape student engagement (Klem & Connell, 2004; Leithwood & Jantzi, 1999). Fourth, engagement and student motivation are understood to be theoretically different (Finn & Zimmer, 2012). While student motivation is thought to represent energy directed toward learning (Assor, 2012), engagement reflects the activation of energy and direction (Skinner & Pitzer, 2012).

Research has explored the malleable nature of student engagement, including the effects

of principal leadership on school conditions and, in turn, student engagement (Cook-Sather, 2007; Leithwood & Jantzi, 1999; Quinn, 2002). In addition, other scholars have focused on the association of specific instructional practices, such as authentic instruction, with student engagement and increased academic performance (Marks, 2000; Newman et al., 2001).

Teachers' Conceptions of Engagement. While a considerable amount of research has focused on student engagement, few studies have examined teachers' understanding of the concept, and its relationship to their actions in the classroom. Teachers' conceptions and understandings are important, as various researchers have shown that teachers' actions influence student engagement (Brewser & Bowen, 2004, Marks, 2000; & Sharkey, You, & Schnoebelen, 2008). For example, Brewster and Bowen (2004) used the School Success Profile (SSP) to survey 699 American Latino middle and high school students. Their regression analysis showed teachers' social support influenced school engagement, after controlling for demographics and parent support (i.e., single parent, poverty, gender, etc). The few studies that have examined teachers' conceptions of student engagement have had a relatively small sample size (Cothran & Ennis, 2000; McMahon & Zyngier, 2009; Ravet, 2007; Zyngier, 2007). Through interviews and observations of four teacher participants, Cothran and Ennis (2000) found that all four teachers believed students' poor attitudes and low engagement in all subjects was the greatest barrier to student engagement. Furthermore, the teachers cited behavioral and psychological explanations for the students' behavior, indicating a greater focus on these aspects than on cognitive engagement. Teachers expected students to be receptive to classroom lessons, and did not feel personally responsible for engaging students. The students on the other hand, explained that the teachers could engage them through demonstrating care, offering students choice, and providing relevant curriculum.

In another study of five primary teachers, Ravet (2007) examined perceptions of the causes of engagement. Based on interview data, Ravet (2007) found all five teachers focused on behavioral engagement, and used student deficits relating to attitude, personality, or ability to explain eight out of ten cases of student disengagement. The teachers explained the causes of student disengagement were attributable to factors such as: family background, student personal deficits, peer factors, school changes, relationship with the teacher, and the teacher's lack of management. In contrast, the students provided twelve reasons for their disengagement, emphasizing their teachers' lack of awareness and understanding of their perspectives.

The teachers in both the Cothran & Ennis, (2000), and the Ravet (2007) study seemed to view students as the problem in their own disengagement and focused more on a deficit mindset (Vibert & Shields, 2003). Other studies by Zyngier (2007; 2008) and McMahon and Zyngier (2009) provided a broader range of teacher understandings of student engagement. These studies embraced the ideological viewpoint that student disengagement was an expression of social resistance to schooling experiences that students felt were irrelevant or culturally inappropriate (McFadden & Munns, 2002; McMahon & Portelli, 2004; Vibert & Shields, 2003). The research involved teachers' work with engaging pedagogy that would be integrated into the curriculum.

Through interviews with the high school teachers and students, Zyngier (2007) found that although some teachers worked from the deficit mindset, other teachers viewed engagement from a constructivist or critical perspective. In particular, this group of teachers provided several different explanations of engagement factors such as: the use of different learning tools, allowing students freedom of expression and choice in the lesson, providing opportunity for students to develop additional skills, not allowing students to disrupt the lesson, and demonstrating interest and care. These findings indicate that there is a range of different perspectives that teachers may hold relating to student engagement.

Overall, limited research has been conducted on teacher conceptions of student engagement and the existing studies have included relatively small teacher samples. In several of the studies, the majority of teachers seemed to emphasize behavioral and psychological aspects of engagement, rather than cognitive engagement, suggesting a focus on classroom procedures and participation rather than student understanding.

Authentic Instruction

Researchers have theorized the relationship among the individual, engagement, and contextual factors. According to a theoretical framework proposed by Fred Newmann, three broad factors influence student engagement in academic work: “students’ underlying need for competence, the extent to which students experience membership in the school, and the authenticity of the work they are asked to complete” (p. 17, 1992). Newmann’s framework indicates that the degree to which students experience membership and authentic work in class shapes how students’ need for competence is channeled into academic success. Therefore, schools must address students’ experience of membership and authentic work in school. Other research has also focused on individual needs as a mediator between contextual factors and engagement (Connell & Wellborn, 1991; Fredericks et al., 2004). Connell and Wellborn (1991) identify individuals’ three psychological needs: relatedness, autonomy, and competence. Students’ perception of the extent to which classroom context meets their individual needs determines their level of engagement in school.

In addition to the conditions that are important to nurture a sense of membership or relatedness, Newmann explains that authentic work includes tasks that are meaningful, significant, valuable, and worthy of one’s effort (1992). He contrasts these tasks with those that are trivial, useless, nonsensical, and unworthy of effort. Authentic work includes students’

interests, a sense of ownership, connection to the world beyond school, and fun (1992). Work that entails these attributes is more authentic and more likely to engage students.

Newmann and Wehlage (1993) explain that when students experience high cognitive engagement they demonstrate authentic achievement. Newmann and Wehlage propose that highly engaged students approach learning with an interest beyond superficial coverage of the material. After an extensive study of school restructuring, they suggest reform initiatives and instruction should aim toward authentic achievement. They argued that innovations could be implemented in ways that undermine meaningful learning when they are not guided by substantive and meaningful educational ends. Based on the main proposals in the restructuring movement, Newmann and Wehlage define authentic achievement by the following criteria: (a) students construct meaning and produce knowledge, (b) students use disciplined inquiry to construct meaning, and (c) students direct their work toward generation of products, performances, and discourses that have value or meaning beyond success in school (1993). The focus on authentic achievement emphasizes fundamental standards of intellectual quality of work over procedural and technical aspects of standards for curriculum and assessment.

Newmann and Wehlage (1993) also examined the types of instruction that cognitively engage students and presented a framework for authentic instruction. The five standards of authentic instruction include (a) higher-order thinking, (b) depth of knowledge, (c) connectedness to the world beyond the classroom, (d) substantive conversation, and (e) social support for student achievement. The framework was intended to guide practice and research on instructional practice that engages students to use their minds well. Their work also considered the extent to which authentic instruction and student achievement are enhanced or constrained by organizational features, the content of PD, the quality of school leadership, and school community.

In a study examining authentic work, Marks (2000) found a positive association between authentic instruction and student engagement in academic activity among elementary, middle, and high school students. The nationally selected sample included 3,669 students from 143 social studies and mathematics classrooms of 24 restructuring schools. Based on survey data in which students reported about themselves, their school, and their classroom experience, the findings indicate the effect of authentic intellectual work on engagement enlarges somewhat as students progress through grade levels (0.34, 0.40, 0.42, respectively). Marks defined authentic academic work as “work that involves students intellectually in a process of disciplined inquiry to solve meaningful problems, problems with relevance in the world beyond the classroom and of interest to them personally” (2000, p. 158). Authentic intellectual work diminished the effect of personal background on engagement and explained approximately 20 percent of the variance among elementary, middle, and high school students. The study provides support for the importance of the quality of intellectual work within educational reform initiatives.

Not only is authentic work associated with increased student engagement across the grade levels, it is also linked to increased student achievement. Newmann, Bryk, and Nagaoka (2001) investigated Chicago teachers’ assignments in mathematics and writing in grades 3, 6, and 8. Data included over 1,200 assignments at each of the grade levels over a 3-year time period. The study findings indicate that students who received assignments involving more challenging and authentic intellectual work performed better than average on the Iowa Basic Skills Test and achieved higher performance on the Illinois Goals Assessment Program. The evidence suggests that an increased emphasis on authentic intellectual work can promote achievement on standardized tests as well.

Nystrand and Gamoran (1991) also studied the kinds of instruction that foster student engagement, and the effects of such instruction on achievement. The authors differentiated

procedural engagement, including rules and procedures, from substantive engagement, involving academic study and commitment to content. Using data on literature instruction from 58 eighth-grade classes, Nystand and Gamoran reported that features of substantively engaging instruction included reciprocal interaction between students and teachers. Some of the substantively engaging instructional practices included authentic questions, or open-ended questions without prespecified answers; and uptake, or the incorporation of student responses into subsequent questions and discussions.

The empirical and theoretical work on engagement indicates there are gaps in the current research on the malleability of engagement, and a limited number of studies on interventions (Fredericks et al. 2004). Further research is needed which addresses the complex nature of how individuals and context interact, and how changes in context influence student engagement. In addition to the focus on engaging instruction, one key aspect of this study is the focus on middle school-aged students. Middle school is a critical time for students to connect with school and a time when engagement begins to drop substantially (Rumberger, 1995; 2011). Research has found that student engagement with schooling generally decreases as students move from elementary school to middle and high school (Martin, 2009; Wang & Eccles, 2012); thus, my focus on student engagement is particularly appropriate. In addition, a mixed method approach can further contribute to the understanding about which aspects of the environment are salient to engagement and how to design finely tuned interventions. The review on student engagement leads to the question: how can we help teachers get better at engaging students? Three possible organizational factors that can influence instructional practice, and in turn, student engagement, include PD, teacher professional community, and principal leadership.

I chose these three organizational factors based on prior studies indicating that each factor was important for enhancing ambitious instructional practice and promoting student

learning. First, effective instructional leadership is essential to promote improved instruction and to implement sustained change. In a review of the literature, principals were found to be the second greatest influence on student learning among school related factors, after classroom instruction (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Principals can support teacher learning and improved instructional practice through a variety of avenues (Darling-Hammond & Richardson, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001). Therefore, I chose principal leadership as a key variable in this inquiry to understand the organizational factors that may facilitate or impede authentic instruction and student cognitive engagement.

Research indicates that principal influences on student learning is largely indirect, and operate through school organizational factors (see, e.g., Hallinger & Heck, 1996; Witziers, Bosker, & Kruger, 2003). When school principals organize sustained professional development opportunities around a common instructional framework, teachers' professional learning and quality of classroom instruction are likely to improve (Darling-Hammond & Richardson, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001). High quality PD is associated with improved instructional practice and student learning outcomes (Cohen, Raudenbush, & Ball, 2003; Corcoran et al., 2003; Correnti, 2007; Garet et al. 2001). In turn, I chose PD as a central variable due to the focus on the AIW initiative and the association between high quality PD and improved instructional practice and student learning outcomes.

Furthermore, a number of studies have demonstrated the important role of colleagues and teacher professional community in supporting instructional improvement (Horn & Little, 2010; McLuaghlin & Talbert, 2003; Penuel & Gallagher, 2009; Scribner, Sawyer, Watson, & Myers, 2007) and higher student achievement (Louis & Marks, 1998). In particular, Newmann and associates (1996) found that schools with stronger professional communities, as defined in the section below, also had greater instantiation of authentic pedagogy. A strong professional

community can mediate the effect of professional development on instructional quality and can be a conduit to support teacher learning toward ambitious instructional practice that enhances student cognitive engagement. Therefore, including teacher professional community as a variable in this study is particularly relevant to the enactment of authentic instruction.

These three factors are particularly important for developing individual and organizational capacity in schools. Research by Youngs and King (2002) suggests that effective principals can promote high levels of capacity by developing structures that promote teacher learning. In addition, their findings indicate that it is useful for studies focused on the effect of principal leadership to include professional community and program coherence as variables that mediate the relationship between principal leadership and student achievement (Youngs & King, 2002). In turn, these are important variables to consider in this study that is focused on principal leadership and student cognitive engagement, rather than student achievement. Newmann, King, and Youngs (2000) argued professional development should address five aspects of school capacity: teachers' knowledge, skills, and dispositions; professional community; program coherence; technical resources; and principal leadership. They found considerable variation in school's use of professional development to address capacity.

Research on organizational capacity for high quality teaching and learning (King, 2002; King & Bouchard, 2011; Newmann et al., 2000; Youngs & King, 2002) informed my decision to include these three factors over other organizational conditions. There is considerable consensus in the research literature that the quality of instruction that teachers provide has the greatest influence on student learning (Leithwood et al., 2004). In addition to individual teacher competence for effective classroom practice, teachers' also work together to advance the collective work of the school. Newman and colleagues define school organizational capacity as the collective power of the faculty in a school to strengthen student performance (2000). King

and Bouchard (2011) explain the relationship of capacity to instructional quality and student achievement. Their model illustrates that student achievement is directly affected by the quality of instruction, which is influenced by the key dimensions of capacity. In addition, the five dimensions of capacity are interrelated and affect one another. This study considers aspects of the dimensions of capacity: principal leadership, professional community, aspects of the teachers' knowledge, skills, and dispositions, and program coherence. To focus the inquiry and analysis of this project on instructional leadership, I chose to limit the number of variables in the study to principal leadership, teacher professional community, and the professional development of the AIW initiative. I did not include technical resources as that was beyond the scope of this study. Aspects of teacher's knowledge, values, and skills as well as coherence were included in the analysis.

In turn, previous research informed my focus on principal leadership as a key factor associated with the nature of learning opportunities provided to teachers through PD and the teacher professional community that may support and nurture such teacher learning. I chose these three factors over other organizational conditions such as the length of the school day, teacher workload, scheduling of instruction, or the content of particular programs because they were factors directly related to developing capacity and factors through which the principal could influence instructional improvement and the quality of students' intellectual work. Below is a review of the literature on each of these possible ways of helping teachers to increase student cognitive engagement.

Features of Professional Development

Professional development can be an essential mechanism to develop teachers' content knowledge and instructional practices (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). As a result, PD has been central to various reform efforts that aim to build teachers' capacity to teach

(Avalos, 2011; Smith & O'Day, 1991; Timperley, Wilson, Barrar, & Fung, 2008).

Understanding the characteristics of PD that affect teaching practice can be pivotal for reforms targeting changes in instructional practice. However, many policies including PD initiatives intended to stimulate improvements in student learning have been ineffective or inconsistent in terms of the outcomes that were produced (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; McLaughlin, 1991). In some cases, the shortcomings of some past reform efforts have galvanized research and policy efforts to further investigate the necessary conditions that contribute to changes in instructional practice and enhanced student learning. The next section outlines research on PD and its effects on teaching practices and student learning. While there are many different perspectives on PD, less empirical evidence exists on the substance and features of high-quality professional development. However, recent research has increasingly focused on the importance of situated learning for effective PD, and the connections among the design of PD, teachers' learning, and subsequent changes in classroom practice (Borko, 2004).

In study on in-service teacher education, Kennedy (1998) investigated features of effective PD. Drawing on a synthesis of a selection of PD studies in math and science, Kennedy (1998) contrasted what she distinguished as the *form*, or the delivery methods, with the *substance*, or content of the PD. Kennedy identified paths of influence from the in-service PD programs and categorized them into four groups based on the extent to which the program provided to teachers was prescriptive and the content was specific. Based on her analysis of effect sizes, one key finding indicated the important role of substance or content of PD in predicting teachers' change in instructional practice. Kennedy concluded, "Programs whose content focused mainly on teachers' behaviors demonstrated smaller influences on student learning than did programs whose content focused on teachers' knowledge of the subject, on the curriculum, or on how students learn the subject" (p. 17). The findings indicated that successful

programs emphasized how students learn particular subject matter, rather than on subject matter itself. In addition, the study demonstrated there was a scarcity of empirical research connecting participation in PD with student outcomes. A limited number of the studies selected for review had investigated the benefits to student learning. Kennedy's seminal study prompted other researchers to also examine the importance of the content of PD (See, *e.g.*, Cohen & Hill, 2001; Corcoran, McVay, & Riordan, 2003; Desimone, Porter, Garet, Yoon, & Birman, 2002; Fennema et al., 1996; Newmann, King, & Youngs, 2000). However, there is a need for further research focused on the substance over the form of PD.

Also, Kennedy's (1998) research argued that the topic and substance of the PD provided made a difference. She distinguished the topic of subject matter from the topic of how students learn subject matter. Some research that came after Kennedy misunderstood her study, and used it as an argument that all PD should be about subject matter. The clarification between a focus on the content of the PD, and PD that is driven by subject specific content is important for this study, as AIW PD is not oriented to specific subject matter, but the content of the PD is an important aspect of AIW. The following studies include subject specific PD initiatives, but the emphasis of this review is on the content of the PD and the form of delivery.

Two studies examined the effects of reform-oriented mathematics focused PD on changes in teacher practice, which also included increases in student learning. Fennema et al. (1996) studied the effects of an approach called Cognitively Guided Instruction (CGI) on the instructional practices of 21 elementary teachers over a 4-year period. The CGI instructional method required students to justify their thinking and use different mathematical representations rather than rote procedural strategies. In the program, teachers learned about how students understand mathematical content and ways to approach instruction and assessment using students' existing reasoning ability through workshops and support provided in their classrooms.

Instructional practice was evaluated through observations of their instruction, interviews, a belief scale instrument, and informal interactions. The goals of CGI were used to assess the lessons on a scale of 1 to 4. Although most teachers received a level 3, Fennema and colleagues found the CGI intervention was associated with large changes in instructional practice of individual teachers, which were related to changes in student achievement as measured by classroom tests of mathematics concepts and problem solving. The study provides evidence of the benefit of coherent, content-based PD programs and provides an example of a multi-year school-wide program in which teachers learned a specific research-based model regarding student thinking through PD and used that model in the classroom.

One limitation is the study did not include measures of peer interactions or the social context of the teachers' schools. Cohen and Hill (2001) also investigated the effect of mathematics-focused PD on changes in teaching practices and subsequent gains in student learning. Their study focused on PD opportunities in curricular workshops focused on mathematics content, which were also related to reform-oriented teaching practices encouraged by the state of California. The authors compared this approach with PD on special topics related to math instruction, but not focused specifically on math content. Cohen and Hill found that increased time spent in student curricular workshops was associated with more reform-oriented practice and less conventional practice. In contrast, teacher participation in the special topics PD without a focus on mathematics content was not associated with conventional or reform-oriented practice.

Furthermore, time spent in the student curricular workshops directly focused on mathematics content was associated with increased student learning. An important aspect of both the Cohen and Hill (2001) and the Fennema and et al. (1996) study is that the instructional outcomes included in the study were consistent with the goals of the PD. Another important

point is that neither of the studies was a formal experiment, so there are potential confounding variables. In Fennema et al. (1996), the teachers volunteered to take the PD, so they had more motivation to learn than the comparison teachers. In Cohen and Hill (2001), the researcher were studying schools, not individual teachers, and they could not tie student scores to their individual teachers and furthermore, the scores were from 3rd graders whereas the teacher reports came from all teachers in the school.

Three other studies also investigated instructional outcomes that were aligned with the aims of reform-oriented PD. Supovitz et al. (2000) examined the effect of PD on changes in instructional practice toward inquiry-based practices in math and science. In their longitudinal study, Supovitz et al. (2000) found teachers changed their instruction toward more inquiry-based practices consistent with the goals of the statewide systematic reform initiative in Ohio. Corcoran et al. (2003) studied the effect of the Merck Institute for Science Education intervention on teachers' instructional practice. Teachers involved in the inquiry-based PD changed their practice to focus on higher order thinking, deep knowledge, substantive conversation, and connections to students' life beyond school.

Furthermore, in the analysis by Desimone, Porter, Garet, et al. (2002) the content-based PD predicted teacher change in corresponding content-based instructional practices. When the outcome measures included the use of higher order thinking or alternative assessments, the best predictor of changes in instructional practice was the extent to which the PD focused on higher order thinking or alternative assessments. These three studies included PD programs aligned with outcome measures that emphasized reform-oriented, inquiry-based teaching in math and science. The findings provide further evidence that content-aligned PD is associated with changes in teacher practice. While the outcome variables measured were aligned with the PD

programs, there were varying interpretations of the instructional quality that resulted from teachers' participation in the PD.

In terms of PD in the area of language arts, Correnti (2007) examined subject matter content-focused PD and its effect on teaching practices. In a study using 75,689 lessons from almost 2,000 classrooms in 112 schools, Correnti (2007) investigated the effects of literacy content-aligned PD on instructional practice using teachers' self-report of instruction in daily logs. Correnti found that teachers who received PD in comprehension and writing offered at least 10% more instruction in these areas. The study contributes to the understanding that coherent, content-aligned PD can make a difference for teacher practice. Furthermore, the study found both teacher-level effects of PD as well as a school-level effect; there was an additional effect on instruction in schools in which a greater proportion of teachers received intense PD.

Although the Correnti (2007) results suggest subject-matter, content-focused PD is an important lever for changing teachers' instructional practice in literacy, the survey measures indicated changes in instructional content for the teachers receiving PD and did not include information on changes in instructional process. While the teachers reported they provided more instruction in comprehension and writing, the study measured accumulation rates of literacy strategies for each teacher and did not include an indicator of instructional quality. In addition, the study draws on teacher self-report data to determine the intensity and duration of PD does not include additional sources of data on the nature of PD or the magnitude of the effect of PD on instructional practice or student learning outcomes.

Extending findings that content, coherence, and the mode of teacher learning are central features for effective PD, Garet, Porter, Desimone, Birman, and Yoon (2001) conducted a notable study on the various structural components of effective PD and the linkage to changes in teachers' knowledge and practice. In an examination of the PD funded through the Eisenhower

Math and Science program, Garet and colleagues identified six key features of PD related to teachers' self-reported change in instructional practice. Using a nationally representative, cross-sectional sample of 93% of all districts in the country, surveys were mailed to a probability sample of 1,027 teachers. Although the study collected school-wide measures, only a few people from each school were represented and the number of teachers per district was low.

The six key features of PD related to increases in teachers' self-reported knowledge and skills and changes in teaching practice included three structural features and three core features. The three core features represented the characteristics of the substance of the activity include opportunities for active learning such as active engagement in the analysis of teaching and learning; coherence of professional development; and extent to which the activity has a content focus and is focused on deepening and improving teachers' content knowledge. The three structural features of PD activity were reform type, such as study group or mentor relationship as opposed to a traditional workshop or conference; duration of the activity including total contact hours and the timespan of the activity; and collective participation of groups of teachers from the same grade level or school in contrast to individual teachers from many schools. The structural features were understood to operate through the core features.

The Garet et al. study contributed empirical evidence from a nationally representative sample of teachers on the features of high-quality PD associated with changes in teaching practice. Although other studies had identified features of effective PD, this study provided empirical evidence on the importance of specific PD features. On the other hand, the large-scale nature of this study makes it difficult to distinguish effective PD for a particular program. The general questions on the teacher survey provided broad information on subject matter or program outcomes, without detailed information on the implementation of a specific program or the factors that influenced teachers' learning. A further limitation of this study is the sole use of

teacher self-report to gather information about changes to teacher knowledge or practice.

Although some agreement has been found between teacher self-report and observation, teachers may be biased toward specific practices in their response. Direct observation or another independent measure of practice was not used to validate the self-report data.

Building on the theoretical constructs from Garet et al. (2001), Penuel, Fishman, Yamaguchi, and Gallager (2007) further investigated characteristics of effective PD. Their study on the influence of different aspects of PD on teachers' knowledge and program implementation included a sample of 454 teachers involved in an inquiry science program. The authors used a hierarchical linear modeling framework to analyze teacher survey data. Findings from the study indicated that teachers' perceptions of the coherence of their PD experiences were significant for teacher learning and program implementation. In addition to coherence, planning time for teachers and technical support were important for program implementation. This study contributed to the understanding of the importance of general processes and specific contexts for teacher learning within the field of science, and within a specific program. Specifically, Penuel and colleagues outlined the importance of the following characteristics in the study of PD: duration and time span, content focus, active learning, coherence, the role of colleagues, and local supports and barriers. There is a need for further investigation of the substance as well as the path of influence of PD on instructional practices as described by Mary Kennedy (1999).

In another PD study, Sun, Penuel, Frank, Gallagher, and Youngs (2013) examined the role of teachers' professional networks in the diffusion of effective teaching strategies. The study included longitudinal and sociometric data on 39 schools participating in writing PD. The authors found that the influence of PD on teachers' instructional practice disperses through a network of teachers providing help to one another on instructional matters. The study distinguished direct and spillover effects from PD, and noted that when estimating the

knowledge and skills that could be attributed to learning in PD, it is important to note that teachers also acquire knowledge and skills from peers. The authors explain, “Professional development programs in writing that encourage and promote teacher collaboration as a means to improving instruction may both develop individual teachers’ expertise in enacting high quality writing instruction and facilitate the diffusion of new expertise” (p. 361). Sun and colleagues’ findings indicate that teachers benefit from interacting with professional development participants almost as much as directly participating in PD (2013). These spillover mechanisms that operate through intraschool networks are important to consider in the study of PD programs.

Finally, Newmann, King, and Youngs (2000) found variability in the extent to which PD addressed aspects of organizational capacity among schools. Data from interviews, observations, and fieldwork in nine urban elementary schools over two years indicated some schools used PD more comprehensively to address five aspects of school capacity: teachers’ knowledge, skills, and dispositions; professional community; program coherence; technical resources; and principal leadership. Comprehensive professional development occurred through both externally developed and school-based initiatives, and was most strongly associated with the school’s initial level of capacity and principal leadership. The Newmann, King, and Youngs study was an important contribution to the literature because it moved beyond individual teacher learning and included related organizational conditions in the comprehensive use of PD.

The previous section presented research on PD and the relationship between PD and changes in teachers’ instructional practice, as well as subsequent changes in student learning outcomes. Before moving on to the conceptual framework for this study, I will outline relevant literature on teacher professional community and principal leadership.

Teacher Professional Community

In order to understand the relationship among PD, instructional practice, and student engagement, it is important to consider the relevant organizational conditions. While there are many organizational features that are associated with teachers' work, some features are more or less pertinent to teacher PD. Newmann and colleagues (1996) reviewed previous research and determined professional community is one of the key factors to consider among school organizational conditions. Other research has indicated that school leadership and teacher professional community in particular are both associated with development of teaching practices, successful reform outcomes, and student learning (Desimone 2002; Youngs & King, 2002; Newmann et al., 2001). Based on the previous research, this study focuses on school leadership and teacher professional community and the outcomes of interest, teachers' instructional practice and student cognitive engagement.

Teacher professional community has been conceptualized in different ways in the research literature; therefore, it is important to delineate professional community for the purpose of this study. Youngs and King (2002) characterize a strong school-wide professional community by (a) shared goals for student learning; (b) meaningful collaboration among faculty members; (c) in-depth inquiry into assumptions, evidence, and alternative solutions to problems; and (d) opportunities for teachers to exert influence over their work. While the definitions differ slightly, professional community can be summarized as individuals in a school taking collective responsibility for achieving shared educational goals, and working together to achieve that purpose (Newmann, 1994). Drawing on these definitions and the conceptual and empirical work in this review, I conceptualize strong school-wide teacher professional community to include (a) shared goals for student learning, (b) meaningful collaboration among faculty members, and (c) teacher responsibility in decision making.

A number of studies have addressed teacher professional community in supporting instructional improvement (See, *e.g.*, Horn & Little, 2010; McLaughlin & Talbert, 2003; Penuel & Gallagher, 2009; Scribner, Sawyer, Watson, & Myers, 2007) as well as increased student achievement (Louis & Marks, 1998). Penuel and Gallagher (2009) found that professional community lacking cohesion and teachers unwilling to ask one another for help impeded diffusion of improvements. Other single- and multiple-case studies have examined the role of teacher professional community in supporting instructional improvement (See, *e.g.*, Horn & Little, 2010; McLaughlin & Talbert, 2003; Scribner, Sawyer, Watson, & Myers, 2007). Although some of these studies focus on teachers working together in groups in learning communities, the nature of the work includes shared goals, collaboration, and/or teacher responsibility in decision making; therefore, these instances are included as aspects of the conceptualization of teacher professional community² in this study.

In a follow-up study on the CGI intervention 4 years later, Franke, Carpenter, Levi, and Fennema (2001) found that teacher professional community was an important factor in effective PD toward sustained educational change (2001). The study focused on 22 teachers who participated in the CGI PD on understanding the development of students' mathematical thinking. Using interviews and classroom observations, they examined teachers' ongoing learning and the extent to which the changes in their instructional practice were sustained over time. They found that the design feature of PD promoted effective methods of sharing instructional expertise among teachers and, in turn, continued instructional change over time.

² The term teacher professional community is used to refer to instances of shared goals, collaboration, and shared responsibility of decision making, which may also include professional learning communities.

The teachers continued to meet to collectively discuss students' work after PD ended. In turn, the professional community at the school expanded and extended the impact of the PD program.

Principal Leadership

Previous research findings suggest that school principals are instrumental in shaping opportunities for teachers to learn (Borko, Wolf, Simone, and Uchiya, 2003; Printy, 2008; Youngs & King, 2002; Thoonen, Slegers, Oort, Peetsma, & Geijssel 2011). Two central themes most relevant to teacher learning emerge in the research literature on leadership: designing the organization and developing people (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Principals can influence teachers' practice and student outcomes through two primary avenues; they can change and cultivate schools' organizational conditions and they can enhance instructional quality through teacher mentoring and development (Hallinger & Heck, 1996).

In a multiyear, qualitative study of four urban elementary schools, Youngs and King (2002) found that effective principals could sustain high levels of organizational capacity by facilitating teachers' participation in PD. The qualitative study included fieldwork, observations of participation in PD, and interviews. Youngs and King found that principals could promote capacity by establishing trust, creating structures that promote teacher learning, and providing opportunities for faculty to learn from external expertise or develop reform within the school. Youngs and King reported principals supported shared collaboration by providing instructional planning time in grade-level teams, prioritizing school-wide PD, and organizing training so that all teachers participated in activities that involved collaboration. Their study helps to clarify important factors in the relationship among principal leadership, school organizational conditions, and student outcomes.

Along with teacher collaboration, other research found that principal leadership practices could promote additional aspects of teacher professional community such as participative

decision-making and relational trust (Leithwood & Sun, 2009; Slegers, Geijssels, & Van den Berg, 2002; Thoonen et al. 2011). In turn, principals can enhance or hinder teacher professional learning through their influence on PD opportunities and teacher professional community.

Specifically, principals shape teachers' interactions related to professional learning by creating structures and conditions that enhance collaborative practice (Coburn, 2001; Printy, 2008). They structure content, set boundaries, and influence the direction of conversation within the teacher professional community (Borko, Wolfe, Simone, & Uchiyama, 2003; Coburn, 2001; Printy, 2008; Young, 2006). Principals' provision of time for collaboration also influences teachers' opportunities to learn from exchanges of ideas, information, perspectives, and feedback (Kwakman, 2003; Timperley, 2009). Although support of teacher collaboration and the exchange of ideas can promote professional learning and lead to improvement in teaching practices (Darling-Hammond & Richardson, 2009), collaborative interactions vary in the extent to which they are generative for learning, even within the same school (Horn & Little, 2010). Other factors contribute to the learning opportunities afforded by collaborative work, such as collective resources available to teachers.

The school principal plays a central role in coordinating organizational conditions that influence the professional learning opportunities afforded to teachers. Borko, Wolf, Simone, and Uchiya (2003) found that principal support of structures and resources for PD connected to reform efforts contributed to teachers' opportunities to learn and improve instructional practices. In addition, conceptions of teacher learning play an important role in influencing principals' actions and learning opportunities provided to teachers (Coburn, 2005). Coburn describes how principals influence teachers' enactment of policy through shaping access to policy ideas, participating in the social process of interpretation and adaptation, and creating conditions for teacher learning in schools (2005).

The research literature indicates that leadership has significant effects on school conditions, and in turn, student engagement (Leithwood & Jantzi, 1999). Quinn found academic leadership, resource provision, and communication promotion were beneficial to promote a climate of engagement in schools (2002). In addition, principals' creation of collaborative relationships has been shown to increase student engagement (Cook-Sather, 2007).

Summary and Research Questions

From this review of the literature, it is evident that student engagement is important, we have ideas about what teachers need to do to foster student engagement, there are some indications about how PD can help support teachers to engage students, and that principals and teacher professional community can also promote teachers to develop more engaging instruction. At the same time, there are still many things we do not know about promoting student engagement.

While many studies examine the extent to which PD affects individual teachers' instruction, less attention has been given to the quality of instruction throughout a school. In addition, the studies that investigate the influence of PD on individual teachers' instruction focus less on measures of the quality of instruction as the outcome of interest in particular. Furthermore, while some studies explore the impact of PD on teaching practices and subsequent changes in students' achievement, they do not examine the influence of PD and particular instructional practices on other student outcomes, such as student engagement. There is increasing evidence related to the features of high-quality PD from both large-scale quantitative analyses and qualitative based case studies; however, fewer researchers have employed an approach to capture both general patterns as well as an understanding of specific programs or contexts. Finally, although several studies include measures of teacher professional community,

studies seldom investigate other organizational factors such as principal leadership, and few studies focus on principal leadership in relation to teacher professional community.

This study builds on previous literature that examined features of teacher learning, instructional practice, student engagement, and relevant organizational factors. It draws on prior findings regarding the importance of an instructional program with a coherent focus. In addition to other studies that use reform-oriented teaching practices as the outcome of interest, this research examines PD toward reform-oriented teaching that includes higher order thinking and ambitious instructional practice. Specifically, this research examines how a particular type of professional development, Authentic Intellectual Work, focused on rigorous and demanding intellectual work affects a particular type of instructional practice aligned with these aims. In turn, I examine how that particular type of instruction affects student cognitive engagement in the classroom.

This inquiry examines the wide-sweeping effort of the AIW initiative to influence what happens in classrooms and the quality of students' intellectual work. The investigation extends earlier PD studies that include student outcomes to include student engagement; previous PD studies including student engagement as the outcome of interest were not found in the review of the literature. In addition, teacher self-report as well as other objective criteria will be used to examine instructional practice with an emphasis on authentic instruction measured as the outcome variable. This study will also examine the extent to which principals influence instructional practice in a school, and the factors that facilitate or constrain principal leadership in a school toward ambitious instruction. Finally, teacher professional community and principal leadership will be included to address the context in which PD is delivered and the various factors that enhance or constrain student cognitive engagement and authentic instructional practices. Through a mixed-method approach, I will explore the following research questions:

1. Do teachers with different levels of AIW instructional practices have different levels of cognitive engagement in their classrooms?
 - a. What are the ways in which teachers with different levels of AIW instructional practices conceive of student engagement?
2. What are the ways in which principal leadership seem to influence teacher learning in AIW PD, and enactment of AIW instruction?
3. What is the association between teachers' knowledge, values, and beliefs, and their instructional practice regarding AIW?

