DATA-DRIVEN DECISION-MAKING IN SCHOOLS

LITERATURE REVIEW | K20 CENTER

Abstract

Data plays an important role in decision-making for schools. Unfortunately, most administrators and teachers lack the knowledge, or data literacy, to make data-driven decisions. Data literacy is a foundational skill needed in schools to close the achievement gap. The purpose of this literature review is to examine the current research on data-driven decision-making, how it is structured, and how it is implemented in schools within the United States. The literature shows that schools who implement a data-driven decision-making framework can increase student learning and work to close the achievement gap. In order to be successful, data-driven decision-making frameworks must be intentional and meticulously implemented within schools. This involves purposefully creating teams, understanding data literacy, and committing to the process of using data to guide decisions around evidence-based interventions and strategies to drive progress toward shared goals and visions.

Keywords: data-driven decision-making, data-based decision-making, data-informed

Introduction

As teachers and administrators seek to improve educational outcomes, student data can be a foundational source for goal setting and decision-making. Data is a collection of information that is used to make evidence-based conclusions (Love et al., 2008). Data can exist in many forms including numerical, written, or pictorial (Love et al., 2008). Data-driven decision-making is grounded in educational reform and accountability (Abrams et al., 2021; Albiladi et al., 2020; Blumenthal et al., 2021). However, understanding how best to use available data, finding avenues for collecting new data, and equipping teachers to effectively use data can be daunting tasks. Administrators may not feel equipped to be data leaders in their buildings and may not be comfortable providing adequate professional development for their teachers. Therefore, it is important to determine best practices for data literacy, data usage, and data-driven decision-making in order to aid educational leaders in acting as data leaders and coaches in their buildings. This is why some prefer to refer to data-based educational practices as data informed rather than data-driven (Barnes et al., 2022). Educators and counselors can take on the role of a data leader as well with proper training and supports. This literature review is a collection of recommendations and frameworks for best practices to inform administrator and teacher preparedness in their use of data to drive decision-making in their buildings. This review covers recent literature surrounding data-driven decision-making and presents a synthesis of the findings from this literature in addition to recommendations for engaging in data-driven decision-making.

Authentic Teaching & Learning

Data-driven decision-making is a continuous cycle of processing information to make informed decisions (Bowers & Krumm, 2021). Education is not a one-size-fits-all process, so it is rational that primary interventions will not address all students' needs (Buffum et al., 2012; Lane et al., 2014). Schools need to graduate students capable of finding success in a workforce that increasingly requires skills in mathematics, reading, communication, and computational thinking (Boudett et al., 2020). There is a growing reliance on standardized testing to evaluate learning (Abrams et al., 2021). With this increasing reliance, data-driven decision-making has been used more frequently to align local practice to national policy (Abrams et al., 2021). A large market has emerged from this data-driven mindset to facilitate benchmarking and increase progress toward desired outcomes (Abrams et al., 2021).

Data analysis can be perceived negatively by administrators and educators, particularly those in struggling schools experiencing close district oversight (Abrams et al., 2021). The close relationship between data and accountability measures contributes to these negative perceptions. This relationship can make data seem punitive and dissuade teachers from engaging with it. Teachers' beliefs and years of experience can impact how they view data (Beck & Nunnaley, 2021). Overcoming a deficit mindset around data is imperative to making productive use of student information and educators' knowledge to empower and problem-solve rather than cast blame (Barnes et al., 2022). When data teams become frustrated or struggles to interpret data, it is easy for them to blame other factors or stakeholders for inconsistent data or undesirable outcomes, which is not a productive practice (Love et al., 2008).

It is necessary to provide teachers with guidance on how to collect data and interpret it so that they are not making decisions based on their perception alone (Wilcox et al., 2021). Teachers require instruction in how to use data to make instructional decisions (Wilcox et al., 2021). Once teachers have been given data, they should be provided with strategies they can use to impact student learning (Wilcox et al., 2021). Professional development around the process of data-driven decision-making is needed (Gesel et al., 2021). When teachers are given direct support on how to use data to inform their instruction, student outcomes improve (Gesel et al., 2021). Research shows that professional development should be scaffolded and broken down into components that build on one another (Washburn et al., 2022).

Data-drive practices should be used to improve student learning and close the achievement gap among students (Bowers, 2021; Love et al., 2008). Achievement gaps are an important part of data as they illustrate discrepancies between students and highlight inequities (Love et al., 2008). Data-driven decision-making should begin with a clear goal in mind (Romer et al., 2023). The goal should be specific and assessable (Mandinach & Schildkamp, 2021). Careful attention should guide data-driven decision-making to ensure that all students are considered, since people can sometimes be influenced by assumptions they may not realize they're making (Barnes et al., 2022; Romer et al., 2023). Without a focus on all students, educators at the administrative and classroom levels could approach data analysis in a way that reinforces existing stereotypes of sub-groups of students (Lasater et al., 2021).

Teachers may be more inclined to rely on data that aligns with their pre-existing beliefs (Barnes et al., 2022). They need practice in not inferring results from the data that are not actually evident (Boudett et al., 2020). Making inferences can lead to blame, so the data team should set the norms of stating facts evident in the data and determining how to remedy any deficits in instruction (Boudett et al., 2020). All students have the right to learn at high levels and to be successful (Love et al., 2008). Teachers need to focus on data with the needs of all students in mind, not on assumptions about students' background or culture (Love et al., 2008). Data-driven practices should be focused on teacher actions, rather than on student accountability (Mandinach & Schildkamp, 2021). These practices should not be used to justify labeling causes as beyond the control of the school (Mandinach & Schildkamp, 2021). When analyzing data, educators should assume a whole-child viewpoint and look at the data with all students in mind (Mandinach & Schildkamp, 2021).

Benefits

Research has resulted in a mix of findings related to the correlation between student outcomes and data-driven practices (Abrams et al., 2021; Albiladi et al., 2020; Barnes et al., 2022). Understanding best practices and methods that result in positive student learning outcomes is key to making sure administrators and teachers make the most of their time. These mixed findings could be attributed to inconsistencies in data usage and application. Even when data teams are aware of the potential for inaccurate assumptions, the use of data-based practices can result in lessened expectations for Black and Latino students (Debnam et al., 2022). However, student achievement has been shown to improve with the use of data-based practices in some instances (Debnam et al., 2022).

One particularly interesting finding related to data-driven decision-making is a positive correlation with student engagement (Albiladi et al., 2020). It appears that when teachers focus on addressing individual needs, students tend to be more connected to learning.

