

CONDITIONS FOR EFFECTIVE DATA USE TO IMPROVE SCHOOLS: RECOMMENDATIONS FOR SCHOOL LEADERS*

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Abstract

Although data driven-decision making has been the mantra of school reform for the last 10 years, school leaders benefit from frequent discussions in how to engage teachers in the process. As a result, the purpose of this paper is to apply Reeves (2004) framework concerning Antecedents of Excellence in creating a school culture that routinely uses data to inform instruction. The authors argue principals must focus on three antecedents as precursors to effective data use: leadership responsibilities, professional development responsibilities, and school culture responsibilities. Additionally, the authors highlight shared leadership as being instrumental when creating a data-driven culture. Applications for practice are included.

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2 Sumario en español

Aunque la manejo-toma de decisiones de datos haya sido el mantra de reforma de escuela desde hace 10 años, líderes de escuela benefician de discusiones frecuentes en cómo comprometer a maestros en el proceso. Como resultado, el propósito de este papel es de aplicar Reeves (2004) armazón con respecto a Antecedentes de Excelencia a crear una cultura de la escuela que utiliza rutinariamente los datos para informar instrucción. Los autores discuten a directores deben centrarse en tres antecedentes como precursores a datos efectivos utilizan: responsabilidades de liderazgo, responsabilidades profesionales de desarrollo, y responsabilidades de cultura de escuela. Adicionalmente, los autores destacan liderazgo compartido como siendo instrumental al crear una cultura datos-manejado. Las aplicaciones para la práctica son incluidas.

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3 Introduction

In response to the No Child Left Behind Act of 2001 (NCLB, 2002), the current educational landscape places great emphasis on testing as a primary mechanism for defining student success (Boudett, Murnane, City & Moody, 2005; Datnow, Park, & Wohlstetter, 2007; Earl & Fullan, 2003; Park & Datnow, 2009; Picciano, 2006; Tanner, 2011; Wayman, 2009). As a result, today's schools are experiencing increased pressure to prove their effectiveness as it relates to student achievement data (Popham, 2010). Schools adopting the belief

¹<http://www.ncpeapublications.org/latest-issue-ijelp.html>

that data are a necessary and important piece of decision making processes have been the most effective in meeting school reform demands (Pulliam, 2005).

Data-driven decision-making is a process involving the collection, analysis, and use of data to guide decisions (Bernhardt, 2009; Creighton, 2001; Kowalski, Lasley & Mahoney, 2008; Picciano, 2006; Protheroe & Tucker, 2008). The process embodies a cyclical design rooted in focused inquiry (Boudett, City, & Murnane, 2006). As successive cycles of analysis occur, educators gain capacity in the process and apply new learning to each subsequent cycle (Abbott & McKnight, 2010; Gallimore, Ermeling, Saunders & Goldenburg, 2009). The successful adoption and implementation of data-driven decision-making processes results in improved staff capacity and produces augmented levels of student achievement (Bernhardt, 2009; Park & Datnow, 2009). In sum, Bernhardt (2005) argues that “if a school wants to improve student learning, it has to use data” (p. 66).

Although the phrase *data-driven decision-making* has been the mantra of school reform since NCLB (2002), school leaders benefit from frequent discussions about how to engage teachers and stakeholders in data-driven decision-making (Protheroe & Tucker, 2008). Additionally, policymakers expect principals to use data to create learning environments that address equity, effectiveness, and efficiency (National Policy Board for Educational Administration, 2002). As a result, the purpose of this paper is to provide educational leaders with a deeper understanding of the conditions associated with effective implementation of data-driven decision-making, including preconditions for success and determining what data is useful in decision making processes. Using Reeves’s (2004) framework concerning *Antecedents of Excellence*, the authors apply a similar process concerning conditions that must be in place in order to create a school environment that values data (National Association of Elementary School Principals, 2001). In sum, the intent of the paper is to illuminate school leaders’ influential role in ensuring schools use data to drive instruction.