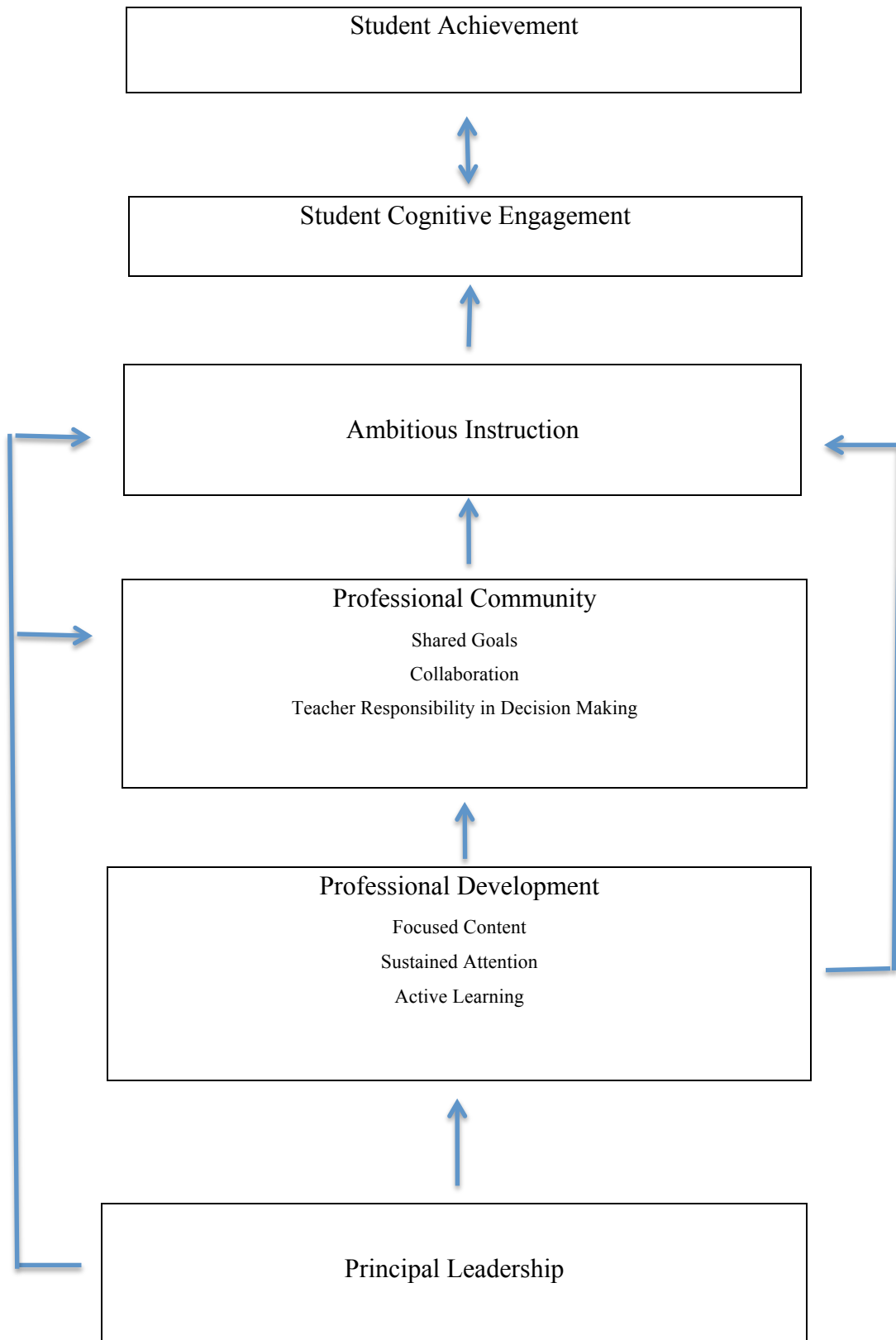
Conceptual Framework

Drawing on the preceding review of extant literature, my conceptual framework theorizes the role of school principals, professional development, and teacher professional community in promoting instructional quality and enhancing student cognitive engagement. I begin by describing the relationship between authentic instruction and student cognitive engagement. Then, I discuss the role of the school principal in promoting high-quality professional development, which can contribute to authentic instructional and student learning. I will then explicate the relationship among principal leadership, professional development, and teacher professional community. These elements provide a foundation for analyzing the relationship between cognitive engagement and the instructional environment, and the school conditions upon which educational leaders can intervene.

This framework draws on complexity theory, which states that elements of three subsystems (the teacher, the school, and the learning activity) interact and combine in different ways to affect teacher learning. People are nested in these different systems and one cannot be studied without the influence of others (Opfer & Pedder, 2011). According Opfer and Pedder, it

is important for research on professional development to focus on the reciprocal influences of all three subsystems in order to understand teacher learning and the impact that learning experiences have on their knowledge and instructional practices (2011). This approach helps to explain why teachers attending professional development with all of the features of effectiveness may not necessarily lead to learning or targeted instructional practices, or why some teachers may learn and demonstrate instructional practice from experiences that do not have the characteristics of effectiveness. The conceptual model is outlined in Figure 1 below.

Figure 1. Conceptual Model



My framework posits that school principals are in a unique position to influence ambitious instruction³ in a school. They are able to directly influence instruction through coaching, instructional feedback, and the teacher evaluation process (Leithwood et al., 2004). In addition, principals are able to indirectly influence teachers' instructional quality through orchestrating professional development and promoting strong teacher professional community (Borko et al., 2003; Printy, 2008; Youngs & King, 2002; Thoonen et al., 2011). At the same time, principals differ in their approach to leadership, and in the extent to which they support teacher learning throughout the school (Marks & Printy, 2003; Printy, 2008). Nonetheless, principals have the potential to influence these various organizational factors, which, in turn, influence student engagement (Cook-Sather, 2007; Leithwood & Jantzi, 1999; Quinn, 2002).

Hypotheses

Hypothesis 1. For hypothesis 1a, I anticipate that authentic instruction promotes student cognitive engagement. I expect that teachers' AIW instructional practices will be associated with students' cognitive engagement. Previous studies have found that certain instructional task characteristics are linked to students' cognitive engagement (Helme & Clarke, 2001; Lee & Anderson, 1993). In addition, the framework for authentic instruction developed by Newmann and Wehlage (1993) identifies five key aspects of instruction that are associated with meaningful intellectual work and cognitive engagement. Marks (2000) has also shown that student report of authentic instructional work was associated with student engagement. Student perception of instruction that provided opportunities for analysis, depth of inquiry, and connections beyond school was associated with increased levels of student engagement. As instruction provides meaningful opportunities for learning, students will be more likely to engage cognitively.

³ Ambitious instruction will be defined by the instructional practices outlined by the AIW framework.

The framework for Authentic Intellectual Work is intended to promote instructional practices that elicit high levels of engagement. The AIW framework is also based on extensive research on school restructuring, and quality instructional practices focused on intellectual work associated with improved student achievement (Newmann, Bryk, & Nagaoka, 2001). In turn, my conceptual framework posits that authentic instruction will be related to cognitive engagement including students' thought processes and willingness to apply effort to understand and master the ideas and skills available in school.

Hypothesis 2a. For hypothesis 2a, I anticipate that teachers' participation in high-quality PD is associated with authentic instruction. I anticipate that authentic instruction will be associated with the extent to which teachers participate in high-quality PD. Overall, empirical evidence supports the three core features identified by Garet et al. (2001) that are associated with effective PD: focused content, active learning, and sustained attention. The degree to which principals organize high-quality PD aligned with the three core features will influence the quality of teacher learning and instruction.

The first core feature of PD is focused content. The contents and skills addressed by professional development should be subject-specific and linked to standards, curriculum, and assessments. Various studies have replicated the finding that PD content connected to practice is associated with improved instructional practice and student learning outcomes (Cohen, Raudenbush, & Ball, 2003; Corcoran et al., 2003; Correnti, 2007; Garet et al. 2001). When professional development content is anchored in practice it is associated with teachers' self-reported increases in knowledge and skills and change in instructional practice (Cohen & Hill, 2000; Penuel, Fishman, Yamaguchi, & Gallagher, 2007). Professional development that is sustained and based in practice may help to overcome tendencies toward conservatism and strongly held routines and beliefs that are connected to previous experiences (Coburn, 2004).

The second core feature of PD is active learning. In addition, active learning experiences for teachers are an important feature of high-quality professional development. Opportunities for active learning such as small group discussions and analyzing students' work are associated with changes in instructional practice (Desimone, Porter, Garet, Yoon, & Birman, 2002; Garet et al., 2001). These activities provide opportunities for teachers to reflect on their practice, to receive feedback from peers, and to construct new knowledge together. In the process, teachers also have the opportunity to take responsibility for their learning. Professional development may provide active learning opportunities through peer observation and instructional coaching (Darling-Hammond et al., 2009), and small group discussions of student work (Horn & Little, 2010).

The third core feature of PD is sustained attention. Research evidence also suggests professional development should be coherent and sustained over time, rather than an isolated presentation or one-day workshop (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Newmann, King, & Youngs, 2000; Newmann, Smith, Allensworth, & Bryk, 2001; Yoon et al., 2007). Often there can be a large gap between teachers' current practices and the targeted practices of educational interventions. Sustained exposure reinforces the new practices and provides opportunities for teachers to make changes to their existing practices (Coburn, 2004). However, there is no agreed upon number of hours or time frame for professional development. In the Eisenhower-assisted professional development, the teachers participated in an average of 25 contact hours over one year (Garet et al., 2001), while other professional development programs require teachers to participate from 1 hour to over 40 hours in a year (Gallagher et al., 2009; Yoon et al., 2007). Other studies indicate a benefit of multi-year schoolwide focus on PD initiatives (Correnti, 2007; Fennema et al., 1996).

PD can promote specific instructional practices that foster cognitive engagement, such as higher-order thinking, depth of knowledge, connectedness to the world beyond the classroom, substantive conversation, and social support for student achievement. As teachers participate in PD, they can develop competence to deliver these various instructional practices. PD can deliver meaningful content to enhance teachers' instruction and opportunities to practice and collaborate with other teachers can also occur through PD. Ongoing PD can provide teachers with support structures to gather new understanding, receive feedback, and continually improve their instruction. Authentic instruction will in turn contribute to increased student engagement as learning tasks become more intellectually challenging and relevant to students' lives.

Hypothesis 2b. For hypothesis 2b, I posit the association between high-quality PD and instructional quality is mediated by the strength of teacher professional community. I hypothesize teacher professional community will contribute to instructional quality as teachers work together toward common goals, and take responsibility for student learning. Teacher professional community can be cultivated through professional development experiences that foster shared goals for learning, collaboration, and teacher responsibility in decision making. Professional development can create new structures for collaboration within schools (Coburn & Russell, 2008), and promote structures that lead to lasting collegial support, reflection on student work, and feedback, which can all contribute to improved instructional practice (Datnow & Park, 2010; Franke, et al., 2001; Sargent & Hannum, 2009). Strong professional community can promote aims of professional development through collaborative support for teacher learning and sustained changes in instructional practice (Franke et al., 2001). In turn, a strong professional community can mediate the effect of professional development on instructional quality.

A number of studies have demonstrated the important role of colleagues and teacher professional community in supporting instructional improvement (Horn & Little, 2010;

McLuaghlin & Talbert, 2003; Penuel & Gallagher, 2009; Scribner, Sawyer, Watson, & Myers, 2007) and higher student achievement (Louis & Marks, 1998). The strength of a given teacher professional community can influence teacher learning. Shared goals, collaboration, and responsibility in decision making can contribute to structures and experiences that enhance instructional practice. In this way, professional community can be a conduit for professional development in a school toward increased instructional quality.

Hypothesis 3a. For hypothesis 3a, I anticipate that principal leadership will shape teacher experiences with PD, and the association between PD and AI. School principals can foster teachers' continual learning within practice by aligning professional learning opportunities around a coherent instructional framework. When school principals organize sustained professional development opportunities around a common instructional framework, teachers' professional learning and quality of classroom instruction are likely to improve (Darling-Hammond & Richardson, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001). Principals can provide opportunities for collaboration, critical feedback, and sharing about the implementation of new approaches in the classroom. Principals can further support teacher learning by promoting coherent learning strategies that are sustained over time (Darling-Hammond et al., 2009).

Principals can involve teachers in the decision making process regarding professional development experiences. They can also shape teacher experiences with PD through teacher hiring, evaluation, and provision of resources. When principals recruit and hire new teachers, they can establish criteria that emphasize a new teacher's commitment and ability to implement a PD framework. Teacher evaluation can be based upon the instructional framework and the effectiveness of teachers' instructional practice in relation to the instructional framework. In addition, professional development programs and strategies can become the focus of teacher

discussions and reflection. In turn, principals can create a school climate in which administrators and teachers hold each other accountable for the implementation of the framework outlined by PD.

Aspects of professional development that promote teacher learning can support the implementation of schoolwide reform for ambitious instruction. Principals can create similar conditions to comprehensive reforms, which have high levels of agreement on the goal of instruction, and orchestrate resources to build a coherent infrastructure to support teachers as they improve their instruction (Berends et al., 2005; Cohen, 2011). It is likely that PD focused on developing regular collaboration among teachers can stimulate new innovations, promote diffusion of knowledge on instructional reform, and facilitate coherent instructional practices among teachers throughout the school (e.g., Datnow & Park, 2010; Sargent & Hannum, 2009; Sun et al., 2013). Similarly, teachers' experiences with PD can be negatively affected when principals do not promote the conditions mentioned above. It will be important to consider the factors that influence the extent to which principal leadership supports and/or hinders teacher learning.

Hypothesis 3b. For Hypothesis 3b, I expect that principal leadership will shape the association between PD and teacher professional community. Principal leadership can shape the extent to which high-quality professional development and strong professional community provide teachers with the knowledge, skills, and resources to pursue ambitious instructional practice. High-quality professional development characterized by active learning, sustained coherence, and focused content can foster teacher learning and provide teachers with the knowledge and skills to pursue instructional quality (Darling-Hammond & McLaughlin, 1995; Printy, 2008; Webster-Wright, 2009). In addition, as teachers develop shared goals for student learning, their intentions will be aligned toward a common purpose and they will be better able to negotiate potentially conflicting policy demands. Collaboration among teachers will also enable them to share resources with one another to improve instructional practice (Horn & Little, 2009). As discussed above, principals play a central role in the orchestration of PD opportunities. These experiences, in turn, can strengthen or weaken teacher professional community. Furthermore, principals can directly promote professional community within a school, which can facilitate the aims of PD. High-quality PD can foster teacher knowledge, skills, and collaboration for education reform. Strong professional community can be a conduit to support teacher learning toward ambitious instructional practice that enhances student cognitive engagement.

CHAPTER 3: RESEARCH METHOD

Study Context: Authentic Intellectual Work in Iowa Public Schools

In the fall of 2007, the Iowa Department of Education (IDE) began the Authentic Intellectual Work (AIW) project with high school administrators and teachers to enhance the intellectual quality of student work in Iowa schools. The Center for AIW provides professional development for instructional and assessment reform using the framework for Authentic Intellectual Work. Fred Newmann, Bruce King, and colleagues at the Center for Organization and Restructuring of Schools, University of Wisconsin-Madison originally developed the framework based on extensive research evidence. The AIW framework is currently part of a professional development initiative with numerous schools throughout Iowa.

The number of schools participating in the AIW reform initiative has increased over the last several years. The project initially included mostly high schools; however, over time, middle and elementary schools have also joined the project. The initial cohort of schools in the 2007-2008 school year included 8 high schools. The second cohort in the 2008-2009 school year included 12 additional schools. The third cohort increased to 28 schools in the 2010-2011 school year. The largest cohort yet, the fourth cohort was comprised of 36 elementary, middle, and high schools. As of 2012-2013, when 9 schools joined the fifth cohort, there were a total of 93 schools participating in the project throughout Iowa. At each school, an administrator and an AIW coach help facilitate the implementation of the AIW framework.

The goal of AIW is to increase student learning by engaging students in authentic intellectual work. The framework defines Authentic Intellectual Work by three criteria: (a) construction of knowledge, (b) disciplined inquiry, (c) to produce discourse, products, and performance that have high value beyond school. The framework provides criteria for instruction that elevates expectations of intellectual challenge for students and increases student

interest in academic work. Teachers are supported to teach for in-depth understanding rather than cursory coverage of material. In addition, the framework establishes a common conception of student intellectual work that aims to foster professional community among teachers of different subjects and grade levels. Finally, the intention is to prepare students for complex intellectual challenges of work, civic participation, and personal life beyond school.

AIW PD was designed to improve teachers' ability to design instruction and assessments to increase student authentic intellectual work. Schools participate in the project voluntarily, and teams of teachers and administrators attend institutes at the beginning and middle of the school year. Other features include working groups at each school to promote the successful implementation of AIW and periodic on-site coaching by external coaches trained in AIW. Teacher, administrators, liaisons, and coaches form the working groups that sustain the work of the professional development for instructional and assessment reform. Leadership Meetings provide leadership to support expansion within a school, allocation of resources, and a complete understanding of the AIW framework. The intention is for teachers and instructional personnel at each school to develop a common vision of quality instruction based on research and focused on improving student achievement. In addition, the framework emphasizes teacher application of AIW to their daily classroom practice. Another component of AIW is that teachers are expected to become more reflective with regard to their instructional practices (Newmann, Kings, & Carmichael, 2007). Regular team meetings are held to critique and improve teachers' assignments, assessments, and lessons.

The AIW initiative includes various resources and materials to facilitate implementation of the framework. Participating school personnel receive various materials to promote an in-depth understanding of the framework. In addition, rubrics for scoring classroom tasks provide those involved in the project with examples and a means to assess the quality of instructional

tasks they assign to students. The AIW PD involves both content and process features to promote sustained change in instruction and assessment. Extensive evaluation of the AIW initiative has been conducted involving administrators, teachers, and student learning outcomes. The previous research conducted on the project through both case studies and a comparison of test score data indicates positive outcomes due to the AIW professional development (Weinstein & Associates, 2012).

In addition, AIW PD was also developed with an understanding of the aspects of high quality PD. The structures, form, and mechanisms of learning that constitute AIW PD reflect critical aspects of effective PD. These aspects include an awareness and plan for short term and long term implementation with recommendations for scaling up over time. In addition, the initiative includes various structures for training and ongoing support to develop local expertise in schools. The fundamental mechanism of learning is based on critical inquiry, reflective dialogue, and examination of problems of practice, teacher instructional tasks, and student work that is relevant to teachers' work. An essential aspect of this process is the collaboration within teacher learning communities and the support of a strong teacher professional community to engage in the challenging work of examining existing notions and developing new understandings of teaching and learning. These structures are of great importance in the approach of the AIW initiative, and provide a foundation of teachers' and principals' work in this study.

Sampling Strategy: Site Selection. Several factors contributed to the selection of sites for this study. First, I wanted to ensure the efficiency and depth of data collection by focusing on a few school sites within one school district involved in the reform, rather than multiple individual sites in various locations. This way, I could examine patterns within schools that were involved in relatively similar educational contexts. Second, I preferred sites that were actively involved in the AIW work, and that had a few years of experience so that they had moved

beyond the initial learning phase. Third, I was interested in sites that were recommended by one of the founders of the AIW initiative, Bruce King. As a consultant within the AIW project, King provides PD to teachers and consults with schools as they implement the AIW reform. Based on King's experience with several schools, he indicated two middle schools in particular were farther along in their work with AIW. In addition, he noted the principals of the two schools demonstrated leadership that supported the AIW PD and the work of the teachers. This provided a setting in which there were aspects of strong school leadership supporting the initiative as well as teachers involved in the work to promote Authentic Intellectual Work. The two schools afforded the opportunity to learn about the successes and challenges of implementing aspects of ambitious instructional practices in the context of two schools that were currently committed and actively engaged in promoting these types of teaching practices. From these sample options that were known to be successfully implementing the AIW initiative, I hoped to learn more about the factors that support reform oriented teaching within schools, while also understanding some of the factors that limit these practices, even within schools that have support structures and are invested in the reform process to some degree.

The two schools were part of the Camden Unified School District⁴, one of the many school districts in Iowa participating in the AIW initiative. The district serves a town of about 58,000 people, with an estimated median family income of \$43,358 in 2012. The Camden Unified School District serves over 11,000 students, and the K-12 per pupil expenditure in 2011 was \$12,182 in the thirteen elementary schools, 3 middle schools, and 3 high schools. Of those schools, AIW was implemented in all three middle schools, and one high school at the time of

⁴ All names of persons and places in this study have been changed to pseudonyms.

this study. The two middle schools selected for participation in this study have both been involved with the AIW initiative for the past two years.

The first school, Birch Middle School, serves more than 650 students, with a population of 80 percent White, 9 percent Black or African American, 3.7 percent Hispanic, 0.7 percent Asian, 0.3 percent American Indian, 1.8 percent Pacific Islander, and 1.8 percent of the students from two or more races. Out of those students, 43 percent receive free or reduced-cost school lunches. On the eighth grade state-wide standardized Iowa Test of Basic Skills (ITBS), 72 percent of the students had met the reading skills standard, and 76 percent had met the math skills standard. The achievement scores at Birch Middle School are very close to the district averages for reading and math proficiency, at 71 and 78 percent respectively. Birch Middle School employs 50 full time teachers, with a ratio of 13 students per teacher.

The second middle school, Cedar Middle School, serves almost 600 students, with a population of 77 percent White, 11 percent Black or African American, 4 percent Hispanic, 0.3 percent Asian, 0 percent American Indian, 2 percent Pacific Islander, and 5 percent from two or more races. Compared with the national average of 46 percent, and the district average of 37 percent, 60 percent of students at Cedar Middle School are eligible for a free or reduced price lunch. On the eighth grade state-wide standardized Iowa Test of Basic Skills (ITBS), 61 percent of the students had met the reading skills standard, and 62 percent had met the math skills standard. Cedar Middle School employs 48 full time teachers, with a student teacher ratio of 12 to 1.

Selecting Teachers. The strategy for soliciting teachers was to present my study to the principal and instructional coach within each school. The instructional coach then announced the need for participants at a faculty meeting. This announcement included a letter describing the purpose of the study, the procedures involved, the amount of time required from the teachers,

and a consent form. Participation was completely voluntary. At each site, nearly all of the teachers agreed to participate in an online survey, and a selection of teachers volunteered to participate as focal teachers in the study. At Birch Middle School, 6 teachers representing various subjects and grade levels participated in the study. At Cedar Middle School, 6 teachers representing various subjects and grade levels participated in the study.

My initial plan was to focus mainly on the same grade level and the basic academic subjects of language arts and mathematics. Due to the teachers who responded to the study, I accepted teachers from sixth, seventh, and eighth grade. In addition, all of the core academic subjects, language arts, mathematics, science, and social studies, were included in the study with one teacher teaching a math application class titled Financial Literacy. I also gathered information from two special education teachers separately as they were interested in participating, and provided the opportunity to include their experience in the study. Although this sampling scheme featured a small sample, it provided the opportunity to study one program in depth for teachers from different subject areas at two schools. The final sample of 12 focal teachers is included in Table 1 below.

Table 1. Birch and Cedar Middle School Focal Teachers' Years of Experience, Content Area, and Course Level

Teacher	Years of Experience	Content Area	Course Level
<u>Birch Middle School</u>			
Lila	2	Science	8
Dan	7	Math	8
Jeff	3	Social Studies	7
Tom	38	Language Arts	7
Tori	11	Science	7
Kari	12	Math	6
<u>Cedar Middle School</u>			
Holly	3	Math	8
Donna	2	Social Studies	7
Kionna	4	Social Studies	7
Greg	11	Language Arts	6
Jana	23	Math	6
Trine	11	Language Arts	6

Other Participants. The research also included student voluntary participation on surveys in two classes for each of the focal teachers. In addition, the school principal and instructional coach, AIW founders and coaches, as well as district and state personnel responsible for the implementation of the AIW initiative (n=10) also participated in the study. The sampling strategy enabled me to capture data from the different levels of the school system to give perspective on the embedded contexts of teachers' work and student engagement.

Research Design

A mixed-method approach was best suited for the purpose of this study. I employed qualitative methods including interviews and observations to understand the contextual factors that encouraged and inhibited Authentic Instruction and student cognitive engagement. Drawing on the understanding that teaching is shaped by the situation and context within which it occurs,

I gathered information from the classroom, school, and district levels. In addition, quantitative analysis of teacher and student survey data allowed me to analyze more general patterns and to make comparisons among principal leadership, PD, teacher professional community, instructional practice, and student cognitive engagement. Finally, quantitative scoring of classroom observations provided information about levels of AIW instructional practices.

Using a multiple case study design, I examined the relationship among individual teacher participation in AIW professional development activities, their classroom practice, and their students' engagement. To estimate the effect of AIW professional development on student engagement, the design included data on (a) individual teachers' nature of participation in AIW professional development, (b) the quality of each participating teacher's implementation of AIW as measured by their scores on classroom instruction, and (c) student engagement for specific students linked to their teachers. This study design enabled me to document the perceived effects of AIW professional development on teachers' practice and the effects of teachers' practice on student engagement. The data linking individual students' engagement responses to their teachers, along with indicators of the quality of teachers' implementation of AIW standards, and teachers' self-report of their level of participation in AIW professional development, was gathered from the focal teachers in the study. The relationship between levels of AIW instruction instantiated in the classroom and student cognitive engagement was estimated by comparing student engagement data among teachers who were identified as high or low AIW implementing teachers. In addition, teacher information on the extent to which they participated in the AIW PD as well as perceptions of principal leadership, teacher professional community, and student engagement was gathered to examine the relationship among these factors. Descriptive statistics and a multiple regression model were employed to analyze the teacher and student survey data.

The research questions required data collection from various levels of the school system to include different potential situational influences. The situational influences include teacher professional community and principal leadership, as well as professional development, different reform initiatives, and district policies. Table 2 provides an overview of the data collection and analysis for each of the research questions.

Table 2. Data Collection and Analysis Summary

Research Question	Data Collection Overview	Data Analysis Overview
1. Do teachers with different levels of AIW strategies have different levels of cognitive engagement in their classrooms?	<p><u>Observation</u>: teacher classrooms in core academic subjects</p> <p><u>Interview</u>: selected teachers</p> <p><u>Teacher Survey</u>: selected teachers</p> <p><u>Student Survey</u>: students in selected teachers' classrooms</p> <p><u>Instructional artifacts</u>: samples of lesson plans, assignments, and student work samples</p>	<p><u>Observation</u>: AIW Observation Scoring Protocol</p> <p><u>Interviews</u>: pattern coding (Miles & Huberman, 1994); retroductive analysis (Ragin, 1994)</p> <p><u>Surveys</u>: Descriptive statistics, frequency counts, and multiple linear regression.</p> <p><u>AIW criteria and Lesson Scoring Rubric</u>: Scoring of lessons and assignments (Newmann, King, & Carmichael, 2007).</p>
2. How does professional development associated with AIW promote certain teaching strategies, and how do teachers see those practices as influencing student engagement?	<p><u>Observation</u>: AIW PD, team meetings, and teacher classrooms</p> <p><u>Interview</u>: selected teachers and principals</p> <p><u>Teacher Survey</u>: all teachers in the school</p>	<p><u>Observation</u>: AIW standards and criteria, field notes on PD, AIW Observation Scoring Protocol</p> <p><u>Interviews</u>: pattern coding (Miles & Huberman, 1994); retroductive analysis (Ragin, 1994)</p> <p><u>Survey</u>: Descriptive statistics, frequency counts, and multiple linear regression.</p>
<p>3. What are the ways in which teacher professional community can support and/or hinder teacher learning regarding AIW and engaging instruction?</p> <p>3a. What are the ways in which principal leadership can support and/or hinder teacher learning regarding AIW and engaging instruction?</p>	<p><u>Observations</u>: AIW PD, team meetings, and teacher classrooms</p> <p><u>Interview</u>: teachers, coaches, principals, and district office administrators</p>	<p><u>Observation</u>: AIW standards and criteria, field notes on PD, CLASS classroom observation protocol (Pianta et al., 2008).</p> <p><u>Interviews</u>: pattern coding (Miles & Huberman, 1994); retroductive analysis (Ragin, 1994)</p> <p><u>Surveys</u>: Descriptive statistics, frequency counts, and multiple linear regression.</p>

Figure 2 outlines the various levels, variables, and instruments in the study.

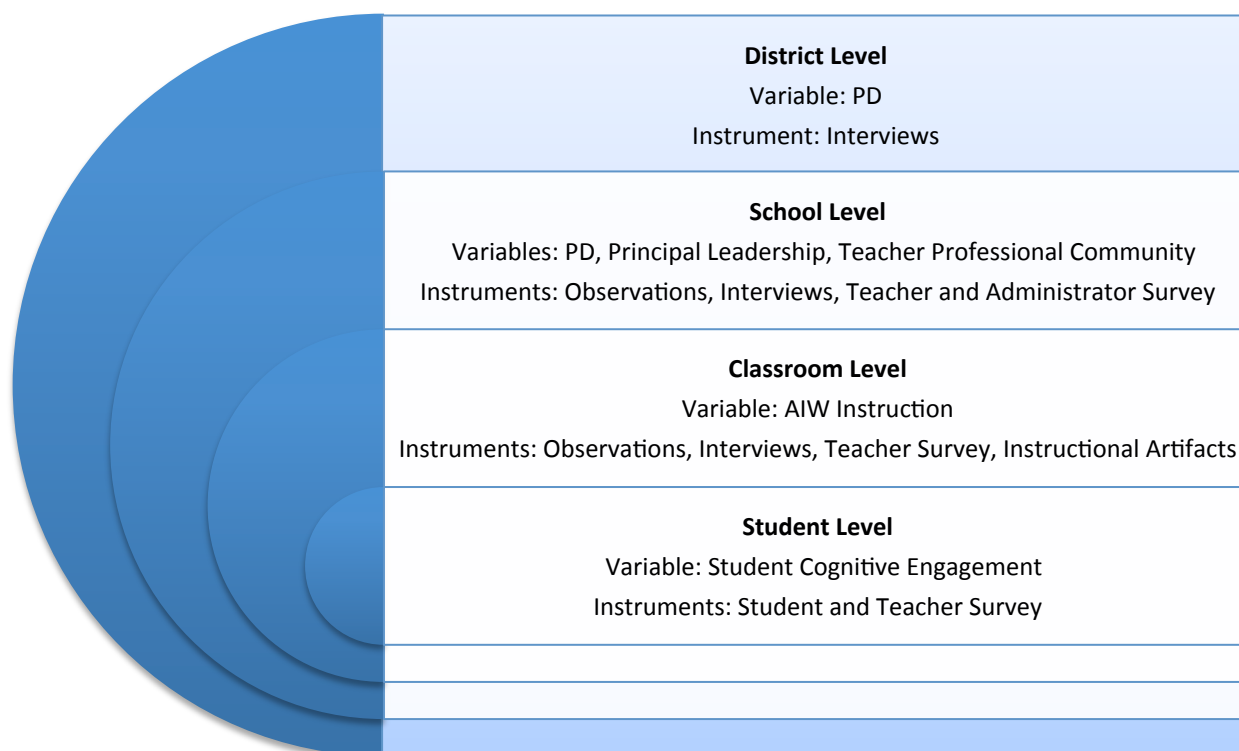


Figure 2. Levels, variables, and research instruments.

Data Collection

The following section outlines the data collection procedures for the study as well as the instruments used for data collection including survey, interview, and observation protocols.

Interviews. In order to understand teachers' experiences in AIW PD, and aspects that contributed to their enactment of AIW instruction, I conducted semi-structured interviews with all of the focal teachers at each school, the school principals and instructional coaches, AIW founders and coaches, as well as district and state personnel at two time points in the 2013-2014 school year. The length of the initial teacher interviews was approximately an hour on average. The principal, instructional coach, AIW founder, district and state personnel interviews lasted between one and two hours. Conducting the interviews at two time points allowed for follow-up interviews when necessary. All of the focal teachers participated in at least two interviews at two different time points. The design for the interview protocols was guided by the three main research questions. The focal teachers at each of the two schools were interviewed to gather information about their teaching background, their participation in PD, and their perceptions of teacher professional community, principal leadership, and student engagement at their school. Specifically, the interviews were designed to elicit information about teachers' use of AIW instructional practices and their perceptions of how those practices influenced student cognitive engagement in the classroom. Many of the interview questions were adapted from previous studies involving student engagement, professional development, and professional community (Franke et al., 2001; Marks, 2000; Youngs & King, 2002). I developed additional research questions that were specifically relevant to the AIW initiative. The interview protocols can be found in Appendix A.

The school principal interviews inquired into their understanding of the AIW initiative, its alignment with school goals, their decisions related to PD, and their role in promoting

professional community and instructional quality. In addition, I conducted interviews with the three AIW founders and the AIW coaches at each school as well as the district and state personnel involved in the AIW initiative. The interviews gathered information on the nature of the PD initiative in the schools and the perceptions of influence on student cognitive engagement. The information gathered from the interviews were designed to gather information regarding Research Questions 2 and 3, which concern PD, principal leadership, and professional community, and their relationship to instructional quality and student engagement.

Observations. To gather objective criteria of teachers' AIW instructional practice, I observed and videotaped each focal teacher (n=12) for at least two lesson periods in the spring of the 2013-2014 school year. The intention of the classroom observations was to gather instances of the teachers' instructional practices in the classroom. These observations provided information on teacher's instruction beyond their self-reported perceptions captured in the interviews and teacher surveys. Some of the initial observations were scheduled and the teachers knew I would be visiting the class that day. I sat in the back of the room, and placed a video recorder on the teacher to capture the teacher's instruction. Student voices and classroom discussion was audible on the tape as well. I requested the lesson be a usual lesson as other days, and to visit a general education class that was not specifically an honors or specialty class. Both of the schools had an open door policy, and the teachers extended open invitations to visit their classes at any point. On subsequent visits to the schools, I visited the classrooms unannounced and spent further time observing. These follow-up observations provided further experience in the focal teacher's classrooms and allowed me to gather additional field notes on the classroom instruction.

I then used the AIW Classroom Instruction Scoring Protocol developed by Newmann, King, and Carmichael (2007) at the Center for AIW to score each lesson. This provided an

assessment of AIW instructional quality. An overview of the AIW Classroom Instruction Scoring Protocol developed by Newmann, King, and Carmichael is included in Appendix B.

I also observed the professional learning communities engaged in the AIW lesson scoring or student work scoring process at each school. These meetings consisted of teachers, an administrator, and at times, an AIW coach. The teachers are grouped into these professional learning communities based on their assigned teaching group called their “house” within the school. This is a group of teachers who teach various subjects at a particular grade level. While these groups were initially formed as professional learning communities, their purpose has changed to focus on AIW when the initiative began at the schools two years prior. Each team was also assigned an anchor who had received additional AIW training and was tasked with facilitating the group. These meetings allowed me to collect information on the nature of PD, as well as the strength of the teacher professional community. I drew on the conceptions of high-quality PD and teacher professional community mentioned above to guide my collection of field notes. I also observed the mid-year AIW institute at each school to gather further information in the PD. This was a daylong PD session in which the local AIW coach as well as the AIW regional coach provided further support for teachers involved in the AIW scoring process. The classroom and PD observations provided information to answer Research Questions 1, 2, 3.