Counselors can also provide a benefit when making decisions based on data. Research has shown that when counselors are added to the school leadership and implement interventions based on data, disruptive student behaviors and office referrals decrease, student attendance increases, and grades improve (Geiger & Oehrtman, 2020).

Barriers

Whenever a new process or initiative is started in a school, barriers are likely to arise. Administrators should share the reasoning behind a new initiative before introducing the details of the initiative (Buffum et al., 2012). Decision-making that begins at the district level may not be communicated clearly to teachers, which can cause confusion at the school level (Schildkamp & Datnow, 2022). Teachers, especially those concerned about the impact of any new initiative on their time and expectations, should be encouraged to express their concerns early, and administrators should provide clear, correct information in multiple formats (Love et al., 2008). Communication plans should encourage the continuous flow of information through the school and the framework during the implementation process. School leaders should be transparent about what is happening during progress monitoring and data reevaluations (Lane et al., 2014). Concerns may arise behind these steps in the process, which is expected, but leaders should address those concerns when they arise (Love et al., 2008). Transparency allows teachers and staff to remain informed and participate in progress and continuous growth in student learning.

Overwhelming teachers and staff with multiple programs and initiatives simultaneously is another barrier schools may encounter. Schools tend to have multiple initiatives happening simultaneously, which can be overwhelming and put a strain on staff. There is an innate pressure that comes with data and its close ties to accountability (Boudett et al., 2020). Connecting data-driven instruction to initiatives already in place will help teachers and staff see how they can support each other and affect multiple initiatives (Love et al., 2008).

One significant barrier to data-driven decision-making is teachers' ability to accurately read visual data and interpret data (Oslund et al., 2021). Very few college education programs expose pre-service teachers to the process of data literacy (Beck & Nunnaley, 2021). Those few colleges that do offer programs in data literacy are limited by privacy acts that prevent pre-service teachers from working with authentic data (Beck & Nunnaley, 2021). The result of these limitations is an influx of teachers with little to no experience in data-driven teaching and experiences. Providing support is crucial when developing data teams since teachers report a lack of time to learn how to collect and analyze data (Albiladi et al., 2020; Bengtson et al., 2020; Bowers, 2021). Teachers may lack the confidence or self-efficacy to feel like they can effectively use available data to inform decision-making (Barnes et al., 2022; Oslund et al., 2021). Teachers need to be properly briefed on how data will be collected and used. By maintaining the same priorities for data usage over a longer period of time, administrators and teachers become familiar with the data process and do not have to continually re-learn data collection and implementation (Schildkamp & Datnow, 2022).

When interpreting data, there is a tendency to focus on a smaller grouping of students. It becomes tempting to focus only on those students who are just below grade level as they are more likely to change subgroups through interventions (Boudett et al., 2020). While providing help for these students is not a bad thing, teachers need to keep in mind that curriculum and instruction are the bigger areas of focus (Love et al., 2008).

When first looking at data, you may encounter issues like not having enough data, or having too much data spread over a long time period, to make sound conclusions. At this point, you should make sure you are combining different types of data to provide a clear picture of student learning (Love et al., 2008). Teachers can also run across the issues of criterion-referenced test (CRT) assessments not releasing all of the data needed to make a data-driven decision (Love et al., 2008). The opposite is true as well; you can have too many data sources from multiple locations. Most schools have several different assessment programs and each shares their data in their own unique ways (Beck & Nunnaley, 2021). Conflicting data sources can create barriers for teams analyzing data (Beck & Nunnaley, 2021). These programs also imply that teachers can analyze data with little to no training (Beck & Nunnaley, 2021). Teachers still need to engage in thoughtful processes to

determine their own findings in the data and how the data compares with other sources (Beck & Nunnaley, 2021). Knowing what the barriers are and preparing for them in advance helps with teacher preparation and commitment.

Data-Driven Processes

Data analysis is not only about targeting weaknesses, but also about celebrating strengths and identifying where practices result in desired effects (Abrams et al., 2021). Balancing strengths and needs can help to maintain a positive view of data analysis. Setting a culture for the positive use of data is key in establishing a tone that promotes the positive use of student information. However, it is not the only element needed for effective data-driven decision-making. Understanding data sources, frameworks for working with data, how to build capacity, and how to implement an iterative process are all elements that underpin the successful use of data in improving student learning.

Data-Driven Culture

There is a need for schools to embrace data and promote a culture in which data empowers decision-making. This should be a top-down process that involves stakeholders such as district administrators, school board members, principals, coordinators, teachers, research partners, and even parents (Abrams et al., 2021; Baharav & Newman, 2019; Love et al., 2008). The district often sets the data expectations that guide administrator and teacher initiatives (Abrams et al., 2021). When building a positive data climate, administrators need to moderate how data is used so that it is not perceived to be a metric for judging teacher and student performance (Lasater et al., 2020). Administrators can intentionally build positive environments that support collaboration and trust while also addressing the need to analyze data surrounding measures of school accountability (Lasater et al., 2021). However, administrators must be willing to take on this responsibility.

Before beginning to analyze data and implement changes, administrators need to create a feeling of trust between leaders and teachers (Lasater et al., 2020). School leaders can shape how conversations surrounding data analysis take place by modeling expectations for their staff (Lasater et al., 2020). Administrators should drive the creation of a culture that encourages analyzing data in a positive way (Baharav & Newman, 2019; Lasater et al., 2020). In order to build a positive data culture, conversations around data should be approached from the angle of improving student learning, rather than from the angle of improving student test scores (Lasater et al., 2020). When administrators seek solutions to issues identified by data, they should place value on collaborating with teachers to find these solutions (Lasater et al., 2020).

The first step toward creating a positive culture around data is to set norms and build a team that is dedicated to seeking instructional solutions (Boudett et al., 2020). At the school level, setting clear expectations and norms for how to use data is key, along with acknowledging the time it will take and the devotion required of school leaders in order to honor and preserve that time (Abrams et al., 2021; Baharav & Newman, 2019; Boudett et al., 2020). Establishing norms and expectations shortly after the formation of a data team is a crucial step in the process of building a positive data culture (Romer et al., 2023). Having a deliberative plan for the process of gathering and analyzing data is important.