4 School Leadership and Data

School leaders play a vital role when implementing data-driven decision making processes within schools (Abbott & McKnight, 2010; Kowalski et al., 2008; Park & Datnow, 2009; Picciano, 2006; Wayman, 2009). While data have always played a role in school improvement, they were historically used on a yearly, summative basis to evaluate the outcomes of the school year or to meet administrative requirements (Bernhardt, 2007; National Association of Elementary School Principals, 2001; Pulliam, 2005). In this model, instruction, assessment, and learning all served as separate entities within the school. However, today’s school leaders must monitor and evaluate various sources of data to support school efforts (Marzano, Waters, & McNulty, 2005; Smith, Johnson, & Thompson, 2012). As a result, the best way to implement this change is by focusing on collaboration between stakeholders who have a vested interest in data analysis, typically school leaders and teachers (Wayman, 2009).

In order to create long-term change, school leaders should foster a school culture that understands and values data (Abbott & McKnight, 2010; DuFour, 2002; Kowalski et al., 2008; Park & Datnow, 2009; Schmoker, 2004). Building a school culture that relies on data should be supported through ongoing professional development that provides teachers with guidance in data analysis, including the use of data tools (Bernhardt, 2009; Boudett et al., 2005; Park & Datnow, 2009; Picciano, 2006; Pulliam, 2005). Building the capacity of teachers to engage in efforts centered on the betterment of instruction creates a common purpose among educators (Abbott & McKnight, 2010). School leaders should recognize that “all educators play a critical role in using data to accelerate student achievement” (Kowalski et al., 2008, p. 118). Two responsibilities of school leaders when engaging in data-driven decision-making are creating leadership teams and ensuring pertinent data are easily accessible.

4.1 Leadership Teams

Current school reform models pivot on the notion that school leadership should be a shared endeavor (Henson, 2010; Spillane, 2005), and successful school leaders recognize the entire organization improves when they employ the knowledge of the larger group (Fullan, 2011; Reeves, 2006). Principals expecting to utilize data-

driven decision making processes benefit from the formation of a leadership team (Abbott & McKnight, 2010; Bernhardt, 2004; Boudett et al., 2006; Marzano et al., 2005; Park & Datnow, 2009; Wayman, 2009; Zepeda, 2004). When establishing such a team, educational leaders might create the team from members of the organization with a strong desire to engage in the work of school improvement (Marzano et al., 2005). Additionally, team members should be trained in shared decision making and selected in a democratic fashion (Eastwood & Tallericco, 1990). This group of individuals meets regularly with the goal of increasing the capacity of the entire educational staff about how to use data to drive instruction (Park & Datnow, 2009). In sum, “improvement requires distributing leadership coherently around focused problem solving in the organization” (Elmore, 2005, p. 141).

In conjunction with the leadership team, school leaders should ensure they establish clear purposes for data usage that are rooted in the goals and vision of the school (Bernhardt, 2007; Kowalski et al., 2008). At the onset of data analysis, teams create a clearly stated goal for the investigation that aims to answer questions about student performance within the school (Kowalski et al., 2008; Moore, 2011; Reeves, 2005; Schmoker, 2004; Zepeda, 2004). Datnow et al. (2007) expounded on this by stating “integral to [data-driven decision-making is] establishing specific, measurable goals at the system, school, classroom, and individual student levels” (p. 5). Once these benchmarks are established, they serve as a way to monitor and evaluate data-driven decision-making process utilized by schools. Additionally, problem identification helps leadership teams recognize what additional information is necessary. Teams should focus on problems that have the greatest influence on student achievement (Boudett et al., 2006; Marzano et al., 2005), namely, teaching and leadership responsibilities (Leithwood, Louis, Anderson, & Wahlstrom, 2004).

4.2 Data Accessibility

In order for data to be effectively used, there should be a plan for how data will be regularly collected and stored (Kowalski et al., 2008). Large amounts of data are currently available to educators; however, this data is not often readily accessible to those who benefit from its use (Kowalski et al., 2008; Wayman, 2009). The simple act of keeping data in a common location eliminates one barrier to ongoing data use (Moore, 2011). When considering how to manage data available at a school site, professionals should first ascertain what it is they need the data to do for their system (Kowalski et al., 2008). A data warehouse is one such tool for compiling information and provides schools with the advantage of long-term storage of data accompanied by the ability to pull various data points quickly in order to make educational decisions (Bernhardt, 2007; Datnow et al., 2007; Picciano, 2006). Providing such a system allows teachers and leaders to mine multiple points of data to answer questions about how schools are performing (Kowalski et al., 2008). Without the employment of some type of data management system, the full impact of data-driven decision making cannot be realized (Bernhardt, 2007; Boudett et al., 2005; Pulliam, 2005). Finally, principals might utilize school level personnel to assist others in effective data use. Datnow et al. (2007) argued that data-driven schools “had at least one designated person who assisted with data management and use” (p. 34). This individual might be an instructional coach, a data savvy teacher, or the leadership team as a whole.