Surveys. To gather teacher self-report of various items related to AIW PD, and the school context, I administered a survey to all of the teachers in both of the middle schools in the spring of the 2013-2014 school year. All of the teachers in the two schools received the survey; it was not limited to the twelve focal teachers participating in the interviews and observations. I designed the survey based on previous studies involving student engagement, professional development and professional community (Franke et al., 2001; Youngs & King, 2002). The items on the teacher survey were primarily based on a four-point Likert scale; with the response

options ranging from strongly disagree, to strongly agree for questions about organizational conditions. The questions about the individual teachers' instructional practice included a five-point scale for frequency including never, yearly, monthly, weekly and daily. The questions relating to AIW described different levels of AIW classroom practice. There were also a few ranking and open-ended questions that related to planning, delivering, and reflecting on instruction. The survey included a selection of questions solely for the instructional coaches and administrators at the school with a similar format. In total, there were 13 questions on the instructional coach and administrator survey, and 24 questions on the teacher survey. The teacher and administrator survey provided information about Research Questions 2 and 3. The teacher survey is included in Appendix C.

In order to gather information on students' level of cognitive engagement in the classroom, a student survey was also administered to a selection of the students in both of the middle schools in the spring of the 2013-2014 school year. Each focal teacher administered the survey to students in two of his or her classes. The surveys for each class included a cover sheet in which the teacher filled in the information about the class, as well as any comments about student learning and their AIW instructional practice. This information was gathered to answer Research Questions 1 and 2, which concern AIW instructional strategies and levels of student cognitive engagement. The student survey was comprised of items from previous studies and instruments including the Student Engagement Inventory (SEI, described below) and the study on student engagement and authentic instruction by Helen Marks (2000). In addition, several items were developed to align explicitly with the aims of AIW. The student surveys were initially piloted with a selection of middle school students and feedback was gathered on the nature of the questions and the students' responses. This information was used to further edit the student survey before it was administered to the students in the two schools for this study.

The use of a selection of items from the SEI instrument was appropriate for the student survey in this study because it was designed specifically to measure cognitive engagement. However, the instrument was intended for student engagement with the school as a whole. Therefore, several items were selected and adjusted to inquire about student engagement in the classroom specifically. Appleton and Christenson (2004) developed the SEI from a review of relevant literature on engagement. The instrument includes 30 items to measure cognitive engagement and 26 items intended to measure psychological engagement from the perspective of the student. Using a study sample of 1,940 ninth graders from randomly selected classrooms in an urban school district, Appleton and Christenson reported that the SEI was an effective measure of cognitive and psychological engagement. A draft of the student cognitive engagement survey is included in Appendix D.

Data Analysis

Interviews. All of the interviews were audiotaped and then transcribed. The semi-structured interviews were designed to cover similar topics in each interview, but to also allow for the different topics and ideas introduced by teachers regarding their instruction and experience. I used a qualitative software program called HyperResearch to categorize, code, and classify the interview data. Using a retroductive coding process outlined by Ragin (1994), I employed both top-down and bottom-up procedures to code the interview data. First, I utilized a deductive coding process using concepts from the conceptual framework to organize the responses. As I initially read through the interview transcriptions I used a descriptive coding process as described by Huberman and Miles (2002) to identify categories of teachers' responses to the interview questions. Some examples of these initial categories were AIW PD, Principal Leadership, Conceptions of Student Engagement, Collaboration, and Purpose.

In my second pass through the interview data, I employed pattern coding as explained by Huberman and Miles (1994). Responses were labeled based on identifying patterns and emerging themes from the data. After two or three passes through the data, I reduced the main patterns and themes into broad categories and organized the data into analytic units. I then used the analytic units along with the observation and survey data to identify relationships in response to Research Questions 2, 3, and 3a. I did this by creating an analytic matrix (Miles & Huberman, 1994) with a row for each of the 12 focal teachers, grouped by their level of student engagement average scores from the surveys. This process led to teachers in three groups according to the level of student engagement; high, medium, and low student engagement. Using the HyperResearch coded data, I filled in the matrix by listing the codes assigned to each teacher. Once the matrix was constructed, I looked at the patterns for individual teachers, and among the different groups of high, medium, and low student engagement teachers. I identified a number of patterns that differentiated the teachers – particularly in the areas of AIW PD, principal leadership, teacher professional community, and principal leadership. These patterns formulated the beginning of my findings.

I then returned to the interview data to read through the transcripts to identify instances in which the teachers' responses supported or contradicted my initial findings. I revised my findings of the patterns among the different groups of teachers, and distinguished cases in which teachers from the high and low student engagement groups had opposing views on certain categories. This process helped me to understand differences among the different groups of teachers. I then grouped the teachers according to their level of student engagement, and their level of high, medium-low, or low AIW instructional practice based on the classroom observation scores. This provided me with a table of the teachers according to the level of student engagement as reported by the students in their class, and the level of AIW instructional

practice, according to the scores of the classroom observations. This provided the basis for organizing the patterns from the HyperResearch coded data.

To ensure validity in the coding process, a second coder was also involved in coding a selection of the interviews. After we each completed a coding session, I met with the second coder to discuss the various coding categories and the assignment of various codes. We discussed any discrepant codes and established an inter-rater reliability score of 75% for the interviews we jointly coded. This helped to inform both the development of the list of codes, as well as the validity of the assignment of codes to the interviews.

Observations. To analyze the observations of the focal teachers' classroom instruction, I utilized both my field notes from the observations, as well as the video recordings of lessons. I first organized my notes from the observations and recorded instances of AIW instructional practice during the lessons. I utilized the AIW lesson scoring protocol to generate scores for each of the twelve focal teachers. This process allowed me to identify high and low AIW implementers. The AIW lesson scoring protocol was chosen as a useful tool to identify teachers who differ in their AIW instructional practices because the tool is consistent with the objectives outlined in the PD. The AIW lesson scoring protocol also provided an objective assessment of instructional practice to evaluate relationships among teachers' practice and student cognitive engagement, PD, principal leadership, and professional community.

It is important to note that I was not formally trained in the AIW lesson scoring protocol. I received instruction from an AIW coach, and read the AIW manual (2007) to inform myself on the framework and underlying principals, as well as the various categories for scoring classroom instruction. In addition, I worked with a second scorer, and one of the founders of AIW, to ensure validity of the scores I assigned to the classroom observations. After viewing a selection of the classroom observation videos, the second scorer and I discussed the scores we assigned to

the teachers, and any discrepancies between our scores. We made note of any category in which we differed by more than one point, and then returned to discuss those categories after reviewing additional videos of the classroom observations. In total, we established an inter-rater reliability score of over 80% on the selection of videos we coded. This process provided insight into the practices of the teachers and greater validity in the scoring of the classroom observations. Information on the lesson scoring procedures from the AIW manual is included in Appendix B.

Surveys. To develop a comprehensive understanding of student engagement and the organizational factors at each middle school, I conducted a multiple, embedded case study (Yin, 2003), which included the two schools and the 12 individual classes.

Student Survey. The first task was to edit, code, and input the data in an excel spreadsheet. To analyze student cognitive engagement as a dependent variable, I selected the corresponding items on the survey. Initially, I used descriptive statistics including the mean and frequency counts for the student survey responses. I created a composite score of the student engagement items from the student survey to create an engagement score for each student. These scores were then averaged for each class. The student engagement score for each teacher was then calculated from the average score of two of the teacher's classes. This information was examined alongside the qualitative data.

Teacher and Administrator Survey. The teacher and administrator survey was administered online through Qualtrics; therefore, all of the data was available in a format that was compatible with SPSS software. I first analyzed the teacher survey data by organizing the different questions into groups that represented the categories I was interested in analyzing. For example, I grouped all of the questions relevant to teachers' self-reported level of AIW instructional practices. I then created one score for each of these categories by conducting a factor analysis for select items. I did not end up reporting the factor analysis as they were not

correlated with the other variables I was examining. I then conducted a Pearson's correlation to determine the relationship between the variables. To analyze the data for RQ3, the appropriate analytic technique for the size of the sample was an application of Single Linear Regression. Single Linear Regression allowed for the variance in the dependent variable (teacher change in instruction) to be analyzed based on each teacher's score for their AIW instructional practice. The model investigated whether teachers' knowledge or values were predictive of teacher change in instruction. I also analyzed the open-ended questions by creating a table of the responses for each teacher. I then grouped the responses into a number of categories.

Procedures for Triangulating Data and Establishing Validity. In this study, I employed four main strategies to establish validity of the data. As recommended by Morse and colleagues (2002) these strategies were interwoven into the inquiry process, which enabled me to adjust both the analysis and the direction of the study to ensure rigor. These strategies included 1) sampling sufficiency, 2) triangulating the data by using multiple data collection and analysis methods; 2) a multiple, embedded case design; and 3) peer review and debriefing (Deyhle, Hess, & LeCompte, 1992; Glesne, 2006; Morse, Barrett, Mayan, Olson, & Spiers, 2002; Patton, 2001). First, I ensured the sample was appropriate by identifying participants who had specific knowledge of the AIW research topic. Additionally, I emphasized sampling adequacy by seeking evidence of saturation of categories and replication during data collection and analysis (Morse, 1991) to ensure I had obtained sufficient data for different aspects of the phenomenon.

Second, I used multiple data collection and analysis methods to ensure validity of the data (Stake, 2004). Specifically, I collected data on the three main constructs through observations, interviews, and surveys. In addition, I used both qualitative and quantitative approaches. I then analyzed the teacher survey data to cross-check teachers' interview responses about their perceptions of principal support, the AIW framework, teacher professional

community, participation in PD, and their enactment of AIW instructional practices. I found that the teachers' responses to interview questions on these topics were very similar to their survey responses regarding the same topics. I also identified a few instances that were inconsistent between the two data sources. This helped to create additional sub-categories in the coding, and to note such differences to inform my findings. In addition, I referenced observation data, and compared findings in the interview and survey data to analyze different sources of data concurrently (Morse et al., 2002). This process enabled me to capture different dimensions of the same phenomenon.

Third, my use of a multiple, embedded case design (Yin, 2003) enabled me to examine the two different groups of teachers in each school and to identify patterns that were consistent across the teachers in the two schools concerning their conceptions of student engagement, principal leadership, PD, and teacher professional engagement. In addition, I examined the observation, interview, and survey data across groups of teachers and individuals to identify patterns as well as cases that were exceptions to the patterns.

Fourth, I gathered feedback on my research design, and on the findings throughout the process from faculty and graduate student colleagues in the areas of educational administration, instructional improvement, and educational policy (Glesne, 2006). The peer review helped to decrease any of my own researcher bias that may arise in the qualitative analysis. This feedback also helped me to reexamine the theoretical basis for specific coding categories, to refocus the scope of the study to a selection of teachers, and to emphasize the construct of instructional leadership. Throughout the process, I sought to approach my work from both a grounded and theoretical perspective in which new ideas emerging from the data were reconfirmed in data that was already collected. I employed these strategies incrementally and interactively to contribute to the validity of the study (Morse et al., 2002).

Ethical Considerations. All aspects of this study were conducted in accordance with the Institutional Review Board (IRB) guidelines. The researchers involved in the study completed the necessary training and completed the process to receive exempt status for the study through the IRB at Michigan State University. In addition, teachers were provided an honorarium for their participation in this research.

Limitations. One limitation of this study was the small sample size of the participating schools and teachers. The intention of the sampling strategy and focused case study design was to gather an in-depth understanding of the particular phenomenon in the context of the two schools. At the same time, this limited the inquiry to a specific context with a limited number of individuals. Another limitation is the study did not involve a control group that was not participating in the AIW PD to provide a comparison group for analyzing differences between the individuals who received the PD, and those that did not. A further limitation was the fact that data was only gathered in the spring of the 2013-2014 school year. The study would be further strengthened by longitudinal data gathered at multiple time-points over the course of the implementation of the AIW PD. Future studies could explore similar aspects of student cognitive engagement and related organizational factors in the context of different PD initiatives over multiple years to explore their influence on instructional practice.

CHAPTER 4: STUDENT COGNITIVE ENGAGEMENT AND AUTHENTIC INSTRUCTION

Student Cognitive Engagement and Authentic Instruction

The aim of this study is to examine the factors that contribute to increased student cognitive engagement in the classroom, including aspects relating to the teacher, professional development, and organizational conditions. In particular, I examined teachers' perceptions and instructional practices as well as students' report of their cognitive engagement in the context the AIW PD initiative. This inquiry included both qualitative analysis of interview data and quantitative analysis of student and teacher survey data. The mixed method approach allowed for qualitative analysis of patterns and descriptions of instructional practices, student engagement, and organizational conditions in the particular AIW context. The quantitative analysis provided administrator, teacher, and student perceptual responses, as well as an analysis of objective criteria of instructional practices. In the sections that follow, I report on the findings according to the first and second research questions.

The first research question asked: 1) *Do teachers with different levels of AIW instructional practices have different levels of cognitive engagement in their classrooms?* And 1a) *What are the ways in which teachers with different levels of AIW instructional practice conceive of student engagement?* To answer these questions, I first present the focal teachers levels of AIW instructional practices. Second, I delineate the levels of student cognitive engagement in the focal teachers' classrooms. I then compare the association between the levels of the focal teachers' AIW instructional practices and the level of student cognitive engagement in their classrooms. Finally, I examine the different ways teachers with high and low levels of AIW instructional practices conceive of student engagement. Throughout the results chapters, I discuss some of the similarities and differences among the different groups of teachers.

Levels of AIW Instructional Practices. The focal teachers' levels of AIW instructional strategies were based on the average scores from two classroom observations. Although the levels of AIW strategies are based on a small selection of lessons, the intent is to capture salient aspects of the teachers' approach to instruction, rather than the specific score of a particular class lesson. Overall, the AIW classroom observation scores represented the extent to which the instruction in the classroom involved teacher demands for and student participation in authentic intellectual work. The focal teachers' AIW average score for lesson 1 and lesson 2 and the mean AIW classroom observation score are listed in Table 3 below. The cell values are mean raw scores on a scale of 1-5, with an overall teacher mean for both schools of 2.4.

Table 3. Birch and Cedar Middle School Focal Teachers' AIW Average Score for Lesson 1 and Lesson 2 and Mean AIW Classroom Observation Score

Teacher	Lesson 1 AIW Average Score	Lesson 2 AIW Average Score	Mean AIW Classroom Observation Score (overall teacher mean = 2.4, SD = 1.08)
<u>Birch Middle School</u>			
Lila	3.5	4.0	3.75
Dan	3.5	3.0	3.25
Jeff	3.25	3.25	3.25
Tom	2.5	1.5	2.00
Tori	1.5	1.25	1.40
Kari	1.0	1.0	1.00
Birch School Mean	2.54	2.33	2.44
Birch School SD	1.08	1.24	1.13
<u>Cedar Middle School</u>			
Holly	1.5	1.25	1.25
Donna	1.0	1.0	1.00
Kionna	1.5	1.75	1.60
Greg	1.5	1.25	1.40
Jana	3.5	3.0	3.25
Trine	3.5	3.5	3.50
Cedar School Mean	2.08	1.96	2
Cedar School SD	1.11	1.04	1.09

Note: The cell values are mean raw scores on a scale of 1-5, with an overall teacher mean AIW Classroom Observation Score for both schools of 2.4, and SD of 1.08.

To assess whether the level of AIW instructional practice was possibly associated with teachers' years of experience, content area, or course level, I also analyzed the mean AIW classroom observation scores alongside these data. As you can see in Table 4 below, the teachers with high and low mean AIW classroom observation scores represent a range of years of experience, content areas, and course levels. Teachers with high scores range from 2 to 23 years of experience, represent every content area, and course levels 6-8. Similarly, teachers with low mean AIW classroom observation scores range from 2 to 38 years of experience, represent every content area, and course levels 6-8. It does seem that teachers at Birch Middle School with high

scores also teach seventh and eighth grades, whereas teachers with high scores at Cedar Middle School teach sixth grade. Nonetheless, the teachers with high and low mean AIW instruction scores at both schools combined represent a range of years of experience, content areas, and course levels. In turn, the AIW scores did not seem to be associated with these factors.

Table 4. Birch and Cedar Middle School Focal Teachers' Years of Experience, Content Area, Course Level, and Mean AIW Classroom Observation Score

Teacher	Years of Exp.	Content Area	Course Level	Mean AIW Classroom Observation Score (teacher mean = 2.4, SD = 1.08)
<u>Birch Middle School</u>				
Lila	2	Science	8	3.75
Dan	7	Math	8	3.25
Jeff	3	Social Studies	7	3.25
Tom	38	Language Arts	7	2.00
Tori	11	Science	7	1.40
Kari	12	Math	6	1.00
Birch School Mean				2.44
Birch School SD				1.13
<u>Cedar Middle School</u>				
Holly	4	Math	8	1.25
Donna	2	Social Studies	7	1.00
Kionna	8	Social Studies	7	1.60
Greg	11	Language Arts	6	1.50
Jana	23	Math	6	3.25
Trine	11	Language Arts	6	3.50
Cedar School Mean				2
Cedar School SD				1.09

Note: The Mean AIW Classroom Observation Score cell values are mean raw scores on a scale of 1-5, with an overall teacher mean AIW Classroom Observation Score for both schools of 2.4, and SD of 1.08.

Levels of Student Cognitive Engagement. The level of student cognitive engagement in the teachers' classrooms was calculated using the average student cognitive engagement in two different classes, and then finding the mean student cognitive engagement across the two classes from 7 cognitive engagement items on the student survey (See Appendix D). The average student cognitive engagement for the first and second classes, as well as the overall mean student cognitive engagement across the two classes is included in Table 5 below. When the mean student cognitive engagement scores were compared with the teachers' years of experience, content area, and course level, there was not a clear pattern of association between the engagement scores and the other teacher data. This indicated that student cognitive engagement was not directly or solely associated with one or all of these other factors.

Table 5. Birch and Cedar Middle School Focal Teachers' AIW Mean Student Cognitive Engagement Score for Class 1 and Class 2 and Overall Mean Student Cognitive Engagement Score

Teacher	Class 1 Student Cognitive Engagement	Class 2 Student Cognitive Engagement	Mean Student Cognitive Engagement (teacher mean = 3.8, SD = 0.23)
<u>Birch Middle School</u>			
Lila	3.7	3.8	3.8
Dan	3.3	4.3	3.8
Jeff	3.9	4.1	4
Tom	3.6	3.6	3.6
Tori	3.7	4.1	3.9
Kari	3.7	3.7	3.7
Birch School Mean	3.65	3.93	3.8
Birch School SD	0.20	0.27	0.14
<u>Cedar Middle School</u>			
Holly	3.5	3.2	3.4
Donna	3.7	3.7	3.7
Kionna	3.7	4	3.9
Greg	3.6	3.8	3.7
Jana	4	4	4
Trine	4	4	4
Cedar School Mean	3.75	3.78	3.78
Cedar School SD	0.21	0.31	0.23

Note: The cell values are mean raw scores on a scale of 1-5, with an overall student cognitive engagement mean for both schools of 3.8, and a SD of 0.23 for both schools.

AIW Instructional Practice and Student Cognitive Engagement. Finally, the overall mean student cognitive engagement scores were compared with the mean AIW Classroom Observation Scores for each teacher. Table 6 depicts the overall mean student cognitive engagement score alongside the mean AIW Classroom Observation Score for each teacher. Given that the scores are so close to one another, and many teachers differ by only 0.1, the differences among student cognitive engagement for the teachers are not clearly distinguishable. There are several teachers just below or just above the mean, for example, Kionna and Tori are 3.9, and Kari and Greg are 3.7, just 0.1 above and below the mean respectively. This is not a great enough difference to conclude a possible association between teachers' level of student cognitive engagement in the classroom and teachers' level of AIW instructional practice.

Although the differences were not great enough to distinguish among the teachers, there was some indication of a pattern in which five teachers who scored above the overall mean for both schools of 2.4 for AIW instruction, also scored above the teacher mean for both schools of 3.8 for student cognitive engagement. In addition, five of the teachers who scored below the AIW classroom observation school mean for both schools combined, also scored below the school mean for both schools combined for student cognitive engagement. There were also two exceptions, Tori, a teacher who scored below the AIW classroom observation school mean for both schools combined, scored above the overall teacher mean for student cognitive engagement. Kionna also scored below the AIW classroom observation school mean for both schools combined, and scored above the overall teacher mean for student cognitive engagement. However, these differences were small, and do not lead me to conclude there are marked differences among the teachers to make a clear distinction regarding the level of student cognitive engagement based on these measures.

I computed several different scores for teachers' level of student cognitive engagement in the classroom to determine whether other cognitive engagement items may reveal a clearer distinction between the teachers; however, the other combinations of student engagement items did not yield student engagement scores that demonstrated marked differences among the teachers. This exploration was warranted given that student cognitive engagement is measured in numerous different ways in the research literature and there are different approaches to characterize items that make up student cognitive engagement.

Table 6. Birch and Cedar Middle School Focal Teachers' Mean Student Cognitive Engagement Score and Mean AIW Classroom Observation Score.

Teacher	Mean Student Cognitive Engagement Score (teacher mean= 3.8, SD .23)	Mean AIW Classroom Observation Score (teacher mean = 2.4, SD 1.08)
<u>Birch Middle School</u>		
Lila	3.8	3.75
Dan	3.8	3.25
Jeff	4	3.25
Tom	3.6	2.00
Tori	3.9	1.40
Kari	3.7	1.00
Birch School Mean	3.8	2.44
Birch School SD	0.14	1.13
<u>Cedar Middle School</u>		
Holly	3.4	1.25
Donna	3.6	1.00
Kionna	3.9	1.60
Greg	3.7	1.50
Jana	4	3.25
Trine	4	3.50
Cedar School Mean	3.78	2
Cedar School SD	0.23	1.09

In turn, I was not able to determine the relationship between student cognitive engagement in the classroom and the level of observed AIW instructional practices. Hypothesis 1a stated that I expected teachers' AIW instructional practices would be associated with students' cognitive engagement. The evidence is not clear whether higher levels of teachers' AIW instructional practices were associated with higher levels of student cognitive engagement. Furthermore, it is also not clear whether lower levels of AIW instructional practices were associated with lower levels of student cognitive engagement. There were also two exceptions in which the teachers had lower levels of AIW instructional practices and higher levels of student cognitive engagement.

Given the findings for student cognitive engagement that did not clearly distinguish the teachers, I will focus on the differences between teachers with high and low-levels of enactment of AIW instruction in the classroom as measured by observation and scored using the AIW scoring rubric. For the further analysis in this study, I will refer to high and low-level teachers as teachers who had high and low levels of AIW instructional practices in the classroom. This will be used as a means to understand ways in which these teachers may differ in other regards, and potential avenues through which principals may support instructional improvement.

Teachers' Conceptions of Student Engagement

Teachers with high and low levels of AIW instructional practice differed in other ways. The next aspect of the research examined the ways in which teachers with high and low levels of AIW instructional practices compared and contrasted from each other. Specifically, research question 1b asks): *What are the ways in which teachers with different levels of AIW instructional practices conceive of student engagement?* In this section, I outline the findings on teachers' conceptions of what student engagement is and how to encourage student engagement through instruction.

Student Engagement as a Priority. According to teacher self-report on the survey, student engagement was rated as the factor that was most important to teachers when planning, delivering, and reflecting on instruction. Teachers were asked to rate the top three factors in order of importance regarding instruction. Three separate questions inquired about teachers' top priorities for each of three different aspects of instruction: planning, delivery, and reflection on the effectiveness of their instruction. In both schools, student engagement was rated as the most important priority out of 9 possible options. In addition to student engagement, other highly rated items included Common Core Standards, AIW, covering course material, and classroom

management. Figure 3 below shows a graph of the teachers' response to one of the questions, which focused on the most important factor during the delivery of instruction with the top 6 priorities.

The question stated: *Please respond to the following items in terms of your instruction. Teachers have to consider many things during their instruction; however, at the same time teachers have to choose among different priorities. I would like to know what is most important to you during instruction. Please mark your top three priorities. Give a 1 to your first priority, a 2 to your second priority, and a 3 to your third priority.* The questions were stated similarly for the two other questions focused on priorities when planning for instruction and reflection on the effectiveness of instruction. The graph reflects a total of 58 teachers' responses to the survey. The top six out of 9 priorities are included in the graph. Student engagement was the highest rated priority for all three questions by both teachers and administrators at both schools.

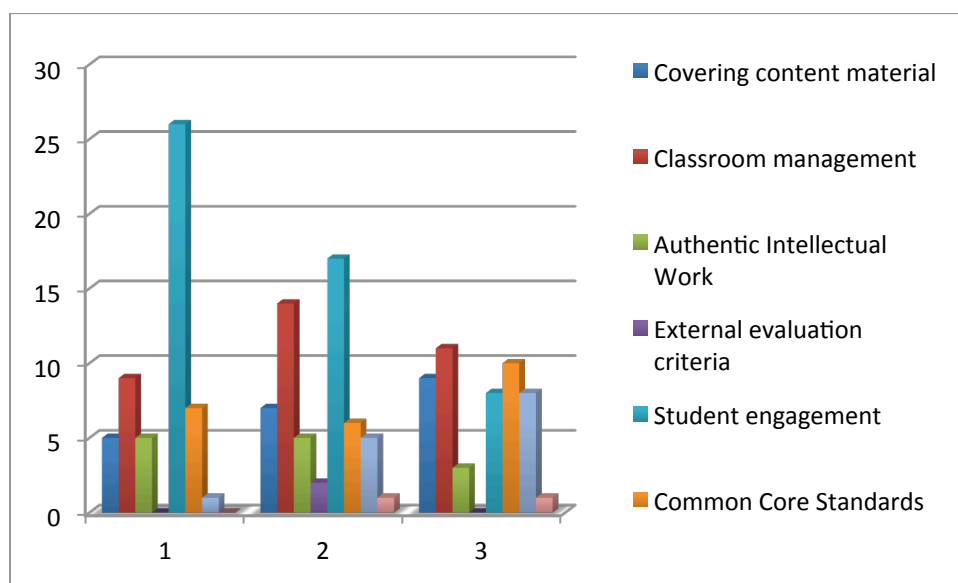


Figure 3. Teachers' top three priorities during instruction at Birch and Cedar Middle School in order of priority from one to three.

This finding indicates that student engagement is one of teachers' highest priorities regarding instruction. It is important to note that not all of the participants were teaching

English/Language Arts and mathematics, and therefore, we might not expect teachers of other subjects to make the CCSS a priority. Nonetheless, although there is some agreement among the teachers that engagement is important, teachers held different notions of what constituted student engagement and engaging instruction.

Conceptions of Student Engagement. There were qualitatively different ways in which teachers conceptualized student engagement and the ways in which these conceptions were related to teachers' levels of enactment of authentic instruction in the classroom. The findings indicate that teachers with high and low levels of AIW instructional practices conceptualized student cognitive engagement differently according to two primary categories. These two broad categories characterized the differences in teachers' understanding regarding student engagement. In this section, I discuss these categories, and provide evidence to support these differences. Then, I further outline the association between the categories of how teachers conceptualized student engagement, and their instructional practices in the classroom.

There were two primary categories that described teachers' conceptions of engagement. In many ways, these categories reflected aspects of the student engagement dimensions discussed in the literature review: behavioral, psychological, and cognitive engagement. Although the teachers' descriptions included more detail and nuance, they captured some similar understandings of the nature of engagement. Some teachers focused on one conception of engagement, while a few teachers seemed to have combined notions of engagement, or notions of engagement that did not fit into the two main categories. These exceptions to the pattern are further discussed below.

Engagement as Activity, Excitement, and Interest. In the first category, engagement as activity, excitement, and interest, teachers reported they conceptualized student engagement as instances of being excited, interested, or involved in an activity. These descriptions included

participation in classroom activities, interest in completing work, and excitement about learning. This understanding was similar to definitions of behavioral and psychological engagement presented in the literature review. Teachers described the need to keep students busy, to monitor their completion of tasks, and to look for external indicators of their engagement. A total of 4 of the 6 focal teachers with low levels of AIW instructional practice conceptualized engagement as activity, excitement, or interest.

Tori, one focal teacher with low levels of AIW instructional practice described her conception of engagement in the following way: “You can’t really lecture anymore because these kids—this kind of group, they need to do something with their hands and so constantly every day, coming up with something that’s going to hold their interest.” Tori described the need keep the students busy and the notion that she is responsible for creating lessons to “hold their interest.” In this way, she emphasized the importance of her work to occupy the students, so they have something to “do with their hands.” In this conceptualization, Tori viewed student engagement as involvement in the activity and interest.

In responding to a question about her highest priority, the Tori further explained, “Highest priority is engagement, to have something for them to physically do, or to make sure that they’re not tuned out.” This example demonstrates that Tori values engagement and deems it her highest priority; however, her description helps to clarify what she means by the term engagement. She explains her conception of engagement is to keep the students occupied and have something for the students to “physically do,” so they are not “tuned out.” Another low AIW instructional level teacher, Holly, described a similar conception of student engagement based on behavioral indicators including students’ willingness and ability to do the work presented to them: “I’ve only heard “I don’t get it” a few times, but, not very often. It’s not – so, I feel like, when students feel like they can do it and they’re ready and willing to do it, then

they're engaged in whatever it is." In this instance, the Holly perceived engagement as student activity, involvement, and willingness to participate in the lesson.

In addition to notions of activity and interest, this category of engagement included another dimension of interest and activity, teachers' perceptions of excitement about the activity. Kari, also a low-level AIW instructional practice teacher, described her experience with student engagement: "I think the student engagement, they can be working but are they really excited to be working. And I think if they're exciting and if they're excited about what you're doing they are engaged." Student excitement was described as particularly important and a key indicator of student engagement. Kari focused on participation in the activity and the importance of students' excitement.

In speaking about whether students became more engaged in response to AIW instruction, Tori reported, "They get more excited, I noticed when they... they got to bring in a Frappuccino, some of the groups, I mean they're pretty pumped they got to light potato chips on fire! So, they are definitely more engaged, definitely more excited." She described the students' excitement in the activity and that the students were more engaged, indicating that students' level of excitement is a way she perceives and comprehends student engagement. In addition, Tori provided examples from her practices that reflect her notion of student engagement.

Two teachers that were below, but closest to the school average for AIW instruction, were interesting exceptions to the pattern. While they also provided examples of engagement as thinking, their descriptions were more theoretical in nature and lacked concrete examples from practice. Both Tom and Kionna were able to theoretically describe the importance of student thinking, but they did not discuss applications to their teaching practice. These two low AIW teachers shared about the value of student intellectual work, but did not provide examples from the classroom. These two teachers seemed to be emerging AIW teachers, with developing

conceptions of student engagement as thinking and student understanding, yet with less competence in integrating these notions into their instruction.

Engagement as Thinking and Student Understanding. The second category, engagement as thinking and student understanding, included aspects of cognitive engagement and levels of academic challenge. While teachers in the previous category mentioned active participation and excitement, the focus for these teachers was on students' conceptual understanding, their effort to engage in intellectual work, and the development of student thinking. Teachers shared their expectations and experiences with lessons that required students to construct new knowledge, collaborate and problem solve, and articulate their ideas. Primarily, teachers with high levels of AIW instructional practice conceptualized engagement as thinking and student understanding.

Emphasizing this intellectual effort, Dan, a teacher with a high level AIW instruction explained,

Okay, engagement would be everyone thinking and everyone doing something. Whether it's talking to a neighbor about a problem, or writing, or calculating... but it's doing something that's taking effort. So it doesn't necessarily have to be like filling a worksheet out, but if they are trying to figure out a pattern or make a prediction of what's going to happen next, then that's engagement.

Dan emphasized student thinking in his description of engagement. Although he also emphasized doing something, he characterizes this by different forms of thinking such as figuring out a pattern or making a prediction. In this way, he demonstrated the variability of his conception of engagement, and the flexibility in his understanding of how different students may demonstrate thinking in different ways.

Another high-level scoring teacher, Lila, further described her understanding of student engagement as different forms of student thinking and understanding about the class material:

So engagement to me can look as far off left field as why is this happening or I saw this last night on TV and so it's that connection that they're making. But in the same respect, it can also be them laughing or taking notes. I love it when I see my kids focused, but I also know what I was like when I was in middle school. I could fake focus like nobody's business. So I think it's more about those discussions that we have, those questions that come up and whenever I have a class that gets off-topic, but it's not really off topic, it's just, it's that enthusiasm that they have regarding the content that we're learning about but they're putting in their own ideas. We do this thing with the last couple of minutes of class... we do the what-if game. Any time my what-if questions are about what we've been learning about, I know that I got the kids hooked. That they're interested in knowing more about what we're studying in class.

Lila perceived student engagement as a wide range of daily interactions in the classroom in which the students ask questions, contemplate the material, and demonstrate engagement through the connections they make in their thinking. She described how her notion of student engagement has changed over time from ideas about lessons being fun to students thinking about the lesson. Lila also provides concrete examples from her teaching to describe how her conception of engagement relates to her instruction in the classroom. Although she did mention enthusiasm, it is in direct relation to her descriptions of thinking and making connections.

Jana also described her understanding of engagement as thinking, "I've seen them engaged in these problems and these kids were so engaged in these silly swim problems, they were engaged because it was challenging. So, I'm thinking, in my experience for math anyways, if it's challenging but yet attainable with a little bit of thinking." This explanation demonstrates an understanding that engagement involves challenge and intellectual work. Yet, she highlights that the challenge must be attainable: "So if they're not doing something I'm thinking it's either boring or it's too hard." This understanding illustrates the notion that challenging work must be suited to the ability level of the child so they have the skills to engage in the task. Jana describes nuances to her understanding of engagement and specific examples from her teaching to elucidate the connection between her notion of engagement and her teaching.

The role of student thinking and the different ways student thinking may look in the classroom was further emphasized by another high-level of AIW teacher, Trine, in her definition of engagement:

I would say that if they're – if students are thinking – that's huge, they might not be... somebody might be sitting there quiet in the classroom, but if they're thinking, and then I think they also just – as long as there's a way that they can express whatever it is. Maybe it could be writing it down, it could be sharing it out loud, it could be, something I think that's really important that, you have – if you want to prove you're engaging kids and you can prove that they've been thinking and that there's some that they have a chance to then take what their thoughts are and get it out somehow. And that could look a lot of different ways.

This description highlights the importance of students' thinking and the articulation of their understanding. The focus is on student thinking, and then multiple ways students may demonstrate or express their understanding. Trine went on to explain her task as a teacher: "It took me a while in education to realize that a big part of what we're teaching kids especially, you know, at sixth grade, it seems like it's just learning how to be thinkers." Representative of the thinking and student understanding category, Trine described the central aspect of her work is to teach students to learn how to think.

This view of engagement was consistent throughout these teachers' description of other aspects of their teaching. In one example, Dan further emphasized the importance of student thinking and understanding in describing his highest priority as a teacher: "Quality thoughts. I think I just want the kids to have quality thoughts. Sometimes not even getting it, not even creating it on their own, but taking pieces of what other kids are saying and then making it their own. I just want quality thinking." Dan demonstrated complexity in his thinking about engagement and described his understanding that the students may not "get it" or even create it on their own, but that there are different ways to demonstrate they are engaged in thinking and developing their own understanding.

How to Cultivate Engagement as Activity or Interest. In accordance with the two different categories about *what* teachers perceived and comprehended student engagement to be, there were two corresponding categories of *how* teachers described they promoted student engagement in the classroom: 1) Creating activity or excitement and 2) Facilitating student thinking and demonstrations of student understanding. The first how category of student engagement, Creating activity or excitement, was characterized by teachers' description of practices that create activity to occupy students, stimulate excitement, or elicit interest. In this category, the instructional practice was primarily teacher led and the teacher was primarily responsible for producing a desired behavior or affect in the students.