The exact ways that data will be used should be clearly defined (Lasater et al., 2020). Setting norms in advance helps members of a data team to navigate difficult topics that arise in discussion of the data (Love et al., 2008). Building collaborative group dynamics is a necessary component of a positive data culture (Lasater et al., 2020). School counselors are an important addition to this group, as they tend to have the knowledge needed for data collection (Geiger & Oehrtman, 2020). School administrators should be supportive and open to change, and should be seen that way by teachers, when creating a data team (Schildkamp & Datnow, 2022). When creating a data-driven culture, schools need a shared vision, clear goals, and support from administrators (Baharav & Newman, 2019; Buffum et al., 2012; Love et al., 2008). Leaders set the tone for their building's use of data, and they must not only establish conditions for data-driven decision-making but also engage in working with data alongside teachers (Abrams et al., 2021; Albiladi et al., 2020). Leaders can act as data coaches and support discourse around data (Abrams et al., 2021). However, leaders have to strike a balance between setting expectations while working alongside teachers and giving teachers space to make

their own instructional decisions (Abrams et al., 2021; Beck & Nunnaley, 2021).

District-level and school-level administrators should understand the amount of power they have over how school data is disseminated, to whom it is disseminated, and the decisions made using the data (Debnam et al., 2022). When reviewing data and implementing changes surrounding high stakes accountability reporting, administrators should ensure that they are making decisions that positively benefit all students (Lasater, Albiladi, Bengtson, 2021). When evaluating school climate data, educational leaders often give value to data that validates opinions they already have over data that challenges their assumptions (Debnam et al., 2022). Leaders should encourage a constructive approach to utilizing data and ensure that teachers do not feel professionally threatened (Lasater, Albiladi, Bengtson, 2021). Leaders should be careful not to assign blame to teachers when analyzing data at the risk of causing teachers to disengage with the process (Schildkamp & Datnow, 2022). Giving teachers the ability to decide what changes they will make in their teaching based on the data gives teachers buy-in and furthers the development of a positive data culture (Lasater et al., 2020). Having teacher commitment is central to the inquiry and data-driven decision-making processes (Baharav & Newman, 2019).

Not only should principals be active participants in meetings that involve analyzing data, but they should occasionally observe these meetings so that they can understand how well-versed their teachers are in understanding data (Garry, 2021). By attending data meetings, principals can discern what training the data teams need, gain an understanding of existing problems, and contribute to finding solutions for existing problems (Garry, 2021).

Data use should be consistent and deliberate. Additionally, data analysis does not happen in a bubble; it is a collaborative experience (Abrams et al., 2021). An effective data-driven culture is a highly collaborative one (Abrams et al., 2021). Consideration should be given to defining tasks and the part each person plays on a data team with agendas that set goals for meetings (Romer et al., 2023). From a mathematical standpoint alone, having more data points to compare will help to facilitate more reliable interpretations. Collaborators can also see opportunities where another educator may have a blindspot. Multiple perspectives enrich interventions.

Professional Learning Communities

The use of professional learning communities (PLCs) is one way in which schools can embed data-driven decision-making in the work of the school and provide teachers with support (Abrams et al., 2021; DiMarco & Guastello, 2021). PLCs encourage teachers and administrators to work together (DuFour et al., 2021). Prior to the implementation of PLCs, teachers typically worked in isolation and did not have the opportunity to collaborate with their colleagues (DuFour et al., 2021; DuFour & DuFour, 2009).

PLCs offer a source of continued professional development and provide a space for teachers to collaboratively grow their understanding of how to analyze data (DiMarco & Guastello, 2021). PLCs create structures that prioritize professional development for teachers (DuFour et al., 2021; DuFour & DuFour, 2009). In a PLC, all educators work collaboratively and share the responsibility for student learning (DuFour et al., 2021; DuFour & DuFour, 2009). The members of a PLC should be dedicated to continuous improvement of student outcomes (DuFour et al., 2021; DuFour & DuFour, 2009). Evidence from assessments is analyzed during PLC meetings and teachers make adjustments to their instruction methods (DuFour et al., 2021; DuFour & DuFour, 2009).

PLCs have been shown to improve the achievement of students (DuFour et al., 2021; DuFour & DuFour, 2009). However, this is only true if school leadership builds a shared vision of the purpose of PLCs and is determined to devote the time needed for proper implementation (Abrams et al., 2021). When building structures for PLCs, schools should be deliberate in outlining how PLCs function (Riggins & Knowles, 2020). School leaders should make decisions about who participates in PLCs, when the meetings occur, and how meetings are designed and organized into routines (Beck & Nunnaley, 2021). This can vary depending on the school; an urban school will organize a PLC differently from a rural school (Beck & Nunnaley, 2021).

In PLC meetings, teachers and principals work collaboratively to regularly examine student learning and the progress that is being made toward learning goals (Espin et al., 2021). To be successful, PLCs should have clear goals and steps to achieve those goals that are agreed upon by teachers and principals (DiMarco

& Guastello, 2021). It's essential that principals provide space and set recurring times for PLC meetings so teachers can focus on collaborating without distractions (DiMarco & Guastello, 2021). Additionally, principals should build trust and provide a positive environment for teachers to participate in PLCs (Goode et al., 2020).

Data Sources

Administrators and educators may at times feel that they have more data points than they know how to manage (Abrams et al., 2021; Boudett et al., 2020). It is important to have a reason for the collection and use of data (Abrams et al., 2021). Data should not be used just because it is available, but rather because it is informing educators about a deficit they hope to address. Teachers should be able to determine whether or not the data is useful (Beck & Nunnaley, 2021). In order to improve student learning, schools need to examine more than one source of data. Students are continuously growing, and therefore the data is constantly changing (Love et al., 2008). Within a school, there are two levels of data: macro and micro levels (Abrams et al., 2021; Albiladi et al., 2020; Blumenthal et al., 2021). Macro encompasses school-wide trends, and micro aligns with classroom-level data. Within these two levels of data, there are two types of data: formal and informal (Albiladi et al., 2020; Blumenthal et al., 2021; Love et al., 2008). It is important to include both formal and informal types of data when making decisions (Mandinach & Schildkamp, 2021). Formal data can include more than test scores and encompass things like graduation, attendance, enrollment, and demographic information. Formal data is an important aspect of the foundational decision-making process (Blumenthal et al., 2021). Informal data can include anecdotal notes, survey responses, opinions, and classroom-level assessments (Albiladi et al., 2020). Through the process of analyzing informal data, teachers can have a more holistic view of the student (Blumenthal et al., 2021). Principals in particular tend to have a level of distrust of informal data, while educators exhibit greater distrust of formal data (Albiladi et al., 2020; Barnes et al., 2022). Understanding how each type of data is collected and the best use of each type could help to encourage greater trust. Data must be timely (Barnes et al., 2022). If students have progressed further beyond when the data was collected, the collected data might be inefficient and incorrectly inform current interventions. This is especially true of formal data that is often reported as an overall score rather than by item, leaving teachers to wonder which part of a standard was difficult for students (Barnes et al., 2022).