4.3 School Culture

Organizational culture describes what members of an organization believe and deem significant, as well as how groups process situations (Marzano et al., 2005; Owens & Valesky, 2011). More specifically, school culture includes the assumptions, beliefs, and behaviors of school stakeholders concerning student learning and professionalism (Murphy & Lick, 2005; Zepeda, 2004). When implementing data-driven decision-making processes, school leaders must initially foster a positive school culture that centers on collaborative staff interaction with the intent of increasing student achievement (DiPaola & Hoy, 2008; Marzano et al., 2005; Owens & Valesky, 2011; Sutherland, 2004; Wayman, 2009). In order for schools to experience success with data-driven decision making processes, educational leaders must be able to foster a *culture of continuous inquiry* that values and routinely utilizes data to inform decisions (Boudett et al., 2006; Park & Datnow, 2009; Sutherland, 2004). A critical change to school culture is an understanding that data-based decision-

making is not just another task; it is a decision-making variable entrenched in the daily lives of educators (Kowalksi et al., 2008).

Creating trust. In order to both develop and sustain a positive school culture, principals must develop strong levels of trust with and between staff members (Bernhardt, 2007; Park & Datnow, 2009). Trust is built over time (Bryk & Schneider, 2002), and principals who behave in certain ways are more likely to develop trusting teacher relationships. Zepeda (2004) argued principals who promote a positive school culture through trust communicate with teachers that they as leaders:

- Empower others to make decisions;
- Adopt an attitude of continuous improvement in all they do;
- Promote an attitude of collaboration drawing on collective strengths; and
- Assume responsibility, seek help, and take risks. (p. 47)

For these reasons, administrators should present data in a light that eliminates blame and punitive action and offers data as a tool for identifying areas for improvement of student learning (Bernhardt, 2007; Kowalksi et al., 2008; Park & Datnow, 2009; Reeves, 2005). This is not an easy task, because with accountability mandates (i.e. NCLB, 2002) the use of data has been perceived as a top-down initiative aimed at penalizing educators (Elmore, 2005). When data is wielded as a tool for placing blame and making threats, it is difficult to make improvements to the quality of teaching (Reeves, 2005). School leaders should reinforce “the purpose in using data is not to prove, but to improve” (Kowalksi et al., 2008, p. 119).

School leaders can foster trust by allowing teams of teachers to develop autonomy and ownership in making decisions informed by data (Fullan, 2011; Schmoker, 2004). Additionally, administrators should value the knowledge and expertise of their teaching staff as a critical piece of the puzzle (Picciano, 2006; Wayman, 2009). Principals need to recognize the power of being present in the process and embarking on the goal of analyzing data for student achievement with teachers (Abbott & McKnight, 2010). A final element in developing trust is the simple act of recognizing the success teaching teams experience when engaging in decisions informed by data (Schmoker, 2004).

Providing structure. School leaders are responsible for creating environments that expect data-driven decision-making and should be cognizant that an adequate amount of time should be devoted to the process (Bernhardt, 2009; Boudett et al., 2006; Gallimore et al., 2009; Kowalksi et al., 2008; Park & Datnow, 2009; Wayman, 2009). In short, how schools structure their work days reflects what they value (Murphy & Lick, 2005). When principals provide teachers time to analyze data, they convey the message that collaboration is a requisite to increased student learning (Eaker, DuFour, & Burnette, 2002). Ideally, collaboration between teams of teachers should take place during the contract day (Clauset, Lick, & Murphy, 2008; Murphy & Lick, 2005).

During the collaborative teacher meetings, school leaders should train teachers in structured routines that allow them to utilize data to identify, problem solve, and implement solutions in a continuous manner (Boudett et al., 2006; Gallimore et al., 2005; Schmoker, 2004). With provided structure, school principals model best practices in their own data use and communicate, through actions and words, a high value on using data (DuFour, 2002; Park & Datnow, 2009; Picciano, 2006). For example, principals might develop staff meeting agendas centered on the use of data to address concerns within schools (Moore, 2011). This action communicates the importance of collaborative decision making processes informed by data. Initially providing teachers with structured steps, schedules, and protocols can aid in easing the transition to data-driven processes (Anderson & Fagerhaug, 2006; Boudett et al., 2006; Clauset et al., 2008).