In the following section, Tori described indicators of needing to create more activity and how she cultivated activity through various ways of getting the students out of their seats.

...If I scan the room and I see eyeballs starting to glaze I know they have to get out of their seat. Today they're in their seat the whole day but, well, they were pretty active but, you know, if I'm going over something and I want them to get more engaged then I'm going to put them into groups and they discuss it or they do it together or, you know, every day I have an activity, you know, usually for them. Even if it's just little matching cards, just to get them out of their seats for 90 minutes, I mean I couldn't sit for 90 minutes. I'll throw in a video clip, usually from YouTube cause they are about 2 minutes and that way they're not only getting an auditory but they're also going to be visually seeing it. Usually I have some type of writing involved just because I don't do homework but I want them to.... write it down, I'm just that way though, I have to write everything down. But usually everyday there's some type of activity.

In this example, Tori said "eyeballs starting to glaze" is an indicator she uses to know the students need more activity. She looks for ways to "get the students out of their seat." Various ways of engaging students are described such as working together or in groups, matching cards, a video, or writing; yet, the intention of keeping the students physically active is emphasized in all of the activities listed. She mentioned several different forms of activity and provides specific examples from her practice, yet she does not emphasize the cognitive aspects of the students' activity.

Kari also explained she makes instructional decisions to cultivate engagement based on topics that are exciting to the students: “The principal said that they were all engaged, and I’m like, well it’s choosing things that you know they’re excited about. They like shopping, they like sports, so if they love shopping and sports they get more excited about it, but what’s going to draw their attention and hold their attention so they’re not realizing that the work they are doing is actually math. For students, learning experiences were chosen based on what would be exciting and interesting for students.

These teachers focused on making learning more exciting for students, over constructing knowledge, disciplined inquiry, or producing discourse, performance, or products that have value beyond school. Kari further explained: “I wanted to find a project that would kind of show something that they are going to have to do in the real world but would get them excited about it. Even as teachers who described engagement in this category were striving to develop more ambitious instructional practice, to make learning more relevant for students, it seemed that excitement was seen as a gateway for engagement, which in some cases became an obstacle for creating rigorous learning experiences. In these instances, teachers’ focus on students’ level of excitement and activity came at the price of promoting deeper levels of authentic intellectual work and cognitive engagement. For example, Tori explained that she does not focus on one of the aspects of authentic instruction, elaborated communication; because she would rather have the students do something “hands on.” “Yeah. Elaborated communication, I don’t do that enough because, you know, I’d rather have them do something hands-on. I don’t really have them explain in great detail what they know. And that’s something where I fall short.

In another instance, Holly evaluated her instruction based on students’ participation in the lesson and the extent to which they were able to do the work: “I think that I feel like my lesson worked... if it’s something that the students are like ‘Okay.’ They’ll start on right away instead

of looking like “I don’t get it. This conception of engagement focuses on students’ ability to be involved in the activity, rather than on working through material that they may not understand. The emphasis on the students’ positive response to the class material was also evident in Holly’s other descriptions of factors that influenced her instruction and AIW in the classroom.

How to Cultivate Cognitive Engagement. The second how category of student engagement was facilitating student thinking and demonstrations of student understanding. The teachers’ role in this category was about fostering, challenging, and providing opportunities for student thinking and articulation of their ideas. Rather than producing a specific result in students’ behavior, these teachers focused on the process and student development of their capacity. Dan described his experience with challenging students and promoting articulation of their ideas:

Its been great, with the math that we do it’s a lot of problem based so already it’s really rich in that student task and construction of knowledge, and it’s been that way since we’ve been using it. But what I’ve noticed is that when I’m asking kids to do for explanation like verbally or on paper I’m asking for a lot more, like more in-depth instead of just, ‘Hey, you answered it. Cool, lets move on.’ It was, ‘Why did you answer it like that?’

In this conception of engagement, it is evident that Dan views his role as a facilitator to promote students’ ability to think about the material and explain their understanding.

Lila describes her efforts to scaffold and build in elements of communication to develop students’ level of reflection and inquiry with the material: “You can tell that it’s really triggered them when they’re still carrying on a conversation after the whole thing. I had kids come back to me two weeks later and say, remember when we were talking about this? I was thinking about that the other night and I wanted to know more.” Lila described her collaboration with other teachers to develop her lessons to meet the diverse needs and abilities of her students to promote higher levels of intellectual work and student understanding. In addition, Jill explained that the work presented to the student needs to meet their ability level in such a way that it is challenging,

but they are capable to meet the challenge: “I think it’s more of they feel like, maybe I can do this if it’s challenging enough. They need that balance, challenged enough but attainable.”

In another instance, Trine described that instructional practices focused on intellectual work led to higher levels of engagement. She explained that students relate to themselves and others in accordance with the expectation of higher order thinking: “They know that they’re capable of thinking deeply and that people are going to expect them to do that. And then I think they’re just, you know, they’re more just in tune of what’s going on and I think they – you just see a lot better work because of that.” Rather than being content with the day’s lesson, Trine expressed her desire to challenge the students to think about the larger question driving their work: “They’re excited about their topics, but I think – you know, I have some reflection to do as far as like how do I, you know, we get them to really be thinking about their guiding questions.” This demonstrates Trine’s focus on student thinking and understanding as she ponders how to promote these capacities in her students.

Teachers’ Conceptions and Instructional Practices

Overall, teachers who tended to have higher levels of enactment of AIW instructional practices also tended to define student engagement as *thinking and student understanding*. It is not clear whether these teachers already held views that were similar with the AIW framework, and therefore, were more successful at implementing the framework, or whether they became more successful through professional development, collegial support, and experience and changed their view in accordance with the reform initiative.

Alternatively, many teachers who had lower levels of AIW instruction in their classroom practice conceptualized engagement as *activity, excitement, or interest*. The findings from this study indicate the teachers’ conception of engagement and the AIW instruction they provided in the classroom were associated with one another. There were a few cases that differed from the

pattern. Two teachers seemed to have more mixed conceptions of engagement in which they mentioned a mix of different notions, or focused on other aspects of engagement such as behavioral participation. The teachers and their conception of engagement, listed as Activity/Interest or Thinking/Understanding to represent the first and second categories, or another category, as well as each teachers' level of AIW instruction is presented in Table 7 below.

Table 7. Birch and Cedar Middle School Focal Teachers' Conceptions of Student Engagement and AIW Classroom Observation Score

Teacher	Conception of Student Engagement	Level of AIW Instruction (teacher mean = 2.4)
<u>Birch Middle School</u>		
Kari	Activity/Interest	Low (1.00)
Tori	Activity/Interest	Low (1.40)
Tom	Mixed	Low (2.00)
Jeff	Thinking/Understanding	High (3.25)
Dan	Thinking/Understanding	High (3.25)
Lila	Thinking/Understanding	High (3.75)
<u>Cedar Middle School</u>		
Holly	Activity/Interest	Low (1.25)
Donna	Other	Low (1.00)
Greg	Mixed	Low (1.40)
Kionna	Thinking/Feeling	Low (1.60)
Jana	Thinking/Understanding	High (3.25)
Trine	Thinking/Understanding	High (3.50)

Summary

In the first part of this chapter, I presented both teachers' levels of AIW instructional practice as well as teachers' levels of student cognitive engagement in the classroom. Overall, the teachers in both schools differed in their levels of AIW instructional practice. There were teachers with both high and low levels of AIW instruction, as well as two teachers that were

closer to the mean and at a medium-low level of AIW instruction. In regards to the student cognitive engagement score for each teacher, it was difficult to distinguish between teachers' levels of student cognitive engagement because many teachers differed by only 0.1 in their student cognitive engagement scores. Therefore, I did not determine whether or not there was a relationship between a teachers' level of AIW instruction and the level of student cognitive engagement in the class.

A few of the somewhat divergent cases warrant some discussion. For example, Tori scored a 3.9 for student cognitive engagement, but a 1.4 for her AIW classroom observation score, and the interview data reveals she defined engagement as activity, excitement, and interest. Similarly, Kionna scored a 3.7 for her student cognitive engagement score, yet she scored a 1.0 for her AIW classroom observation score. There are a few possible explanations for why some teachers with high student cognitive engagement scores were rated low on the AIW Classroom Observation. The first is the potential for measurement error, which is further discussed below.

In the research literature, there are currently many different ways to conceptualize and study student cognitive engagement. A recent review listed 21 different instruments for measuring student engagement (Fredericks & McColskey, 2011). One challenge that researchers and practitioners face in measuring student engagement is identifying the appropriate and available measure for different dimensions of student engagement. Instruments for measuring student engagement are based in different disciplinary fields, with different conceptual frameworks, and are not easily compared. One critical challenge for the field is to identify consistent measures for different dimensions of engagement, across different educational levels, and in some cases, in different educational contexts.

Given this challenge, my measures were limited. Further inquiry is needed to create validated measures that are used across the field of education to examine aspects of student engagement, including the different dimensions of engagement when measured separately. I gathered my items from two different existing student engagement measures, and specifically focused on student cognitive engagement. Nonetheless, there are many items used to measure student cognitive engagement, and perhaps my findings would indicate greater variance with items that were better suited to capture cognitive engagement of middle school students.

It is also possible that the language used for the items and the likert-scale did not allow for an accurate measure of student cognitive engagement. Rewording the items, and conducting further pilot studies with middle school students could help inform the development of a more accurate measure. It is possible there was measurement error in the survey due to the selection of items, the phrasing, or the scale of measurement. In addition, perhaps the sample size was too small, which contributed to the little variation seen among the teachers. A replicated study with a bigger sample of students would allow me to collect more data to determine whether this was the case.

Another possibility is the potential for bias in the survey responses. Some of the students may have responded with what they thought the researcher or teacher wanted to hear. Particularly in the classroom setting, the students could perceive a strong influence to provide socially desirable responses. An extension of this is the potential for students to have inaccurate self-perception, especially for some of the items that required metacognition or self-regulation. Some of these items involve skills that students might have not developed. This presents a challenge, as observation alone does not provide complete understanding of student cognitive engagement since this aspect is largely internal. Future inquiries into student engagement would benefit from involving students and providing them with an understanding of cognitive

engagement. In addition, it would be beneficial for both research and practice to support students to distinguish their metacognitive processes.

Time is another important limitation in the student survey data. The information was collected at one time point, and a variety of factors could have contributed to how students responded that day. Ideally, a series of measures, like the Experience Sampling Method (Hektner, Schmidt, Csikszentmihalyi, 2007), would be used to determine students' cognitive engagement at different time points over the day, and for an extended period of time. And finally, it is also possible that there are other factors that were not accounted for in this study that could be influencing the level of student cognitive engagement in the teacher's classes. All of these limitations have important implications for policy as increasing attention is being placed on student engagement in schools. Caution and consideration should be taken before such measures are used in teacher, school, and administrator evaluations. While it is important to include students' perspectives about their learning experiences, it is also critical to take great care in how this information is gathered and interpreted, as results in this study illustrate.

Given these potential limitations of the measurement of student engagement, there are also other possible explanations for why Tori and Kionna scored low on their AIW classroom observation, but high on student cognitive engagement, and defined engagement as activity, interest and excitement. First, it is possible the theory that greater focus on student thinking leads to greater student cognitive engagement could be incorrect. Perhaps greater emphasis on student thinking and understanding poses challenges to students, and they in turn choose to disengage, particularly if the challenge is much greater than their ability level. Tori and Kionna may have provided fun, exciting, activities that the students enjoyed, and in turn found themselves deeply interested and engaged in the work. This points to the multidimensional nature of engagement, and the importance of the affective, cognitive, and emotional domain. Perhaps students enjoyed

the games and rewards in the class, and responded highly to the survey items based on these other positive associations, and the experience of being emotionally or behaviorally engaged. Another potential explanation is that the teachers enact higher levels of AIW instruction, yet on the observation days they focused on other aspects of the curriculum.

I also presented the findings from an examination of teachers' conceptions of student engagement. Specifically, I discuss the qualitatively different ways teachers experience, conceptualize, and understand student engagement phenomena in the classroom context. Evidence from the data indicates some variation in teachers' conception of student engagement were associated with differences in their delivery of instruction. The results show that while some teachers held conceptions focused on student understanding and cognitive engagement, other teachers emphasized students' affective experiences and aspects of behavioral engagement. The findings suggest that conceptions of student engagement are associated with teachers' implementation of authentic instruction intended to promote students' quality intellectual work.

In further analysis in this study, I focus on high and low level teachers based on their AIW instruction score as a means to understand potential differences among the teachers, and potentially inform our understanding of promoting instruction for engaging students as well. In addition, I use both the terms authentic instruction and AIW instruction to refer to teachers' instruction that promoted authentic intellectual work for students as described by the AIW framework. In the next chapter I further explore aspects of principal leadership that seemed to enhance and/or hinder the development of teachers' authentic instruction.

CHAPTER 5: PRINCIPAL LEADERSHIP FOR INSTRUCTIONAL IMPROVEMENT

Coherence, Community, and Culture for Teacher Learning

Given that teachers in this study demonstrated different levels of AIW instructional practice and student cognitive engagement in the classroom as well as different conceptions of student engagement, I next sought to understand other factors that may influence their learning experiences and enactment of instruction in the classroom. In the conceptual framework, I assert that principals can influence instructional practice and student engagement through professional development and aspects of teacher professional community because they have the potential to promote a supportive context for shared understanding, critical inquiry, and teacher learning. In this part of the analysis, I examine dimensions of principal leadership in relation to teachers' instructional practice. The second research question inquires: 2) *What are the ways in which principal leadership seem to influence teacher learning in AIW PD, and enactment of AIW instruction?* In answering this question, I present 3 dimensions of principals' actions and behaviors that seem to influence teachers' learning and AIW instruction: the extent to which the principal set up and supported PD coherence, the ways in which the principal did or did not promote aspects of teacher professional community, and whether the principal fostered risk taking and a growth mindset in the school.

I outline these dimensions of principal leadership, which emerged from the quantitative and qualitative data, as being collectively important for teacher learning in PD. I argue that the dimensions do not simply exist or not exist in a given school. Rather, they are interconnected and there are variations in how the principal may promote the different dimensions. In turn, different forms of implementation can promote teacher learning and enactment of ambitious instruction more than others.

In this study, several principal characteristics supported teacher learning regarding AIW PD and enactment of AIW instructional practices in the classroom. While some of the teachers benefitted from the PD experience, others had less beneficial experiences. In this chapter, I first outline the extent to which the two principals set up and supported coherent PD in the schools. Next, I detail principal actions and behaviors that led or did not lead to shared goals, collaboration, and teacher input in decision making. Then, I examine the ways in which the principal did or did not cultivate a growth mindset among the teachers in the school. Finally, I present differences in how high and low-level teachers perceived principal leadership in relation to their experiences in PD.

Up to this point, the analysis has focused on all of the teachers across the two schools. In this chapter, I focus on principal leadership in the two schools separately. This approach provides the opportunity to present the data in a case specific format for each of the schools. Although there were many similarities between the two schools, there were also important differences in principal leadership and teachers' professional development. In both schools, there were aspects of high instructional leadership and high levels of AIW instructional practice. At the same time, there were also instances of low AIW instructional practices and teacher reports of their needs for greater principal support and involvement. This study points to ways in which teachers benefitted from specific principal actions and behaviors as well as ways in which more teachers could be supported, and how principal leadership may have supported their learning in the complex context of the school.

Conceptualization of Leadership. With a focus on school leadership relations between principals and teachers, I examine the potential of their active collaboration around instructional matters to enhance instructional practice. My analysis is grounded in the instructional leadership conception of leadership. Based on evidence from several reviews of educational leadership

literature, Hallinger (2005) defines three core characteristics of the instructional leadership role of the principal: *Defining the School's Mission, Managing the Instructional Program, and Promoting a Positive School Learning Climate*. These core aspects include 10 instructional leadership functions. *Framing and communicating the school's goals* are part of the principal's work in *Defining the School's Mission*. *Supervising and evaluating instruction, coordinating curriculum, and monitoring student progress* are functions of *Managing the Instructional Program*. *Promoting a Positive School Climate* includes the following functions: *Protecting Instructional Time, Promoting Professional Development, Maintaining High Visibility, Providing Incentives for Teachers, Developing High Expectations and Standards, and Providing Incentives for Learning*.

This aspect of instructional leadership is broader than the others and includes the notion that instructionally effective schools promote “academic press” by setting high standards and expectations for students and teachers. In addition, effective schools are based on a culture of continuous improvement and the principal promotes a school culture of continuous improvement of teaching and learning by modeling values and practices. Hallinger's review of research indicates that instructional leadership had a substantial influence on school performance as measured by the quality of its pedagogy and the achievement of its students (2005). In addition, in a seminal review of the literature on principal effects, Hallinger and Heck (1996) argue it is essential to address the school context in the study of principal leadership.

With this frame of understanding principal leadership, I examine the influence of the principal on teacher learning and argue that a focus on creating a coherent learning environment, aspects of teacher professional community, and failure as a part of learning are crucial, often ignored, mechanisms that generate an environment and conditions conducive to the development of teacher capacity to advantageously respond to ambitious instructional reform. In this chapter, I

present qualitative data from the focal teacher and administrator interviews as well as the observations of the PD sessions to understand the nature of these relationships as well as specific instances of how principal actions and behaviors may influence teacher learning and instructional practice in the different school contexts. I explore principal and teacher perceptions of the coherent PD learning experiences and the relationship with teachers' AIW instructional practices in the next section.

Professional Development Coherence

A key issue was the extent to which the principal set up and supported PD coherence at the school. Research on Chicago public schools demonstrated that schools with stronger program coherence made stronger gains in student achievement (Newmann, Smith, Allensworth, & Bryk, 2001). Instructional program coherence has been characterized by three conditions, 1) A common instructional framework guides curriculum, teaching, assessment, and learning climate; 2) Organizational conditions support the implementation of the framework; and 3) Resources are allocated to advance the school's common instructional framework. In this study I focus on coherent aspects associated with professional development and teacher learning. This includes the extent to which there is a coherent school improvement strategy over time, professional development in the school aligns with a common instructional framework and evaluation, and whether there are competing demands among the different reform initiatives.

According to my data, principal leadership prioritized a coherent PD focus for teachers. The principals described that they designed, planned, and implemented coherent PD experiences to ensure that teachers were able to focus on coherent learning experiences to improve their instruction. In addition, the principals described how they buffered teachers from external demands and filtered out unnecessary influences on teachers. Based on the actions and behaviors modeled by the principal, teacher leaders also helped to frame the initiative in ways that helped

teachers make connections among the different reforms. From the teachers' perspective, they reported a consistent focus for the school improvement strategy and connections among the three different reform initiatives at the school. There were varying reports on the use of evaluation tools that were reflective of the AIW framework. Some teachers also commented on the impact of a lack of PD coherence. These different aspects of principal leadership regarding PD coherence at each school are further explained below.

PD Coherence at Birch Middle School. The principal at Birch Middle School, David Grand, has been there for the past 10 years. He described the school as a place where teachers can take risks and learn together. The school began implementing the AIW initiative with a small cohort of teachers in the fall of the 2012-2013 school year, with complete staff participation by the end of that school year. Grand became principal in 2003 after several years teaching middle school social studies, coaching, and working as an assistant principal. After another administrator encouraged him to get his administrative license, he returned to school and then was recruited to Birch Middle School. He described his most formative influence as a professor who focused on key capacities that she wanted to develop in each individual. Grand stated his primary focus was on the Birch school mission: developing each child's learning potential in a caring environment.

Grand took specific actions to set up and promote coherent PD at Birch. First, he was committed to school-wide implementation of AIW and he structured sustained time for AIW professional development, as well as time for the two other initiatives at the school. He put a plan in place in which teachers would take on leadership roles for the three different initiatives in the school, and then gradually all teachers in the school would participate in the initiatives. In addition, he ensured that the initiatives would be implemented over several years in the school, and that there would be dedicated time for teachers to meet for professional development. This

ensured that all teachers in the school were involved in common professional development experience with dedicated time to participate in the PD.

He also ensured a gradual scale up and the development of local expertise in the building. He did this by selecting a small cohort of teachers to be anchors or instructional leaders for the AIW initiatives in the school. These teachers received several sessions of initial training with a district coach of the initiative. Once the cohort of teachers were trained, they then served as facilitators for the collaborative learning communities in which they modeled the scoring session process for reflecting on teacher instructional tasks and student work. In this way, the team of teachers developed their expertise and was then able to facilitate a team of teachers in the reflective process of engaging in meaningful conversation about their teaching and student learning based on the AIW framework.

In addition, Mr. Grand developed his own expertise in AIW. He read the AIW materials, attended trainings, and participated in the PD sessions. This afforded him the ability to provide direction and feedback to teachers based on tenets of AIW. His knowledge also enabled him to coordinate a common school improvement strategy with the other initiatives and to incorporate aspects of AIW into the school SMART Goals based on his comprehensive understanding of the reform. In addition, Grand attended teachers' PD collaborative learning meetings which further informed him of teachers' experiences with enacting aspects of the initiative in their classrooms. He also met with the district and AIW regional coaches to better understand the implementation process in the school, reflect on teachers' progress, and to collaborate on the plan to best support teachers' future development.

Another way that Grand promoted PD coherence was he limited external influences to ensure a focus on three select reforms in the school. He described the different strengths that each initiative provided for teachers: AIW emphasized students' quality intellectual work,

Assessment for Learning supported teachers' assessment, and 21st Century Skills promoted technology use and higher order thinking skills in the classroom. Grand framed these initiatives as facets of an integrated approach to instruction. He also communicated this to the teacher leaders so that they could frame the initiatives in the same way for teachers in the school. He ensured that those programs continued over several years, and did not allow new programs to be introduced during that time. Grand described how he buffered teachers against other potentially conflicting demands from external influences. These actions helped to provide a coherent learning environment for teachers in which they could focus on specific aspects of their instruction outlined by the three initiatives.

Although Grand took many steps to promote PD coherence, there also may have been some tradeoffs to his framing of the connections between the reforms. It seemed that some teachers spoke about how the reforms all said the same things. In this way, while teachers were able to see connections among the different initiatives, it may have also contributed to superficial understanding, or a tendency toward oversimplification and the interpretation that something was similar to what the teacher already knew, rather than the teacher being involved in the process of developing deep understanding about the similarities and differences of the reforms, and the intricacies of what full implementation with fidelity may entail. It seems that an approach of framing PD initiatives as similar to promote PD coherence, without also explicating the differences and nuances may detract from teachers' potential to engage in deep and meaningful learning about the reform and the development of new approaches to their instruction.

PD Coherence at Cedar Middle School. The case of Cedar Middle School illustrates the importance of understanding school context in examining the role of the school principal. Steve Miller had served as the principal at Cedar Middle School for the past 8 years. In his 39 years of experience as an educator, he had been in the classroom for 19 years as a middle and

elementary school teacher and then a coach. He also had filled several administrative roles in his over 17 years of experience as a middle and elementary school principal. Miller described Cedar as a place where teachers were empowered to be leaders, and everyone learned. Miller described his beliefs about shared and distributed leadership and his priorities for teacher empowerment at the school. He talked about how he was willing and able to make the decision when needed, but that he believed the power was in the people, the classrooms, and other places. When asked what his highest priority as a principal was, Miller responded, “The development of those that work within the school. That’s my number one priority.”

These beliefs seemed to shape Miller’s approach to leadership. Although he worked to promote coherent PD, he seemed to take a different approach as compared to Grand. He did not describe the same level of involvement or the processes and structures regarding PD implementation. He believed it was important for people to feel valued, to feel important, and to feel that they were doing significant work and making a difference. In describing his ultimate mission for the school he said it is important that: “kids make growth and you want it to be a warm and inviting place, where kids feel safe and comfortable and adults feel valued, and that their work is meaningful.” In this description, he seemed to focus on the school culture, and socio-emotional aspects of teaching.

Although Miller also supported school-wide PD coherence at Cedar, he provided fewer descriptions of the process. He promoted school-wide implementation of AIW as well as the two other professional development initiatives at the school. Miller structured sustained opportunities for the teachers to meet in cooperative learning communities throughout the school year, however his attendance at these meetings was inconsistent. The two primary forums for collaborative work focused on AIW included grade-level teams and whole-staff meetings. Miller seemed to support the AIW professional development at the school through empowering the

teachers and others in the school. He was aware of the programs, and communicated with the individuals responsible for the implementation, but Miller seemed to allow the teachers and the instructional coach to take more ownership for the process. His actions reflected aspects of a shared style of leadership in which he empowered leaders in the building.

Miller also ensured a gradual scale up and the development of local expertise in the building. A small cohort of teachers was selected to be anchors or instructional leaders for the AIW initiatives in the school. These teachers developed their expertise through initial training with an AIW district coach. The cohort of teachers then served as facilitators for the collaborative learning communities and guided the scoring session process for teachers to reflect on instructional tasks and student work. The initial cohort of teachers developed their expertise and supported other teachers to reflect on their instruction and to engage in conversations regarding their practice and the AIW framework.

Although Miller's principal leadership was similar to Grand's principal leadership in this regard, some of the anchors at Cedar seemed to take less ownership of the facilitation and scoring process. It seemed that Miller communicated differently to the teachers, was inconsistent in his attendance at the meetings, and handed more of the responsibility over to teachers. In turn, some of the PD groups took on the self-direction and followed the protocol while others experienced challenges in their AIW PD scoring sessions. Many teachers were actively involved in the process of reflection and revision of their instructional practice, yet there seemed to be challenges and limitations that the various groups experience. There were a few teachers at the school who were invested and committed to the initiative, many teachers who were advocates of the approach, and saw the value but seemed less proficient in their implementation, and other teachers who seemed to experience their PD learning as a series of events that needed to be completed.

In terms of developing his own expertise in AIW, Miller was aware of the AIW framework and had attended the initial training. Miller described his additional training but did not speak about incorporating aspects of AIW into the school plan and goals. Miller attended some teachers' PD collaborative learning meetings and shared about working to address conflicts and lack of productivity those teachers described regarding some scoring sessions.

Leadership for Instructional Improvement. These principal actions and behaviors possibly affected teachers' levels of AIW instruction. When both principals promoted PD coherence through school-wide implementation of the AIW initiative, they supported coherent learning experiences for teachers and promoted teachers' shared knowledge about instructional improvement. Principal leadership to provide time for sustained focus over several years on specific PD initiatives at the schools allowed teachers to focus deeply on problems of practice over time in a situated learning environment. Both principals provided opportunities for teachers to become leaders of the reform and to frame a coherent PD experience for other teachers. This provided local expertise for the situated learning to occur in the teams with guidance and direction from the AIW anchor. Although the two principals had different approaches in terms of their involvement with the PD and the teams, the structures in place provided opportunities for teachers to focus on the three initiatives.

At Birch, Grand's selection of teachers to be instructional leaders was associated with high levels of AIW instructional practice. Two of the three high-level teachers in the school were AIW anchors. These teachers seemed to echo the principal's messages of coherence to other teachers on their teams and in the school. They also expressed positive, coherent experiences with AIW PD and actively participated as instructional leaders in the school regarding AIW. Other teachers who seemed to be less invested in the reform still reported a commitment to understanding and implementing aspects of AIW. These teachers also described a sense of

coherence in their PD experiences. It seemed that Grand's leadership provided the opportunity for a range of teachers with different perspectives on the AIW initiatives to become involved and to benefit in some way from the AIW PD. Teachers at various levels of practice described coherence they experienced and described ways they were implementing AIW into their practice. Nonetheless, there was still mention of the myriad of demands teachers had to attend to, despite the principal's efforts. In addition, some teachers did not perceive coherence in the PD, while others perceived the reforms to all say the same thing essentially.

In contrast, while Miller followed the similar structure to have teacher leaders perform as AIW anchors, there was not the same association between high-level AIW teachers who participated in the study, and the role of AIW anchor. The two high-level AIW teachers observed in the school were not AIW anchors. Miller's selection of the teacher leaders as anchors may have been made on some other criteria, or perhaps the high-level teachers who were also anchors did not participate in the study. While there were descriptions of some challenges in the AIW sessions, the meetings seemed to follow a clear format and to meet the guidelines outlined by the AIW framework. Many of the PD sessions followed the protocol and teachers were prepared with teacher tasks and student work.

It is difficult to ascertain whether teachers in one school benefitted from a more coherent learning experience than teachers in the other school. Both principals demonstrated aspects and behaviors that contributed to the dimension of PD coherence. However, Grand seemed to promote coherent learning experiences with AIW at Birch in a way that enabled a wide range of teachers to participate in the lesson scoring and revision process, and to experiment with implementing the AIW standards in the classroom. Teachers described a number of ways in which their learning was enhanced through AIW and ways in which Grand's principal leadership of their PD made a difference in their learning. While teachers at Cedar had greater

independence and freedom, Miller promoted coherent learning experiences that allowed the teachers to participate in the PD sessions in a way that they were prepared and followed the lesson scoring protocol. At the same time, it seemed that Miller's style of involvement might have contributed to the teachers with a strong grasp of AIW further developing their practice, while other teachers developing a superficial understanding or becoming less involved in changing their instruction and implementing AIW. His more informal and less visible approach to coherence may have also contributed to teachers' frustration regarding the AIW scoring sessions. In addition, there seemed to be less in-depth understanding and application of the AIW framework across the range of teachers.

Aspects of Teacher Professional Community

In both schools, the principals demonstrated several actions and behaviors to support active collaboration around learning. There were also differences in the extent to which the principals promoted aspects of teacher professional community in each school. Based on previous research, I conceptualize strong school-wide teacher professional community to include the following aspects (a) shared goals for student learning, (b) meaningful collaboration among faculty members, and (c) teacher input into decision making. I also include direct collaboration with the principal regarding teacher development of instructional practice. The following section outlines examples of the extent to which the principal at each school promoted individuals in the school to take collective responsibility for achieving shared educational goals, and working together to achieve that purpose.

Aspects of Teacher Professional Community at Birch Middle School. Principal leadership at Birch promoted aspects of teacher professional community in a number of ways. First, Grand organized school structures that promoted collaborative interactions among teachers. He created collaborative grade-level teacher meeting time as well as school-wide development

toward common goals regarding the three reform initiatives. He supported the organization of teachers into separate houses based on grade level to provide a structure for teacher collaborative planning and reflection. Grand also created a plan for the coming year to differentiate and allow more time for collaboration on a weekly basis with a late start to the school day every Friday.

In addition, Grand promoted common goals and shared language among the teachers at Birch. This provided teachers with shared language to discuss their instruction and student learning outcomes in their meetings. He authentically shared his experience of AIW and his goals and vision for student learning with the teachers at the faculty meetings to promote shared goals among the faculty. He asked questions at PD sessions to develop shared understanding of new terms. This active involvement in the AIW learning process helped to align teacher's knowledge, values, and beliefs with the objectives of the initiative. It modeled active participation and the use of new terms to develop shared knowledge and common goals. Grand's leadership also challenged existing notions and assumptions among teachers to help develop deeper understanding of AIW and to facilitate teachers' ability to communicate around a mutual understanding of the reform. This common knowledge and shared goals potentially led some teachers to develop higher levels of AIW instructional practice.

Another aspect of principal leadership that supported AIW instruction at Birch was Grand's direct collaboration with teachers regarding the development of their instruction. Grand's support of collaboration was an element of effective leadership that was embedded in the school culture, expected, and routinely delivered. First, he attended at the AIW PD and collaborative team meetings. In these meetings, he participated with the teachers by asking questions and providing recommendations. This experience also supported him in his later discussions with teachers about instruction. He was aware of some of their challenges and their efforts to implement AIW in the classroom. This awareness potentially contributed to the

development of teachers' instructional practice as he had conversations with them about their instruction, provided feedback, and worked with them to set goals for their teaching. At the same time, the lack of positive affirmation and feedback on their progress may have adversely influenced the development of some teachers' implementation of AIW. Although Grand was actively involved with teachers, some teachers did not receive clear indication of specific ways they could improve their instruction.

In addition, Grand established organizational structures in the school to promote collaboration. He ensured that teachers met regularly with the same group of colleagues to discuss their instruction and student work. He also provided opportunities for teachers to meet in pairs with same subject peers to develop their lessons and collaborate on projects. In support of this time for collaboration, he did not interrupt these meetings with administrative concerns, and trusted the teachers to use the time to have meaningful conversations about their instruction. This allowed the teachers to focus on the task at hand, to self-direct their learning, and develop their relationships with one another. These aspects of trust and independence were key in enabling the teachers to learn from one another and reflect on their instructional practice.

Grand also established a leadership structure to facilitate teachers' participation and shared decision making. Grand selected teacher instructional leaders who served as the anchors to facilitate the AIW collaborative meetings. A number of teachers also served as the house chair of grade level teams. These individuals participated in the leadership group that made relevant decisions about the school goals and programs. In turn, many of the house chairs were the same individuals who served on the leadership group, and who also were the AIW anchors for the PD meetings. At Birch, there was a clear understanding among the teachers of who was on the leadership group. Teachers are also recognized as the star teacher of the month, and these individuals are also recognized as leaders by the administration.

The leadership team met regularly with the principal and contributed to decisions about PD, instruction, curriculum, planning, and assessment. Grand also gained teacher input to design structured time for teacher collaborative meetings focused on specific areas of need for teachers. It seems that teachers' participation in the leadership roles was positively associated with higher levels of AIW instructional practice. However, in selecting these leadership roles for teachers, the principal did not address the potential adverse effects it may have on other teachers in the building to not be included in the leadership roles. These teachers indicated that the principal's identification of leaders in the building led to the perception of favoritism in which some teachers were valued more than others. These experiences may have adversely influenced the development of these teachers' AIW instructional practice.

Grand promoted shared goals, collaboration, and teacher input in decision making in many ways that supported teacher learning of the AIW framework, and enactment of AIW instruction. He promoted aspects of respect and trust in the process as well. However, there were also teachers who did not feel included in the leadership structures, or who felt criticized for their instruction. Although there were many aspects of a strong teacher professional community at Birch, there were also divisions among the staff that potentially influenced their teachers' learning of the AIW framework, and the development of their instructional practices.

At Birch, there were tensions that occurred between two groups of teachers. The teachers who were selected to participate in leadership roles at the school were also the teachers who demonstrated high levels of AIW instructional practice. These teachers were the anchors of the AIW teams, the chairs of their grade level, and the individuals who participated in school governance. Some of the teachers who did not participate in these leadership roles experienced a division between the teachers who were selected for leadership roles. The teachers who were not included in the leadership roles perceived a sense of favoritism, and that their performance was

not valued or acknowledged in the same way. These teachers who experienced the division in the school were also the teachers who demonstrated lower levels of AIW instructional practice. It was not clear whether these perceptions negatively influenced teachers' learning of the AIW framework and the enactment of AIW practices, or whether these teachers were not selected to participate in leadership roles in part based on factors associated with their low levels of AIW instructional practices.