One type of useful data is demographic data. This is data that includes enrollment, ethnicity, gender, home language, economic status, mobility, and academics (Love et al., 2008). By analyzing and reviewing this data, schools can find ways they can impact a specific area where students are struggling (Love et al., 2008).

Data can be broken down into even smaller sections called strand data. Strand data is focused on specific standards, objectives, content, or process skills (Love et al., 2008). By analyzing this type of data, teachers can pinpoint specific areas where students have weaknesses and areas where students are stronger (Love et al., 2008). This is seen as one of the most valuable types of data by data teams (Love et al., 2008). However, this type of data can be overwhelming for teachers. When looking at strand data, teachers should focus on the area(s) where students need the most improvement (Love et al., 2008).

Student work is a valuable source of data. This work can include journals, reports, essays, drawings, or other forms of class work. This type of data provides teachers with a deeper understanding of student thinking and their comprehension of content (Love et al., 2008). This work also provides teachers with a unique view of how students process information (Love et al., 2008). When teachers have this knowledge, it can help them find evidence-based strategies to help students improve in areas of weakness. Teachers who feel they have the power to make choices as to which data sources to use are more willing to engage in data analysis (Barnes et al., 2022).

There are many types of data beyond data related to students that must be collected and used when working to close the achievement gap. These types of data include information about teacher practices and curriculum (Love et al., 2008). This data is referred to as context data and can highlight processes that support or impair student learning (Blumenthal et al., 2021). It is imperative that data teams connect selected data to a target standard (Barnes et al., 2022). If there is not a connection between the two, data cannot accurately inform decision-making.

When only one source of data is consulted, it can provide only limited information about a student's learning as a whole (Love et al., 2008). When considering all students in the process, it is important to include many types of data from a variety of sources (Romer et al., 2023). Multiple types of data should be collected to provide a bigger picture into how students are, or are not, understanding content they are taught (Schildkamp & Datnow, 2022). Data from standardized tests, teacher created assessments, student surveys, and even observations of classroom instruction should be considered (Schildkamp & Datnow, 2022). Criterion-referenced and norm-referenced tests are both ways to measure the bigger picture. Criterion-referenced tests measure a student's knowledge based on the criteria or standards of the test (Love et al., 2008). Norm-referenced tests measure how a student is performing in comparison to other students in a pre-defined group (Love et al., 2008). Norm-referenced tests can include not only academic assessments but climate surveys and interviews with all stakeholders (Romer et al., 2023). Some research has shown that teachers are mostly using academic data to inform their instruction (Reeves et al., 2022). The use of non-academic data, such as data related to the students' home environments and student motivation at school, has not been regularly incorporated into data analysis (Reeves et al., 2022). Teachers may need training on how to analyze non-academic data (Reeves et al., 2022). By examining many types of data, team members can feel confident that they are considering many points of view and that their decisions are all-encompassing (Romer et al., 2023). Teachers have a unique opportunity to add a personal element to the data. Teachers know their students best and can add insights to the data that can create meaningful context in the classroom (Bowers, 2021).

Informal data can be non-academic, such as behavioral and social data. Behavioral data can include office discipline referrals, suspensions, expulsions, daily progress reports, and behavior plans (Lane et al., 2014). Social data can come from counselors. Social data includes questionnaires about prosocial behavior, counselor referrals, and information on bullying (Lane et al., 2014).

Frameworks

Several authors have recommended frameworks to guide data-driven decision-making (Abrams et al., 2021; Blumenthal et al., 2021; Boudett et al., 2020; Buffum et al., 2012; Chaparro et al., 2022; Geiger & Oehrtman, 2020; Lane et al., 2014; Love et al., 2008; Oslund et al., 2021). Having a process can help all involved build self-efficacy with using data to drive instruction (Boudett et al., 2020). This literature review explores some of the primary frameworks and examines commonalities between these frameworks. Having a framework to guide practice sets expectations and intentions for data-driven decision-making. The following frameworks have been selected and will be further discussed related to the use of data in schools: (1) collaborative inquiry, (2) context and practice of data use, (3) the Data Wise Framework, (4) the Team-Initiated Problem Solving framework, (5) Multi-Tiered, Multi-Domain Systems of Support framework, (6) Comprehensive, Integrated Three-Tiered framework and (7) response to intervention.

Collaborative Inquiry

Schools without structured approaches struggle with underperformance, especially schools with underserved student populations (Love et al., 2008). One possible framework is collaborative inquiry. Collaborative inquiry is a framework and process where teachers work together in data teams to understand student-learning problems, then create and test solutions through the use of data and discussions (Love et al., 2008). This process helps data teams access student data and instructional practices to discover success and determine tangible issues to address, one at a time (Love et al., 2008). This process involves the components of building a foundation, identifying a student-learning problem, verifying causes, generating solutions, and implementing, monitoring, and achieving results (Love et al., 2008). The first step is building a foundation. This step involves setting the groundwork by creating a culture of shared vision, values, and goals for all students (Albiladi et al., 2020; Love et al., 2008). The second step is identifying student-learning problems during which leaders help their teams develop data literacy and define student-learning problems that are supported by multiple sources of data (Love et al., 2008). The third step in the process, verifying causes, is an important step that tends to be skipped (Love et al., 2008). In this step, data teams should verify the cause of identified student-learning problems, and other problems like attendance and behavior, through data and research, including instructional

practices, within the school's control (Love et al., 2008). The fourth component, generating solutions, should focus on evidence-based practices within the school and the United States that are backed by research (Love et al., 2008). Implementing, monitoring, and achieving results is the final component, during which data teams implement their strategies, review the new data, celebrate success, and adjust course as needed (Love et al., 2008).

Another step in the process is building data teams. Data teams vary depending on the size of the school, grade levels, and content areas. Professional learning communities, or PLCs, are one example of functioning data teams (Love et al., 2008). Keep in mind the purpose of the data team, collaborative inquiry, and the grade or content area when selecting teachers to be part of a data team (Love et al., 2008). Data teams use multiple sources of data to drive their discussions during their weekly meetings (Love et al., 2008). A data team lead, or a coach with knowledge of data literacy, can help create team norms, goals, and a culture of trust, and guide team discussions (Albiladi et al., 2020; Love et al., 2008). Data teams focus on three questions: What do we want students to learn? How do we know if they have learned it? What do we do if a student doesn't learn? (Love et al., 2008).