Collaboration. Throughout the history of teaching, classroom instruction has been viewed as a solo task where teachers had little expectation to collaborate (Abbott & McKnight, 2010). As the role of principals began to shift to instructional leadership, the initial focus was on honing the skills of individual teachers versus increasing the capacity of teaching teams (DuFour, 2002; Ylimaki, 2007). In the current school reform context, the implementation and support of collaborative teaching teams has proven to be an effective strategy for data analysis leading to increased student achievement (Abbott & McKnight, 2010; Eaker et al., 2002; DuFour, 2002; DuFour, DuFour, Eaker, & Many, 2010; Schmoker, 2004; Smith, 2012). Teachers might be grouped to collaborate in action research teams, critical friends groups, study groups, curriculum

committees, or department and grade-level teams (Lick & Murphy, 2005). Regardless of team structure, collaborative teams should have the understanding that “the object of collaboration is to improve instruction so that all students will master essential learnings” (Wilhelm, 2011, p. 27). The establishment of collaborative teams allows for teachers to develop aligned assessment plans, address discrepancies between expected and actual student achievement, and benefit from the expertise of a larger group (Abbott & McKnight, 2010; DuFour et al., 2010; Picciano, 2006; Pulliam, 2005). Additionally, with the adoption of the Common Core Standards (CCSSI, n.d.), collaboration between teachers should increase because all will have a shared language concerning universal expectations for all students (Kendall, 2011).

4.4 Data Sources

Researchers have argued that school leaders and teachers should use a wide variety of data to form conclusions about student learning; instructional data alone are not enough (Bernhardt, 2004; Boudett et al., 2005; Halverson, Grigg, Prichett, & Thomas, 2007; Kowalski et al., 2008; Reeves, 2005). Ignoring the broader context within which student achievement occurs actually prevents systems from reaping the benefits of data-driven processes (Bernhardt, 2004). Educators must have an awareness of the fact that “data without context or analysis simply will not take you anywhere” (Kowalski et al., 2008, p. 104). Bernhardt (2004) asserts educators need to include student learning data, demographic data, school process data, and stakeholder perception data in order to accurately pinpoint student achievement goals.

Student learning data .The most common type of data accessible to schools is student learning data which refers to facts that represent what students have learned (Bernhardt, 2004; DuFour et al., 2010; Kowalski et al., 2008). Within state and district accountability guidelines, some schools have limited their definition of student data to include only summative measures of performance (Popham, 2010; Reeves, 2004; Wilhelm, 2011). “In effective schools, both quantitative and qualitative data and summative and formative measures inform critical decisions” (Kowalski et al., 2008, p. 226). When making decisions in response to data, it is critical that leadership teams understand the nature and scope of assessments (Boudett et al., 2005) which lead to increased proficiency in teachers ability to respond to data in effective ways (Picciano, 2006). Examples of student learning data include norm-referenced tests, state assessments, grade distributions, grade point averages, and benchmark tests (Zepeda, 2004).

Demographic data . Demographic data describe the general characteristics of the student population and includes information about students’ ethnicity, socioeconomic status, language proficiency, and other factors that are inextricable from the life of students (Bernhardt, 2004; DuFour et al., 2010; Kowalski et al., 2008; Picciano, 2006; Reeves, 2005). Additionally, school and community demographic data might include overall attendance rates, retention rates, student discipline infractions, drop-out rates, socioeconomic factors, and political factors (Zepeda, 2004). As required with NCLB (2002), demographic data allows schools to answer questions about how schools are meeting the needs of specific student groups (Bernhardt, 2004; DuFour et al., 2010). As such, “demographic information is important and should be displayed as part of comprehensive accountability systems, but it must not be used to explain, excuse or influence the results” (Reeves, 2005, p. 119). According to Taylor (2010), educational leaders must communicate high expectations for all students and guide teachers in the comparison and analysis of progress for each demographic group.

