Data Use Among Principals and Teachers: Divergent Paths or Common Ground? Implications for the Leadership Preparation Programs

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ABSTRACT

This study examines teachers' and administrators' use of data to inform their practice in one south-central state. Using a qualitative research approach, the study involved 76 educators representing eight school districts. Data were collected using focus groups with teachers and in-depth interviews with school principals. Data were inductively and deductively analyzed using multiple cycles of coding. Analysis of data revealed three themes that exposed differences in the use of data by teachers and administrators: the challenges of data use, the "levels" at which data are viewed (micro and macro lenses), and the value placed on formal and informal data. Findings suggest that by understanding the differences between teachers' and administrators' perspectives on data use and recognizing the common ground that unites their perspectives, schools can create data cultures that foster shared expectations, collaboration, and trust between teachers and administrators.

Keywords: administrators' use of data, culture of data use leadership preparation programs, teachers' use of data

For nearly two decades, there has been greater emphasis on using student data for instructional decision-making (Datnow & Hubbard, 2015; Kowalski, et al., 2008). Due to the accountability movement and ongoing attempts at school reform, data have increasingly taken center stage in decision-making processes (Marsh & Farrell, 2014). Data-driven decision-making has become important in part because of pressure from policymakers to make education a more evidence-based field (Mandinach & Schildkamp, 2020). This growing attention to data use in school decision-making processes opens up both great possibilities for improvement and pitfalls (Datnow & Park, 2014). The improvement potential can be found in changing teaching practices and learning experiences for students, leading to improved learning outcomes. The potential for less-productive results is often rooted in the use of data solely to pursue accountability measures and goals. This leads to an important question asked by Datnow and Park (2014): "Are we in danger of chasing numbers and forgetting the central purpose of data use, which is to improve teaching and learning?" (p. 2). This question has ramifications for how school leaders are prepared to approach the use of data with their teachers.

Interestingly, the literature on the relationship between data use for instructional decision-making and increased school or student performance is inconsistent. Schildkamp and Datnow (2020) remind us that educators often wonder whether data-driven decisions make a difference in educational practice and whether there is evidence of their impact. Mandinach and Jackson (2012) and Staman et al. (2017) found no clear connection between the use of data and student performance. Yet, Van der Scheer and Visscher (2016) found a connection between the use of data and increased teacher efficacy in the areas of instructional strategy and student engagement. Often, the connection to increased teacher efficacy is equated with increased student performance (Dunn et al., 2013).

Currently, there is little research on how leaders are being prepared or trained to understand the uses of different data. Also, current leadership preparation and training is not adequately teaching leaders to develop a data culture or to

have a shared vision and comprehensive understanding of effective data use. To fill this gap and identify how leadership preparation and development programs can be improved, the study attempts to shed light on how data are used by educators in the field.

The study sought to explore teachers' and administrators' experiences using data to inform instructional decisions. Specifically, the purpose of the study was to examine teachers' and administrators' use of data to inform their practice in one south-central state. We believe that to better prepare and train school leaders to be more effective users of data, there is a need to understand how both groups use data within their practice. Understanding the differences and similarities can help leaders develop a shared vision for data use and allow for a broader understanding of data-use practices. This can foster a culture of data use defined by shared expectations, collaboration, and trust. It is also noteworthy that the current research grew out of work with the state department of education, which is invested in serving the professional development needs of educators concerning the effective use of data.

Research Questions

Two research questions were examined to achieve the goals of study:

1. How do teachers and school leaders describe their experiences using data?
2. What challenges do teachers and school leaders encounter when using data?

LITERATURE REVIEW

Data Use in Schools

The use of data to derive educational decisions among teachers and school leaders can vary (Marsh et al., 2006). Marsh (2012) characterized data that should be considered in the decision-making process as "encompassing not only student test results but also other outcomes (dropout and graduation rates), input (student demographic information), process (data on quality of instruction or program implementation), and perception (survey results or opinions from teachers, students, and parents) data" (p. 3). Despite this definition and a general understanding that data are types of information that come in different forms, outcome data (e.g., achievement test results, graduation rates, etc.) play a dominant role in the instructional decision-making processes of schools (Marsh et al., 2006).

Teachers' Use of Data

Teachers find that certain types of data (e.g., state assessment data) are useful for sorting students into ability groups, which easily could be seen as an administrative action related to scheduling of classes and placement of students (Farrell & Marsh, 2016). Using student achievement data to anchor communication with students and their parents and using data systems to track the progress of individual students are practices that teachers find valuable (Gallagher et al., 2008). In addition to communication with parents, teachers use data to evaluate students' performance, plan and develop instructional goals, improve instruction, and detect behavioral and social issues in students (Gallagher et al. 2008; Sun et al., 2016).