Overall, the focus of collaborative inquiry is to process and understand student-learning problems, then test and reflect on multiple data sources and discussions as a team of educators, staff, and administrators (Love et al., 2008).

Context and Practice of Data Use

Abrams et al. (2021) suggest a cyclical model that grounds the processes of data analysis and decision-making within the organizational structure of the school. The use of data nested in data literacy and teacher self-efficacy in using the data is at the heart of the framework. Teachers engage in a cycle that includes steps such as data gathering, analysis that leads to changes in practice, and evaluation, which starts the cycle again (Abrams et al., 2021; Oslund et al., 2021). The cycle of analysis takes place within elements of the school's organizational structure including culture, resources, and collaborators (Abrams et al., 2021). Data alone cannot initiate change, instead it must be processed through the lens of those who analyze the data and bring their own rich experiences and expertise to the data (Abrams et al., 2021).

Data Wise

The Data Wise model consists of three primary stages: preparation, inquiry, and action (Boudett et al., 2020). Those stages include the following steps: (1) organization, (2) data literacy, (3) preview data, (4) analyze data, (5) evaluate instructional practices, (6) create an action plan, (7) develop assessments to gauge progress, (8) implement an action plan and assess (Boudett et al., 2020). The model is cyclical, with participants returning to the third step after completing the eighth step rather than starting back at those foundational processes of organization and data literacy (Boudett et al., 2020). However, as teams encounter needs, they may return to steps out of order and should not feel as if the process does not lend itself to being agile and flexible to meet needs (Boudett et al., 2020). The focus of successful teams should be to use data to impact instruction through a willingness to take action, engagement in assessments, and adjustments made as a result (Boudett et al., 2020).

Team-Initiated Problem Solving

Team-Initiated Problem Solving (TIPS) is a scientifically-based approach for data-driven decision-making (Chaparro et al., 2022). Research shows that schools that have implemented the TIPS process, through positive behavioral interventions and supports (PBIS), have found that the TIPS process offered benefits when solving problems with school, staff, and student needs (Chaparro et al., 2022). The TIPS process involves meetings, problem solving, and implementation and adaptation (Chaparro et al., 2022). One of the three parts of TIPS is the dedication to running efficient and organized meetings that lead to more effective decision-making processes (Chaparro et al., 2022). The other two parts of TIPS are a common purpose for the meeting and providing a meeting agenda, which helps with minimizing team meetings and maximizing time (Boudett et al., 2020; Chaparro et al., 2022). By establishing a clear intention behind a meeting, teams

can ensure that data-driven practices are being used efficiently. An intention ensures that the team does not spend too long reviewing the data without creating an action plan, or that the team does not take action too quickly without considering the implications of the data (Boudett et al., 2020). It is important that every member of the team has an understood role and responsibility; this will help with expectations for regular attendance in the meetings (Chaparro et al., 2022). Next, the team focuses on problem solving during the meeting. While problem solving, the team should focus on identifying the problem, creating a SMART goal related to the change needed, and identifying the solutions and an implementation plan (Chaparro et al., 2022). When identifying a solution, the team should focus on the use of evidence-based practices that fit into the school's skills and values, match what the school already does well, and align with the targeted needs (Chaparro et al., 2022). Oftentimes, bridging the gap between forming a solution and implementing the solution can prove difficult (Boudett et al., 2020). While implementing the solution, the teams should do so with fidelity and gather data on the impact of the evidence-based practice (Chaparro et al., 2022). As this process is a continuous cycle, modifications should take place where needed or to maintain movement toward the goal (Chaparro et al., 2022). Note that the mandate of the process is to make modifications. A lack of course correcting in staunch adherence to the action plan is just as problematic as completely abandoning an intervention the moment it appears that it will not produce the desired results (Boudett et al., 2020). Interventions should be incremental to determine which elements are working and which are not (Lansford, 2017).

Multi-tiered, multi-domain systems of support

Multi-tiered, multi-domain systems of support (MTMDSS) is a framework that is made up of several principals: school-wide support for all students, use of school data, identification of students who need extra support, progress monitoring and screening, and implementation of evidence-based practices (Geiger & Oehrtman, 2020). Through this framework, students are placed in one of three tiers based on their academic, social, or behavioral needs. Tier 1 involves universal supports for all students. Evidence-based practices implemented on this level are school-wide (Geiger & Oehrtman, 2020). Tier 2 is targeted to provide supplemental support to students who were not responsive to the Tier 1 intervention (Geiger & Oehrtman, 2020). Tier 3 offers more intense intervention to a student or students who have yet to respond to the interventions in the previous tiers (Geiger & Oehrtman, 2020).

Comprehensive, Integrated Three-Tier Model

Comprehensive, Integrated Three-Tier (CI3T) is a model that guides schools toward discovering which students need academic, social, or behavioral interventions beyond what is being done within the school and classroom (Lane et al., 2014). Using this model, data teams start by identifying the data sources they are currently using and will provide them with data for all students (Lane et al., 2014). Creating an assessment schedule that shows the month each test will be given to students helps data teams dictate when data will be collected and reevaluated (Lane et al., 2014). Once the data team knows what data to collect and when to review it, they must divide up responsibilities within the team: Who is responsible for giving the test? Who is collecting all the data? Who is in charge of the progress monitoring? (Lane et al., 2014). The next step is for data teams to create a blueprint of all the interventions and supports that already exist in the school for both Tier 2 and Tier 3 (Lane et al., 2014). This includes information about each intervention, the type of data needed to monitor progress, and what students need to achieve to be removed from the current tier (Lane et al., 2014). The data team then chooses which strategies and interventions they will use to provide support (Lane et al., 2014). The data team also needs to determine entry and exit criteria scores for each intervention they plan to put into place (Lane et al., 2014). As the interventions are being used, the team will then progress monitor all students receiving the intervention (Lane et al., 2014). The cycle then continues as interventions are adjusted or until interventions are no longer needed (Lane et al., 2014).