School process data . School process data refers to information about the structures and routines within school environments and, as a result, educators have the most power to control school process data (Bernhardt, 2004; Reeves, 2004, 2005). Consequently, data garnered from school processes, typically measurable teaching and leadership behaviors, had tremendous impact on student learning (Leithwood et al., 2004; Reeves, 2004). School process data includes information about what is programmatically and instructionally offered by schools as well as the delivery of these elements (Bernhardt, 2004; Kowalski et al., 2008). For example, teacher to student ratios, the number of courses offered by high schools, the number of classroom walk-throughs, and elementary curriculum scope and sequence are considered school process data (Zepeda, 2004).

Perception data . Perception data refers to information collected on how individuals perceive schools (Bernhardt, 2004; Kowalski et al., 2008). Perceptual data are gathered from various individuals who are

affected by schools (Bernhardt, 2004) and is typically collected through surveys or interviews (Bernhardt, 2004; Kowalski et al., 2008). For example, surveying students regarding their perceptions of teachers' instructional styles, interviewing parents and families in reference to their perceptions of issues surrounding the school, and measuring community attitudes about student learning are all examples of perceptual data (Zepeda, 2004).

4.5 Professional Development

Bernhardt (2007) and Reeves (2005) argued professional development is vital to facilitating the use of data-driven decision-making and recommended school leaders ensure professional development instigates instructional change. A strong focus on increasing student achievement should be present in the planning of professional development (Kowalski et al., 2008; Schmoker, 2004). In order to maximize results, school leaders should limit the number of specific goals identified to guide improvement processes (Reeves, 2006; Schmoker, 2004) and provide training centered on issues specific to schools (Kowalski et al., 2008). In order to create long-term, sustainable gains in achievement, staff development might include opportunities for both initial and ongoing training in data use (Park & Datnow, 2009; Picciano, 2006). Providing teachers with ongoing practice in a supported environment helps to improve their competency with analyzing data and making decisions that positively impact student achievement (Pulliam, 2005; Wayman, 2009).

The knowledge and skills necessary to effectively implement data-driven decision-making processes varies greatly from what most teachers experienced during their pre-service education (Kowalski et al., 2008). As such, Bernhardt (2009), Elmore (2005), and Park and Datnow (2009) recommended that school leaders recognize the need for the development of new skills and focus on creating environments where support and time are allocated for teachers to develop skills in data analysis and application. This requires educational leaders to fully understand the key role teachers play in analyzing student achievement and to provide the necessary support for teachers to gain capacity in this role (Bernhardt, 2009; Park & Datnow, 2009; Picciano, 2006).

One of the most challenging steps in implementing data-driven decision making processes is turning data into useful information about student performance (Earl & Fullan, 2003; Kowalski et al., 2008; Moore, 2011; Wilhelm, 2011). In many schools, having an adequate amount of data is not the problem. In fact, Wilhelm (2011) argued many schools are suffering from *DRIP*, that is schools are *data rich, information poor* (p. 30). With the overabundance of data currently available, many teachers have grown adept at analyzing data to find an issue; however, they are unable to see a clear connection between data and how to adjust their instruction (Moore, 2011; Wayman, 2009). Consequently, student data should be an integral part of professional development experiences in order to create a strong link between teaching and learning (DiPaola & Hoy, 2008; Pulliam, 2005). Data analysis is useless if those deciphering data are not provided with the knowledge to make meaning from the information (Bernhardt, 2007).

4.6 Professional Learning Communities

The goal of school reforms centered on data-driven decision making processes is to create *norms of continuous improvement* (Schmoker, 2004, p. 427) that transpire into the development of a culture of continuous inquiry (Park & Datnow, 2009). The impact of such changes creates what DuFour (2002) called the *opportunity for sustainable growth*.

When teams of teachers engage in the process of analyzing data to identify, prioritize, and address student learning, leadership is distributed throughout the organization. Engaging teachers this way provides the potential for a positive impact on student achievement (Schmoker, 2004). As teams begin to embed the processes associated with the concept of the PLC, the skills of the individuals and the group are increased, creating a persistent condition of improvement throughout the school (DuFour et al., 2010).