In both schools, teachers shared instances of conflict or difficult interactions with specific teachers in their AIW professional learning communities. One teacher, Tori, at Birch shared that another member on her team seemed to make personal attacks on her work during the lesson scoring sessions. Tori stated that she had repeated conflicts with this other teacher, which undermined her success and progress with the AIW process. She explained that the differences she had with the other teacher was one of the greatest challenges she experienced in her collaborative work and that it was a barrier in her learning and the development of her instruction. One possible explanation would be that these conflicts might potentially explain the low AIW scores that Tori received on her instruction; however, both high and low scoring teachers reported instances of conflict.

Two high scoring teachers at Cedar Middle School, Trine and Jana, indicated conflicts they experienced with other teachers in their collaborative groups. Trine explained that one teacher seemed to be resistant to changing her instruction, and that she made comments that were counterproductive to the AIW scoring session work. Trine indicated that this particular teacher affected the work of the group and interfered with her professional learning experience in the group. She indicated the need for further intervention to address the participation of the other teacher.

Jana also indicated that some scoring sessions seemed to be more about a personal attack from another teacher on her team, than about having a productive conversation based on critical inquiry and mutual goals for learning. Jana explained that the other teacher would give low scores on her AIW teacher tasks based on an interpretation of the work that was not accurate for the subject matter. It was unclear whether the teacher did not understand the mathematical content or whether the teacher was not invested in providing supportive feedback. Jana indicated the need for supportive peers that had an in depth understanding of the mathematical concepts underlying her instruction.

While both Jana and Trine experienced challenging interactions with their colleagues regarding the AIW collaborative work, these interactions did not keep them from implementing high levels of AIW practice. However, given the fact that this study did not include pre- and post- assessment of teachers' levels of AIW instructional practice, it is possible that the teachers already demonstrated high levels of AIW instructional practices, and that the conflicts negatively influenced their learning and the further development of their instructional practice. While it is possible that some conflicts may have negatively influenced teacher learning of the AIW framework and their subsequent enactment of AIW instructional practices, both high and low level teachers shared about conflicts with other teachers in the AIW groups. Therefore, it seems that other factors also contributed to their enactment of AIW instruction in the classroom.

Aspects of Teacher Professional Community at Cedar Middle School. Principal leadership at Cedar Middle School promoted aspects of teacher professional community. Miller described the work he had done over the past eight years to transform the culture of the school. He shared about counseling teachers out of their positions who did not seem to align with the changes he was bringing to the school such as increased teacher leadership. Upon his request, the district agreed to provide a student program to develop a positive school culture and address the

many behavior problems. Miller explained that there was a substantial amount of work that he had to do to create an environment focused on learning at the school. Once he had a plan to address the behaviors, he was able to focus on teaching. He described it as a hierarchy of needs. Once he had managed the concerns regarding student behavior, he was able to direct energy and resources to teachers' instruction.

Miller had professional learning communities in place with regular meeting time, which supported the transition to the AIW collaborative team meetings. He promoted collaboration through the regular AIW PD meetings in which the teachers followed the AIW scoring protocol. This supported some teachers in the development of their instructional practice. During the daylong AIW PD sessions observed as part of this study, the teachers followed the guidelines of the protocol, and moved through the process. Teachers were prepared for the meetings and engaged in the conversations to reflect on teacher tasks and student work.

There were different ways in which Miller collaborated directly with teachers. Some aspects of this dimension of Miller's leadership are not possible to include as he was not present at the PD sessions during the observations for this study, and there was not a coordinated meeting with the district and regional coaches. One approach to support teachers was through individual, informal meetings. Miller met with teachers individually to discuss their AIW instructional practice. He provided feedback and helped the teachers to set goals for their instruction. Rather than direct involvement, Miller seemed to focus on structural changes and noted his effectiveness in changing the culture and operation of the school in his time as principal. He shared how he initially focused on the adults' actions, beliefs, and understandings to change the school culture. He also commented on the challenges of serving a high population of students from impoverished backgrounds. He explained that his actions in changing the school culture supported teacher collaboration and the development of teachers' instructional practice.

Miller's beliefs about the importance of shared leadership and teacher autonomy shaped his actions and behaviors regarding aspects of the teacher professional community at Cedar as well. He explained that the district had identified which initiatives would be implemented in the school, but that he believed it was not possible to force teachers to adopt new instructional practices. So, he met with individual teachers to support them with the change, but respected their process. He also empowered teachers to take on leadership roles and to take responsibility for the three initiatives in the school. While some teachers demonstrated high levels of AIW practice, these teachers were not identified as leaders to develop their leadership capacity or to support other teachers' learning.

In terms of direct interaction with teachers, Miller reported he spent approximately 60 percent of his day interacting with teachers around their instruction and evaluation. He provided praise in the form of notecards that he left in teacher's boxes, and were often seen on teachers' bulletin boards. He also emphasized the importance of asking teachers questions to have them reflect on their instruction, rather than giving feedback that may be perceived as negative. Miller also engaged in both formal and informal conversations with teachers about their instruction. He described this time as collaboration as he worked alongside teachers to support the development of their practice, and how these interactions promoted a positive culture of learning and collaboration at the school.

Miller also ensured there was accountability for collaboration through the AIW meetings. He described AIW as one of the strongest influences on supporting teachers to work together to change instruction. He created structures and time for teachers to get together to review their teacher tasks and student work. He prioritized this time and ensured that it was consistent, non-negotiable, and not interrupted by administrative tasks. Miller relied on the AIW protocol to hold teachers accountable and to provide the structure within the meetings for collaboration. He also

felt that following the AIW structure and protocol could help teachers who may not have alignment of their knowledge, values, and beliefs with the AIW initiative to see results and to hear about positive student outcomes in their collaboration with other teachers. This in turn, could support teachers' adoption of the new practices.

In order to promote more effective and productive collaboration among teachers, Miller made interventions with specific teachers that contributed to challenges in the AIW meetings. He walked teams through the protocol, and even suspended teachers for their behavior in meetings. He also acknowledged there were some teachers in the building who may not be a good fit, and worked with them to have them leave the school. These actions were intended to promote positive collaboration among the teachers in the PD meetings. Although Miller also promoted trust, respect and aspects of teacher professional community at Cedar, there were still teachers that did not seem to be as involved in the teacher professional community, did not share common goals, or actively participate in collaboration and decision making. It is possible that principal leadership to provide structures to promote common language, to facilitate collaboration, or to provide opportunities for teacher input in decision making could promote these teachers' participation in the teacher professional community, and in developing their instructional practice. At the same time, there may be other aspects beyond the scope of this study that contributed to these challenges.

Leadership for Instructional Improvement. Grand provided many formal structures to promote shared goals, collaboration, and teacher input in decision making at Birch. Teachers reported the strength of their collaboration with other teachers and the ways it supported their learning and the development of their instructional practice. Collaboration in teams was a strong source of support for teachers, but they also benefitted from one-on-one partnerships with other teachers in the school. Grand provided structures to ensure common planning time and

collaborative learning in teams was a priority at the school. Grand's open door policy also promoted teacher collaboration, as teachers felt free to go into each other's classroom at any time. This supported the sharing of ideas and spontaneous collaboration.

Miller developed structures for collaboration at Cedar for the teachers as well. The time to collaborate in teams provided teachers with a clear structure to receive feedback on their instruction. In addition, Miller's emphasis on following the AIW protocol provided clarity for teachers to understand the process to engage in reflection and meaningful conversations about their instruction. Miller encouraged collaboration through informal processes at the school as well. He focused on the overall school culture and worked individually with teachers. This allowed teachers to have a common understanding of expectations, and to also address individual differences. His approach to create interventions for student behavior allowed teachers to focus more directly on instruction. Miller did not discuss structures for teacher input into decision making, and this seemed to be apparent in some teachers' frustration about their unmet needs and may have influenced the development of their AIW instruction.

Although both principals encouraged collaboration in a number of ways, there were instances in both schools in which individual teachers seemed to influence the tone and teachers' experiences in the AIW PD meetings. It seemed that despite the principal's efforts, some teachers were not aligned with the objectives of AIW or the PD process and this made the experience difficult for other teachers. A few teachers in each school explained that specific individuals were the biggest barrier to their collaboration, learning, and the development of their AIW instruction.

Culture: Risk Taking and Growth Mindset

Another important dimension of principal leadership was the way each principal created a culture in which failure was part of learning for teachers. Principals created this culture by

developing teachers' understanding of having a growth mindset, by promoting risk taking, and by providing opportunities for modeling and experimentation. Principal's actions that supported a growth mindset promoted increased opportunities to innovate and practice through their implementation of AIW instructional practice.

Growth Mindset at Birch Middle School. Grand promoted a culture at Birch of adopting a growth mindset, which included risk taking, and learning from failure. Grand encouraged teachers to try new things in their practice and to take risks in implementing new ideas. He shared in the excitement of trying new approaches with teachers and ensured them it was ok to make mistakes in the learning process. The open door policy at the school further provided a context in which teachers, administrators, coaches, and visitors were welcome to visit one another's' classroom at any time. This created a space in which teacher practice was less private and more shared. Teachers were welcomed and expected to openly share about what they were learning as well as the successes and failures they experienced in their efforts to implement new approaches in their instruction.

To support the notion of risk taking and making mistakes as an important part of developing their instructional practice, Grand ensured that teachers had an understanding of the notion of growth mindset and provided support to develop this capacity. He had all of the teachers and staff read the book, *Mindset: The new psychology of success* by Carol Dweck. This book study provided a common understanding and vocabulary among the teachers that intelligence and talent were not fixed, and that everyone could develop their abilities. Teachers learned that a growth mindset focuses on learning from mistakes and failures, rather than interpreting failure and setbacks as indicators of deficiencies in fixed abilities. Teachers were involved in discussions about the book, and reflected on how it applied to their teaching practice.

Grand also continued the focus on growth mindsets over the course of the year. He referred back to the distinctions in the book and made references to his own experience in meetings. The instructional coach commented that even the mention of mindset helped people refocus their attention on growth and learning, rather than on seeking affirmation or validation of their existing skills and abilities. This focus on growth mindset helped teachers to feel safe making mistakes and to allow themselves to move out of their comfort zone with new instructional practices. It was repeated by the administration in different contexts to remind the teachers to look for ways to further develop themselves and seek out avenues and opportunities for growth.

In line with the growth mindset, Grand ensured teachers had differentiated learning opportunities. He created a PD plan in which teachers could sign up for different aspects of training in the new PD initiatives. He included teacher input in the decision making process to schedule weekly time for differentiated PD. He also communicated to teachers that he had an open door and invited them to talk to him about any aspect of their instruction and their learning and he ensured them of his support.

Grand also modeled aspects of the growth mindset. He used the language of growth mindset and fixed mindset in meetings and referred to his own learning experiences. He shared in the excitement of teachers trying new ideas and encouraged teachers to take on new directions in their learning. He signed up and participated in differentiated PD sessions. He also acknowledged teachers who were taking risks, and celebrated opportunities to learn from failure.

The leadership structures in the school also provided an opportunity for Grand to involve teachers in the growth plan for the school. He demonstrated how to match outcomes with measureable goals. Grand involved these teachers in analyzing school data and making a plan to reach student growth measures. The teachers worked with Grand to not only share current

challenges in the school, but to also develop plans and further structures to facilitate learning for teachers in the building. In this way, Grand had teachers focus on the growth of the school, as well as their own growth. He involved them in the process of identifying an outcome, developing a plan with support structures, and then analyzing data to determine their progress toward the goal. This provided a model so teachers could also engage in a similar process regarding the development of their instruction and provide support to other teachers as they worked to develop their practice.

Modeling and experimentation was another an important aspect that Grand facilitated to promote a growth mindset. He encouraged teachers to learn about AIW by experimenting in the classroom. Teachers were expected to try out new approaches and to share about them in the AIW PD sessions. There were opportunities to learn from modeling by visiting other teacher's classrooms and observing their instruction. In addition, teachers were expected to bring teacher tasks and student work samples to the AIW PD scoring sessions that they would want to improve and reflect on. In this way, teachers were expected to not bring their best work to receive affirmation of their work, but rather to bring work that would provide opportunities to engage in substantive conversation about areas for growth and development of their teaching.

Despite these efforts to promote a growth mindset, there were teachers who were more focused on the affirmation of their abilities than on taking risks. They were not as comfortable with the ambiguity of uncertainty, and felt like the luxury to make mistakes was permitted among the leadership group, but was not afforded to those who were not viewed as favorably in the building. In turn, these teachers attributed their hesitance to take up the notion of growth mindset to their disposition, and aspects of the school context in which they perceived themselves as less effective, and therefore concluded it was not as safe to take risks. Nonetheless, these teachers still reported instances of experimenting with AIW standards in their lessons.

Risk Taking at Cedar Middle School. Miller spoke about the importance of risk taking. He believed that many teachers did not change their practice because they found it challenging to depart from the comfort of their existing, familiar approaches to teaching. He observed that many teachers taught in the way that they had been taught, and often did not invest in the necessary planning to intentionally change their practice. He was not sure whether teachers did not want to engage in the planning, or whether they did not have the skill and capacity. In turn, he believed in risk taking and encouraged teachers to openly explore new ideas in their instruction to support their growth. However, it did not seem that Miller had the same structures in place to promote shared language around risk taking for teachers, or structures that may promote goals to support a risk taking culture over time.

One way that Miller interacted with teachers was through his use of informal conversations. He kept a log of the teachers he spoke to every week, and made a plan to speak with teachers he had not spoken to the following week. These informal conversations were often in the hall, and Miller found ways to intentionally “bump” into the teachers during the school day. He would speak with them about their instruction, things they may be challenged by, and areas of needed support. These conversations were a source of information for Miller, but also an intended support for teachers to provide praise, reassurance, and direction when needed. He would frequently ask questions so that teachers did not feel threatened by criticism, but to have them think about new areas for them to explore or reflect on their instruction. While this provided an opportunity for Miller to connect and provide support to teachers in a potentially non-threatening way, it did not provide the same guidance for common language and an opportunity for teachers to examine their existing notions about risk and failure.

Although Miller promoted risk taking and failure as part of learning, he demonstrated fewer actions, behaviors, and structures for teachers to develop shared language, knowledge, and

capacity to integrate this perspective in their teaching. He articulated that this was an important for teachers, but provided fewer opportunities for teachers to see him model risk taking or to explore how it may apply to their own teaching. It seemed that teachers made some adjustments to their teaching, yet beyond the two high-level teachers, there were fewer descriptions of teachers' risk taking, grappling with the complexity and challenges of integrating AIW into their existing instruction, and collaborating with other teachers in the development of these aspects of their instruction.

Leadership for Instructional Improvement. Grand clearly communicated a focus on having a growth mindset for the teachers at Birch. Teachers throughout the school made reference to risk taking and growth mindsets in reference to their instruction. In turn, it seemed that there were many more high and low-level teachers who experimented with a wide range of AIW practices. Teachers shared about their successes, failures, and challenges while trying to integrate these practices into their instruction. Although some of these teachers did not score highly on the AIW rubric, it was evident that they were implementing aspects of the AIW framework and reflecting on ways to improve their instruction.

It seemed that some teachers at Cedar embraced the AIW approach and were effective at implementing aspects of the framework in their classroom at relatively high levels. Other teachers did not seem to embrace the conceptual understanding of the initiative. These teachers seemed to take fewer risks in trying new approaches in the classroom. The most common AIW standard that teachers referred to was value beyond school, but even these attempts to expand their instruction seemed superficial. Both Grand and Miller emphasized the importance of risk taking, yet Grand demonstrated and described more examples and structures that created a culture of learning from failure at Birch.

Teachers' Perceptions of Principal Leadership

High and low-level teachers seemed to have different perceptions of principal leadership in the two schools. In general, the high-level teachers at Birch reflected many of the similar perspectives as those shared and demonstrated by the principal about PD coherence, aspects of teacher professional community, and a growth mindset. Some of the low-level teachers at Birch also shared the same views and experiences, while one of the low-level teachers indicated a different experience from the one described by the principal at the school. In contrast, the two high-level teachers at Cedar shared experiences that were different from the perspectives described and demonstrated by Miller and several of the low-level teachers reflected the views similar to those of the principal. The following section includes high and low-level teachers' perceptions of principal leadership at the two schools.

Teachers' Divided Perceptions at Birch Middle School. Of the six teachers in the study from this school, all six noted positive aspects of Grand's leadership that contributed to their experience with AIW PD and their instructional growth. One of these teachers also described challenges or areas for change in the principal leadership.

In terms of coherence, all of the teachers at the school agreed or strongly agreed with the teacher survey statement, *"My principal demonstrates that school resources are directed toward a coherent instructional program aligned with AIW."* All of the teachers also agreed or strongly agreed with the statement, *"My school has a coherent school improvement strategy."* However, it seems that high-level teachers were more likely to perceive or report that, *"PD has had one main focus over the past several years."* In turn, while all teachers in the school perceived strong PD coherence, only the high-level teachers experienced PD to be connected under one main focus.

This perception of coherence reflected by Dan, who communicated that he experienced coherence among the PD reforms, but that some other teachers in the school saw the reform as another disconnected acronym:

I see the connection, (the reforms) are all trying to do the same thing and sometimes they are different verbiage. Like value beyond school, or that's strictly AIW, but then for something else that's relevant. It's all the same thing, and I can see that. I know some teachers don't. I know you throw another acronym out and then, 'ahhhh.'

Kari, a low-level teacher, commented on the connection she saw among the reform and indicated both her AIW anchor and the principal shaped her view. She said,

[The reforms] will all kind of align underneath one framework, this is where we are at, this is where we can go, here's what we can do to bring it projects and ideas, and that they are not separate. It's just adding one more thing to it. Once all the pieces are in place, you're able to think about it differently and that it's changed. And it's not where, okay, we're doing this, we're doing this, we're doing this. They slowly, gradually getting us into it all together so it should hopefully align.

Kari described her perspective that the reforms will all align into broader goals that fit together, rather than individual parts. She indicated that it was helpful to have the principal and the AIW anchor providing support and facilitating the process to create a sense of connection.

Jeff, a high-level teacher, perceived the principal as promoting PD coherence at the school, yet he still recognized the challenge for teachers to design lesson plans amidst the multiple demands of the reform initiatives and different organizational expectations at the school:

I think that there's a lot asked of teachers, which is wonderful. I would never err on the side of anything else, but I think that when you develop a lesson plan, it is tough to hit on multiple, you know, modalities of 21st, AIW, seventh grade social studies according to the community school districts, and then the Iowa teaching standards.

Jeff acknowledged the leadership at the school for coordinating the different initiatives, and even with the principal's efforts, he still observed the challenge for teachers to address multiple different aspects in their daily instruction.

Regarding aspects of teacher professional community, all of the high and low-level teachers agreed or strongly agreed with the teacher survey statement: *My principal promotes the professional community at our school.* In describing perceptions of the principal's role in collaboration, the high-level teachers shared how the principal provided structures and facilitated teachers' ownership of the process during the AIW meeting. For example, Lila described Grand's leadership in providing direction for the teachers, but allowing the teachers to take ownership of the meeting structure that would best facilitate their collaboration:

The fact that at it hasn't been Grand standing over us saying you have to do this... you have to do this. It's really just become our own and I know that we stress that in the classroom so much, the kids take more ownership when they have a say in what they're doing and how they're doing it. The fact that Grand has allowed us to do that and has given us that suggestion and then we're still able to make it our own is really, really beneficial.

Lila explained how helpful it was to have Grand provide the suggestion for the structure and focus on the PD meeting, and then for the teachers to have the freedom to take ownership of the experience. She commented on how this supported a culture of ownership they were also working to foster in the students.

Other high-level teachers spoke about the positive and beneficial aspects of Grand's leadership in supporting their professional development. Jeff spoke about the authentic expression of the principal and his leadership in front of the staff:

I think the thing that David does best is he is willing to be passionate in front of us instead of the authoritative leader. And he will tear up at the beginning of the year in that first meeting of, 'Here's why we're doing it, and just please know at the end of the day, they're kids, and they go home, and they have struggles.'

Jeff shared his experience of Grand sharing his feelings and connecting with the staff in an authentic way about the students, rather than maintaining an authoritarian stance to elicit teachers' response or alignment on the goals and objectives. Jeff explained how he viewed Grand effectively cultivated leaders in the building, "I will say that the thing that I like the most about Mark is that he's a leader like a good coach in the NFL or college football, he's a leader that wants to make other leaders. He doesn't want to hoard talent, he wants to cultivate other leaders." Jeff was a high-level teacher that Grand had cultivated as a leader in the school.

Lila, a high-level teacher, explained that the principal's participation in the AIW PD meetings was beneficial:

(Mr. Grand) is there at our meetings, which has been really nice because I do think it gives him an opportunity to see what we're doing, how we're doing it, and to really open up that door for conversation. That good constructive stuff that's important to have, that third or fourth head that's going to allow you to see those little holes that you've left that you can use to improve on.

Lila is positive about Mr. Grand's presence at the meetings and sees it as an opportunity for the principal to understand the teachers' work and to contribute in the meetings. She appreciated that he was able to experience what the teachers are working on and that he provided ideas to support the teachers' efforts to improve their instruction.

Dan, another high-level teacher, also noted that when Grand attended the meetings, he was involved in the teachers' work, rather than working in his office:

He comes to...like when we meet for eighth grade for AIW. However he has it set up there is two groups meeting at once for AIW and he's always at one of the meetings so he's there and present in part of the conversation with all of our AIW stuff for sure. So then that shows that he's into it and supports it and it's not something that he's telling us to do and then going to his office to do work, so he's in the thick of it.

Dan indicated that he saw a benefit from Grand's consistent participation in the AIW PD meetings. He described the structure that Grand had established to be in regular attendance at one of the two meetings, and that the teachers knew to expect his presence. Dan noted that Grand's

presence in the meetings demonstrated his support and his involvement in the initiative, rather than telling the teachers what to do, and focusing on other separate work.

Alternatively, one low-level teacher had negative perceptions of the principal. She shared perceptions of favoritism and criticism. In speaking about the principal's attendance at the meetings, Tori commented that some of the feedback has been critical:

Sometimes when administrators are there they are very critical... I've heard a lot of teachers crying after the meeting and I don't think that it's supposed to be that way.... when administrators aren't there it's kind of nice because you get a lot of feedback in just organizing while here.

Tori experienced the principal to be very critical in the meeting, and reported that it was better when the principal was not in attendance. She explained that some support and feedback from colleagues could be helpful, but that teachers were upset by the administrator's critical comments.

On the teacher survey, all of the high and low-level teachers responded that the principal involved them in relevant decision-making opportunities. In response to the statement: *My principal involves me in relevant decision making opportunities*, all six teachers indicated they were involved in decision making opportunities on a weekly basis.

In describing his involvement in writing the goals with the leadership group, Dan, a high-level teacher, said, "I think he does a really good job at listening to the building leadership team." Dan spoke about her ownership in the process of writing the smart goals for professional development for the coming year. "So (Grand) is the one saying what's going to happen, but it was us that kind of, I don't know if he thought of it, or led us to think of it, but he is definitely embracing it." His comment demonstrated how Grand had created ownership in the ideas for the members on the leadership team to the extent that Dan was not able to separate what may have been the teachers' ideas from the principal's ideas.

High and low-level teachers differed in their perspectives on Grand's selection of certain teachers as leaders in the building. Dan described how it felt to be among the distinguished leadership group of individuals in the building:

I think working with AIW as an anchor has been really awesome, because I would call those teachers kind of the superstars of the building, so just being part of them and like they are the top minds in the building some of the best ideas. Personally being with them has been awesome.

Dan felt that it was great to be surrounded by other "superstars" and "top minds." He indicated the clear difference between this group of individuals, and other teachers in the building. His comment reflected the perception at Birch that some teachers were superstars and others were not, and that it was desirable to be part of the group.

In contrast, Tori shared her experience of not being part of the leadership superstar group. In response to the question about the extent to which she felt supported she commented:

I think it depends on the type of teacher you are. There are definitely some teachers that are very pleasing to the administration, that they are very rewarded. I'm not—they have like the teacher of the month or something and the students get to vote, which is great, and those are the teachers that usually have positive voice in the school. Then there's me, I just kind of try to fly under the radar and make sure that I'm not upsetting anybody and, you know, and I want to watch and see what other people are doing to make them more successful and I want to incorporate that but it's pretty much on my own.

Tori shared that the select group of teachers were rewarded by the administration and had a positive voice in the school. She also shared that she was not one of those individuals, that she made an effort to not get noticed, and although she was interested in what makes those other teachers successful, she felt on her own.

When asked what would make a difference for her, Tori responded, "I think more feedback in a positive way or a constructive way: I noticed that you did that, I really like how this is working." She mentioned that she really needed positive affirmation to know she was doing the right thing, and to validate all of her hard work. Tori compared her experience with

leadership at Birch to her previous school, “I just think at the (other school) the administrators kind of view you as a professional and they know that not everybody’s perfect and they help you improve. Whereas here I feel like it’s just cut and dry, ‘oh, you’re a bad teacher, go away.’” Although only one teacher expressed these feelings about the tone of leadership and the labeling of good and bad teachers, Tori described what it was like to not be included among the superstars in the building, and the influence on her growth as a teacher.

The perceptions of Grand’s leadership and support regarding AIW PD seemed to be divided. The high-level teachers described ways in which Grand was supportive and involved. One low-level teacher expressed her experience that Grand was critical and less involved. The medium low-level teacher, and the other low-level teacher had more neutral views. They described Grand as a good principal with whom they interacted minimally or when required.

With respect to developing a growth mindset at the school, the high-level teachers commented on how this dimension of principal leadership supported their learning and enactment of AIW instructional practices. Lila, a high-level teacher, shared that she had frequent interactions with the principal, that she felt supported as a new teacher, and that she had multiple avenues to receive feedback when she has a question.

I also feel like he's got a great open-door policy. I know if I were ever struggling with a student or being able to teach something or just needing advice or having a bad day for that matter, I could go to him or pretty much anybody in the office and receive some sort of feedback that would not only let me know that it's okay but also guide me in some manner that's going to really help me to improve what I'm going to him about.

In contrast, Tori, a low-level teacher commented that the feedback she received from the administration was very critical. Tori compared her experience with Grand to her previous principal and explained that the critique helped her to improve, but that she needed verification from Grand about her progress.

At the (other) school I would talk to my principal, you know, a lot and I would get some really good feedback... this principal, I get feedback, usually very critical and I do meet—try to meet the needs, I don't know if there's a lot of follow through as to did I ever, you know, meet that need, but I do definitely find that critique is very helpful and I do improve a lot from that critique, I just... I want some verification that I am in fact doing the expectations.

Despite the emphasis of a growth mindset, Tori expressed a need for more affirmation. While Tori expressed her willingness to work hard and make an effort to change, she explained that she did not have clear goals or a progression of steps to assess her growth toward specific goals, and needed clear feedback along the way to let her know whether she is on the right track, or whether she needed to adjust her course.

Jeff, a high-level teacher, shared about the importance of taking risks for his learning and how Grand encouraged teachers to try new approaches in their instruction and to take risks. As Jeff stated, “(Grand) lets us take risks, I mean this whole thing, huge risk. And I think there's a buzz and people are excited about it; ergo he's excited about it.” In this way, Jeff described a school culture in which teachers were encouraged to take risks, and a principal that shared in the excitement of trying new approaches to teaching and allowing room for making mistakes in the learning process.

Another high-level teacher, Lila, echoed the benefit of how Grand created a school culture of risks taking as part of learning, and how important it was to model that it was ok to make mistakes and fail in front of students. Lila was appreciative to have an environment in which failure and risk taking was part of the learning culture:

I feel really spoiled knowing that that's kind of the environment that we have and I think the kids see that, too. You know, we're working that, that culture within our building to know that failure's okay and it's, you got to let people see you as a real person or else they're not going to connect. So it's been good and Mr. Grand is very involved in creating that, that environment.

Lila and three other teachers at the school noted the important role the principal had in creating the school culture that allowed for risk taking and making mistakes. She stated that the students

were also aware of the environment that encouraged risk taking and making mistakes as an important part of learning. Teachers shared that the learning environment created a space in which they could experiment with new ideas, especially when learning about AIW and new approaches to instructional practice.

Teachers' Perceptions of Areas for Improvement at Cedar Middle School. The teachers at Cedar did not share extensively about Miller's leadership and how it influenced their learning. Most of the comments were brief, or focused on related aspects rather than the principal leadership directly. Two low-level teachers shared positive comments about Miller's leadership, and two high-level teachers mentioned a need to improve teachers' ability to reach their potential at the school. The following section includes teacher perceptions of principal leadership that made a difference in their experience with AIW PD.

In terms of coherence, all of the focal teachers at the school, except one, disagreed with the teacher survey statement, *"My principal demonstrates that school resources are directed toward a coherent instructional program aligned with AIW."* One high-level teacher agreed with the statement. All of the focal teachers at the school, except one, disagreed or strongly disagreed with the statement, *"My school has a coherent school improvement strategy."* One low-level teacher agreed with the statement. All of the focal teachers at the school, except one, agreed that, *"PD has had one main focus over the past several years."* One low-level teacher strongly disagreed with the statement. Although several teachers agreed that PD had one main focus at the school, the majority of teachers did not perceive the principal directed resources toward a coherent instructional program aligned with AIW or that the school had a coherent improvement strategy.

There was only one comment regarding Miller's participation in the AIW PD meetings.

Doug, a low-level teacher, described Miller's principal leadership regarding the AIW PD meetings in the following way:

My principal is a leader in our faculty meetings. He has discussed AIW, along with one of his colleagues, Christy Bentley, who is one of our coaches. So they have introduced us and helped us a little bit. Not on a day-to-day basis, or even a monthly basis, really. From time to time, the principal, he will come in today for AIW and we'll discuss with him, which is good, because we can bounce some questions off of him too, what he's looking for.

Doug explained that Miller has introduced and discussed AIW in the faculty meetings. He shared that the help from the principal regarding AIW is less than on a monthly basis. Doug mentioned the opportunity to discuss with the principal was good so that they can get some feedback to better understand his expectations.

When asked if there was anything further the principal could do to support his experience with AIW and his instruction, Doug replied, "He provides ample time for us to get together, pretty much almost on a weekly basis for this. And then we do fill out our online scores, and some other information online, which is sent to him, I believe, so he can review that." Doug did not indicate further need for support, and shared that the teachers have sufficient time to work together. He also mentioned the online information the principal was able to review to track the teachers' work.

Regarding Miller's level of involvement, Trine, a high-level teacher, commented on how the principal is consistent, but only involved on a minimal basis.

He's very consistent but not involved enough. So, consistent on a minimal basis. And I think that I would like to see, you know, because I think that there could be – there are some great things happening at our school, but there could be even more great things and I just would like to see some more directness from him just with everyone, you know, including – I'm not just like – you know, I'd like to hear – just get some more feedback myself.

Trine acknowledged how there are great things happening at Cedar, but that she would like to see more great things happening. She also mentioned that she would like to see more directness and feedback from the principal for everyone, including herself.

Trine described the experience she had in AIW PD sessions in which some individuals were not aligned with the AIW framework and they made comments that were more based on personal differences, than focused on instructional feedback. In those instances, she indicated that further support and intervention was needed.

And then I just wonder, you know, if there are people who are really far off of where that we should be with AIW, when is the point? I just feel like there's probably been some points this year where he could have stepped in and been like, 'Okay, what do we need to do?' You know, 'Let's have an intervention here.' Whatever you want to call it because I just think it's really important work, and I see that as part of his job. That if there's somebody who needs some sort of support or intervention, just like with the kids, you know, we're all learning too.

Trine recognized that everyone was learning, and that adults needed reminders and support similar to the students need for support and direction. She expressed a need for the principal to be more involved to provide direction and intervention to other teachers when needed.

When asked about the principal's support of her work with AIW PD, Jana, a high-level teacher, noted the limitations she perceived in the structure of professional development at the school.

That's a hard one because I know, what I don't like is that we're locked into timeframes. What if there was a teacher that was as motivated as I was and we could do our AIW outside of school hours? That's not allowed. So I can never get together with the people who might want to do it because it's not really considered—yeah, I can get together with them for fun for coffee and do it but it's not going to count for AIW or something because it's not within school hours and that bothers me.

Jana shared about her need to collaborate with other teachers in her same subject area to support her implementation of AIW in the classroom. She did not speak specifically about the principal

in her response to the question. Jana expressed her frustration with the limitations of the PD structure and her needs to further collaborate with other teachers.

Holly, a low-level teacher, described a conversation she had with Miller in which she felt empowered to take risks and make instructional decisions on her own. “I was able to have a conversation with Mr. Miller about social studies because – I can’t remember how it came up – that I said ‘I’m kind of doing things a little different.’ And he’s like ‘Oh, no. That’s good.’” Miller encouraged her to do things differently in the classroom. She went on to explain, “He said that students should be excited about history and social studies, not dreading it because there’s a chapter in the book and the worksheets and the test and things like that.” Miller emphasized Holly’s innovative approach and the importance of student excitement about a subject rather than any negative experiences associated with the protocols of the textbook.

Overall, there were fewer focal teacher interview comments about Miller’s principal leadership at Cedar, and teachers’ commented on less direct influence from the principal on their PD experiences. Three teachers shared about the support they received from the principal. Three of the six teachers indicated that the professional development in the team meetings was not as effective as it could be and that there was a need for additional intervention or direction from the principal. It was evident that there were many aspects of principal leadership that were effective at Cedar, and there were also areas to further develop potential at the school.

Summary

In sum, both Grand and Miller promoted teachers’ development through their direct interactions with them and through their indirect influences on their experiences. However, there were differences in the ways in which the principals enacted leadership at each school in response to the different contexts. At Birch Middle School, David Grand supported teacher learning and the development of their AIW teacher learning and AIW instructional practice by

promoting PD coherence, aspects of teacher professional community, and a growth mindset at the school. He framed reform initiatives in a way that provided teachers with a way to see the connections among them. Grand's emphasis on structures to support the teacher professional community reinforced shared language among the teachers, common goals, collaboration, and teacher input in decision making. Grand also promoted growth mindsets and risk taking which enabled teachers to experiment with new instructional practices and focus on their instructional growth.

At the same time, Grand's framing of the connection among initiatives may have contributed to some teachers' more superficial view of the different reforms in which they interpreted all reforms as saying the same thing. Similarly, despite the many ways Grand promoted aspects of teacher professional community, there still seemed to be divisions between some teachers at Birch. In some ways the divided perspectives at Birch seemed to detract from teachers' work with AIW, and their collaboration to improve their instructional practice. Furthermore, enactment of shared leadership practices in which some teachers were selected as leaders or labeled as good and bad teachers contributed to some divisiveness and frustration in the building. Although Grand promoted and modeled a growth mindset, there were still some teachers who were seeking affirmation and validation of their ability and hesitated to take risks or expose themselves to potential failure, which may have also influenced the extent to which they engaged in new AIW instructional practices.