Response to Intervention

Response to Intervention (RTI) is an initiative used in general education to help identify areas where students are struggling (Blumenthal et al., 2021). RTI is mostly used for identifying students who would qualify for special education (Oslund et al., 2021). Data-driven decision-making has recently been incorporated with RTI (Blumenthal et al., 2021). RTI teams are made up of a variety of educators, interventionists, administrators, school psychologists, speech-language pathologists, and many other professionals (Blumenthal et al., 2021; Buffum et al., 2012). There are four components of the RTI model: screening, multilevel instruction, progress monitoring, and data-based decision-making (Oslund et al., 2021). RTI divides instruction into three tiers. Tier 1 represents all students and the initial delivery of instruction (Buffum et al., 2012). Teachers must then document and back up students' lack of progress with data to place them in Tier 2 (Buffum et al., 2012). When a student isn't responding to the approaches used in the classroom, they are placed in Tier 2 (Buffum et al., 2012). This intervention is not always done by the teacher, due to time constraints, but can be done by a member of the collective team (Buffum et al., 2012). Students who do not respond to interventions in Tier 2 are moved, based on data, to Tier 3, where they receive more individualized instruction (Buffum et al., 2012). RTI places a strong emphasis on collaboration, targeted instruction, data, and the value of reaching every student (Buffum et al., 2012).

Common Themes Among Frameworks

Common among the frameworks explored in this literature review is the cyclical nature of the data process. Data is always informing practice, which results in actions that are evaluated, thus generating new data to explore. Data is used to determine the point of need for targeted students. Educators then bring their own expertise to the data to determine the best path forward to address gaps in student learning.

Collaboration is a key element of all frameworks explored in this literature review. Teams should decide for themselves what this process needs to look like in the context of their schools (Boudett et al., 2020). Each framework includes analysis of multiple sources of data to create goals and identify areas for improvement. Once teams have a clear understanding, they use evidence-based strategies and make adjustments to the curriculum to improve teaching practices that will, in turn, impact student learning. As each framework is a cyclical process, each one ends with evaluation and progress monitoring to ensure that the interventions put into place are working and students are responding positively.

Building Capacity

There are several steps that must be taken on the part of administrators, counselors, and educators to ensure there is capacity for effective data-driven decision-making. These factors include data literacy on the part of administrators, counselors, and teachers, building self-efficacy in using data and making instructional decisions, and a background in effective strategies or seeking out effective strategies for needed interventions. Additional factors should be addressed including the ability to review recent data in regular intervals and attitudes toward data usage. Time is a scarce resource, but it is required to prioritize the resources and work to complete the inquiry process (Baharav & Newman, 2019).

Data Literacy

Data literacy is the ability to use multiple forms of data to make conclusions and evidence-based inferences (Abrams et al., 2021; Lasater, Albiladi, Bengtson, 2021; Love et al., 2008; Mandinach & Schildkamp, 2021). Teacher preparation programs are lacking in data literacy for educators (Beck & Nunnaley, 2021). Teachers come to the workplace ill-prepared to analyze data and determine next steps based on that analysis, and professional development opportunities for growth are not always readily available (Abrams et al., 2021; Bowers, 2021; Oslund et al., 2021). Building administrators also lack preparation in how to use data and lead data teams (Albiladi et al., 2020; Barnes et al., 2022). Lack of data literacy and graph literacy affects the interventions chosen by teachers and therefore has serious implications for the data-driven decision-making process (Oslund et al., 2021). Administrators and teachers who are new to the processes of data literacy can work with experienced staff to learn how to identify relevant data (Beck & Nunnaley, 2021). However, data

literacy is essential for effective data-driven decision-making (Abrams et al., 2021). Schools need to build leadership and capacity by training to teach skills to teachers and administrators about how to improve teaching and learn how to use multiple data sources (Abrams et al., 2021; Baharav & Newman, 2019; Beck & Nunnaley, 2021; Love et al., 2008). As well as understanding the value of using multiple forms of data to validate and confirm areas of improvement (Love et al., 2008). Professional development focused on data literacy can improve teacher abilities and self-efficacy while promoting greater collaboration and trust (Abrams et al., 2021; Barnes et al., 2022; Bowers, 2021; Washburn et al., 2022). Teachers who believe in their abilities to use data will be more willing to make use of data to inform practices (Abrams et al., 2021). Teachers who engaged in professional development centered around data literacy recorded lower levels of anxiety when working with data (Abrams et al., 2021). They were also more likely to adjust instruction based on data to help students improve their learning (Oslund et al., 2021). However, a one time professional development session will not be enough to provide teachers with all the training they need (Oslund et al., 2021). Professional development should be consistent and focused on skills and processes (Oslund et al., 2021). Teachers must follow this professional development by continually practicing these new skills and processes using their own data with a focus on practical applications (Abrams et al., 2021). In order to use the skills they learn, teachers need to be provided with support and opportunities to engage in data-driven decision-making (Bowers, 2021). Teachers continue to grow in their understanding of data and assessment literacy by taking opportunities to self-assess (Washburn et al., 2022). Administrators also have to acknowledge that teachers may have different viewpoints and goals related to data use than they do (Albiladi et al., 2020). Clear communication is essential throughout data collection, analysis, and decision-making.

Data literacy encompasses more than knowledge of how to collect or look at the data, but also knowledge of how to act on the analysis (Abrams et al., 2021). Data literacy then includes elements of inquiry (Abrams et al., 2021; Boudett et al., 2020). Data literacy includes breaking down the data for district criterion-referenced tests (CRT) and norm-referenced tests (NRT) (Love et al., 2008). When analyzing data, teachers need to watch for trends or patterns (Love et al., 2008). This can be done by looking at more than one year of data collection. Using this data, teachers can increase their focus on content that students are struggling with year after year. With that information, teachers can then implement evidence-based practices into their classrooms. Teachers may feel that they are unable to devote time to an in-depth analysis of data (Albiladi et al., 2020). Time could feel even more constraining when teachers are novices who require more time to analyze and act on data due to inexperience. Both the amount of time dedicated to data analysis and frequency of data meetings are important. Data meetings need to happen on a regular schedule (Barnes et al., 2022). At those meetings, teachers need adequate time to analyze and reflect on the data in order to make informed decisions. When teachers know how to use data, they are able to reflect on their own teaching practices (Datnow et al., 2021).

Some schools already have data experts on staff, and these experts should be included in data teams to serve as role models. Administrators, counselors, and teachers, or veteran teachers, who are considered experts in data literacy are proficient at collecting and analyzing data, as well as identifying problems and collaborating with teams (Baharav & Newman, 2019; Beck & Nunnaley, 2021). They are also skilled at identifying appropriate interventions and instructional strategies to address learning needs (Barnes et al., 2022). Data experts have a thorough knowledge of data ethics and often consider multiple variables during data analysis (Beck & Nunnaley, 2021). Administrators should have these experts serve in leadership roles as data coaches and on PLCs (Beck & Nunnaley, 2021).