Teachers' multiple uses of data echo the call from some scholars of data use for teachers and administrators to shift their focus away from traditional ways of looking at their classrooms and schools towards an attempt to digest a variety of different types of data that are more encompassing of the student's total education experience (Thomas & Hoffman, 2011). There is value in considering different types of data at multiple points in time more frequently than annual or semi-annual test score reports (Marsh et al., 2006).

Principals' Use of Data

Principal data use plays a key role in responding and meeting the expectations for student achievement and school improvement (White, 2011). Principals have experienced intense pressure to use and promote data use in their schools to inform school-wide decisions (Sun et. al., 2016). School leaders often use test scores, graduation rates, and similar academic indicators to determine the status of their schools in relation to external accountability mandates (Hamilton et al., 2009). Additionally, the conditions for optimum data use in a school are established by and large by principals and their administrative team (Gerzon, 2015; Lange et al., 2012).

School principals can either guide or hinder data use in their schools. Principals are responsible for building effective data teams in schools by establishing a clear vision for data use, providing individualized support, allowing for more autonomy regarding data use, and creating a safe school climate where data is used for improvement purposes rather than accountability (Schildkamp et al., 2019). The paucity of literature related to how school leaders view the use of data adds value to this study, particularly given the research that suggests school leaders play an indispensable role in fostering a school culture in which data is valued and understood (Gerzon, 2015; Lange et al., 2012; Park & Datnow, 2009).

School Data Culture

In the process of data-driven decision making, schools can have data use cultures, which are defined by teachers' and school leaders' beliefs, uses, attitudes, and practices regarding student data (Gerzon, 2015; Mandinach & Jackson, 2012). Hamilton et al. (2009) defined data culture in schools and districts as a learning environment that includes "attitudes, values, goals, norms of behavior, and practices, accompanied by an explicit vision for data use by leadership, that characterize a group's appreciation for the importance and power that data can bring to the decision-making process" (p. 46). Data culture also reflects the learning environment and involves the recognition that teachers and leaders are responsible for frequently collecting various forms of student data and using them to inform and guide their practice (Gerzon, 2015; Hamilton, et al. 2009). Both teachers and school leaders play essential roles in creating a culture of data use in schools (Datnow & Park, 2014). This requires a shared vision and goals for data use (Marsh, 2012).

In terms of school leaders, successful implementation of data-driven decision-making is usually related to and supported by strong leadership. The role of school leaders can go beyond merely using data to also establishing conditions (e.g., time, support, accessibility) that support the use of data to inform instructional decisions among teachers (Schildkamp & Poortman, 2015). Teachers also play an essential role in creating and maintaining a data-use culture in schools (Mandinach, 2012). This culture is determined by their data literacy (Mandinach et al., 2015; Mandinach, 2012), self-efficacy (Dunn, et al., 2013), accessibility to data (Wayman, 2009), and understanding of their leaders' data-use expectations.

The data-use practices of teachers and school leaders determine whether a school has a healthy or unhealthy data culture. In a healthy data culture, there is a sense of collaboration and trust among school personnel and data are used to improve the school and students' learning (Lasater et al., 2020). In such a culture, teachers and administrators share ownership of data and set clear and attainable expectations for data use. In an unhealthy data culture, a sense of distrust and isolation exists among teachers and school leaders because data are used for compliance and accountability purposes instead of school improvement. In this culture, there is a lack of shared responsibility for data, a shortage of leader competency, and a lack of clear expectations or vision for data use. In such an environment, it is unlikely that teachers and administrators will use data effectively to inform their school-related decisions (Lasater et al., 2020).

METHOD

This study used a qualitative approach anchored in constructivism and influenced by phenomenology to pursue the research questions. Data collection strategies included semi-structured interviews (Vagle, 2018; Van Manen, 2014) with building principals and guided focus groups (Krueger & Casey, 2015) with teachers, principals, and central office personnel. Interviews help researchers learn "how participants interpret events and experiences" and to "develop full, detailed, and contextualized descriptions of experiences and perspectives" (Ravitch & Carl, 2016, p. 147). Stewart et al. (2009) suggest that focus groups are commonly used for "identifying similarities and differences among respondents with respect to specific behaviors, experiences, interests, perceptions, opinions, attitudes, or other characteristics" (p. 591).

Data Collection

The study involved data collected through interviews and focus groups in one south-central state. Specifically, data were collected from 76 teachers and school principals in different school systems throughout the state. The study was conducted in two phases by a research team consisting of two seasoned qualitative researchers and two PhD graduate assistants.