While there were many ways in which Miller also promoted PD coherence, aspects of teacher professional community, and a growth mindset at Cedar Middle School, the messages and structures regarding these dimensions of leadership were not as clear. Miller emphasized teacher empowerment and shared leadership, however, structure to support these ideals were not clearly articulated or maintained. Much like school leadership at Birch, Miller worked to

establish PD coherence, aspects of teacher professional community, and a supportive school culture for risk taking. However, it seemed that a few teachers at Cedar resonated with the AIW approach, and worked to integrate the AIW standards into their practice, while other teachers viewed AIW as beneficial, but were less invested in the initiative. These other teachers were less willing to embrace the approach, or seemed enthusiastic about the premise of AIW, but less proficient at enacting the instructional practices in the classroom. Another group of teachers seemed to follow the protocol and complete the necessary steps for their participation, yet the extent to which they altered their approach to teaching was not evident.

Miller's leadership at Cedar also illustrates the importance of understanding the school context in which leadership actions and behaviors occur. Miller described a school setting in which there were high levels of student behavior problems when he arrived at the school 8 years prior. Although there were aspects of the dimensions of PD coherence, teacher professional community, and risk taking that Miller promoted, he explained that much of his focus had been on establishing a clear approach to address student behavior, then to work with teachers who may have been resigned to the lack of engagement and learning in the school. Miller described how he intentionally worked with hiring and counseling out some teachers to develop a staff with common goals for student learning.

Miller also described the demographics of the student body and the many challenges of the students who attended Cedar Middle School. Miller's efforts to support AIW and to create school structures combined with the AIW PD contributed to increased teacher focus on AIW instructional practices. Alternatively, some teachers expressed a need for greater principal involvement and intervention to redirect teachers who may not be as aligned with the intentions of AIW and the reflective inquiry process.

CHAPTER 6: ALIGNMENT AND REFORM

Alignment and Reform

The ways in which effective principal leadership shapes school conditions can further contribute to our understanding of teacher learning and the development of their instructional practice. Through principals' beliefs and actions, they can contribute to the tone in the school, professional development experiences, and the formation of the teacher professional community, but they can also influence teachers' core knowledge, values, and beliefs. This chapter inquires into associations between teachers' knowledge, values, beliefs and AIW teaching practice. Research question 3 asks: *What is the association between teachers' knowledge, values, and beliefs, and their instructional practice regarding AIW?* Drawing on the quantitative and qualitative data, I argue that the greater the degree of alignment of teachers' knowledge, values, and beliefs, with AIW objectives, the more likely the teacher is to have a higher AIW rating.

Teachers' Knowledge, Values, and AIW Instruction

Based on surveying 59 teachers from both Birch and Cedar Middle Schools, the general pattern indicates a positive relationship between teachers' alignment of values with the AIW framework, and self-reported change in instructional practice. In the focal teacher interview data, teachers with higher AIW instructional scores demonstrated greater alignment of their knowledge, values, and beliefs with the tenets of the AIW framework. Conversely, teachers with lower AIW instructional scores exhibited less alignment of their knowledge, values, and beliefs with the AIW framework. Overall, the results indicate a general pattern in which a higher AIW instructional score is associated with greater alignment of teachers' knowledge, values, and beliefs with AIW objectives.

Drawing on the quantitative analysis of the teacher survey data, I first present the association between teachers' knowledge, values, and beliefs and teaching practice. Next, using

the qualitative analysis of the focal teacher interviews, I further explicate this relationship. Then, I examine teachers' priorities and how they may be related to their implementation of AIW instruction. Finally, I describe teachers' perceptions of the influence of PD on their instruction.

Survey Analysis. One step in answering this research question was to understand whether there was any association between teacher's knowledge and values and their instructional practice. To start, a Pearson correlation was computed to examine the association between teachers' AIW knowledge and values and their instruction. Then, to examine the relationship between teacher AIW knowledge and values, and teachers' instruction, I utilized a linear regression analysis. This provided information on whether the predictor variables explained the variance in the outcome variable.

I measured AIW knowledge and values using self-report items from the teacher survey. I measured teacher self-report of instruction in 2 ways: teacher self-report of enactment of lessons that involved: construction of knowledge, elaborated communication, and value beyond school; and teacher self-report of a change in their instructional practice. These constructs were based on the AIW framework, the literature review, and the conceptual framework. The exact items and scale are further described below.

The responses in the teacher survey were based on a 4-point Likert-scale with two different response types. For AIW Knowledge, values, and change in instruction, the responses included 1) strongly disagree, 2) disagree, 3) agree, 4) strongly agree. The other response type for the items Construction of Knowledge, Elaborated Communication, and Value Beyond School was a 5-point scale of 1) never, 2) yearly, 3) monthly, 4) weekly, and 5) daily. The items for each variable were as follows: *I have a clear understanding of the standards in the AIW framework* (AIW Knowledge), *The AIW framework is consistent with my personal views of good teaching* (Values), *I provide opportunities for students to construct knowledge* (Construction of

Knowledge), *I encourage students to develop and express their ideas and findings through elaborated communication* (Elaborated Communication), *I create opportunities for students to apply the subject to problems and situations in life outside of school* (Value Beyond School), *I see a difference in my instruction as a result of my participation in AIW* (Change in Practice).

The descriptive statistics from the Birch and Cedar Middle School teacher survey are included in table 8 below.

Table 8. Descriptive Statistics from Birch and Cedar Middle School Teacher Survey

	N	Mean	SD
AIW knowledge ^a	58	3.034	0.529
Values ^a	58	3.052	0.605
Construction of Knowledge ^b	52	4.25	0.682
Elaborated Communication ^b	52	3.481	0.725
Value Beyond School ^b	52	3.404	0.970
Change in Instruction ^a	58	2.862	0.661

Note: ^aResponses were 1 (strongly disagree), 2 (disagree), 3 (agree), 4 (strongly agree)

^bResponses were 1 (never), 2 (yearly), 3 (monthly), 4 (weekly), and 5 (daily)

I performed a correlation analysis to examine the possible relationships between the teacher AIW knowledge and values and teacher instructional practice variables. Although there are limitations to this approach, it provided the opportunity to explore some of the possible relationships between teacher's knowledge and values and instructional practice. The correlation analysis was helpful for testing hypotheses of association.

Table 9 shows the correlation between teachers' AIW knowledge and Values and aspects of instructional practice. The analysis indicated that both AIW knowledge and values were correlated with teacher perception of change in instruction. In particular, there was a positive correlation between teachers' understanding of the standards in the AIW framework (AIW Knowledge) and teacher perception of change in instructional practice, $r = 0.26$, $N = 58$, $p = 0.045$. There was also a positive correlation between the extent to which the AIW framework was consistent with teachers' personal views of good teaching (Values) and perceptions of

change in instruction, $r = 0.46$, $N = 58$, $p = 0.000$. There was no correlation between AIW knowledge and values and teacher report of the enactment of AIW instructional practices. These correlations are included in Table 10 below.

Table 9. Correlations Among Teacher AIW Knowledge and Values with Teacher Instructional Practice

	Change in Practice	Construction of Knowledge	Elaborated Communication	Value Beyond School
AIW knowledge	0.26*	-0.06	-0.17	-0.15
Values	0.46***	-0.05	-0.22	-0.17

Note: * $p < 0.05$, *** $p < 0.001$

Based on the correlations above, I ran a simple linear regression to test the efficacy of knowledge and values in predicting change in instruction. Unstandardized and standardized regression coefficients are shown in table 10 below. The results of the regression indicated the Values predictor explained 20.9% of the variance ($R^2 = .209$, $F(2, 55) = 7.270$, $p < .01$). It was found that Values significantly predicted teacher self-report of change in instruction ($\beta = .465$, $p < .01$), however, the effect of AIW knowledge was not statistically significant as shown in table 10 below.

Table 10. Summary of Linear Regression Analysis for Teacher Change in Practice

Variable	B	SE B	β
AIW knowledge	-.016	.187	-.013
Values	.508	.164	.465**

Notes: $R^2 = .21$, ** $p < 0.01$. $N = 58$.

While there are other aspects that contribute to teachers' change in instruction, this quantitative analysis was conducted to be exploratory in nature. The intention was to investigate the extent to which teachers' self-report of their knowledge and their values were associated with, or predictive of, their self-report of change in instruction. In turn, the correlational analysis indicated that teachers' self-report of AIW knowledge and values were both correlated with

teacher self-report of change in instruction. When the two variables of AIW knowledge and values were put into the regression model, knowledge did not have a significant effect, however, values did have a significant ($p < .01$) effect.

Although this analysis from the survey data is different from aspects of teachers' knowledge, values, and beliefs examined in the focal teacher qualitative data, it is still illustrative. It demonstrates relationships between AIW knowledge and values and teacher's instructional practice in the larger sample of teachers from both schools. The focal teacher interviews provide further information to understand the alignment of teacher's knowledge, values, and beliefs with the AIW objectives, and the relationship with their levels of AIW instructional practice. The following section further explores this association in the focal teacher interview data.

Alignment

The term alignment has been used in different ways in the educational research literature. Researchers have studied the alignment of the informal and formal organizational supports for reform (Penuel, Riel, Joshi, Pearlman, Kim, & Frank, 2010), alignment of formal and social interactions between principals and teachers (Printy, 2010), and teachers' experience of alignment between content standards, tests, textbooks, and instruction (Porter, 2002; Porter, Smithson, Blank, & Zeidner). However, I did not find the term alignment used as a teacher variable in relation to the teachers' knowledge, values, and beliefs and the objectives of a reform initiative. This aspect of alignment further illuminates the ways a principal may influence teacher learning and instruction directly and indirectly.

In the business management literature, the term alignment is defined as the extent to which an individual's knowledge and behaviors match an organization's objective (Gagnon, Jansen, & Michael, 2008). Drawing on this notion, I focus on one aspect and use the term

alignment in this study to mean the extent to which a teacher's educational knowledge and values match the objectives of the school, and the specific AIW reform initiative in particular. I define AIW knowledge as the extent to which a teacher used AIW terms, defined or used the term accurately, and connected the term to a concrete example indicating their knowledge-in-use. Many high-level teachers' descriptions demonstrated knowledge-in-use and integrated conceptual understanding of AIW.

By knowledge-in-use, I mean how teachers described knowledge of AIW in terms of their practice with more attention to how the concept is used, rather than the abstract (Spiro, 2007). This includes "variability and combination in concept instantiation" (p.7, Spiro, 2007). Some teachers demonstrated knowledge-in-use, and integrated conceptual understanding by providing concrete examples of how they integrated AIW practices in their instruction. In addition, they also made connections to other aspects of instruction, noted times when the approach may not be appropriate for their instruction, and demonstrated variability in understanding when and how to best implement different aspects of the framework. In the next section, I outline the high and low-level teachers' alignment of knowledge, values, and beliefs with the AIW initiative.

The extent to which, and the means by which teachers demonstrated a sense of alignment varied across the teachers I studied. Among the 12 focal teachers, the high-level teachers frequently demonstrated alignment of knowledge, values, and beliefs; however, the descriptions, perceptions, and experiences of alignment differed across the teachers. Overall, teachers who enacted high-levels of AIW instructional practices in the classroom also tended to describe ways in which the AIW tenets aligned with their beliefs and values in education. In addition, they demonstrated their knowledge through examples of the application of AIW in their instruction, as well as the integration of the AIW framework to their broader thinking about teaching. These

teachers seemed to embrace the approach and viewed the overall objectives as important to the goals of education in general.

In terms of a strong sense of alignment, two of the high-level teachers described the goals of AIW as consistent with their original views on education. Trine explained that AIW is an integral aspect of her belief system:

(AIW) is why I went into education. I mean, I really believe that this is really what, you know, what needs to happen. And obviously not every day you're going to have, you know, things that aren't – you're going to be teaching bibliographies one day and it's not going to have this, you know, incredible value beyond school, but yeah. I guess – I think that part of it is just you have to kind of own that philosophy, what – you have to really believe that. And the other part is just to know how to, you know, how to put it all together.

Trine states that you have to own the AIW philosophy, indicating the importance of embracing the notions underlying the instructional practices. While she comments on her belief that the approach is essential to education, she also recognized that every lesson may not include all elements and demonstrated a sense of variability of instantiation in her understanding. In addition to believing in the AIW approach, she says teachers also have to know how to integrate the different aspects of the approach with their teaching and they have to “know how to put it all together.” Trine demonstrated both her knowledge and understanding of the initiative, which reflected her broader conceptual grasp of the tenets of AIW.

Trine further described the alignment of AIW with her knowledge, values, and beliefs:

AIW just makes me feel better about everything because I really do believe that that's what it's all about. It's about getting kids questioning and thinking deeply and connecting it to what's really happening and connecting classroom to the community and all of that. I feel like AIW really embraces that.

She mentioned two aspects of the AIW framework in her own words: getting kids questioning and connecting classroom to the community. These aspects reflect construction of knowledge and value beyond school. Trine's descriptions reflected that her values and beliefs not only

aligned with the initiative, but she also articulated her knowledge consistent with central aims of AIW as well as different ways it was integrated in her practice.

Jana, another high-level teacher, also demonstrated alignment between her knowledge, values, and beliefs and AIW,

Well, I completely buy in to AIW. I buy in to, you know, the construction of knowledge, which I've done for years. Bringing it to the value beyond schools has always been important, but I didn't focus on it as much and try to get all my lessons geared around it as much as AIW's been helping me focus. I think that really does help kids engage because they need to understand, especially math, how it fits into their life and how it will fit into their life.

In her comment, Jana shared that she values and believes in the AIW framework. She further explained that she has implemented one aspect of the framework for years. Even with the strong sense of alignment between Jana's original views in education and AIW, she stated that the approach has helped her to focus on the aspects of instruction that she has believed are important, such as construction of knowledge and value beyond school. Jana speaks specifically about aspects of the AIW framework. She explained her belief that AI also promotes student engagement, as students understand their learning in the classroom is relevant to their lives.

Throughout the interviews, five of the highest scoring AIW teachers provided specific examples of the implementation of AIW in their classrooms. They consistently used terms from the AIW framework, shared about different ways they integrated the approach into their teaching, and focused on student learning outcomes. In addition, these teachers also shared about challenges that related to their implementation; however, the challenges related to concrete examples such as the tension between curriculum coverage and developing capacities in students.

In the classroom observations, these high-level teachers seemed to demonstrate high-levels of competence with aspects of the AIW framework. For example, Trine facilitated class discussions about the contribution of the student's learning to contexts beyond school. In another

instance, Jana led students through a math exercise to construct their knowledge of the value of pi through the exploration of measuring various parts of a circle. These high-level teachers seemed to provide opportunities for AIW to the students in a way that was integrated with their teaching, connected to the broader essential question guiding the class, and authentic to the work in the class.

The alignment of knowledge, values, and beliefs with the AIW framework was consistent among the five teachers who demonstrated the highest levels of AIW instructional practices in the classroom. Two of the other high-level teachers, Dan and Jeff, were AIW anchors that were responsible for facilitating the collaborative learning groups. They had participated in additional training, and demonstrated a strong conceptual understanding of AIW, and consistent application of the framework in their teaching. They exhibited their knowledge through the use of terms from the AIW framework, specific examples, and variable cases of different applications in the classroom. They also described in different ways how important and beneficial the tenets of AIW were, and how their values aligned. In addition, Dan and Jeff described their goals for the AIW scoring session, and extended beyond their own teaching to their ideas about developing the knowledge of other teachers.

Lila, another high-level teacher, expressed that AIW had the potential to align with anyone's philosophy. She described how her philosophy had changed, and how AIW had helped her to focus more purposefully on decisions in her instruction and assessment.

The nice attribute about AIW is that I do think it fits to several different aspects of anyone's philosophy. And that although my philosophy has changed, especially like in the grading concepts, like how do I grade, why do I grade, what I do grade. It's helped me to really focus that philosophy a little bit more purposefully, understanding when I look at a rubric that I designed that I don't have to put everything at a 4 to 1 scale.

This example demonstrates Lila's focus on the broader tenets of the AIW approach, and how she has been able to apply it. Although her philosophy may have changed, she perceived AIW as aligning with her developing instructional practice.

Not all of the teachers in the school articulated a sense of alignment of their knowledge, values, and beliefs with the tenets of AIW. A medium low-level teacher, Tom, also described his view of how the work of engaging students through AIW aligned with his values and beliefs. However, he provided little evidence of his in-depth knowledge of the initiative, "I think that having kids engaged in something that is of consequence long beyond their days in the classroom is the most noble type of work that needs to be done in the classroom. And engaging members of the community to assist in that pursuit makes it even better." In response to the question about alignment, Tom explained that the work of AIW was aligned with what was most important in teaching; however, he spoke less specifically about the other aspects of the AIW framework and application to his own teaching. This demonstrated the importance of alignment of all three aspects: knowledge, values, and beliefs with the AIW initiative. It was evident that Tom was passionate and invested in AIW, and experimented with authentic instruction, however, there were areas to further develop his capacity to instantiate different aspects of the framework in his instruction.

This was also the case with medium low-level teacher Kionna, who indicated she really believed in AIW, especially the value beyond school aspect. However, there seemed to be areas in which she could further develop her knowledge of the AIW framework. She indicated that she really enjoyed bringing value beyond school to her lessons, but that it was new to her and she had not explored the other standards as much. Her description of value beyond school in some instances reflected lower levels of practice on the rubric from the AIW framework. She talked about other classes in which the level of student engagement in learning opportunities was

enhanced by lessons that involved value beyond the classroom. She interpreted value beyond school to mean the connection of examples from students' lives to the curriculum, but did not mention other aspects of the standard that went beyond making connections to solving problems outside of school, and applying deep inquiry and construction of knowledge to these projects. During the lesson she would inquire, "Where do you see this in your own life?" or "Can you see this will be valuable in your life?" While she provided relevant learning opportunities for students to make connections to the material they were learning and their lives, they did not involve other aspects of the standard. This represented a lack of alignment between Kionna's knowledge and the goals of AIW, and further room for development.

The four other lower level teachers indicated they did not value certain aspects of the framework, made brief comments about what they valued, or described aspects of the AIW initiative that were different from their values. Overall, they demonstrated less in-depth knowledge or specific examples of application in their teaching. The teachers who did provide examples from their teaching seemed to also present challenges that prevented them from being successful, or other barriers that kept them from implementing the AIW framework. These teachers also tended to provide general agreement about how it may help them, but demonstrated less knowledge or misconceptions about AIW.

For example, when Tori, a low-level teacher, shared about not implementing an aspect of the AIW framework, she explained, "I guess I do not value it enough." Her comments indicated less of an alignment between her instructional values and the aspects of the AIW framework. Tori explained that she is more interested in data, and measurable results. The AIW approach was more difficult for her because it was often difficult for her to assess student progress and evaluate her effectiveness as a teacher:

It's more project based and it's not, you know, numerical like they got this many right or this many wrong and they don't know this term and this concept was

missed, so, it's harder I think for me to let loose and say okay, I'm going to go with this and they can have a variety of different answers and that's okay, you know, and it's like was that answer—was that specific enough?

Tori viewed the tenets of AIW as different from her approach to teaching. She frequently referred to needing to do more AIW projects, rather than to using any terms such as elaborated communication or construction of knowledge. Rather than a conceptual understanding of the AIW approach, she focused on more technical aspects of AI, and felt challenged to implement practices that involved less of a clear delineation and assessment of student responses.

Kari, another low-level teacher, also described how she benefitted from the initiative, but that she struggled with implementing the framework in different ways. She mentioned how there were other aspects of her instruction that were more demanding of her attention, or how other PD had been more beneficial to meet her needs. Although Kari explained the benefit in helping her to change her practice from doing worksheets to providing work that is beneficial to the students, she did not demonstrate a strong sense of alignment of her knowledge, values, and beliefs. She did not refer to aspects of the framework in her description of classroom teaching or AIW, and spoke about the many challenges she experienced with student's different ability levels and the many demands on her time.

Other low-level teachers expressed a range of experiences with the AIW, but they did not articulate or demonstrate high levels of alignment between the framework and their knowledge, values, and beliefs. For example, in response to the question about the extent to which AIW aligned with his personal beliefs and views on teaching, Greg stated, "I'd have to go back to what is vital for my students. And AIW is something that I think, from what I've been able to intake from it, that it is something that can help me. It is a good vehicle to use." Greg described AIW as a good vehicle and something that can help him; however, he did not express a high-level of alignment and demonstrated low-levels of AIW practice in the classroom. Similar to

other low-level teachers, he did not speak about many elements of the AIW framework or provide specific examples from his teaching. When he did mention AIW, he referenced value beyond school with a similar level of application as Kionna. He explained that he liked to show videos at the beginning of the lesson to engage the students, and help them make connections between their learning and the contexts outside the classroom so the students could see the value of what they were learning beyond the classroom. However, these instances were less connected to other aspects of authentic instruction. Out of the four aspects in the AIW framework, value beyond school was the most frequently referred to by the low-level teachers.

When another low-level teacher, Holly, was asked about how AIW aligned with her values and views about teaching she responded about the things she liked about the PD, but she did not demonstrate a deep understanding of the tenets of AIW or a sense of how they aligned with her views. For example, in speaking about AIW PD, she said, “I like the accountability and collaboration. Because I think that having children that are middle school aged myself, I think ‘why are they doing that? What’s the-?’ So, I really feel like, now, it’s more into the why. Why we are teaching it this way, why we are doing these types of things?” Holly explained that she liked the accountability and the collaboration and then explained that it helped her to understand why she was being asked to teach in a particular way. This response indicated that the approach was new to her in certain ways, or at least the conceptual understanding of why she was teaching in a particular way was new to her. She described challenges in learning about and implementing AIW, which seemed to be a barrier to deepening her knowledge and developing her instructional practice.

In speaking about implementing AIW in the classroom, Holly said, “My favorite is the real world connections, because then right away they think, ‘Oh, yeah. This is something I want to learn. This is fun.’” Holly used real world connections to refer to the AIW notion of value

beyond school and described a dream vacation power point project in which students calculate expenses for a dream vacation. This reflected some application of value beyond school in her classroom, but also indicated a misconception about the full description of the value beyond school standard. Her understanding of a project involving Value Beyond School was to have students make a connection to the real world by creating a dream vacation budget. She explained it was her favorite because she perceived it was something the students wanted to learn and thought it was fun. While this was a step in supporting students in making connections, there is room to further develop this aspect of the framework, as well as incorporate other aspects of AIW for students. This understanding indicated her initial efforts in enacting more AIW for students, yet less alignment between her knowledge and the goals of AIW.

Overall, the teachers I observed who enacted high-levels of AIW instructional practice in the classroom, and who also demonstrated alignment of their knowledge, values, and beliefs, with the AIW framework seemed to view AIW as an avenue to further develop their teaching along lines that were consistent with their values and beliefs in education. For the low-level teachers, there was not the same level of alignment between their knowledge, values, and beliefs in education and the AIW philosophy. These teachers implemented lower levels of the AIW framework in their classroom, and some expressed challenges with their efforts to embrace and enact AIW. Some of these teachers were enthusiastic about the approach, and implemented aspects of the framework, yet seemed to demonstrate areas of their understanding that could be further developed. Other teachers reported they did not value the approach, they did not know how, or needed more guidance and feedback. In general, several of these teachers referred to AIW terms less, demonstrated misconceptions, provided fewer examples from their practice, and described barriers and challenges as obstacles to their implementation of the AIW instructional approaches.

Further Examples from Focal Teacher Survey Data. In looking at the survey data for individual focal teachers, all but one of the high-level teachers indicated that they strongly agreed with the statement, “The tenets of AIW align with my values and beliefs in education.” In addition, the two medium low-level teachers, Tim and Kionna, also indicated they strongly agreed with this statement. Although Tim and Kionna strongly agreed that AIW aligned with their values and beliefs, they seemed to speak more theoretically about AIW, did not provide as many clear examples from practice, and did not seem to demonstrate high-levels of implementing aspects of the AIW framework in their teaching. In contrast, the 4 other low-level teachers indicated they agreed that AIW aligned with their values and beliefs, but did not strongly agree. One low-level teacher did not respond.

In terms of knowledge, at Birch, two high-level teachers strongly agreed with the statement: *My participation in AIW PD improves and deepens my content knowledge*. One high-level teacher and one medium low-level teacher also agreed with the statement. In contrast, all three of the low-level teachers disagreed with the statement. Although AIW PD is not content focused, the high-level teachers viewed it as an avenue that strengthened their content knowledge. All of the low-level teachers at the school viewed their participation as not contributing to the improvement of their content knowledge. Although their content knowledge is different from their knowledge of the AIW framework, it is possible that greater AIW knowledge was also associated with the improvement of their content knowledge.

At Cedar, the pattern was reversed. The two high-level teachers disagreed or strongly disagreed with the statement: *My participation in AIW PD improves and deepens my content knowledge*. The two low-level teachers agreed and strongly agreed with the statement. It seems the teachers’ experience of the AIW PD may have been different at the two schools, or there

were different factors contributing to their perception of the extent to which their participation in the AIW PD improved and deepened their content knowledge.

Teachers' Highest Priorities. Teachers' sense of alignment with AIW was also expressed in their descriptions of their highest priorities as a teacher. Teachers in the focal interviews were asked the question: *What is your highest priority as a teacher?* Teachers' priorities were one way to capture teachers' values in relation to teaching and their instruction. The high-level teachers provided responses that indicated a focus on student thinking and understanding and the process of promoting quality intellectual work in the classroom. These priorities or values were consistent with the tenets of AIW to promote students' quality intellectual work in the classroom. In contrast, the low-level teachers' priorities included a range of different ideas and focused on aspects of social emotional connection with students, formative assessment, and data. Their responses were more general and did not emphasize authentic intellectual work in the classroom.

There were several examples in which the high-level teachers described priorities that focused on student thinking, understanding, and promoting quality intellectual work in the classroom. Dan described his highest priority as, "Quality thoughts. I think I just want the kids to have quality thoughts. Sometimes not even getting it, not even creating it on their own, but taking pieces of what other kids are saying and then making it their own. I just want quality thinking." Dan clearly articulated his goal as promoting the students to develop their thinking capacity. When Jana described her priority, she said, "I really care about what the kids are learning." She emphasized the importance of seeing the strategies the students are using for problem solving and how to best structure her lesson to scaffold students to develop higher order thinking. Lila described her highest priority as, "getting out of the way of my students' learning and getting my students working with each other and collaborating and communicating." Lila

articulated her focus on facilitating student learning by providing opportunities for her students to interact and communicate.

Trine also emphasized the importance of authentic thinking and learning in speaking about her highest priority, “Just getting away from regurgitating what you hear, instead, you know, having that chance to really do some authentic thinking and learning.” She went on to describe her comprehensive view of the importance of supporting students on many levels to achieve this in the classroom. “With middle school, we’re talking, you know, not just academically, but socially and behaviorally- that’s my priority. If I can support them and keep that as my ultimate goal, that could mean a lot of different things for a lot of kids.” Trine indicated that student learning is important, but in addition to behavioral and emotional support. She spoke about the different needs of her students, and that support to promote student learning may look different for students. In describing her priority as a teacher she recognized the different needs of her students and described the ways she supported them to promote student learning.

Different from the majority of other high-level teachers, Jeff provided a more general description of his priority as a teacher. He explained his priority was to ensure students were “just a little bit better of a human being.” Jeff spoke about the contribution he wanted to make to his students. He spoke less about the learning process, student understanding, or his instruction. It is important to note that Jeff’s mentor was Tim, a mid to low-level teacher who he described as influencing a great amount of his thinking about teaching. Although Jeff shared this priority, he demonstrated a focus on student thinking and understanding in his instruction.

The low-level teachers tended to describe a range of different priorities, including the social emotional connection with students, formative assessment, and data. Overall, the responses seemed to be more general and less directly connected to the process of student

intellectual work in the classroom. For example, Holly described her highest priority as, “having a positive connection with every student.” Her response indicated that she focused on the social-emotional bond with students as the most important aspect and assessment of her teaching. Similarly, Greg stated his primary purpose as, “anything that can help (the students) to be successful.” He was less descriptive in providing a clear example of his application in the classroom. Katie described her primary focus as an aspect of formative assessment, “looking at where they’re at and what do I need to help them get to where they need to go.” She emphasized what she needed to do to help students’ reach a goal, yet did not focus on developing student thinking and understanding. Tori provided two different priorities, first she responded, “highest priority is engagement, to have something for them to physically do, or to make sure that they’re not tuned out.... I forget the question...” Then, after the question was repeated, Tori responded, “Priority is definitely, I want to see data. I’m a data driven person. I want to see the success. I want to know what I did actually helped them.” Tori provided two different answers, and seemed to be less clear about one focused priority in the classroom.

Similarly, Tom described his goal as a general notion for his students, “I want them to be confident in who they are, be proud of who they are, better understand who they are, and to be accepting of who other people are.” He described more of a theoretical notion of wanting his students to be confident, proud, and accepting. He did not provide a description of how this is achieved in the classroom or a connection to student learning. Two other low-level teachers did not describe their highest priority. Overall, the lower-level teachers tended to have different descriptions of their primary priorities in teaching, and did not make clear references to student thinking and the learning process in the classroom, or other goals consistent with the AIW framework. In contrast, the high-level teachers’ priorities focused on students’ intellectual work, thinking and understanding of the material. The next aspect of the inquiry examines the teachers’

perceptions of the influence of AIW PD on instruction, and further connections between their alignment and enactment of instruction.

Teachers' Perceptions of the Influence of AIW PD on Instruction

In terms of the extent to which the AIW PD influenced teachers' instruction, the majority of teachers reported on the teacher survey that the AIW framework informed their lessons on a monthly basis. A total of 60 percent of the responding teachers designed and/or revised some lessons using the AIW standards and criteria monthly. In addition, 24 percent of teachers reported they designed and/or revised some lessons using the AIW standards and criteria and implemented those lessons weekly. A smaller number of teachers, 14 percent, were aware of the AIW standards and criteria, but rarely designed lessons around them. Only 2 percent of teachers reported they did not consider AIW standards and criteria when planning lessons. Figure 4 below shows the frequency of teachers' instructional planning and implementation regarding AIW.

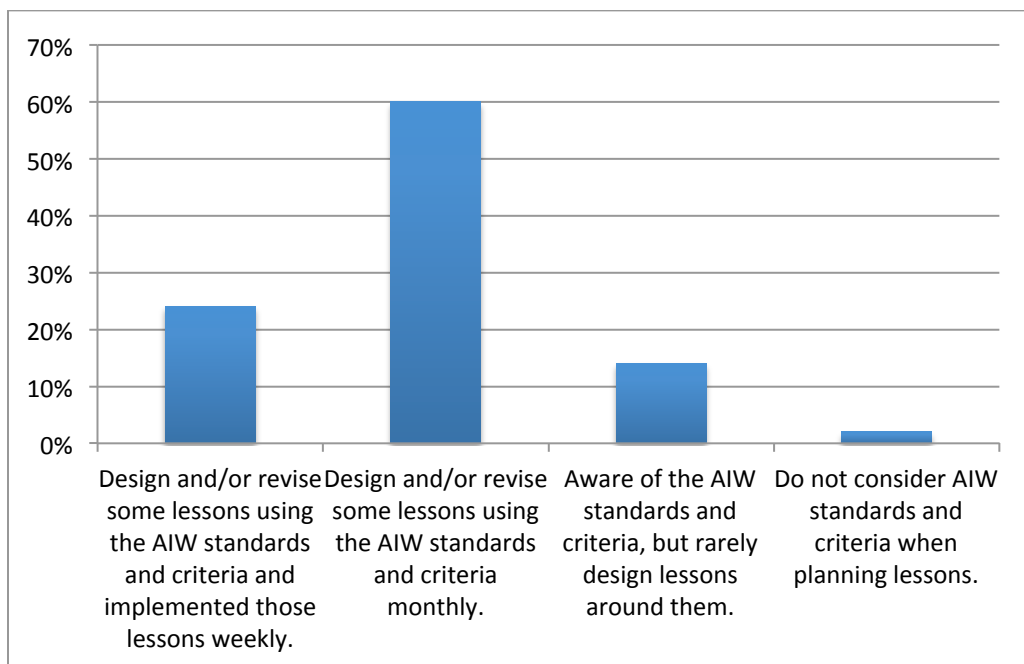


Figure 4. Frequency of teachers' instructional planning and implementation regarding the AIW framework.

According to their self-report, teachers' participation in AIW PD had a positive influence on furthering the frequency and implementation of AIW practices for many teachers. At the same time, the majority of teachers revised or designed some lessons using the AIW standards and criteria monthly. Given that the initiative has only been implemented at the two schools for the past two years, on the one hand this information can be encouraging to see that 80% of the teachers are designing and revising some lessons using the AIW standards and criteria monthly. At the same time, this frequency of design, revision, and implementation on a monthly basis is low given the broad goal toward ambitious and authentic instruction. The high and low teachers' responses were more or less evenly distributed across the first two columns, indicating that they represented a slightly higher frequency of revising and designing lessons compared to the larger sample of teachers.

Teachers' descriptions of how AIW PD influenced their practice provide more information on teachers' perceptions of aspects that were associated with their development and implementation of the new instructional practices. On the teacher survey, there were 32 responses to the open-ended question: *What are some ways AIW may have influenced your instruction in the classroom?* Out of these responses, 94 percent of the comments were about constructive influences on instruction that were consistent with the AIW objectives. Teachers' comments primarily focused on the benefits of reflection, implementing specific aspects of AIW in their instruction, collaboration with colleagues, and schoolwide coherence.

One teacher commented on connections between AIW and another PD initiative in a way that supported reflection on instruction and higher order thinking skills. The teacher explained, "I think AIW and our school's 21st Century Learning Initiative have led me to reflect on higher order thinking skills and how they are explored in the classroom." Some teachers indicated that

AIW PD provided structure and purpose for their efforts focused on reflective dialogue and inquiry to improve instruction. One teacher commented, “AIW gives purpose to our PLCs. Now our PLCs are more focused on improving instruction to improve learning.” This observation was echoed in the interviews with teachers discussed above. Teachers expressed that AIW provided a purpose for their focus on instruction, whereas in the past, the time was spent in more open conversation about students and teaching.

Out of all of the comments, the area that teachers focused on the most was aspects of teacher professional community that supported the development of their instruction. Twelve teachers noted the influence of common language, collaboration, and feedback from their colleagues. One teacher commented that AIW had influenced her instructional practice by providing “common vocabulary and practice within the school.” In terms of collaboration, many teachers focused on feedback and the support provided by peers as illustrated by the following comments: “Collaboration among peers has been most helpful,” “AIW has influenced my instruction by being a platform for teacher feedback,” and “It’s allowed me the opportunity to communicate with coworkers and collectively make some adjustments to my activities to better meet the needs of the students.” This was also evident in another teacher’s comment on how collaboration had supported her thinking about her instruction, “The collaboration with other teachers helped influence my instruction. It helps me view my own lessons in a different way. They may think of ideas I may not have thought of.” These comments indicate that aspects of teacher professional community were important in facilitating the influence of AIW on teachers’ instruction.

Another area that teachers focused on in their comments was the influence of AIW on their thinking and reflection. Eleven of the comments focused on how AIW had influenced their thinking and their reflection regarding their instruction. For example, teacher comments on

thinking and reflection included, “It has forced me to think more deeply about my own instruction,” “It has made me more aware of what and how I am presenting lessons,” and, “Allows me to reflect on how to get my students to have higher order thinking during lessons and tests/quizzes.” These teachers emphasized more reflection, thinking, and awareness of how and why they were making instructional decisions. Six of these comments specifically mentioned aspects of student thinking, understanding, and engagement. For example, “It has helped me think about my students’ thinking,” and “It has helped me develop lessons that are more authentic for students learning and this becomes more engaging for the students.” These comments illustrate aspects of the reform that involve changes in teachers’ thinking, reflection, and awareness as well as a focus on student thinking, understanding, and engagement.