Data Organization

Data can be processed and housed in a variety of ways, though the best way is that which will best meet the needs of the school. Data management systems help with quick access to data, but these systems are not required (Beck & Nunnaley, 2021; Love et al., 2008). Most necessary data can come from sources found in the classroom, such as student work, formative and summative assessments, science journals, math workbooks, etc. (Love et al., 2008). However, data analysis teams should remember that demographic data is self-reported and presents only a preliminary sketch of students (Love et al., 2008). All data should be stored in a way that

allows easy access for all of those working with the data, regardless of their proficiency levels (Bowers, 2021). It should also be in a form that provides all stakeholders with a way to make sense of the data (Bowers, 2021).

Implementation

Data-driven decision-making does not simply occur with the purchase of a data management system, but it takes time, training, access to data, and collaboration (Baharav & Newman, 2019; Love et al., 2008). This includes providing teachers and data teams time to collaborate and discuss data. Research shows that a minimum of 45 minutes per week, uninterrupted, is needed for teachers to effectively use data to drive decisions in their classrooms (Love et al., 2008). However, while teachers and principals agree that dedicated time is necessary, they often disagree on whether or not that time is protected and satisfactory for accomplishing goals (Albiladi et al., 2020).

Teachers need to have knowledge of data terminology in order to interpret data from summative assessments (Love et al., 2008). This knowledge includes understanding the performance levels and cut points on CRT tests as well as understanding how the tests are created (Love et al., 2008).

Teachers need to understand that decision-making can take place at two levels, classroom practices and individual student interventions, and be able to discern when each level is needed (Abrams et al., 2021). Within the classroom, teachers should analyze descriptive feedback, self-assessments, written responses, and practices for checking understanding on a daily or weekly basis (Love et al., 2008). Common assessments given across grade levels or content areas are great resources for data teams. Common assessments align with the curriculum and can usually be examined by standards (Love et al., 2008). These types of assessments can be used to make immediate adjustments to instruction in the classroom (Love et al., 2008). Summative assessments, usually state tests, can be used to see if students have met particular goals and achieved the desired outcomes (Love et al., 2008). Regardless of the type of data being examined, teachers and teams must keep in mind that adjustments might need to be made at the classroom level to help students succeed. Teachers may struggle to use data to identify weaknesses in instructional practices and may require targeted training on how to pinpoint ways data reflects a need for change in pedagogy (Abrams et al., 2021). When teachers implement changes in their classrooms, focus should be on improving learning outcomes for all students, not just students that are falling below set guidelines of growth (Schildkamp & Datnow, 2022).

Team Building

One of the first steps in implementing a data-driven decision-making process is to create a team, or teams, to begin the process. Some schools create a school leadership team in order to create a school-wide focus on learning and improvement (Geiger & Oehrtman, 2020). These teams can consist of administrators, counselors, teachers from each content area or grade level, special education teachers, and career-technology specialists (Geiger & Oehrtman, 2020). In some cases, it is even appropriate to include family members and students as part of the team when focusing on individuals (Lane et al., 2014). The structure of the team varies depending on the size of the school. Leaders must ensure they establish a purpose for the meetings to create an environment where all students can learn and grow (Geiger & Oehrtman, 2020).

Use Data to Identify Needs

After a data team has been established, available data should be carefully reviewed. This is a systematic review process during which the team identifies correlations between multiple sources of data (Geiger & Oehrtman, 2020). Indicators, or data that has an impact on outcomes, should be measurable, malleable, actionable, and impactful (Baharav & Newman, 2019). Data should be reasonably measurable, have factors that can be impacted, be reasonably accomplished by the school, and produce results (Baharav & Newman, 2019). School-wide data should first be evaluated as a whole (Lane et al., 2014). Data teams should focus on academic, social, and behavioral data using universal screening tools that are implemented for all students (Lane et al., 2014). From there, data teams should focus on classroom data to ensure that approximately 80% of students are achieving the desired outcomes (Lane et al., 2014). Data teams should focus on areas of greatest concern, either school-wide areas or individual students (Geiger & Oehrtman, 2020). Teams should

also look for patterns in the data whether the data is academic, social, or behavioral (Geiger & Oehrtman, 2020). A tiered approach helps to ensure that the needs of all students can be met. In tiered approaches, Tier 1 typically represents the student body at large. If the data reveals that approximately 80% of the students are responding to the given context, then data teams should focus on tier 2 and 3 students (Lane et al., 2014). Tier 2 represents a group of students that need some support to reach the desired outcomes (Lane et al., 2014). Tier 3 represents a smaller group of students that need targeted instruction (Lane et al., 2014). Tiers 2 and 3 represent students who did not respond to initial instruction and are struggling with the content. In the RTI method, Tier 2 students receive small-group instruction, whereas Tier 3 students receive individualized instruction. By identifying students that need Tier 2 and Tier 3 instruction, teachers can ensure that no student is underserved (Lane et al., 2014). For a student to qualify for Tier 2 or 3, they must meet predetermined criteria established by the data team (Lane et al., 2014).

Goal Setting

Once the data team has synthesized its findings, members will need to set a goal for student learning (Love et al., 2008). In order for the goal to be successful, it needs to be achievable and have an indicator that shows when it has been achieved (Baharav & Newman, 2019; Love et al., 2008). One type of goal is a SMART goal. SMART is an acronym that stands for Specific, Measurable, Attainable, Relevant, and Time-bound (Love et al., 2008). This type of goal helps the team identify and focus on a critical area of necessary student improvement. By creating a SMART goal, teams can avoid creating a goal that is too large or too small (Love et al., 2008). In addition to having set goals in terms of a shared vision for data use, effective programs also have goals related to the frequency of data collection, such as common assessments, analysis, and action (Abrams et al., 2021; Blumenthal et al., 2021). While setting goals that positively impact student learning is important, other types of goals, such as ensuring all students are supported and addressing their emotional health, should also be considered (Mandinach & Schildkamp, 2021).

Verifying Causes

Once the data has been collected and analyzed, the team needs to verify the cause of the achievement gap. When identifying the cause, teachers want to focus on the data, research, and solutions that will most likely solve the learning problem (Love et al., 2008). Teachers should explore learning practices before jumping in to close the achievement gap (Love et al., 2008). This is a cause-and-effect analysis that helps teachers pinpoint actions that, if taken, will have a positive effect on closing the achievement gap (Love et al., 2008). Once a cause is identified, teachers should determine if it is backed by research (Love et al., 2008). They should verify that research shows that the specific cause has an effect on the student learning issue.