Furthermore, data were collected over a five-month period, with interviews lasting between 56 and 80 minutes and focus groups lasting between 42 and 75 minutes. During phase two, the principal interviews and teacher focus groups were conducted concurrently, with the research team split between data collection events at each site. All focus groups also included an observer/note taker from the research team (Thorne, 2016). Interviews with the principals used semi-

structured protocols with open-ended questions about aspects of the participants' work, including how they define data, their knowledge regarding data use, challenges they face in accessing or dealing with data, and types of support they might have or need to effectively engage in the data-driven decision-making process. For example, the principals were asked questions such as, "How and why do you use student data?," "What kinds of data do you have access to and collect?," and "What kinds of data do you find most useful in your school? Why?" The focus-group protocol consisted of seven questions (e.g., "How do you define student data?," "Where do you find student data?," and "When thinking about data-driven decision-making, what challenges come to mind?") and 21 sub-questions (e.g., "What kinds of data do you look at when planning for classroom instruction?" and "Which data are the most important? Why?").

Data Sources

The scope of this study was limited to public K-12 schools with an attempt to have representation from across the state. The study was done in two phases:

Phase I. The first phase of data collection involved three focus groups with 24 educators. They represented 10 different elementary and high schools from a single school system. In 2015, the total enrollment was 21,211 students served by 30 schools (18 elementary, 4 middle, 4 junior high, and 4 high schools). The school system was one of the state's most diverse school systems, as it includes large Hispanic/Latino and Hawaiian populations due largely to the vibrant poultry and food production industry embedded in the local community (see Table 1).

Table 1

Student Demographics in the School District

Race/Ethnicity	Proportion of students
American Indian/Alaskan	0.6%
Asian	1.6%
Black/African American	2.5%
Hawaiian/Pacific Islander	10.8%
Hispanic/Latino	45.4%
White	37.6%
Two or more other races	1.4%

Furthermore, participants were selected with help from the assistant superintendent of teaching and learning. The sampling criteria included teachers and principals who actively used data in their schools. The rationale for this criterion was that it aligned the sampling method with the purpose of the study – that is, to determine educators' perceptions concerning their use of data to inform instructional decisions. Therefore, we relied on the knowledge of the assistant superintendent of teaching and learning to identify educators who regularly used data in their practice. In addition, we were interested in speaking with educators at different school levels (i.e., elementary, middle, and high school), individuals who worked directly with students (i.e., classroom teachers), and school principals who worked directly with teachers. As a result, three focus-group sessions were conducted with teachers, principals, and instructional facilitators and curriculum writers (see Table 2).

Phase II. The second phase of the study involved 52 educators from four elementary schools, three middle schools, and one high school, representing seven different school systems throughout the state (see Table 3).

In the study's second phase, we interviewed school principals and led focus groups with 42 teachers. The focus group participants were selected by the school principal and made up of classroom teachers and instructional facilitators with a wide range of professional experience. Participants were selected to ensure that teachers who were perceived as actively using data had an opportunity to share their experiences with data use. Schools were selected based on their geographic locations and our relationships with superintendents and principals, who could provide school access. Geographically, three quarters of the state were represented, with the exception being the northeast region. This was due largely to a lack of response and willingness to participate in the study and the lack of time allotted to collect data.

Ultimately, the focus groups allowed the teachers to build on each other's ideas and thoughts and helped us develop a collective understanding of their experiences with data use. Individual interviews with principals allowed us to learn from their experiences related to data use and leading schools.

Table 2

Focus Groups for Phase One

Participant Type	Focus Group Number	School Level (# of participants)
Teachers	7	Elementary (3) Middle School (2) Junior High (1) High School (1)
Principals	8	Elementary (2) Middle School (3) Junior High (1) High School (1)
Instructional Facilitator & Curriculum Writers	9	Elementary (4) Middle School (2) Junior High (2) High School (1)

Table 3

Study Participants (Phase 2)

School	Student Population	Grade Levels	Free & Reduced Lunch %	Report Card Grade	Principal Years of Experience	Focus Group Size
School A	279	9-12	50%	C	1	5
School B	582	5-8	46%	C	10	4
School C	271	K-6	92%	D	1	7
School D	420	6-8	60%	C	15	6
School E	479	3-5	55%	C	2	4
School F	388	6-8	56%	D	3	7
School G	452	K-2	43%	C	4	3
School H	321	P-K	64%	C	6	6

Note. Report Card Grade refers to the school's rating and performance grade. The A-to-F letter grades are based on each school's federal Every Student Succeeds Act (ESSA) Index Score.