The specific standards and terms from the AIW framework were also a focus of many teachers’ comments. Nine teachers made reference to ways in which AIW had influenced their instruction to implement specific standards from the AIW framework. Their use of specific terms and application of concepts demonstrated their knowledge AIW. For example, one teacher specifically mentioned she was “working on ways to have my teacher tasks score higher in construction of knowledge.” Another teacher mentioned she was focused on “increased meaning and value beyond school, which I believe increases student engagement.” Many teachers referred to specific aspects of the framework in their comments such as higher order thinking, construction of knowledge, elaborated communication, and value beyond school. These responses indicated the role of teachers’ knowledge of standards and specific terms from the AIW framework in thinking about the influence of AIW PD on their instruction in the classroom.

The two individuals who did not provide positive comments mentioned that AIW was not as applicable to their teaching. One teacher wrote,

To be honest, AIW really hasn’t impacted my classroom very much. I feel like AIW is a round hole and I am a square peg. Yes, there are aspects of my

classroom that fit into the AIW framework, but not many. The best feedback that I have received from an AIW scoring session was based upon a written assignment, something I only do twice a year. As an instrumental music teacher, it is challenging to find more than one way to make this work for me.

This teacher describes a situation when the feedback was valuable, however; in the subject of instrumental music, the teacher did not see many classroom aspects where the AIW framework can be applied. The other teacher stated, “(AIW PD) really has not influenced my instruction.” There was not further explanation to provide more information on the extent or the level of influence on instruction or the factors that may have contributed to the lack of influence on instruction. In addition, I was not able to determine the extent to which AIW may have or may have not influenced instruction for the 26 teachers who did not respond to this question on the survey. All of the responses are included in Appendix E.

In response to the question, the high-level teachers tended to provide positive comments about the influence of AIW on their instruction, and the low-level teachers tended to provide brief comments or did not respond. Dan, a high-level teacher, referred to an AIW standard in connection to classroom instruction, “The follow up elaborated communication has really been the key learning I have had. I am not satisfied with just answers anymore. I expect an explanation after the answer.” Trine also referenced an AIW standard and noted the connection to student engagement, “(AIW) increased meaning and value beyond school which I believe increases student engagement.” Another high-level teacher, Jeff, commented that AIW had influenced his instruction by promoting his “deeper processing about goals behind lessons/tasks/learning.” Jana mentioned the role of feedback from peers, “AIW has influenced my instruction by being a platform for teacher feedback.” All of the high-level teachers mentioned positive aspects in which AIW PD had influenced their instruction, and many of them provided examples, referred to standards, or made connections to their practice. All but one of the high-level teachers who participated in the survey responded to this question.

In contrast, only one of the participating low-level teachers responded to this question. The one comment from a low-level teacher was brief and nondescript. Tori commented, “Find ways of developing more real-world projects.” This comment reflects her focus on trying to find more ways to develop real-world projects in her instruction. From the lack of response, it is difficult to determine the extent to which the low-level teachers perceived that the AIW PD influenced their instruction.

The interview data revealed further detail regarding teachers’ perception of influences on their instruction. When asked what made had the greatest influence on their instruction, the majority of focal teachers reported that collaborative work with colleagues was the most important factor. A total of 8 out of the 12 teachers explicitly noted that the reflective dialogue and critical inquiry with their colleagues made the biggest difference in changing their instructional practice. Trine explained, “We’re doing a lot of reflecting on our work and questioning each other and we’re kind of breaking things down.” Similar to other teachers, she expressed that the process of critical inquiry supported her the most in developing her instruction. Teachers noted feedback, ability to take risks, and collaborative work together enabled them to reflect on and improve their practice as well as personal resources, PD, principal leadership, and teacher professional community.

Summary

There was a positive correlation between teachers’ AIW knowledge and values, and their self-reported perception of a change in their instructional practice. In addition, the linear regression analysis indicated teachers’ values significantly predicted teacher self-report of change in instruction, however, AIW knowledge did not have a significant effect. This analysis indicated the relationship between AIW knowledge and values and teacher’s instructional practice in the larger sample of teachers from both schools. The focal teacher interviews

provided further insight on the alignment of teacher's knowledge, values, and beliefs with the AIW objectives, and the relationship with high and low levels of AIW instructional practice.

Overall, there was a pattern in which the higher-level teachers demonstrated alignment between their AIW knowledge, values, and beliefs, and AIW objectives. These teachers also implemented high levels of AIW in their classroom. In contrast, the lower-level teachers did not demonstrate alignment of their knowledge, values, and beliefs with AIW objectives. They tended to mention ways the initiative may have benefitted them or limitations they perceived regarding the PD and implementation, but did not articulate ways their knowledge, values, and beliefs were aligned with the AIW framework. These teachers also mentioned they needed to learn more strategies or ideas, which may reflect a focus on the technical aspects of AIW over the broader conceptual understanding, a need for further support, or both. Two of the medium low-level teachers espoused the benefits of the AIW approach and agreed with the tenets of AIW, but did not provide specific examples of implementation, or connect theoretical ideas to their practice. These teachers seemed to be challenged to consistently enact practice in the classroom that was congruent with their espoused theory of ambitious instruction. In turn, the extent to which the teachers' knowledge, values, and beliefs aligned with the AIW framework seemed to be associated with their level of AIW enactment in the classroom.

In addition, teachers reported on their perceptions of the influence of AIW PD on their instruction. In response to an open-ended teacher survey item, teachers primarily focused on the influence of collaboration on their instruction. In addition, teachers' comments also included the role of their thinking and reflection as well as a focus on student thinking, understanding, engagement, and a benefit to students as central to the influence of AIW PD on their instruction. In addition, teachers mentioned aspects of the AIW framework in discussing the influence on their instruction. They made specific mention of terms, and many teachers made connection

between their knowledge of the AIW standards and their classroom instruction. These areas that teachers mentioned were important in the influence of AIW PD on their instruction indicate possible avenues through which the principal can facilitate teachers' alignment of knowledge, values, and beliefs with the AIW framework, and promote enactment of the new instructional approach.

CHAPTER 7: DISCUSSION, IMPLICATIONS, AND CONCLUSION

Discussion

A key concern of many education stakeholders is that schools in the U.S. are falling short in preparing students to successfully transition to future educational and career paths. To address these concerns, the Common Core State Standards (CCSS) define the knowledge and skills necessary to succeed in college and career pursuits. Arguably the most significant educational policy initiative in over a decade, these standards were designed to set new expectations for both students and educators. Individuals in a variety of roles encounter unprecedented challenges as states adopt these standards. School district leaders and principals face important decisions about instructional materials, assessments, and processes to support teachers in learning new instructional approaches. However, school principals and teachers experience limited resources and capacity to undertake this work. In turn, external organizations and individuals are providing assistance to meet these challenges (Coburn, Bae, & Turner, 2008; Datnow & Honig, 2008). A growing number of such external organizations base their work on educational research (e.g., Sherer, Israel, & Resnick, 2013).

The Center for Authentic Intellectual Work is one particular example of an external organization that emerged out of the research of a group of scholars and the needs of educational practitioners. The center focuses on developing local capacity to sustain educational reform work. The AIW initiative in Iowa is intended to provide learning experiences that engage students in rigorous intellectual work through thinking, writing, and discussion; the type of experiences that align with the CCSS. One critical aspect of this work includes engaging students in meaningful learning experiences with valuable outcomes.

Public and private funders are directing increased attention and funding to these organizations (e.g., the Institute of Education Science and the National Science Foundation) in

support of research-based assistance to promote instructional improvement and student learning outcomes. Yet, little is known about the conditions under which principals and teachers employ the use of research-based guidance from external organizations and initiatives to promote instructional improvement and students' cognitive engagement in learning.

This study sought to understand principal leadership and associated organizational conditions that enhance or hinder instructional improvement efforts and increased student cognitive engagement toward valuable learning outcomes. Specifically, I examined three main organizational conditions; principal leadership, teacher professional community, and professional development in the context of a research-based reform initiative developed by an external organization. In the process, I analyzed data from various levels of the educational system ranging from state and district educational policy decisions to school and classroom factors that supported the enactment of the AIW initiative. The findings provide implications for ways to promote a shift in the culture of a school toward ongoing instructional improvement, teachers' enhanced professional development, and high cognitive demand learning for students.

In the first part of the discussion, I highlight and discuss the salient findings from each of the research questions. Then, I present the broader theoretical and practical implications. I integrate the different findings by discussing the role of principal leadership as central to a comprehensive model for instructional improvement associated with student cognitive engagement. Throughout the discussion, I focus on the connections among the different aspects of instructional improvement. Finally, I discuss future directions for research.

Overview of Findings

AIW Instructional Practices and Student Cognitive Engagement. Overall, teachers varied in their levels of AIW instructional practice across the two middle schools. In each school, there were teachers who scored at both high and low levels for their enactment of AIW

instructional practice. In addition, there were a few teachers who seemed to be in the middle and demonstrated medium-low and medium-high levels of AIW instruction. Teachers were not as clearly distinguishable by their student cognitive engagement scores. I found that across all of the classes in the schools, students reported consistently high levels of cognitive engagement. There was relatively little variance in student cognitive engagement as reported by the students among the different teachers. In both schools, teachers indicated that student engagement was a top priority in their planning, delivery, and reflection on instruction.

The findings indicated, however, that teachers conceive of student engagement differently. Specifically, teachers in this study conceptualized student engagement in primarily two different ways: 1) student thinking and understanding and 2) student engagement as activity or excitement. In addition, teachers' conceptions of student engagement were associated with differences in the level of Authentic Instruction in the classroom. Teachers who conceptualized student engagement as student thinking and understanding tended to have higher levels of Authentic Instruction in the classroom. These teachers also had a broad view of classroom events and emphasized personal reflection and competence in discussing challenges or ideas for improvement. Conversely, teachers who conceptualized student engagement as activity or excitement demonstrated mid- to lower levels of Authentic Instruction and focused more on covering material, classroom management, aspects of behavioral engagement, and barriers to their instructional goals. These teachers emphasized challenges and constraints that tended to be outside of their control, and provided theories or ideas to solve their concerns.

Overall, the fact that teachers' conceptions of engagement were so closely related to their level of instructional practice is not surprising. The Authentic Instruction measured in this study was an approach based on promoting quality intellectual work and students' higher order thinking. In turn, teachers who defined student engagement as student thinking also enacted

instructional practices that were consistent with the way engaging students occurred for them. In the classroom, these teachers demonstrated higher levels of instructional practices that fostered the development of student thinking and understanding. Similarly, teachers who emphasized activity and excitement enacted practices in the classroom that involved activity or elicited interest and excitement. These teachers did not emphasize a focus on cognitive engagement and conceptual understanding in their descriptions. In many instances, the teachers were not explicitly aware of the connection between their conceptions and actions.

One theme that arose in the analysis was the tension between making learning relevant, interesting, and exciting, while also having high expectations for intellectual rigor and student learning. For some teachers, relevance was interpreted to mean interesting and exciting for the student. While this may be a byproduct, or related aspect of curriculum that is relevant to students' lives, this is only one aspect. The challenge for some of the teachers who defined engagement as excitement or activity seemed to lie in creating learning experiences that both have relevance to students' lives, and that have intellectual rigor that requires the students to engage in deep thinking about complex concepts, construct knowledge, and then demonstrate understanding through elaborated communication. Despite this challenge, it was evident from the teachers' descriptions of their experiences in the classroom that they are committed and invested in their work.

Many of the teachers that focused on activity and excitement seemed to be dealing with a tradeoff between having their students engaged through excitement, interest, and activity, or having to use traditional approaches of lecture and worksheets to get through the material. While this can be an important aspect of engaging students, it is one approach to teaching out of different approaches that can elicit engagement from students (Cooper, 2013). In particular, activity oriented instruction may be more effective at eliciting certain aspects of engagement

over cognitive engagement. An emphasis on making learning fun, exciting, and interesting can create a tension with other instructional practices that ask students to grapple with the often uncomfortable work of working through challenging problems and new ideas, which is often the case with constructing knowledge, elaborated communication, and disciplined inquiry.

Another challenge emerged for the teachers focused on thinking and student understanding. These teachers described their need to support students to develop capacities and to foster skills occur over time. Cultivating student thinking was not described as a linear process to be neatly packaged into units, blocks, or calendar school years. Some teachers struggled with implementing ambitious instructional practices given that learning is not linear or segmented in such a way. These teachers confronted challenges with pacing and curriculum coverage while also deepening AIW.

Principal Support for Instructional Improvement. The principals at both schools promoted teacher learning of ambitious instructional practices through their direct interactions and indirect influences on organizational conditions. The findings indicate that school principals in this study promoted instructional improvement by cultivating PD coherence, aspects of teacher professional community, and a growth mindset. In addition, each principal demonstrated different actions in response to the different educational contexts. Principal David Grand created consistent messages for the framing and delivery of different initiatives in his school so that teachers saw the connections among the different efforts to improve teaching and learning. Although principal David Miller did not directly communicate the connections among the different initiatives, he provided an overall sense of coherence of PD at the school such that the teachers experienced a cohesive effort toward instructional improvement. Thus, the two principals both supported PD and teacher professional community, however, their actions and decisions were different in the two contexts.

The two principals also promoted aspects of the teacher professional community in each school. Grand cultivated the teacher professional community at Birch through shared language among the teachers, common goals, collaboration, and teacher input in decision making. He regularly attended the AIW PD meetings and asked teachers questions that promoted teachers' shared language and understanding of the key terms and concepts in the initiative. He also shared his own commitment and educational aims to develop common goals among the staff. Grand promoted collaboration among the teachers by structuring shared planning time and an open door policy in the school so that teachers agreed to welcome visitors into their classroom anytime. Finally, Grand incorporated teachers' input in decision making by working with a leadership group comprised of teachers throughout the school who advised him on current needs and future directions for their work. Although there were many clear actions Grand took to cultivate teacher professional community, there were still divisions among the staff, and teachers who experienced a sense of favoritism or conflicts with other teachers that may have negatively influenced their learning and implementation of AIW instructional practices.

Although Miller did not provide the same structures, he also promoted aspects of teacher professional community. Teachers referenced shared language in discussing the reform initiatives and instructional improvement at their school. Throughout the school, teachers referred to common goals in terms of promoting the aims of AIW and improved student outcomes. Teachers also participated in collaborative planning and AIW reflection time. Principal Miller emphasized his approach to shared leadership in which he empowered individuals in the school to take ownership for their development and school goals. He achieved these goals through informal interactions and individual conversations. At the same time, some teachers described conflicts with other teachers that impeded their AIW PD experience and expressed a need for greater principal involvement and intervention to address these issues.

There were also some teachers who demonstrated higher levels of alignment with the initiative, and others that seemed to be superficially involved. This suggests that the lack of some structures may have hindered teacher learning and enactment of AIW instructional practices.

Similarly, principal Grand provided clear and consistent messages to foster a growth mindset among the teachers at Birch. He facilitated a book study at the school and made ongoing reference to growth mindsets to reinforce the focus over time. Principal Miller also discussed the importance of risk taking, especially in the context of instructional improvement, and incorporated these ideas in his conversations with his teacher. There were teachers in both schools who seemed to be supported by this approach, and others who did not mention it as relevant for their learning.

The differences between the two principals illustrate the importance of understanding leadership actions in light of the unique and changing contexts of each school. While Grand described the strong principal leadership that had preceded him at Birch, Miller discussed high levels of student behaviors problems at Cedar when he began as a principal. Grand described existing structures at the school that continue to facilitate the collaboration and work of the teachers. Miller, on the other hand, explained that he had focused on a clear approach to address student behavior, and then to support teachers who were resigned to the lack of engagement and learning in the school. Miller outlined steps he took to hire new teachers and counsel out previous teachers to develop a staff with common goals for student learning. Both principals discussed the demographics of the student body and the challenges of the students who attended the schools, however, this was a greater emphasis for Miller.

The findings from Birch and Cedar are consistent with other research indicating that principals can effect change through two primary avenues, designing the organization and developing people (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Grand demonstrated

leadership in both of these areas. He created structures for decision making and collaboration, as well as promoted the development of the people through a book study about growth mindsets and participated in the PD sessions. Miller explained he focused more on the organization and established structures for collaboration and PD, and he spent less time focused on the development of the people in the building. In turn, teachers expressed a need for greater involvement and support of individual's development.

Overall, there were strengths, limitations, and tradeoffs in the way both principals executed certain aspects of leadership. Although research has indicated that distributed leadership and participative decision-making can be constructive practices for principals (Spillane, 2005; Leithwood & Sun, 2009; Slegers, Geijsel, & Van den Berg, 2002; Thoonen et al. 2011), there are important implications in the different ways principals may interpret the enactment of these practices in schools. The way Grand promoted shared leadership led to teachers' perceptions of superstars in the building, and experiences of being labeled as a good or bad teacher rather than receiving constructive feedback. In the case of promoting teacher learning and ambitious instructional practices related to AIW at Birch Middle School, Mr. Grand created a leadership group to provide training, facilitation, and direction in the professional learning communities. These individuals were selected to receive AIW training, serve as Anchors (Facilitators of the AIW PLC meetings), and to meet regularly with the principal. While this provided the structure and support to realize the implementation of AIW in the PD meetings and in the classroom, there was an inherent tradeoff in selecting some teachers over others for these specialized roles.

The teachers who were elected as star of the month, and who served in leadership positions received the acknowledgement and the opportunity to provide support to other teachers in the building. These teachers promoted the AIW initiative and elicited support and participation

from other teachers in the building. At the same time, those teachers became separated from other teachers in the building, and in some ways, may have limited their access to the conversations of other teachers who may have not felt included in the leadership group. Furthermore, the teachers who were not selected as the superstars were aware of their status in the building. These teachers tended to respond in one of two ways, to either negate the importance of the leadership group and the star of the month teachers, or to question their own value and contribution in the school. Either way, the teachers not in the preferential position of the building superstars seemed to be left with a rather fixed experience of being on the outside, and not having the skills or resources to improve how they were perceived or labeled.

In the case of Cedar Middle School, Mr. Miller advocated a shared leadership model. Teachers were given freedom and responsibility to conduct the AIW PD meetings on their own, and to provide feedback to one another. In some cases, the teachers had experiences in which other teachers were not aligned with the goals and priorities of AIW, or they were not skillful in providing feedback, and the teachers experienced the AIW PD sessions as less productive. In these cases, the teachers requested more support and intervention from the principal, and the shared leadership needed to be balanced by structures and opportunities for leadership intervention in certain instances.

It seems that although principals look to shared leadership models to mobilize staff, encourage support, and share in the decision making responsibility, the ways in which principals interpret and distribute leadership have important implications for teachers' experience in the school, and perceptions of their own potential for growth and meaningful contribution. In the case of Birch Middle School, it seemed that the recognition of teachers with certain skills, dispositions, and abilities provided further support and encouragement for those teachers; however, teachers who were not recognized for their leadership skills and instructional

competence on the other hand, interpreted the selection of others as a clear indication of their lack of competence and potential.

While the leadership group was needed to fulfill on creating a structure to support the reform initiatives, and the star of the month was intended to recognize teachers and potentially motivate other teachers, it contributed to a situation in which teachers who were recognized as leaders were the teachers who received further opportunity. The other teachers received the message that they were not part of the selected superstars in the building. In addition to any challenges they may have experienced in their instructional practice and professional development, these teachers also received fewer leadership opportunities, less recognition, and diminished social standing in the school. Although it can be beneficial to recognize the contribution of teachers in schools, and to promote shared leadership, when it is enacted selectively it can perpetuate structural and social inequalities in which the privileged or talented teachers are further rewarded, recognized, and provided with opportunity, while teachers who are not recognized or selected receive less acknowledgment and fewer opportunities.

Associations Between Teachers' Knowledge, Values, and Beliefs, and Instructional Practice. This study identified a positive correlation between teachers' AIW knowledge and values, and their self-reported perception of a change in their instructional practice in the larger sample of teachers from both schools. The further linear regression analysis indicated teachers' values (as measured by the extent to which AIW instruction was consistent with their personal views of good teaching) significantly predicted teacher self-report of change in instruction; however, AIW knowledge (as measured by teachers' self-report of their knowledge of the AIW framework) did not have a significant effect.

The analysis of focal teacher interview data indicated a pattern between teachers' level of implementation of AIW instructional practices in their classroom and the extent to which their

knowledge, values, and beliefs aligned with the AIW framework. Teachers who demonstrated alignment between their AIW knowledge, values, and beliefs, and AIW objectives tended to implement higher levels of AI in the classroom. These teachers focused on the broader conceptual understanding of AIW, and referenced how they connected their instruction to these broader goals of developing student thinking. In contrast, teachers who did not demonstrate alignment of their knowledge, values, and beliefs with AIW objectives tended to exhibit lower levels of AI in the classroom. These teachers described a need for more strategies and ideas, and focused more on the technical aspects of AIW. Two teachers discussed the benefits of AIW, but were challenged to provide specific examples for implementation, connect theory to their practice, and enact AIW practices congruent with their beliefs.

These findings point to the essential role of principal leadership in promoting alignment through professional development that supports teachers to develop alignment of their knowledge, values, and beliefs with the aims of the PD initiative. For teachers who did not demonstrate a strong sense of alignment, principals may be able to promote opportunities for teachers to experience alignment of their knowledge, values, beliefs, and behavior through different avenues such as coherence of PD, aspects of teacher professional community, and promoting opportunities for experimentation, practice, and modeling including demonstrations of instructional competence in relation to the AIW framework.

It is unclear from the data whether many of the high-level teachers with strong alignment developed it through their PD experiences, or whether they had certain knowledge, values, and beliefs that aligned with AIW before the initiative. For low-level teachers who do not demonstrate high-levels of alignment, there seems to be a need to support them to promote stronger alignment of their knowledge, values, and beliefs with the goals of AIW to facilitate their ability to develop their instructional practice. Some possible avenues to promote alignment

include modeling and experimentation, evidence of student learning outcomes, communication of how AIW aligns with what is valued and measured in the school, and collegial support.

Complete alignment requires teachers within a school to develop aligned goals, knowledge, and behavior to support the learning objectives of the school. To clarify, this does not require all teachers to have one set of particular behaviors or beliefs, but that their goals, knowledge, and behavior are aligned with the goals of the initiative such that they act in a contributory manner to support the goals of the school. A few teachers who highly valued the aims of AIW, but lacked the knowledge, and knowledge in use, and failed to effectively integrate the new practices into their existing approach to instruction exemplified a lack of alignment. Therefore, all of these areas of alignment must be addressed.

Educational policy can benefit from addressing aspects of teacher alignment as new reforms and initiatives are introduced in schools. Acknowledging how the reform may be similar or different from existing structures and different values can support teachers in learning about and understanding new approaches to teaching and learning. Without attention to these important aspects of alignment, educational policy and reform efforts run the risk of disparate implementation, and potentially superficial changes that do not support deep and lasting learning structures in schools for teachers and students.

Theoretical Implications

This research contributes to the existing literature in a number of ways. First, the association between teachers' conceptions of student engagement and their enactment of reform oriented teaching practices contributes to both the socio-ecological theories of engagement as well as literature on educational reform. The relationship between teachers' conceptions, and the decisions they make in the classroom context indicate that there is an important connection between the two domains. This finding demonstrates the need to build on the understanding

about how a phenomenon occurs for an individual and the relationship between that occurring of the phenomena and their actions. Specifically, the findings suggest that teachers' perceptions and conceptions of student engagement are associated with the decisions they make in the classroom context, and the extent to which they provide ambitious instruction to promote students' quality intellectual work.

Furthermore, the teachers' experiences regarding AIW PD and student engagement help to illuminate their social and contextual realities. This suggests the need to explore an additional component to the common components of engagement models (e.g., Finn & Zimmer, 2012). In turn, this work contributes to the theoretical basis for future reform initiatives by highlighting the need to address how teachers conceive of students and their engagement in learning in addition to a focus on teachers' instructional actions and decisions in the classroom context.

My work further contributes to the literature on the training and development of school leaders to improve the quality of schools. The findings indicate that effective principal leadership in the two schools in my study responded differently according to the school contexts to promote coherence of professional development, aspects of teacher professional community, and a growth mindset in the schools. This extends on current leadership models and suggests that principals enact change in schools through specific actions and behaviors related to various organizational contexts. In turn, in addition to an emphasis on principal knowledge in leadership development, this research indicates principals will benefit from developing their ability to draw on a diverse skill set to respond to the changing needs of their schools. This is consistent with emerging theories on teaching leadership (Erhard, Jensen, & Granger, 2013).

These findings also contribute to the literature on PD for instructional improvement by suggesting teacher learning for improved instruction is not uniform. It provides implications for adult learning theories (Knowles, 1980; Mezirow, 2000) and PD to build on frameworks that

allow for adult learners to begin with different levels of knowledge and skill, and to move through stages in progression. In turn, the differences in teachers' learning in this study inform the development of theory on teacher learning progressions and instructional practice progressions for such ambitious instruction associated with student cognitive engagement similar to work on science teacher learning progressions (Schneider & Plasman, 2011). These findings also imply the need for theories to include differentiated approaches to professional development for teachers' implementation of ambitious instructional practices.

In addition to differentiated approaches for teacher learning, this study further contributes to contemporary policy discourse and intervention theories focused on improving schools in difficult or disadvantaged contexts. Alma Harris and Christopher Chapman (2004) provide evidence from schools facing challenges in Britain to illustrate the need for differentiated approaches to improving such schools. This study further extends on the school improvement literature by providing an alternative perspective on school improvement to move from standardized solutions to differentiated approaches that recognize the variability, unique needs, and complexity of U.S. schools in difficult contexts.

Practical Implications

Practical implications from this study suggest principal leadership is central to a comprehensive approach to instructional improvement. This comprehensive approach would involve the different aspects of the school system ranging from school district to school and classroom levels. Building on the broader ideas of complexity theory introduced in the opening framework, principal leadership can be understood in terms of their role in relation to the different levels of the educational system including the district level, the school level, and the classroom level. Complexity Theory emphasizes the need to examine different levels of the system and their reciprocal influences to best understand teacher learning and the subsequent

impact of the learning experiences on instructional practices (Opfer & Pedder, 2011). In this section, I connect the different ideas presented for the three research questions and discuss the practical implications from this study at the district, school, and classroom levels.

At the district level, a comprehensive approach would examine the capacity for decision making as well as the influence of external organizations and the use of research-based support. The school level would include principal leadership, teacher professional community, and school-wide professional development. The classroom level would include the instructional core (Elmore, 2000) involving the teacher, the student, and the content. Any approach to addressing student learning outcomes would emphasize student engagement in valuable learning outcomes. Although this study did not include the broader school community, instructional improvement would also build strong networks with parents and promote teacher's knowledge about the communities they serve (Bryk, et al., 2010). Such a comprehensive approach would also intentionally foster relational trust, when individuals view one another as competent, trustworthy, respectful, and compassionate, to galvanize teacher and parent commitment to the challenging work of school reform (Bryk & Schneider, 2002).

District Level. Although this study primarily focused on the school level, it was evident that the district made decisions, informed by the AIW center, to structure the initiative in a way that supported teacher learning. Decisions made at the district level in terms of selecting the AIW reform initiative as well as other policies that influenced factors at the school level. The principal plays a critical role in translating these messages from the district decisions into structures, programs, actions, and resources at the school level. Districts can create structures to amplify reform by crafting coherence of programs and ensuring opportunities for teacher learning (Spillane, 1996). However, principals ultimately provide leadership in the extent to which district-based programs are coordinated and the nature of teacher opportunities for learning.

Districts can also prepare individuals who support the reform, such as instructional coaches and curriculum specialists, by establishing clear expectations for their roles and developing their knowledge and abilities (Coburn & Russell, 2008; Mangin, 2007). Then principals must ensure those roles are carried out and have to local expertise to best assess how those individuals can best support the teachers at the school. These findings imply principals can act as an essential agent for district-initiated reform in the ways they frame the reform, promote coherence in teacher learning initiatives, and ensure the appropriate resources and support through various organizational conditions.

School Level. In a school context that does not adopt a comprehensive reform, principals are often in the position to implement a school-wide approach to reform. As indicated by existing research, principals can create similar conditions to comprehensive reforms, which have high-levels of agreement on the goal of instruction, and orchestrate resources to build a coherent infrastructure to support teachers as they improve their instruction (Berends et al., 2005; Cohen, 2011). Similarly, the findings in this study indicate the principals in both schools demonstrated specific actions and behaviors to facilitate a school-wide approach to reform.

The findings emphasize the critical role of principal leadership to support and sustain a number of organizational conditions to promote capacity for instructional improvement. Implications for principals include the need to provide a foundation to nurture strong community relations, enhance teacher collaboration and instructional capabilities, and promote a climate for student learning and engagement. Principals can also support instructional improvement through the coordination of coherent professional development opportunities and a growth mindset culture that allows for risk taking and the uncertainty of experimenting with and learning new instructional practices. Consistent with previous literature (Bryk, et al., 2010), strong instructional leadership is critical to establish and sustain instructional improvement.

Instructional leadership must be conceptualized and enacted in relation to the teacher professional community and professional development in the school to generate reform. Teacher professional communities influence teacher practice and are a critical element for instructional improvement (Coburn, 2001; Ingersoll, 2003; McLaughlin & Talbert, 2001). Principals can leverage their unique position to make provisions for teacher collaboration and learning by drawing on external, research-based assistance and intentionally distributing leadership throughout the school in ways that channel each individual's capabilities toward common goals. The schedules, structures, and resources in the school, as well as the climate of learning for both teachers and students are key elements to sustain and support ambitious instructional improvement that cultivates deep student cognitive engagement.

Professional Development. In turn, one dimension in which principal leadership could intervene is the assurance of teachers' coherent PD experience to promote their alignment with a particular reform initiative. The findings in this study build on previous literature, which states that when school principals organize sustained professional development opportunities around a common instructional framework; teachers' professional learning and quality of classroom instruction are likely to improve (Darling-Hammond & Richardson, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001; Newmann et al., 2000; Newmann, Smith, Allensworth, & Bryk, 2001). These findings build on this literature and suggest that opportunities for PD need to be part of a coherent program for teacher learning. Given the multiple reforms that currently exist in schools, there is even a greater need for principals to ensure PD coherence. The principals in this study ensured that there was a coherent school improvement strategy that teachers were involved in over time. They buffered external demands, translated district policies, and framed the various reforms under one school-wide instructional purpose. Principals can

communicate the ways in which different reforms at the school are connected and can frame the initiatives in ways that teachers see the connections among different reforms.

Beyond a list of recommendations, these findings help to provide insight into the daily activities that are present and absent for principals, and teachers' perceptions of support. Overall, high-level teachers noted PD coherence, and the impact on teacher learning in PD. Based on these findings, principals can support teachers through their regular attendance at PD meetings, and by developing their knowledge and understanding of both the content and the mechanism of learning for the different initiatives. Principals can also involve teachers and coaches as instructional leaders to support teachers' coherent experience of PD. In addition, principals are in the unique position to evaluate teachers using tools that are aligned with the reform initiatives and instructional programs in the school.

In terms of teacher learning and professional development, the findings suggest that some teachers and principals may benefit from learning progressions and instructional practice progressions for teachers that outline the progressive steps and skills to mastery of new instructional practices. Learning progressions have been used for students and teachers in the field of science (Schneider & Plasma, 2011). This work is applicable to AIW in that it involves the development of complex intellectual understandings and processes. In the case of learning about AIW, many teachers shared that the instructional practices were new and unfamiliar to them. Some teachers expressed the need for clear expectations and feedback regarding progress toward those goals. Instructional practice progressions for ambitious instructional practices could provide model examples for teachers, and include what progressive steps toward developing those practices may look like. It would provide teachers with further tools to examine the development of their instruction, such as different levels of questioning, feedback, construction of knowledge lessons, and value beyond school projects. In addition, learning progressions

would outline the progressive steps teachers may go through in their learning about ambitious practices such as AIW to enhance PD support in the learning process. Further implications include the need for differentiated approaches to professional development to guide and scaffold teacher learning in different ways according to their learning needs.

Teacher Professional Community. In addition, this study highlights principal leadership as a key factor to ensure structures and opportunities for in-depth and ongoing critical inquiry among a group of colleagues to examine their instruction and reflect on student learning. More than an emphasis of any one particular approach, the implication from these findings suggests that principals must support teachers in their efforts toward instructional improvement through sustained and coherent school-wide structures, collaborative learning communities, instructional leadership, and a process that facilitates their focused reflection in a way that connects theory to practice. This level of reflection and critical inquiry needs to be at the heart of teachers' work to improve their instruction and engage students in meaningful learning experiences with valuable outcomes.

Another implication has to do with the school culture created by the principal that fosters risk taking. These findings build on previous literature suggesting that principals could support collaboration and professional community by providing instructional planning time in grade-level teams, prioritizing school-wide PD, organizing training so that all teachers participated in activities that involve collaboration, promote participative decision-making, and foster relational trust (Leithwood & Sun, 2009; Slegers, Geijsel, & Van den Berg, 2002; Thoonen et al. 2011; Youngs & King, 2002). In examining the nature of professional development, my analysis also suggests that creating school cultures focused on growth mindsets (Dweck, 2006), learning, and risk taking can cultivate the implementation of new instructional practices. Although research has indicated that teachers often avoid risk and favor familiar instructional practices that have

been effective in the past (Cohen, 1990), principals' emphasis on taking risks as part of the learning process can support teachers to implement new instructional practices. Such a growth mindset focus can promote a sense of trust and authenticity regarding critical inquiry and sharing with colleagues. It can also support teachers to engage in conversation and the experimentation necessary to develop authentic and ambitious instructional practices in the context of reform initiatives that require teachers to venture into new instructional territory.

Classroom Level. At the classroom level, the findings indicate that principals also can take action to influence teachers, students, and instruction toward improved learning outcomes. The notion of the instructional core, which focuses the work of classroom instruction on the interaction of teachers and students in relation to the content (Cohen & McLaughlin, 1993; Elmore, 1990; 2000), can help clarify principals' work at the classroom level. Richard Elmore explains that each aspect of the core is interconnected and must be addressed to promote improved outcomes (2000). Principals can play a key role in promoting instructional improvement by focusing on each aspect of the instructional core as well as understanding the ways the ways in which they are interconnected and influence one another. In terms of teachers, the implications from these findings suggest that principals need to address teachers' conceptions of student engagement as well as their sense of alignment with reform objectives in efforts to enhance instructional practice aimed at increasing the quality of intellectual work for students.

Teachers. To do this, principal leadership for reform in difficult school contexts will need to address teachers' existing mind frames (Hattie, 2012); including their perceptions of student learning and their conceptions of student engagement. Addressing these aspects are necessary for authentic teaching and learning so that teachers can examine existing assumptions that may be barriers to developing their instruction and shifting students' role in the learning process. In contrast to providing teachers with a set of tips, techniques, or universal best practice

strategies that are expected to be effective across all contexts or teachers, an approach to promoting instructional improvement and student cognitive engagement needs to address the differences and depth required for such lasting and substantive changes.