Successful school leaders understand the powerful influence creating sustainable change can provide to student outcomes over the long term (Fullan, 2011; Reeves, 2006). Equally important, is the comprehension that leaders and teachers must continue to grow professionally to meet the needs of students (Elmore, 2005;

Picciano, 2006; Reeves, 2006). Providing teachers with purposeful opportunities to engage in team-based inquiry aimed at understanding student outcomes should create an increased understanding of the causal relationship between instruction and achievement (Boudett et al., 2006; Gallimore et al., 2009; Kowalski et al., 2008; Moore, 2011; Picciano, 2006). As educators increase their efficacy with data-driven decision making and equate their work to positive student outcomes, they begin to regard the practice as essential to their work (Fullan, 2011; Gallimore et al., 2009; Park & Datnow, 2009).

5 Practical Application

With increased accountability, the roles of educational leaders have shifted from manager to instructional leader and principals should understand, embrace, and plan for the effective use of data in their schools to undertake this role (Bernhardt 2005; Creighton, 2001; Halverson et al., 2007; Park & Datnow, 2009; Wayman, 2009; Zepeda, 2012). Similar to Reeves (2004) *Antecedents of Excellence*, we argue that school leaders must have a framework concerning antecedents to develop a school culture that embraces the productive use of data. Figure 1 highlights the main elements school leaders need to consider to effectively implement data driven decision making in schools: (a) strong leadership, (b) ongoing professional development, (c) and a positive school culture.

(a) Leadership	(b) Professional Development	(c) School Culture
Develop a leadership team	Organized over long term	Establish trust
Employ a vision for data use	Education about data types	Cultivate collaboration
Provide accessibility to data	Utility with data tools	Embed time and structure
	Translate data to information	

Figure 1. Antecedents of effective data usage in schools. Antecedent framework adapted from Reeves, D. B. (2004). Accountability for learning: How teachers and school leaders can take charge. Alexandria, VA: Association for Supervision and Curriculum Development.

In regards to the antecedent of *leadership*, principals must first establish a leadership team that represents a cross-section of their school’s make-up (Marzano et al., 2005). Once the leadership team is established, principals guide this group of educators in establishing a focus or vision of improvement for the school year, using data to inform their selection. Once this focus is selected, principals provide teachers and other support staff accessibility to data that will have the most impact on this focus.

Because accessibility does not ensure proper data use, principals should turn their attention to the antecedent of *professional development*. Working with their leadership teams, principals first establish a year-long professional development plan. Ray (2011) called this establishing a school wide professional development focus as to ensure all stakeholders have shared knowledge and hold each other accountable for staying on topic. After this school wide professional development plan is secured, the focus then turns to building the capacity of teachers as they undertake data usage in their work-teams (i.e. grade level, department, or PLCs). Thomas (2011) argued the most effective data analysis teacher teams are those who share the same standards and assessments. This professional development plan should include adequate time to discuss data at staff meetings and pre-approved professional development days when students are not in session. Principals should pay significant attention to educating teachers about the types of data the school collects, how to use data tools to understand patterns within data, and how to use these patterns to improve

teaching practices. In the end, the goals of the process are to identify students' strengths and weaknesses in relation to standards, identify individual students who are ready for enrichment or in need of remediation, and brainstorm improvements to instruction all teachers will adopt within the next unit of study (Thomas, 2011).

When principals create explicit norms and expectations for data use to improve teaching (Datnow et al., 2007), overtime, the *school's culture* begins to embrace the use of data to inform instructional decisions. Principals drive fear from the system by creating safe environments in which teachers share common data to improve teaching. Additionally, principals intentionally create time within the school year to allow teachers to discuss classroom data and celebrate successes as they progress towards the school's focus, connecting small victories to student learning (Thomas, 2011).

Ultimately, the establishment of a data-driven school brings about processes of continuous inquiry and professional discourse into the systematic routines of the workday. By fostering an environment that encourages and supports this level of interaction, educational leaders create an atmosphere with internal and external accountability. As the conditions of Professional Learning Communities (PLCs) become embedded in the day-to-day operations of schools, sustainability occurs as leadership is distributed throughout the school. Ultimately, the creation of the sustainable system creates the capacity for schools to repeat these accomplishments and provide persistent gains in student achievement.