Data Analysis

The data analysis process unfolded concurrently with data collection and was conducted by all members of the research team. Data analysis involved dialogic engagement amongst members of the research team within regularly scheduled team meetings. Dialogic engagement provided opportunities for members of the research team to share, discuss, and challenge their analytic interpretations of the data and to arrive at a collaborative understanding of emergent themes (Ravitch & Carl, 2016). Moreover, the data analysis process went through two phases. Phase One of the study was initially focused on how educators in one school district used data; however, during this analysis we found evidence suggesting that teachers and administrators might not view data in the same way. In a real sense, the analysis was inductive, as researchers employed a constant comparative analysis between the three focus groups. This led to the theory that teachers and administrators view the use of data differently and identify different challenges, and we believed further understanding of these differences could provide important insights for leadership preparation and development programs. The second phase was then conducted to examine this theory in multiple settings.

Data analysis for Phase Two of this study was ongoing in a recursive manner throughout the study, and it is the second phase of the study that the remainder of this paper addresses. The linchpins of the analysis process were the dialogic engagement amongst the research team and memos that were analytic, reflective, and descriptive in nature (Ravitch & Carl, 2016). Data were initially analyzed on a case-by-case basis, and codes were added and revised throughout the process. Initial coding was descriptive in nature and the list of codes was extensive, allowing for the merging of some codes after further analysis. During research team meetings, codes were collaboratively and intensively discussed, analyzed, and revised until the team reached a consensus on the merging and grouping of codes into categories (see Saldaña, 2013). These categories assisted in the synthesis of Phase II data and led to the emergence of the themes that constitute the findings.

RESULTS

Analysis of data revealed three themes related to teachers' and administrators' experiences using data: the relationship between time and data use; the representation of two different levels of view (micro and macro lenses) in relation to data; and varying values between formal and informal data. The three themes reflect underlying differences between teachers' and administrators' perspectives on data use. Each theme is identified and discussed below. Figure 1 illustrates the study findings including the recursive data analysis process with a sample of initial codes, categories and eventual themes used in the study.

Moreover, Figure 2 includes some examples of statements from teachers and principals about their experiences in using data. These statements reflect the emergent themes.

Theme 1: Challenges of Data Use

This theme represents the challenges associated with using data to inform school-wide decisions that school principals should be able to address. It also reflects the relationship between time and data literacy with regard to effective data use. Participants in this study believed increased data literacy and effective data use required significant time, but they varied in their beliefs regarding whether or not sufficient time was available.

According to teachers, lack of time presented a significant barrier to effective data use. Teachers acknowledged that there were many data sources and tools that could be beneficial for both their students and schools, but they reported having insufficient time to explore these sources, reflect on data, and determine what to do in response to data. For instance, one teacher at School F stated:

> Another challenge is time. Being able to have the time to interpret the data and then to know what to do. To have time to make decisions about what you're going to do. I think that's really big where we're crunched on time already.

Moreover, teachers in the study expressed frustration with their perceptions of the disconnection between the administration's expectation around data use and their own reality in terms of time. For example, one teacher from School G commented:

> I kind of feel like we're in the trenches – like we're in the trenches, we're getting it. I've stepped out of the classroom for one year to be a counselor and in that one short year I forgot it's a lot easier to say, well, we need to get this done, …but when you're back into the classroom you're like that's a lot easier said than done…To get that data, and then once you get it have the time to sit down and organize it, make a plan. So I think that's kind of the biggest thing, too, is having the time and having school principals understand that we – I'm sure teachers want to have data driven instruction but it does take time.

Interestingly, a similar frustration was mentioned within School E's focus group:

> *Teacher D*:   I think sometimes their expectations are a little higher than reason.

> *Teacher E*:   Unreasonable.

> *Teacher D*:   Thank you. Unreasonable. I mean you, you give them all this data and say, "Okay, go over this data in 20 minutes. We'll watch your class."

Teacher F: Or you're expected to have an effective lesson to go on that day and us to test 50 children in one day. So one of the two is not going to happen either. I'm not going to get this testing done myself or a whole day of instruction is wasted.

Figure 1

The Recursive Data Analysis Process

Sample Codes	Category	Theme	Definition
Too much data Not enough time Lack of knowledge Integrity of data Narrow view of data Resistance to change Need more support	Challenge	Challenges of Data Use	The theme represents the challenges associated with data use. It also reflects the relationship between time and data literacy with effective data use.
Collaboration Trust Teacher ownership Supportive Fear Expectation Compliance	Culture	Macro vs. Micro Lens	This theme reflects two different levels of view in relation to data use among teachers and administrators (Macro and Micro). Macro refers to data that generalizes and informs decision-making and evaluation on more of a systemic level. Micro refers to data that is more specific to the individual student.
Anecdotal Behavioral Artifact-Student work Formal Informal Student Voice Demographic Observational	Type of Data		
Motivate "Inform practice" Change culture Determine growth Change instruction Goal setting Sorting students	Use	Value of Informal and Formal Data	The theme refers to the type of data that teachers and administrators valued (formal vs. informal data). Formal data refers to data that are found in formal reports (e.g., achievement scores, discipline and attendance reports etc.). Informal data are information that are more spontaneous in nature and are not readily reported in a formal report (e.g., observation, anecdotal information, teacher-made assessment, etc.).
High Low Improves students Involvement Self-assessment	Value		