Evidence-Based Strategies

Evidence-based strategies, or interventions, have been significantly studied in many ways with a variety of individuals and have proven to achieve the desired outcomes (Geiger & Oehrtman, 2020). When teachers can back their causes of student learning with research, they can influence the implementation of evidence-based strategies in the classroom. A research-based, or evidence-based, strategy is defined as an intervention that is proven to work through viable evidence (Geiger & Oehrtman, 2020). Finding solutions is an important step toward sustaining continuous growth (Love et al., 2008). Teachers need access to quality, evidence-based strategies and the opportunity to familiarize themselves with research-based interventions (Washburn et al., 2022). Teachers should list their strategies as a team and see if one or more strategies can impact student learning (Love et al., 2008). Teachers should not discount strategies and interventions that are already in place. When choosing strategies, it is essential to select a limited number to avoid creating an overwhelming burden of data and data collection (Love et al., 2008). Data is only one piece of the decision-making process and, while important, the primary focus must remain on student learning (Barnes et al., 2022).

Providing professional development in data literacy for educators and administrators leads to greater levels of confidence and regular use of data to inform practice (Abrams et al., 2021). Teachers need more than data literacy to solve school-wide or classroom-based problems. They also need an understanding of a wide

range of instructional strategies that can be implemented to address identified needs. Even when teachers are given instruction on interpreting data surrounding student growth, they may not know how their instructional methods should be adjusted based on the collected data (Espin et al., 2021). If educators do not have a toolkit of possible interventions, simply identifying an issue will not result in positive change. Teachers have to be able to connect practice to data analysis. To do so, schools must invest in continuous improvement of teaching practices (Beck & Nunnaley, 2021). Educators also have to see the data-driven decision-making process as part of their planning and instruction, and they must understand that data analysis is not a separate, but rather an integrated, task (Albiladi et al., 2020).

Teachers can use data not only to select practices and intervention strategies, but also to group students for targeted instruction, share information with families about student learning, and evaluate how a student is progressing in mastery of key standards (Albiladi et al., 2020). Creating a visual representation of the data provides a way for the data to be shared with other audiences and brings the work into focus (Love et al., 2008). Note that the focus of these interventions has been instructional strategy-based. While test-taking skills have their place, these skills should not be the primary focus or default solution to data analysis (Boudett et al., 2020). Testing, pacing, and stamina are not skills to be ignored, as a deficit in these skills can be a barrier to students demonstrating their understanding, but primarily targeting these skills with interventions essentially ignores underlying causes and misconceptions about learning. Students may have times they encounter standardized testing as part of higher education or competency screenings for careers, but standardized testing does not generally reflect the real world and skills needed for postsecondary success (Boudett et al., 2020).

Monitoring and Achieving Results

As teachers are implementing strategies, their next steps are to monitor student outcomes and collect data. This is called progress monitoring. Progress monitoring is the active process of collecting data to determine if a student is progressing (Buffum et al., 2012). This is an important step, as it determines the effectiveness of the strategy, program, or practice (Lane et al., 2014). Having a schedule for the targeted instruction is another factor that will influence teacher buy-in (Washburn et al., 2022). While monitoring, teachers are also collecting evidence on how well a strategy is increasing student achievement and helping students progress toward the overall goal (Geiger & Oehrtman, 2020; Love et al., 2008). Schools that monitor student progress show more success in improving student achievement (Love et al., 2008). Data gathered on the effectiveness of a strategy can be used to improve, adjust, or adopt certain processes (Love et al., 2008). It is also important to monitor attendance of students receiving the intervention and their levels of engagement (Lane et al., 2014). Data teams should meet at least every two months to view and reflect on the new data collected, which becomes the baseline data to continue improving upon (Love et al., 2008). Teachers should ask the question: Are students achieving the desired outcome? (Geiger & Oehrtman, 2020). The monitoring process also includes celebrating the successes of the school and students. Celebrations help show that the process is working and shared goals are being achieved (Love et al., 2008).

Discussion

Based on research, schools that use data have been shown to improve instruction, narrow achievement gaps, and shift to a culture of trust and support for all students (Baharav & Newman, 2019; Love et al., 2008). However, the outcome greatly depends on how the work is implemented and facilitated. Data-driven practices must be deliberate and disciplined to promote desired outcomes. This process must also be cyclical, sustained, and intentional to promote student progress toward set goals. Implementing a data-driven decision-making process in a district or a school is a top-down process. Levels of support and implementation processes are important decisions made by the administration and should then be communicated with the team. After decisions have been made and communicated, the next step in the process is creating data teams. These teams should include data experts as well as administrators, teachers, counselors, and other staff members. Schools must set norms and expectations for data use and protect the time necessary for analysis and data-based decision-making (Buffum et al., 2012; Love et al., 2008). Time is one of the bigger barriers for data-driven decision-making. The data team should define what protected time looks like and the purpose behind

data team meetings. Strong, developed teams have a clear purpose, hold each other accountable, and work independently to meet shared goals (Love et al., 2008). This helps to create a positive mindset that is built on trust and a collaborative culture.

Training of team members in data literacy is another important step in the process of building a school-wide data culture. Professional development on data literacy can not be accomplished in one professional development session. Data team members need continuous training that builds on itself to help create self-confidence in data analysis. Data teams should be trained on how to use multiple sources of data in order to establish a clear picture of the whole student. These sources can be either formal or informal and can include academic, demographic, enrollment, behavioral, and social data. Support for all students should be kept in mind when looking at data. Data-driven decision-making is not an avenue to blame teachers, students, or circumstances outside of the school's control. Data-driven decision-making should be focused on student improvement through the use of the school's strengths to help balance and impact the areas of weakness. This comes from teacher action in the classroom through the use of evidence-based interventions and supports. Each framework reviewed in this literature review incorporates multiple steps of the data-driven decision-making process. This includes building a team, analyzing data, verifying causes of learning deficits, using evidence-based strategies and interventions, and progress monitoring. This process is cyclical and repeats from the analyzing data step during each cycle. Data is ever changing as student learning continues to change and grow.

Conclusion

If data-driven practices are compared to driving a car, the data itself could be viewed as the fuel that propels the work forward. However, the car of data-driven practices must be driven by leaders and invested stakeholders to determine how the data is used with instructional practices and interventions. Data-driven decision-making is a school-wide process. Every student deserves the opportunity to be successful. In order to best serve students, teachers and all stakeholders must work together to discover the best practices for closing the achievement gap and preparing students for a successful future.

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