6 Conclusion

Data-driven decision making is one piece of an effective school and principals should ensure coherence among all systems in order for data use to have an optimal effect (Bernhardt, 2007). This paper addressed principals' role in leading data-driven decision-making in schools, as well as, the conditions for its effective implementation including leadership, professional development, and school culture. At the crux of this work is the goal of improving student achievement. In sum, Abbott and McKnight (2010) highlighted school leadership's role in leading data savvy schools by stating "the key to success, however, remains the principal, who by prioritizing instruction as the most important activity on campus, empowers all educators to do the same" (p. 24).

7 References

- Abbott, C. J., & McKnight, K. (2010). Developing instructional leadership through collaborative learning. *AASA Journal of Scholarship & Practice*, 7(2), 20 – 26.
- Anderson, B., & Fagerhaug, T. (2006). *Root cause analysis: Simplified tools and techniques* (2nd ed.). Milwaukee, WI: Quality Press.
- Bernhardt, V. L. (2004). *Data analysis for continuous school improvement*. Larchmont, NY: Eye on Education.
- Bernhardt, V. L. (2005). Data tools for school improvement. *Educational Leadership*, 62(5), 66-69.
- Bernhardt, V. L. (2007). *Translating data into information to improve teaching and learning*. Larchmont, NY: Eye on Education.
- Bernhardt, V. L. (2009). Data use. *Journal of Staff Development*, 30(1), 24-27.
- Boudett, K. P., City, E. A., & Murnane, R. J. (2006). The "data wise" improvement process: Eight steps for using test data to improve teaching and learning. *Principal Leadership*, 7(2), 53-56.
- Boudett, K. P., Murnane, R. J., City, E., & Moody, L. (2005). Teaching educators how to use student assessment data to improve instruction. *Phi Delta Kappan*, 86(9), 700-706.
- Bryk, A. S., & Schneider, B. (2002). *Trust in schools: A core resource for improvement*. New York: Russell Sage.
- Common Core State Standards Initiative. (n.d.). *Common core state standards*. Retrieved from <http://www.corestandards.org/the-standards>
- Clauset, K. H., Lick, D. W., & Murphy, C. U. (2008). *Schoolwide action research for professional learning communities*. Thousand Oaks, CA: Corwin.

- Creighton, T. B. (2007, 2nd edition). *Schools and data: The educator's guide for using data to improve decision making*. Thousand Oaks, CA; Corwin Press.
- Datnow, A., Park, V., & Wohlstetter, P. (2007). *Achieving with data: How high-performing school systems use data to improve instruction for elementary students*. Retrieved from <http://www.usc.edu/dept/education/cego/reform/publications/books-chapters/Achieving%20with%20Data-How%20High%20Performing%20Schools%20Use%20>
- DiPaola, M. F., & Hoy, W. K. (2008). *Principals improving instruction: Supervision, evaluation and professional development*. Boston, MA: Pearson Education.
- DuFour, R. (2002). The learning-centered principal. *Educational Leadership*, 59(8), 12-16.
- DuFour, R., DuFour, R., Eaker, R. & Many, T. (2010). *Learning by doing: A handbook for professional learning communities at work*. Bloomington, IN: Solution Tree Press.
- Eaker, R., DuFour, R., & Burnette, R. (2002). *Getting started: Reculturing schools to become professional learning communities*. Bloomington, IN: National Education Service.
- Earl, L., & Fullan, M. (2003). Using data in leadership for learning. *Cambridge Journal of Education*, 33(3), 383-394.
- Eastwood, K. W., & Tallerico, M. (1990). School improvement planning teams: Lessons from practice. *Planning and Changing*, 21(1), 3-12.
- Elmore, R. F. (2005). Accountable leadership. *The Educational Forum*, 69(2), 134-142.
- Fullan, M. (2011). Intrinsic motivation: How do you get people to change? *Leadership Excellence*, 28(12), 6-7.
- Gallimore, R., Ermeling, B. A., Saunders, W. M., & Goldenburg, C. (2009). Moving the learning of teaching closer to practice: Teacher education implications of school-based inquiry teams. *The Elementary School Journal*, 109(5), 537-553.
- Halverson, R., Grigg, J., Prichett, R., & Thomas, C. (2007). The new instructional leadership: Creating data-driven instructional systems in school. *Journal of School Leadership*, 17(2), 159-194.
- Henson, K. T. (2010). *Supervision: A collaborative approach to instructional improvement*. Long Grove, IL: Waveland Press.
- Kendall, J. S. (2011). *Understanding common core state standards*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Kowalski, T. J., Lasley, T.J., & Mahoney, J. W. (2008). *Data-driven decisions and school leadership: Best practices for school improvement*. Boston, MA: Pearson Education.
- Leithwood, K., Louis, K., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning*. New York, NY: Wallace Foundation.
- Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership that works: From research to results*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Moore, B. (2011). *I have the data...now what: Analyzing data and making instructional changes*. Larchmont, NY: Eye on Education.
- Murphy, C. U., & Lick, D. W. (2005). *Whole-faculty study groups: Creating professional learning communities that target student learning* (3rd ed.). Thousand Oaks, CA: Corwin.
- National Association of Elementary School Principals. (2001). *NAESP standards for what principals should know and be able to do*. Washington, DC: Collaborative Communications Group.
- National Policy Board for Educational Administration. (2002). *Standards for advanced programs in educational leadership for principals, superintendents, curriculum directors, and supervisors*. Retrieved from http://npbea.org/ELCC/ELCCStandards%20_5-02.pdf²
- No Child Left Behind Act of 2001, Pub. L. No. 107-110 (2002).
- Owens, R. G., & Valesky, T. C. (2011). *Organizational behavior in education: Leadership and school reform*. Boston, MA: Pearson.
- Park, V., & Datnow, A. (2009). Co-constructing distributed leadership: District and school connections in data-driven decision making. *School Leadership and Management*, 29(5), 477-494.
- Picciano, A. G. (2006). *Data-driven decision making for effective school leadership*. Upper Saddle

