TADBIR JURNAL STUDI MANAJEMEN PENDIDIKAN
http://journal.iaincurup.ac.id/index.php/JSMPI
DOI: http://dx.doi.org/10.29240/jsmp.v10i2.17923

# School Leaders' Practices in Data-Based Planning for School Improvement

**Nani Hartini**
Universitas Pendidikan Indonesia, Indonesia
nanihartini@upi.edu

**Widaningsih**
Universitas Airlangga, Indonesia
widaningsih-2024@pasca.unair.ac.id

**Siti Nurlatifah**
Universitas Pendidikan Indonesia, Indonesia
siti.nurlatifah@upi.edu

**Irvan Gunawan**
Universitas Pendidikan Indonesia, Indonesia
irvangunaa@upi.edu

**Abstract**: This study examines school leaders' reported practices in Data-Based Planning (DBP) for school improvement in West Java, Indonesia. A cross-sectional descriptive quantitative survey involved 329 respondents selected through purposive sampling based on their involvement in school leadership, management, or planning. Data were collected using a 50-item questionnaire and analyzed using frequencies, percentages, means, standard deviations, composite scores, and Cronbach's alpha. The instrument demonstrated high internal consistency ($\alpha = 0.971$). The overall DBP composite mean was 4.31 (SD = 0.44), with 99.40% of respondents classified in the high or very high categories. Leadership commitment, stakeholder participation and collaboration, and reflection and root-cause analysis were the strongest dimensions. Data literacy and analytical capability represented a relative area for further development. Although implementation barriers were generally reported infrequently (M = 2.41), insufficient training and mentoring, limited time, and human-resource constraints remained the most prominent obstacles. The findings highlight the importance of strengthening analytical capacity through sustained professional support, structured collaboration, and adequate time for data-based planning. Given the cross-sectional design and reliance on self-reported practices, the results describe reported implementation rather than demonstrating causal effects or measurable improvements in school performance.

**Keywords:** Data-Based Planning; School Leadership; Data Literacy; Evidence-Informed Decision-Making; School Improvement.

## INTRODUCTION

The growing availability of educational data has transformed school planning from a predominantly experience-based activity into an increasingly evidence-informed process. Assessment results and digital reporting systems now provide school leaders with evidence for diagnosing problems, setting priorities, allocating resources, and monitoring improvement. Yet, the

educational value of data does not lie in availability alone. Data become meaningful only when educators can interpret them, connect them with contextual knowledge, and translate them into purposeful action. Contemporary scholarship discusses data-driven, data-based, and data-informed decision-making, although these terms are sometimes used interchangeably in educational research. In this study, Data-Based Planning (DBP) refers specifically to the planning practices examined in the Indonesian context of *Perencanaan Berbasis Data* (PBD). The term emphasizes the use of educational evidence to identify problems, determine priorities, formulate improvement programs, and inform follow-up actions. Conceptually, these practices are consistent with an evidence-informed approach in which data are interpreted alongside professional judgment and contextual understanding, rather than treated as sufficient grounds for decisions in themselves (Mandinach & Schildkamp, 2021; Visscher, 2021). Effective data use consequently depends on the interaction of data literacy, collaborative routines, organizational conditions, technological systems, and leadership practices (Alonzo et al., 2024; Lee et al., 2024).

School leaders occupy a strategic position in this process. Their role extends beyond personally understanding performance indicators to creating organizational conditions in which data can be discussed, questioned, and used for collective improvement. Lee et al. (2024), in a systematic review of principal data literacy, identified seven dimensions and emphasized that principals differ from teachers in the scope and purposes of their data use. Distinctive dimensions include using data to foster a data-driven culture, support school improvement, and inform leaders' own practices. Earlier work on data teams similarly showed that leaders influence data use by establishing vision, distributing leadership, providing support, developing expertise, and creating conditions for collaborative inquiry (Schildkamp et al., 2016, 2019). Data-based planning should therefore be understood not merely as a technical sequence of collecting and reading indicators, but as a leadership practice through which evidence is transformed into organizational priorities and improvement strategies.

Despite this potential, translating data into improvement remains difficult. Visscher (2021) showed across six intervention studies that educators can learn to interpret student progress data yet often experience greater difficulty converting those interpretations into appropriate actions. Helms-Lorenz & Visscher (2022) likewise highlighted the complexity of moving from measurement and feedback to actual improvement. A sensemaking perspective helps explain this because educational data do not carry a single, self-evident meaning. Teachers and school leaders interpret formal achievement data through prior knowledge, beliefs, professional experiences, social interaction,

and organizational context (Goffin et al., 2022). Data literacy is therefore more than statistical or technical competence; it includes the capacity to formulate relevant questions, interpret evidence, make defensible judgments, and connect findings with decisions and actions (Michos et al., 2023; Sandoval-Ríos et al., 2025).

Collaboration is another critical condition for meaningful data use. Data-based planning increasingly occurs through professional communities, data teams, and organizational routines rather than isolated individual analysis. Collaborative data use can help educators investigate root causes, challenge assumptions, combine perspectives, and formulate responses aligned with identified problems (Jimerson et al., 2021; O'Connor & Park, 2023). Professional learning networks may further support improvement through knowledge exchange and collective learning (Poortman et al., 2022). Nevertheless, collaboration does not automatically result in productive data use. Schildkamp and Datnow (2022) found that data teams may struggle when data use becomes oriented toward accountability rather than improvement or when contextual constraints impede inquiry. Professional development research similarly indicates that effective data use requires sustained support, explicit processes, appropriate evidence, and opportunities to connect analysis with practice (Washburn et al., 2022). Recent meta-analytic evidence also suggests that data-use professional development can positively affect student achievement, although substantial heterogeneity across interventions underscores the importance of collaboration and implementation conditions (Spiele et al., 2025).