Table 4

Examples of Statements from Teachers and Principals

Theme	Example Statement
Challenges of Data Use	"Very time consuming, even when using data to plan, there still was an issue of not having enough time." (Teacher A) "Time is the biggest hurdle. It is hard… So, we do a lot of things…we are very selective with the time that we have and how we use it. I'm very intentional with allowing them to have time to meet." (Principal B)
Macro vs. Micro Lens	" I think everybody in this building has a heart for kids and their success, and we know that you have to look at them individually, and the data to say 'Here's where we go next." (Teacher C) "Those simple management type things we use the data for. Looking at the budget as well, how have I done it previously, let's look at what I've done, to keep me aligned that way." (Principal A)
Value of Informal and Formal Data	"Data is anything that helps your child succeed in class. And it is more than just, did you get that answer right on this multiple-choice question? It could be, oh, you remembered your homework. That's a step forward that's showing responsibility and concern for your grade and so that's data for me." (Teacher G) "For student accountability and teacher accountability, of course, the assessments and the testing. That would be the thing most everyone would look at." (Principal E)

Teachers at School E expressed frustration over not having enough time to generate the data and then use that same data to inform their instruction. In general, teachers in this study were frustrated with not having time to meet the expectations of administrators when it came to using data to inform their instruction, as well as being able to meet their own expectations related to using data effectively.

Administrators also acknowledged that data use required considerable time; however, they believed that they provided teachers with adequate time to do so effectively, thus reducing the challenge of finding extra time for the task of working with data. For example, the school leader at School H stated:

> I'm very intentional with allowing them to have time to meet. So in that team, that instructional team, or either in the big grade level team. We have 17 kindergarten teachers so at least once a month on a Wednesday I want them to all meet together.

Though this administrator believed she provided time for teachers to use data, the practice she described allotted time for data use at the expense of teachers' personal planning time.

Similarly, the principal of School G indicated that he provided teachers with adequate time to work with data through the development of professional learning communities (PLCs). PLCs refer to regular school meetings that school principals facilitate so that teachers can critically discuss data. He explained,

> My philosophy is get as much done during the day as you can . . . We have our PLC [Professional Learning Communities] meetings weekly, and that's during the prep. We've used those for data. We try and make those PLC meetings all data-driven, instruction strategies . . . Whereas we also have their team meetings where we do more of the housekeeping stuff. We have those during the day, and we could have those after school because they don't have common planning time. But they've all chosen, "I'll take my time at lunch or I'll take this time," and we fit that in to the schedule. What I'm getting at is they'll also take that time during team meetings sometimes and you'll hear them discussing kids like in their spelling groups because they're all sitting there together . . . So they do have the time to look at that. We try and make the time for them to do that.

This statement appears to contradict the feelings expressed by teachers at School G. The principal appears to feel that there are opportunities for his teachers to work with data during the school day; however, the focus group at School G indicated that teachers felt time was overlooked by the administration – creating an apparent dissonance in the perceptions between administrator and teachers related to time as a challenge to using data effectively.

At School E, there was a different type of disparity between the principal's perception and the feelings of her teachers. While the principal admitted that there was not enough time for teachers to use data in her school, she felt that it was not due to the availability of time, but it was more that teachers did not have an understanding of how using data to inform instruction was linked to planning. The principal explained,

> We tried to implement PLCs this year . . . we tried to change the dynamic of making that a PLC meeting so that we could bring in more of this data. [This] met with a lot of resistance because they're used to having a planning meeting, "I need that time to plan what I'm teaching next week with my team because there aren't many other days when I have a common planning time with my team." To me, I don't see that the issues are separate. I'm like, "Your data should drive what you're teaching." They don't have that view yet…they're not seeing the connection between my data says this, therefore this is what I teach, so that's a hurdle. I'm going to fix it for next year . . .

This highlights the reality that some teachers look at their work with data as being a separate activity or practice that stands alone from their instructional planning and the delivery of instruction. While the principal wanted her teachers to think of generating and using data in their planning as a critical component of their instruction, her teachers did not understand or accept that using data should be something that was embedded in their planning session. The view that data use is a separate, additional responsibility for teachers was shared by a teacher at School C:

> So by the time I do lesson plans and grading papers and all the stuff that is required of me by the district, you know, find that time to sit down and literally look at my data and say okay this child missed this because of miscalculation, but this child missed this because they have no idea. It's just a matter of time to really sit down and wrap my brain around what's going on.