The notion of cognitive flexibility may also help principals to support the development of teachers' understanding of student engagement and changes in existing mind frames or perspectives. Spiro's Cognitive Flexibility Theory emphasizes the selective use of knowledge to adaptively respond with the appropriate understanding and decision making in a particular situation (Spiro et al., 2004). Teaching for engagement is a domain that requires what Spiro and colleagues call *advanced knowledge acquisition*, or the ways in which individuals develop mastery of complex concepts and effectively utilize and apply those concepts. The theorists further explain that when individuals have not acquired advanced knowledge acquisition in a complex domain (such as engaging students), they demonstrate *reductive biases*, which involve oversimplified understandings of the domain filled with misconceptions. Cognitive flexibility can be used as a framework to develop further approaches to support teachers' ability to understand the complexity of both instructional practice and student engagement.

Teachers' with higher levels of alignment demonstrated *knowledge in use*, an aspect of cognitive flexibility, in regards to their AIW instructional practice. In contrast, lower-level teachers demonstrated tended to demonstrate more oversimplified understanding and misconceptions. To support teachers in further developing advanced knowledge acquisition and cognitive flexibility, principals can promote teachers' capacity for engaging students through the examination of different models of student engagement and illustrative cases. That is, principals can create or seek out PD opportunities in which teachers are able to discuss and explore similarities, differences, and the complexities of student engagement models to deepen their own knowledge and understanding of student engagement and engaging instruction. Such PD

opportunities can also include the examination of illustrative cases of high levels of engaging instructional practices such that teachers are able to reflect on their own instruction and make connections to theories that may support different approaches to engaging instruction. This, in turn, can support teachers' in-depth understanding of different aspects of engaging students, and can serve to counter the oversimplifications and misconceptions of reductive bias. Enhanced cognitive flexibility can also be an essential quality to cultivate teachers' ability to respond to different contexts and events as they work to shift their instruction from existing familiar practices to new ambitious approaches.

Instructional Practice. Extending on the need to address teachers' mindsets, conceptions, and different capabilities, principals must ensure clear purpose and indications for instructional practice to deliver the content. The AIW strategies helped guide teachers' practice toward specific objectives for student learning. Some research has indicated that instructional improvement efforts must first change teachers' values, beliefs, and conceptions regarding the targeted reform, and that teacher beliefs are antecedents to dispositions (Tillema, 1994). Other research has examined approaches that first focus on changing teachers' instructional practice, and that through evidence of success, those teachers would then change their values, beliefs, and conceptions regarding student learning and the reform (Dunn & Shriner, 1999). More recent research suggests that it may be possible to improve instructional practice by teaching teachers to pay attention to certain aspects of instruction, such as student thinking (Levin, Hammer, & Coffey, 2009). Building on this, the findings on teachers' conceptions and alignment indicate that high-level teachers attended to aspects of student thinking and understanding, which were emphasized by the AIW objective. The implications from this study indicate that it is necessary to address teachers' values, beliefs, and conceptions as well as the enactment of their instructional practices, and that they may mutually influence one another.

Students. Finally, in such a comprehensive approach to instructional improvement, the principal must also include the student's role in the learning process. As teachers develop their instructional practices, and the expectations for the content are elevated, students' role in the learning process must also change (Elmore, 2000). Principals can work with teachers to involve the students in their changed role as both the teacher and the instruction change. Clear direction needs to be provided to support students' ability to take responsibility for their learning and to become active participants in such ambitious instructional expectations, such as the construction of knowledge, elaborated communication, critical inquiry, and connection of learning tasks to contexts beyond school. The development of student's metacognitive and self-regulatory skills is essential to support students' in their ability to monitor and assess their learning process. Thus, principals must establish expectations, guide teachers, and prioritize a students' role and their engagement in the learning process.

In summary, all of the teachers in this study participated in the same high quality professional development; however, there were differences in how the teachers took up the PD, and enacted AI in the classroom. The findings described in this study can begin to illuminate some of the aspects that may contribute to differences in how teachers learn from PD experiences, even when participating in high quality PD. Furthermore, the different perceptions between the two schools and the dimensions of principal leadership can begin to indicate areas where teachers may have experienced more or less support, and avenues for intervention to better support some teachers.

Specifically, this section outlined the critical role the principal can play in a comprehensive approach to instructional improvement to support teacher learning at various levels of the educational system. At the district level, there are implications for how the principal can translate district policies, buffer external demands, and integrate a research-based initiative

from an external organization. At the school level, there are a number of actions a principal can take to orchestrate organizational conditions to foster teacher learning and collaboration as well as enhanced capacity for engaging students in meaningful learning experiences toward valuable outcomes. At the classroom level, principals can focus on teachers, students, and the instructional content in efforts to improve instruction and enhance student cognitive engagement.

Future Research

Future research can focus on the changing role of school principals and the leadership required to promote teacher learning for instructional improvement and increased student cognitive engagement in different educational contexts. As understandings have shifted over time from rote learning and basic skills toward cognitive outcomes and critical thinking, understandings of instruction have also shifted from didactic instruction towards diagnostic, adaptive, and authentic instruction. In turn, these changes have contributed to changes in the relationship between administrators and teachers regarding responsibility of knowledge of and control over instruction. In addition, these changes have also required a changing role for both teachers and principals in which principals are involved in instructional leadership for the school and needed to structure learning environments for teachers to support their development in different ways. Furthermore, teachers are involved in the professional community of the school, and their learning and development of instructional practice is further influenced by the actions and decisions of the school principal and colleagues. Developing a greater understanding of these shifting roles can help to provide a context for the social and professional school dynamics observed in schools.

One of the key focus areas for future research on educational leadership will be to examine the ways in which distributed leadership occurs in schools and the influence on school and individual capacity for instructional improvement. Such inquiry can focus on how some

teachers may respond to different aspects of distributed leadership in different contexts. For example, the principals in the two schools distributed leadership in very different ways. In some instances in this study, teachers were very open to the opportunity to interact with the principal, to participate in leadership opportunities, and to embrace instructional initiatives organized by the principal. These teachers shared how their views on instruction aligned with the AIW initiative; they participated actively in the AIW PD and implemented aspects of the AIW framework in their instruction. In other instances, teachers were less invested in the reform activities, did not participate in leadership roles, and described various challenges in their AIW implementation. Future research can explore the relationship between differences in the principal's approach to distributed leadership and teachers' learning and implementation of ambitious instructional practice.

Such future research on various forms of implementation of distributed leadership would take into account the tradeoffs and tensions principals must negotiate as they involve other individuals at the school in the work of instructional improvement. Principals are in the position that they must distribute leadership in some way or another to achieve the visions of ambitious reforms. They need some way to reorient teachers to invest time and effort in reform. Left to their own means, many teachers will continue the autonomous work in their classrooms and will not prioritize the external needs that are often not prioritized or incentivized. Not because they are not driven or committed to improve, but merely because of the daily demands of teaching. In some sense, it is an incredible accomplishment to mobilize teachers to invest their time and effort in the reform, and to participate in a leadership group such as the one at Birch Middle School. At the same time, there are inherent drawbacks of creating a privileged group of teachers that become separate from other teachers in the school. This actively splits the egalitarian ideal of schools. Principals find themselves in a position that they have to play favorites, or find some

way to shift the mesostructures within the school, if they are going to embark on reform needed to shift the ways teachers collaborate with one another and approach their instruction in the classroom. Some network is needed to plan meetings, build momentum for new or different ways to engage with professional development, facilitate meetings, and organize opportunities for structured teacher learning.

At the same time, there is no organizational affordance for principals to distribute leadership if they are going to maintain the status quo. But to embark on ambitious reform, principals need to enlist the support of teachers to support the necessary changes to implement new practices in the classroom. Further research can explore the nature of different forms of implementation of distributed leadership, including both the teachers who are involved in decision making, and those who are not, to better understand the social realities in schools, the influence on teacher professional community, teachers' perceptions of support, and teachers' development of reform oriented instructional practices.

A second area of focus for future research is on promoting the work of engaging students in valuable learning experiences. If teachers' conceptions of student engagement, and potentially teaching and learning, are associated with their instructional practice, then research on how principal leadership may address these conceptions will be helpful. Further studies can examine the associations among cognitive flexibility and teachers with high, medium, and low levels of AI and student cognitive engagement. While we have information on differences in teachers' enactment of AIW instruction, further understanding is needed on how to support teachers to make changes in their conceptions, or mind frames, and associated instructional practices to promote increased student engagement toward valuable learning outcomes.

Another aspect that could be further explored is the relationship between principal awareness of student engagement in the classroom and changes in teachers' instructional

practices. While this relationship emerged in the quantitative exploratory analysis, it was not fully explored in the qualitative inquiry. Other research has examined the indirect effect of principal leadership on student engagement in schools and how the relationships that principals build with teachers have implications on teachers' beliefs of trust and support in a school which have an extended effect on teachers' perceptions of student engagement (Price, 2015). Further research could examine the relationship between principal and teachers' social interactions and teachers' perceptions of student engagement as well as other aspects of principal support and awareness of student engagement.

Finally, further understanding is needed to develop both a comprehensive model for principal leadership to enhance student engagement and an initiative to promote teacher learning regarding engaging instruction. This research would focus on the development of a PD initiative for teachers that supported their cognitive flexibility, changes in their existing conceptions of student engagement, and the use of illustrative cases and modeling to learn new instructional approaches. Further research on developing a comprehensive model for principal leadership to promote student engagement can focus on how changes are undertaken or enacted by school principals in their daily work as instructional leaders to support teacher learning of engaging instructional practices (e.g., Copper, 2013). While there is extensive literature on leadership styles, models, school structures, programs, and processes associated with instructional change, less is known about how principals enact the changes necessary to support teacher learning and instructional improvement in schools on a daily basis, and in particular, changes regarding engaging students. This inquiry is important to support the development of school-wide interventions, comprehensive models, and educational policies that recognize the social realities of teachers, the range of skills and abilities among teachers, and the different ways principal leadership occurs in various contexts. In addition, further research on learning progressions and

learning practice progressions for teachers as well as differentiated collaborative learning PD experiences that meet teachers diverse needs can support teachers in their efforts to develop ambitious instructional practices that enhance student cognitive engagement in the classroom.

Beyond functions of planning, organizing, facilitating change, and motivating staff included in instructional leadership (Hallinger, 2005), principals are increasingly responsible for promoting environments that support teachers' examination of existing notions and the development of new understandings regarding teaching and learning. Reform initiatives that call for a different approach to teaching and learning extend beyond teacher adoption of tips and techniques. A reform, such as AIW that calls for teachers to teach in a different way also requires principals to facilitate teacher learning and professional growth in a different way. The AIW reform does not include a list of practices that teachers can directly implement in their classrooms. It requires teachers to reflect, examine, and critique their instruction and to incorporate new understandings of how to integrate a different approach to teaching into their practice. In also involves a school-wide shift in the overall approach to teaching and learning. Yet, this work can be done incrementally, as the AIW model suggests, with scaffolded learning opportunities for students and teachers to develop and deepen their work over time. Thus, future research can examine the various organizational variables included in this study and ways they may enhance or hinder teacher learning and student cognitive engagement in different educational settings.

Conclusion

The ultimate goal of authentic instruction is to provide students with quality intellectual work that will promote their capacity for meaningful engagement in the complex learning experiences they encounter throughout their lives. As researchers and educators, we have a responsibility to address current levels of student disengagement in schools and to learn from

instances of exemplary leadership and innovation in instruction. The two principals presented in this study demonstrated aspects of leadership needed to shift the cultures in schools, promote supportive teacher professional communities, and prioritize student engagement as critical for their educational endeavors.

The findings presented here can begin to contribute to the development of an organizational framework for engagement in which existing research on schools as organizations, principal leadership, and student engagement can be integrated to help school leaders identify ways in which they can promote authentic instructional practices and enhanced student engagement. In particular, the findings in this study distinguish dimensions of principal leadership to promote coherent professional development for teachers, shared goals, active collaboration, and teacher input in decision-making, as well as a culture focused on learning and support for teachers' deep learning of new instructional approaches that enhance student engagement in meaningful learning experiences. While this work in schools is critical, policy structures must also be in place to address the social and professional realities in schools such that teachers are supported in their development to enact ambitious instructional practices focused on engaging students.

APPENDICES

APPENDIX A: Interview Protocols

Iowa Authentic Intellectual Work Study Middle School Teacher Interview

This interview is part of a research study on middle school teachers and students involved in the Authentic Intellectual Work (AIW) initiative in an Iowa school district. The goal of the research is the better understand factors that influence teacher community and student engagement. In particular, the study will examine the extent to which teachers engage in professional learning opportunities and the extent to which students are academically engaged with instruction. Part of this study includes interviews of teachers at two school sites implementing the AIW framework to learn about their experiences with professional development and various support structures, their instructional practices, and their perceptions of student learning.

Initial Interview Questions:

1. Could you describe your teaching responsibilities, the subject(s) you teach, and the number of years you have been teaching? (Probe to gather background teaching information: grades, subjects, and other work responsibilities)
2. Could you describe the Authentic Intellectual Work initiative at your school and in your district? (Probe for nature/emphasis of the program, perceptions of the program, and the extent to which teacher interpretation of AIW aligns with the initiative itself, as well as the alignment of AIW with the school mission and goals)
3. To what extent does AIW align with your beliefs/views on teaching? (Probe to gather information on the alignment of personal views with the reform initiative)
4. How have you learned about the AIW framework at your school and in your district? (Probe for nature/emphasis of the framework, perception of AIW, and extent to which the teacher has been engaged in professional learning, as well as the extent to which the school approach to the initiative has been consistent and organized)
5. How often do you meet or talk with your principal? What do you discuss when you meet or talk with your school principal? (Probe for whether the teacher talks with the principal about managing student behavior; student engagement; student learning; curriculum, instruction, and assessment; and why the teacher talks with the principal)
6. Could you describe the professional development activities you have participated in during the past year? (Probe for the conception of professional development, the extent of professional learning experiences the teacher has engaged in, whether the teacher has been involved with professional learning teams, the extent of resources provided, and formal vs. informal aspects of professional learning)

7. Please describe what you consider to be the most important and effective professional development activity you have participated in over the past few years. That is, tell us about the activity that you consider to have had the most positive impact on you as a teacher. As you describe this, indicate its main goals, who participated, the amount of time involved, the kind of work you did, and what you gained from it (e.g., new knowledge, skills or attitudes)
8. What is your perception of the impact of AIW instructional practices on student cognitive engagement? (Probe for perception of association between instruction and engagement)
9. When you are teaching, what are the things you are primarily focused upon? (Probe for perceptions of student learning, engagement, and/or content coverage)
10. Could you describe the professional interactions among colleagues at this school? Do you have opportunities to develop shared goals for student learning, collaboration, and shared decision-making? If so, what are they? (Probe for aspects of professional community)
11. What is your conception of student engagement? (Probe for teachers' notion of what they conceive student engagement to be)
12. What are indicators and how do you elicit student engagement in the classroom? (Probe for teachers' notion of how to perceive and elicit student engagement)

Additional Interview Questions:

1. Could you describe your involvement in the AIW initiative? (Probe for level of autonomy and participation in the program)
2. Could you describe the teacher evaluation process at this school? (Probe for content and structure of evaluation process, whether it reinforces the AIW initiative)
3. Could you describe a time in the past year when you changed your teaching practice? (Probe for teacher reflection on development and use of new instructional practices, and source of influence for change)
4. Could you please describe any changes you have observed in your students? (Probe for whether the changes are based on motivation, engagement, and/or achievement; probe for their perceptions of the degree of balance of regulation of learning between teacher and student)

Iowa Authentic Intellectual Work Study

Middle School Principal Interview

This interview is part of a research study on middle school teachers and students involved in the Authentic Intellectual Work (AIW) initiative in two Iowa school districts. The goal of the research is the better understand factors that influence engaging instruction. The study examines the extent to which teachers participate in professional learning opportunities and the extent to which students are engaged. Part of this study includes interviews of principals and teachers at two school sites implementing the AIW framework to learn about their experience with professional development, supporting teacher learning and their instructional practices, and perceptions of student learning.

Initial Interview Questions:

1. Could you please describe your background in education? How long have you been working at this school? (Probe to gather background information: experience and other work responsibilities).
2. What is your highest priority as a principal? How would you describe the school's central mission and major goals? What are the most important programs for achieving the mission? (Probe to gather information about focus of the principals' efforts, articulation of goals, and description of the relevant programs).
3. Could you please describe the Authentic Intellectual Work initiative at your school and in your district? (Probe for nature/emphasis of the program, perceptions of the program, and the extent to which principal interpretation of AIW aligns with the initiative itself, as well as the alignment of AIW with the school mission and goals).
4. To what extent does AIW align with your beliefs/views on teaching? (Probe to gather information on the alignment of personal views with the reform initiative.)
5. How often do you meet or talk with teachers about their instructional practices? (Probe for influence of principal leadership and interaction with teachers regarding teaching practice).
6. Could you describe the professional interactions among colleagues at this school? Do you provide opportunities to promote shared goals for student learning, collaboration, and shared decision-making? If so, what are they? (Probe for aspects of teacher professional community).
7. How would you describe the professional learning opportunities at the school? (Probe to describe coordination of professional development programs and the approach to teacher learning and feedback).
 - a. Please describe what you consider to be the most important and effective professional development activity provided for teachers over the past few years. That is, tell us about the activity that you consider to have had the most positive impact on teachers' instructional practice. As you describe this, indicate its main

goals, who participated, the amount of time, the kind of work, and what was gained from it (e.g., new knowledge, skills or attitudes).

8. What factors influence the extent to which you are able to support the AIW professional development at your school? Are there specific challenges/successes you experience regarding the implementation of AIW? Do the demands of other policies conflict with the expectations of AIW? (Probe to determine various factors that influence the extent to which principal leadership supports and/or hinders teacher learning regarding AIW and engaging instruction).
9. Are there adequate technical and material resources to staff at your school? In what ways, if any, do you depend on expertise, materials, expertise or funding from outside authorities, organizations and agencies external to the school (such as the district, the state, activities of professional organizations). (Probe for organizational conditions and internal and external resources involved in the learning the AIW framework as well as its implementation.)
10. What indicators of student learning do you use to evaluate effective instruction? (Probe for different types of student outcomes including student engagement).

Additional Interview Questions:

1. Do you have any concerns or recommendations about how to make professional development in this school even more effective in advancing student learning? (Probe for aspects of teacher knowledge, skills and dispositions that may or may not be adequately addressed, including aspects of instruction or assessment practices, decision making, the structuring and coordination of professional development activities, technical assistance and fiscal resources available.)
2. Are there additional coaches, mentors, AIW coaches, and district representatives who support teachers? (Probe for how they would characterize the support and relationship with other individuals at the district level). How are they selected?
3. How have you learned about the AIW framework at your school and in your district? (Probe for nature/emphasis of the framework, perception of AIW, and extent to which the principal has been engaged in professional learning, as well as the extent to which the school approach to the initiative has been consistent and organized).
4. Could you describe the school wide focus in the area of professional development? Has there been one focus for a long period of time, or has it changed over time? (Probe for influence and consistency of interventions).
5. Could you please describe any changes you have observed in teachers? (Probe for whether the change is based on motivation, engagement, and/or evaluation, perceptions of balance of regulation of learning, use of evidence to substantiate change).

Iowa Authentic Intellectual Work Study

District Personnel Interview

This interview is part of a research study on middle school teachers and students involved in the Authentic Intellectual Work (AIW) initiative in two Iowa school districts. The goal of the research is the better understand factors that influence engaging instruction. The study examines the extent to which teachers participate in professional learning opportunities and the extent to which students are engaged. Part of this study includes interviews of district personnel involved with the implementation of the AIW framework to learn about their experience.

Initial Interview Questions:

1. Could you please describe your background in education? How long have you been working in your position? (Probe to gather background information: experience and other work responsibilities).
2. What is your highest priority as a district administrator? How would you describe the district's central mission and major goals? What are the most important programs for achieving the mission? (Probe to gather information about focus of the district's efforts, articulation of goals, and description of the relevant programs).
3. Could you please describe the Authentic Intellectual Work initiative in your district? (Probe for nature/emphasis of the program, perceptions of the program, and the extent to which district interpretation of AIW aligns with the initiative itself, as well as the alignment of AIW with the district mission and goals).
4. To what extent does AIW align with your beliefs/views on teaching? (Probe to gather information on the alignment of personal views with the reform initiative.)
5. How have you learned about the AIW framework in your district? (Probe for nature/emphasis of the framework, perception of AIW, and extent to which district personnel have been engaged in professional learning, as well as the extent to which the district approach to the initiative has been consistent and organized).
6. How often do you meet or talk with principals about curriculum, instruction, assessment, and/or student learning? (Probe for influence of district leadership and interaction with principals regarding curriculum, instruction, assessment, and student learning).
7. How would you describe the role of principal leadership in providing professional learning opportunities in your district? (Probe to describe coordination of professional development programs and the approach to teacher learning and feedback).
8. Are there adequate technical and material resources in your district? In what ways, if any, do you depend on expertise, materials, expertise or funding from outside authorities, organizations and agencies external to the district (such as the state and activities of

professional organizations). (Probe for organizational conditions and internal and external resources involved in the learning the AIW framework as well as its implementation.)

9. What indicators of student learning do you use to evaluate effective instruction? (Probe for different types of student outcomes including student engagement).

Additional Interview Questions:

1. Do you have any concerns or recommendations about how to make professional development in this district even more effective in advancing student learning? (Probe for aspects of teacher knowledge, skills and dispositions that may or may not be adequately addressed, including aspects of instruction or assessment practices, decision making, the structuring and coordination of professional development activities, technical assistance and fiscal resources available.)
2. Are there additional coaches, mentors, AIW coaches, and/or district representatives who support principals? (Probe for how they would characterize the support and relationship with other individuals at the district level). How are they selected?
6. Could you describe the professional interactions among colleagues at this school? Do you provide opportunities to promote shared goals for student learning, collaboration, and shared decision-making? If so, what are they? (Probe for aspects of teacher professional community).
3. Could you describe the district wide focus in the area of professional development? Has there been one focus for a long period of time, or has it changed over time? (Probe for influence and consistency of interventions).
4. Could you please describe any changes you have observed in principals? (Probe for whether the change is based on motivation, engagement, and/or evaluation, perceptions of balance of regulation of learning, use of evidence to substantiate change).

APPENDIX B: AIW Rubric

AIW Classroom Observation/Lesson Scoring Rubric

The complete observation rubric can be found in Chapter 3, pages 35-46 of the *Authentic Instruction and Assessment: Common Standards for Rigor and Relevance in Teaching Academic Subjects* (Newmann, King, & Carmichael, 2007). The rubric is extensive; therefore, it is not included here. A brief description of the lesson standards is provided below.

The rubric includes complete descriptions of different levels of instructional practice for each standard on a scale of 1-5 along with examples.

The descriptions for observing and scoring classroom instruction are provided for the following AIW standards:

- **Standard 1: Higher Order Thinking**
Instruction involves students in manipulating information and ideas by synthesizing, generalizing, explaining, hypothesizing, or arriving at conclusions that produce new meaning and understandings for them.
- **Standard 2: Deep Knowledge**
Instruction addresses central ideas of a topic or discipline with enough thoroughness to explore connections and relationship and to produce relatively complex understandings.
- **Standard 3: Substantive Conversation**
Students engage in extended conversational exchanges with the teacher and/or their peers about subject matter in a way that builds an improved and shared understanding of ideas or topics.
- **Standard 4: Connections to the World Beyond the Classroom**
Students make connections between substantive knowledge and public problems or personal experiences they are likely to have faced or will face in the future.

Included below is an excerpt from Chapter 3 on lesson scoring to provide an example of the AIW scoring rubric for instruction.

Lesson Scoring Rubric

Standard 2: Deep Knowledge

Instruction addresses central ideas of a topic or discipline with enough thoroughness to explore connections and relationships and to produce relatively complex understandings.

Knowledge is deep when, instead of trying to learn or expressing only fragmented pieces of information, students encounter and express details, distinctions, nuances, and different applications of central concepts aimed toward integrated or holistic understandings. Knowledge is superficial or thin when it does not deal with significant concepts or central ideas of a topic or discipline or when important, central ideas have been trivialized, presented only superficially.

Rubric

5 = Almost all students sustain a focus on a significant topic; or demonstrate their understanding of the complex or problematic nature of information and/or ideas; or express reasoned conclusions.

4 = Either the teacher or the students provide information, arguments, or reasoning that demonstrate the complexity of an important idea. Many students sustain a focus on a significant topic; or demonstrate their understanding of the complex or problematic nature of information and/or ideas; or express reasoned conclusions.

3 = Deep understanding of something is countered by superficial understanding of other ideas. At least one significant idea may be presented in depth and its significance grasped, but in general the focus is not sustained.

2 = While some key concepts and ideas are mentioned or covered, only a superficial acquaintance or understanding of these complex ideas is evident.

1 = The lesson does not deal with significant topics or ideas; teacher and students are involved only in the coverage of material.

APPENDIX C: Teacher Survey

Teacher Background

What is your total number of years of classroom teaching experience?

- 0-1 year
- 2-5 years
- 6-9 years
- 10-15 years
- 16 or more years

What content do you teach?

- English, Language Arts
- Social Studies
- Science
- Math
- Special Education
- Art/Music
- Other

How many years have you participated in the AIW initiative?

- This is my first year
- This is my second year
- This is my third year
- This is my fourth year

Teacher Learning and Professional development (PD)

Please respond to the following items with your schoolwide professional development in mind.
(strongly disagree, disagree, agree, strongly agree)

- My school has a coherent school improvement strategy
- PD has had one focus over the past several years
- PD has been relevant to my personal goals in terms of improving my instructional practice
- The Authentic Intellectual Work (AIW) PD has focused on specific instructional practices
- Participation in AIW PD has increased my knowledge about how students learn
- I have been involved in decisions regarding the implementation of AIW PD
- I set goals for my professional development
- I have a plan to reach my PD goals
- I receive coaching to reach my PD goals
- I receive feedback regarding my progress toward my PD goals
- AIW PD involves collective participation of teachers from my school

- AIW PD offers opportunities for me to become actively engaged in the meaningful analysis of teaching and learning
- AIW PD encourages continuing professional communication among teachers
- AIW PD is aligned with state standards and assessments
- AIW PD is focused on improving and deepening my content knowledge

Please respond to the following items in terms of your learning and development with the Authentic Intellectual Work initiative specifically. (strongly disagree, disagree, agree, strongly agree)

- I understand the AIW framework
- I have had opportunities to practice the AIW instructional practice
- I have engaged in authentic intellectual work myself in the process of learning the AIW framework
- The AIW framework is consistent with my personal views of good teaching

Teacher Framing

Please respond to the following items in terms of your own preparation, instruction, and reflection in teaching. (strongly disagree, disagree, agree, strongly agree)

In planning for instruction, my central priority is:

- Covering content material
- Classroom management
- Student understanding
- External evaluation criteria
- Student engagement
- Common Core Standards
- Quality of intellectual work
- Standardized assessments

During instruction my primary focus is on:

- Covering content material
- Classroom management
- Student understanding
- External evaluation criteria
- Student engagement
- Common Core Standards
- Quality of intellectual work
- Standardized assessments

When I reflect on my lesson, I evaluate its effectiveness based upon:

- Covering content material
- Classroom management
- Student understanding
- External evaluation criteria
- Student engagement

- Common Core Standards
- Quality of intellectual work
- Standardized assessments

Student engagement

- All students can engage in AIW
- All students are capable of learning the content in my class
- I can teach basic skills and authentic intellectual work to students simultaneously
- My students like it when I try new instructional strategies
- Most students are motivated to learn
- My students view their learning as relevant beyond school
- My students complete work because they want a good grade
- My students work together to help each other learn
- I can tell by looking at my students whether they are intellectually engaged
- My students enjoy school
- My students are interested in academic work
- My students are able to sustain challenging intellectual work
- My students strive for in-depth understanding rather than superficial awareness
- Factors outside of school prevent students from being engaged in learning

Teacher Professional community

Please respond to the following items with 4-5 colleagues that you interact with most frequently in mind. (strongly disagree, disagree, agree, strongly agree)

- I collaborate with other teachers to plan AIW assignments
- I share a common goals for student learning with my colleagues
- My colleagues and I have responsibility in decision making
- Teachers at my school have the ability and capacity to implement the AIW framework
- Teachers at my school expect colleagues to change their instructional practice when students are struggling.
- Teachers at my school hold each other accountable for the implementation of the AIW framework.
- Teachers at my school expect each other to provide critical feedback about AIW implementation
- At my school, instructional practice is a private matter and each teacher decides what and how he or she wants to teach.
- Teachers at my school have high expectations for student learning
- Teachers at my school let students know their expectations for learning
- Teachers at my school make additional effort to know their students
- My colleagues typically like to try out new ideas in their classrooms.
- I often use my colleagues' ideas in my instruction.
- I share with other teachers about the implementation of new approaches in my classroom.
- My colleagues help me become a more effective teacher.
- Teachers at my school take responsibility for student learning.

Leadership

Please respond to the following items with your school principal in mind. (never, rarely, sometimes, often)

My principal:

- Involves me in relevant decision making opportunities
- Demonstrates instructional competence
- Focuses school goals and priorities on the AIW framework
- Directs school resources toward a coherent instructional program based on AIW
- Evaluates teachers using a coherent instructional program based on AIW
- Connects me to professional development opportunities that are part of AIW
- Helps me to set goals to improve my practice
- Provides regular feedback on my instruction
- Is involved in helping me improve my instruction.
- Speaks to me regularly about student learning
- Is focused on administrative tasks
- Is aware of the level of student engagement in classroom learning
- Promotes the professional community at our school

Authentic Intellectual Work

How often do you currently employ each of the following instructional practices? (multiple times a day, daily, weekly, monthly, never)

- Plan activities or questions to gauge student understanding
- Set instructional goals with students
- Ask students to use prior knowledge and experiences to help them understand new material
- Provide opportunities for students to construct knowledge
- Create experiences that require students to organize, interpret, evaluate, or synthesize prior knowledge to solve new problems
- Provide opportunities for students to strive for in-depth understanding rather than superficial awareness
- Encourage students to develop and express their ideas and findings through elaborated communication
- Ask students to reflect on their work and think about their current level of understanding
- Provide learning experiences that have personal value for students
- Ask students follow-up questions to their responses to probe for understanding
- Ask students to solve new problems
- Provide written and/or verbal feedback to students on their work
- Require students to dig deeply into understanding a single topic
- Create opportunities for students to apply the subject to problems and situations in life outside of school
- Engage in class discussions about the subject with the students

APPENDIX D: Student Engagement Survey

Classrooms Subject Area Mathematics: Code mathematics = 1; English/language arts = 0

Personal Background

(1) Demographic characteristics

Female gender: Code female = 1; male = 0

African American: Code African American = 1; Hispanic = 0; White, Other = -1
Hispanic: Code Hispanic = 1; African American = 0; White, Other = -1

(2) Socioeconomic status

Orientation Toward School

(1) Success

- Grade point average in English/language arts and mathematics; mean of four grades.

(2) Alienation

- I was late for school.
- I got in trouble for not following school rules.

Please respond to the following items in terms of your experience in class. (strongly disagree, disagree, agree, strongly agree)

- I am capable of learning the content in my class.
- My teacher provides opportunities for me to learn basic skills.
- My teacher provides opportunities for me to be intellectually challenged.
- I like it when my teacher tries new things in class.
- I am motivated to learn.
- Many of my assignments are relevant beyond school.
- I complete work because I want a good grade.
- I work well with other students.
- When I understand something well, I help other students to understand it, too.
- I enjoy school.
- I am interested in academic work.
- I am able to sustain challenging intellectual work.
- I prefer to be given the answer, than to figure something out on my own.
- I have assignments to solve complex problems that do not have one right answer.
- Sometimes I just act like I am listening in class.
- Factors outside of school prevent me from being engaged in learning.
- My teacher asks questions to find out how well I understand the material we are learning.
- My teacher sets goals for learning with me.

* Please respond to the following items in terms of your experience in class. (strongly disagree, disagree, agree, strongly agree)

- My teacher is interested in me as a person, not just as a student.

- The tests in my class do a good job of measuring what I'm able to do.
- Most of what is important to know I learn in school.
- The grades in my class do a good job of measuring what I'm able to do.
- What I'm learning in my class will be important in my future.
- After finishing my schoolwork I check it over to see if it's correct.
- When I do schoolwork I check to see whether I understand what I'm doing.
- Learning is fun because I get better at something.
- When I do well in my class it's because I work hard.
- I plan to continue my education following high school.
- Going to school after high school is important.
- Schoolwork in this class is important for achieving my future goals.
- My education will create many future opportunities for me.

How often do you experience the following in class? (multiple times a day, daily, weekly, monthly, never)

- Questions about your understanding of the material
- Setting instructional goals
- Use prior knowledge and experiences to understand new material
- Opportunities to construct knowledge
- Experiences that require you to organize, interpret, evaluate, or synthesize prior knowledge to solve new problems
- Verbal and/or written feedback from your teacher on your work

How often do you experience the following in class? (multiple times a day, daily, weekly, monthly, never)

Student Engagement in Instructional Activity

- In English/language arts/mathematics class, how often do you try as hard as you can?
- How often do you complete your assignments for this class?
- How often do you pay attention in this class?
- How often do you feel bored in class?

Authentic Instructional Work

- You are asked interesting questions and solve new problems.
- You dig deeply into understanding a single topic.
- You apply the subject to problems and situations in life outside of school.
- You discuss ideas about the subject with the teacher or students.

Social Support for Learning

(1) School

- In school I often feel "put down" by other students (Rev.).
- Most of my teachers really listen to what I have to say.
- I don't feel safe at this school (Rev.).
- Disruptions by other students get in the way of my learning (Rev.).
- My friends and I are treated fairly in this school.

(2) Classroom

- The teacher expects me to do my best all the time.
- The teacher gives me extra help when I don't understand something.
- My friends and I help each other with our homework.

(3) Parental Support for Learning Index

Since the beginning of the school year, how often did your parent(s), guardian(s), or other family members:

- Attend a school meeting
- Phone or speak to your teacher or counselor
- Attend a school event in which you participated
- Act as a volunteer at your school

Since the beginning of this school year, how often have you or your parent(s), guardian(s), or other family members discussed:

- School activities or events of interest to you
- Things you have studied in class
- Your grades
- Transferring to another school
- Selecting courses or programs at school
- Plans and preparation for ACT or SAT tests
- Going to college

*Items drawn from the Student Engagement Instrument (Christenson et al. 2006)

Bold items from Marks 2000 study.

Student Cognitive Engagement

The following Items were used to measure student cognitive engagement:

9) I am intellectually engaged; 10) I am challenged; 12) When I am lost or confused, I ask questions; 13) When I am distracted, I am able to refocus myself on my work; 26) I share my ideas; 27) I solve complex problems that do not have one right answer

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