²http://npbea.org/ELCC/ELCCStandards%20_5-02.pdf

- River, NJ: Pearson.
- Popham, W. J. (2010). *Everything school leaders need to know about assessment*. Thousand Oaks, CA: Corwin.
- Pulliam, L. A. (2005). The quest for quality instructional data. *T.H.E. Journal*, 32(9), 36-37.
- Protheroe, N., & Tucker, C. (2008). *Data-based decision making* (2nd ed.). Alexandria, VA: Educational Research Service.
- Ray, R. (2011). Extreme makeover reading edition: Seven significant changes that led this school on the path towards achievement. *Principal*, 90(4), 14-17.
- Reeves, D. B. (2004). *Accountability for learning: How teachers and school leaders can take charge*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Reeves, D. B. (2005). *Accountability in action: A blueprint for learning organizations*. Englewood, CO: Lead + Learn Press.
- Reeves, D. B. (2006). *The learning leader: How to focus school improvement for better results*.
- Schmoker, M. (2004). Tipping point: From feckless reform to substantive instructional improvement. *Phi Delta Kappan*, 85(6), 424-432.
- Smith, W. R. (2012). Culture of collaboration. *School Administrator*, 69(1), 14-20.
- Smith, R., Johnson, M., & Thompson, K. D. (2012). Data, our GPS. *Educational Leadership*, 69(5), 56-59.
- Spillane, J. P. (2005). Distributed leadership. *The Educational Forum*, 69(2), 143-150.
- Sutherland, S. (2004). Creating a culture of data use for continuous improvement: A case study of an Edison project school. *American Journal of Evaluation*, 25(3), 277-293.
- Tanner, J. R. (2011). Missing the mark: What test scores really tell us. *The School Administrator*, 9(68), 12-16.
- Taylor, R. T. (2010). Leadership to improve student achievement: Focus the culture on learning. *AASA Journal of Scholarship and Practice*, 7(1), 10-23.
- Thomas, R. S. (2011). Why school teams don't analyze data. *The School Administrator*, 68(9), 24-27.
- Wayman, J. C. (2009). Involving teachers in data-driven decision making: Using computer data systems to support teacher inquiry and reflection. *Journal of Education for Students Placed at Risk*, 10(3), 295-308.
- Wilhelm, T. (2011). A team approach to using student data. *Leadership*, 40(5), 26-30.
- Ylimaki, R. M. (2007). Instructional leadership in challenging US schools. *International Studies in Educational Administration*, 35(3), 11-19.
- Zepeda, S. J. (2004). *Instructional leadership for school improvement*. Larchmont, NY: Eye on Education.
- Zepeda, S. J. (2012). *Instructional supervision: Applying tools and concepts*. Larchmont, NY: Eye on Education.