Ultimately, all administrators and teachers seemed to acknowledge that time presented a challenge; however, there seemed to be a general inconsistency in how the problem was framed. Teachers, in general, felt that there simply was not enough time in the day to use data effectively. Administrators saw the problem more along the lines of teachers understanding that data use was not something extra to be added to the instructional process, but should be considered as part of the reflective dialogue about teaching and learning as well as planning for instruction.

Theme 2: Macro vs. Micro Lens

According to Sun et al. (2016) and Gallagher et al. (2008), there are multiple ways that school personnel use data. The findings in this study resonate with this prior research. There appears to be a theme throughout the cases indicating primarily two broad types of data: macro and micro. Macro refers to data that generalizes and informs decision-making on a systemic level. Micro refers to data that is more specific to the individual student.

When asked how they used data, teachers in this study primarily described data use from an instructional, student-centered perspective. They discussed using data to make decisions about differentiated instruction, grouping of students, goal-setting, progress-monitoring, remediation, referrals to special services, and pacing of instruction. In other words, data were used to make decisions about the individual needs of students. When asked about the type of data they use, one teacher mentioned, "Yeah, individualized. Student needs. It's almost like student need-driven. Data driven, yes, but what they need at that point."

Similarly, the teachers at School B shared that they thought the data that was generated in their classrooms everyday was the most important, as one teacher reported, "I would say their classroom instruction, what they pull from that. Either their common assessments, their anecdotal records, would be . . . that would be mine." Another teacher at the same school described the data that she valued the most:

> I would say what's in front of me right now. When I look at this piece of evidence that just came across my desk, what does that tell me about my class as a whole, how much of that is me as a teacher, how much of that is my curriculum, and then what does that tell me about this student and their understanding of what I need to do with that child? I think it's, you know, in the classroom at the time with what's in front of me.

These teachers seemingly find informal data that speaks to the individual learner to be of most value, as opposed to data that allows more formal generalizing about what might be happening in their classroom.

Administrators also recognized instructional, student-centered uses of data, but they further described data use from a systemic, managerial perspective. They used data to develop and monitor systems within their buildings and to

guide systemic decision-making. For example, administrators described using data to develop the master schedule, assign students to classroom teachers, and evaluate school programs. At School D, the principal shared one way she uses data in a macro sense with budgeting: "I have a federal budget that's a pretty good amount, that I can use for math, literacy and science and I usually use my data on purchases, on what do you need." The principal at School B shared that data "really drives my master schedule to a huge extent, looking at the MAP scores that we have, our benchmark scores, or whatever the scores might be." Seeing data though a macro lens also allowed some administrators to determine professional development needs, as one principal explained,

> One of the biggest pieces of data that I use is classroom monthly data, because of throughout the years I'll know exactly where our PLCs need to go or professional development needs to go. Is it an instructional issue, is it a curriculum issue, just be looking for data and looking for the trends that I find throughout.

In addition, some teachers in the study indicated an understanding of how their view of data was different from the view of their principals. For example, teachers at School F were asked if administrators looked at data differently than teachers. They responded with this exchange:

> *Teacher O*:   I think they look at it on a different level because you just naturally do that when you are in an administrative position versus a teaching position . . . You just have a different perspective. Being a teacher in the classroom, you have a different perspective from a leader.

> *Teacher P*:   I think we're focused on individual kids because they're our kids. Not that the administration doesn't think of them that way, as well, but it's bigger picture. The umbrella is different. They're looking at groups of scores where I'm looking at this child and where you are at . . . I take it that way. It's not that they don't value it, it's just like you said a different level.

This theme was also evident in teachers' and administrators' discussions of the challenges associated with data-driven decision-making. The challenges described by teachers focused primarily on instructional and student-specific issues such as meeting students' needs, developing common assessments, and the loss of instructional time due to frequent assessments. Conversely, administrators focused more on the systemic challenges of data use, such as effective implementation of PLCs and teacher leadership within PLCs.

Theme 3: Value of Informal and Formal Data

The third theme reflects the different types of data that teachers and administrators value (formal vs. informal data). Formal data for the purposes of this analysis refers to the data found in formal reports (e.g., academic achievement score reports, discipline and attendance reports generated from computer programs, etc.). Informal data are those bits of information that are more spontaneous in nature and are not readily reported in a formal report (e.g., observation, anecdotal information, teacher-made assessment, etc.). Administrators and teacher perceptions varied in terms of the types of data used most often and found to bring the greatest value to their professional practice**.** Teachers found the day-to-day, informal data generated directly from classroom instruction and informal teacher-made assessments to be the most valuable. Administrators most often described using formal data, such as standardized assessments and formal attendance or discipline reports to guide decisions.

In fact, some administrators expressed concerns that informal data may be subjective or lack integrity compared to the objective nature of formal reports. For example, when talking about teachers using their own assessments for data, the principal at School C reflected,

> The thing about teachers creating their own interims, I'm a little worried about the rigor and the quality. First of all, they don't have the time and they don't have the skills. Some teachers do, but if you're talking a building-wide thing, no, they don't. They don't have the knowledge or the skills.

Not trusting teachers to be able to generate accurate data was also talked about in terms of grades. When asked about different types of data that her teachers use, the principal at School E responded,

> Grades, of course, they've got that. Um, one of the issues we've really talked about (laughs) in the past years is making sure that grades match performance. I don't know if that's an elementary issue or what, but for me, when I'm looking at it and I've got a kid here who's below basic or whatever we're calling it with this next test but, you know, they're at the very lowest level, then you've got an A in reading . . . something is wrong. Either

something was wrong when you took the test or something is wrong every day because why are you getting an A?

Some principals questioned the integrity and legitimacy of teacher-made assessments and grading procedures, which perhaps led them to trust the more formal data generated from standardized tests.

On the other hand, there were other principals who clearly supported the use of informal data as a legitimate source of information to inform decisions. The principal at School A observed,

> I think data is something that, like you said, we constantly are getting feedback and it might not . . . a lot of data is not formal. It's just observation but that's important data also, and it doesn't need to be overlooked.

The principal at School F shared that while he and his teachers used formal data to make instructional decisions, they also valued more informal data:

> If a child is struggling, through observations, through weekly formative type assessments, then they'll make recommendations there. A lot of that is based on our grading system. Or if someone struggling behaviorally or if there's an issue that might be through counseling type services or even medical issues, then you're going to say, "Okay, we need to look at that information and see how we're going to teach this child."

Principals in this study all reported placing high value on formal data; however, there appeared to be inconsistency in the value they placed on informal data. This indicates that there might be a tendency for some school leaders to have a narrow view of the types of data they find valuable, while others look at a wider range of data for teachers to base their instructional decisions. Related to how principals in this study valued different types of data was *trust*. There seemed to be a relationship between how much school leaders felt they could trust the teacher-made assessments and grades and how much they valued these less formal forms of data.

In contrast, though teachers also reported using standardized assessments, they expressed concerns that formal data did not accurately reflect students' abilities. In other words, they did not trust that formal assessments measured what a student really did or didn't know. As an example, the teachers at School E expressed concerns regarding the integrity of the formal standardized data, suggesting that it could have been a "bad day" for the student:

> *Teacher G*:   If we could include other factors like, you know, this parent just lost . . . This child just became an orphan last week. We can't even include that information in it. They look at everybody the same way as a whole or this child maybe eats twice a week at home.

> *Teacher E*:   Right. And that happened on my MAP test just a couple of weeks ago. This girl's score just went down drastically and I was just like . . . I looked at the data and was like, "What? No, no, no, no, no. So I called the girl in and I was like, and she had stuff happen that was affecting her. And I mean, I did, I said, "Can I retest her?" That was not fair. It is not fair for her not to be rewarded for growth or whatever because of that one morning where it was a bad day. It was a bad few days, you know, and she was going to be measured on that and that . . . Mm-mm. I retested her. And it showed a whole different picture when I did.

This was echoed by a group of teachers at School C when they spoke of their large special needs population:

> *Teacher R*:   I don't think things like that measure the progress that's made. They look specifically based upon the test score coming from my students being special ed . . . they are not on grade level. Well, we test them on grade level. It's not fair to test somebody here when they're not there and that's the reason why they're with me. We make a lot of progress from where they were when they started with me at the beginning of the year and sometimes it's not academic. Sometimes it's behavioral. We have to get to those things first and that's not something it takes into account with it.

> *Teacher S*:   Or how about ELL students? And we're having them take the test. It's ridiculous.

> *Teacher T*:   You know, because data shows if a child who does not speak English at Home, it takes 7 years just for them to have academic language. That's not conversational, that's academic, and we're testing a 1st grader who has only been in school for one year and they're expected to read stories on the state tests and I can't read the stories to them, I can't read the questions to them, and they're just barely getting the conversational English down much less the academic language down.

> *Teacher S*:   . . . and being judged by it.

Ultimately, when sifting through the often overwhelming amount of data available to them, teachers often based decisions on informal data generated in their classrooms; whereas, administrators more often based their decisions on more formal data presented in standardized reports. This finding is related to the use of different lenses (i.e., macro and micro) by administrators and teachers and is not necessarily unexpected in terms of how administrators and teachers interact with data. However, our findings related to the needs and expectations of administrators and teachers around data use warrant further consideration by both pre-service and in-service leadership preparation and development programs.

DISCUSSION

Findings from this study suggest that teachers and leaders' perspectives on data use vary in three main ways: the time they believe is available for effective data use, the use of data for micro versus macro-level decisions, and the value of informal and formal data sources. As teachers and leaders have distinct roles and responsibilities within schools, it makes sense that they would approach data use in ways that support their unique positions. And while it is not inherently problematic that teachers and leaders approach data use differently, it *is* imperative that school leaders understand how to create a shared vision for data use and how to enact data practices that are responsive to the needs of teachers. Leadership preparation and development programs play a critical role in this process – not only in ensuring leaders are able to use data in their own practice (i.e., data literacy) but also in preparing leaders to develop systems and supports that facilitate effective, productive data use by teachers.

In addition, time was an issue identified by both teachers and leaders in our study; however, many leaders believed the structures they created within their schools provided teachers with adequate time to use data effectively (e.g., common planning times, PLCs, etc.). Despite these well-intentioned supports, many teachers believed they lacked the time necessary to consistently collect, analyze, and use data to inform instructional decisions, and they further believed the time that was provided by their leaders was often at the expense of valuable planning time. This finding resonates with other research (e.g., Mandinach, 2012; Marsh et al., 2006.), which identified lack of time to collect, analyze, or use data to inform instructional decisions as a main challenge of data use.

Moreover, findings from our study suggest that current and future school leaders need to understand two important points related to data use and time. First, there is a strong relationship between time and teachers' data literacy: without data literacy, teachers are unlikely to use data effectively or efficiently (Mandinach et al., 2015). Second, rather than viewing data use and instructional planning as distinct processes, teachers need to recognize data use as an integral part of planning. The ability to use data to guide instructional planning is, once again, related to data literacy. As such, it is imperative that school leaders have the capacity to develop their teachers' data knowledge and skills (Mandinach et al., 2015). Leadership preparation and development programs can assist school leaders in this process by preparing leaders to collect, analyze, and use data to guide their own decision-making processes and preparing them to effectively coach and mentor teachers in the use of data.

IMPLICATIONS

The study emphasizes the importance of understanding how teachers and school leaders use data and how that understanding can lead to more effective and fruitful data use in schools. Both teachers and principals view data through different lenses because both have different reasons for using data. As such, leadership preparation and development programs can play a critical role in increasing understanding between teachers and principals. Not only can leadership preparation and development programs support principals in acquiring the skills necessary to use data in their own practice, but they can also support principals in developing coaching and mentoring practices that are responsive to teachers' data needs.

To begin with, leadership preparation and development programs should prepare and train school leaders to appreciate differences in how they and their teachers will use data. For example, both formal and informal data can provide valuable information to guide instructional planning and system-wide decision-making. As such, it would be advantageous if teachers and school leaders understood, appreciated, and were able to comfortably work with the multiple types of data that might be present in their school. Recognizing the value of both formal and informal data can lead to a more robust environment for making meaningful decisions about instruction.

Moreover, leadership preparation and development programs should prepare and train school leaders to create a strong data culture in which micro and macro data are valued and used to guide student, teacher, and school improvement. In such a culture, school leaders can effectively coach teachers to use data at the micro level. If school leaders better

understand how teachers use data and recognize and trust the types of data that teachers value, they can offer teachers more relevant and impactful support. Farrell and Marsh (2016) emphasize that school leaders are expected to stay "attuned to teachers' needs and perspectives, which includes an understanding of what teachers value in data and how to ensure data made available to teachers lends itself to meaningful use" (p. 451).

CONCLUSION

The study suggests that teachers and administrators experience data use in both similar and unique ways. Teachers focus on informal student-level data that can support students' individual needs and guide instructional decisions. School leaders seem to value data that are periodically presented in a more formal fashion through reports generated by the state or district (i.e., standardized test scores, benchmark data). They focus on more formal types of data and use them to create, manage, and evaluate systems within their buildings. Despite these differences, teachers and administrators' perspectives on data use converged in two important ways: they both valued data-driven decision-making, and they both recognized that data could be used to support student achievement and improve schools. Therefore, by understanding the ways in which teachers' and administrators' perspectives on data use differ and the common ground that unites their perspectives, schools can create data cultures that foster shared expectations, collaboration, and trust between teachers and administrators.

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