These international developments are particularly relevant to Indonesia, where the Education Report (*Rapor Pendidikan*) and Data-Based Planning (*Perencanaan Berbasis Data*, PBD) have strengthened expectations that schools use evidence systematically in planning and improvement. The Education Report provides indicators for problem identification, reflection, and formulation of improvement activities. Indonesian research indicates that the platform can help schools identify root causes and facilitate constructive discussion among education stakeholders (Musakirawati et al., 2023). Studies examining PBD in relation to school activity and budget planning show that implementation is supported by accurate data, managerial competence, and a culture of data-based decision-making, while limited planning skills, restricted data access, inadequate mentoring, and time constraints can hinder the process (Dwikawati & Prasojo, 2025). A recent case study further illustrates how principal leadership may facilitate the PBD cycle through problem identification, reflection, collaborative planning, program revision, and supervision (Sudadi et al., 2025).

However, an important empirical gap remains. International scholarship has developed increasingly sophisticated accounts of principal data literacy, sensemaking, collaborative data use, digital data systems, and evidence-informed school improvement (Alonzo et al., 2024; Goffin et al., 2022; Lee et al., 2024; Rääk & Eisenschmidt, 2025). In contrast, the emerging Indonesian literature on PBD has largely concentrated on qualitative descriptions and case studies of particular schools or selected aspects of Education Report utilization (Dwikawati & Prasojo, 2025; Musakirawati et al., 2023; Sudadi et al., 2025). These studies provide important context but limited evidence about how a broader group of school leaders enact the multiple practices required to move from data to planning decisions and improvement actions. Furthermore, Indonesian PBD research has rarely been explicitly connected to international scholarship on principal data literacy, data sensemaking, collaborative inquiry, and organizational routines.

Addressing this gap is important because successful data-based planning cannot be inferred merely from the existence of a national data platform or formal compliance with planning procedures. Sustainable school improvement requires routines that connect evidence, professional dialogue, organizational learning, and action (Rääk & Eisenschmidt, 2025). Digital data systems can facilitate access, but their productive use remains shaped by leadership, individual dispositions, system characteristics, and sociocultural conditions (Alonzo et al., 2024). Examining school leaders' actual practices therefore provides a more meaningful indication of whether data-based planning functions as an improvement mechanism rather than an administrative requirement. Accordingly, this study investigates school leaders' practices in data-based planning for school improvement, focusing on how leaders use data, engage stakeholders in identification and reflection, translate evidence into improvement priorities, and navigate enabling and constraining conditions. By connecting Indonesian PBD practices with contemporary international scholarship on data-informed leadership, this study seeks to contribute contextually grounded evidence to the broader literature on evidence-informed school improvement while offering practical insight for strengthening school planning and policy implementation.

## RESEARCH METHODOLOGY

This study employed a cross-sectional descriptive quantitative survey to examine school leaders' practices in Data-Based Planning (DBP) for school improvement in West Java, Indonesia. Participants were selected using purposive sampling based on their involvement in school leadership, management, or planning, yielding 329 respondents with complete responses to

all 50 closed-ended questionnaire items. The instrument covered eight dimensions: data-based leadership commitment, data literacy and analytical capability, problem identification, reflection and root-cause analysis, program planning and follow-up, stakeholder participation and collaboration, data-based decision-making culture, and implementation barriers. Items 1–40 used a five-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree), whereas items 41–50 measured barrier frequency from 1 (never) to 5 (very often). Descriptive survey methods and Likert-type data analysis followed established approaches (Ranganathan & Aggarwal, 2019; Sullivan & Artino, 2013).

Data were analyzed using frequencies, percentages, means, standard deviations, and respondent-level composite scores. Barrier items were reverse-scored when calculating the overall DBP composite so that higher scores consistently represented more favorable implementation conditions; original scores were retained to analyze barrier frequency separately. Mean scores were interpreted using five categories: very low (1.00–1.80), low (1.81–2.60), moderate (2.61–3.40), high (3.41–4.20), and very high (4.21–5.00). Internal consistency was assessed using Cronbach's alpha, following Tavakol and Dennick (2011), and the 50-item instrument yielded $\alpha = 0.971$. The item grouping and measurement approach were informed by established principles of scale development and evaluation (Boateng et al., 2018). Before data collection, permission to conduct the study was obtained from each participating school. The findings are interpreted within the scope of the participating respondents and the descriptive survey design.




Source: Authors' elaboration

**Figure 1. Research Workflow**

## RESULTS AND DISCUSSION

### Results

#### *Respondent Profile and Instrument Reliability*

A total of 329 respondents were included in the quantitative analysis, with complete responses to all 50 closed-ended questionnaire items. Female respondents accounted for 55.93% (n = 184), while male respondents

represented 44.07% (n = 145). Valid age information was available for 326 respondents. Their mean age was 50.92 years, with a median of 54 years and a range of 29–64 years. After reverse-scoring the ten negatively worded barrier items, the 50-item instrument yielded a Cronbach's alpha of 0.971, indicating excellent internal consistency. These results describe the respondent profile and the internal consistency of the instrument used in the study.

Table 1. Respondent Characteristics and Measurement Summary

| **Indicator** | **Result** |
|---|---|
| Total respondents | 329 |
| Female | 184 (55.93%) |
| Male | 145 (44.07%) |
| Valid age data | 326 |
| Mean age | 50.92 years |
| Median age | 54 years |
| Age range | 29–64 years |
| Closed-ended items | 50 |
| Cronbach's alpha | 0.971 |

Source: Authors' analysis of survey data.

### *Overall Level of Data-Based Planning Implementation*

The respondent-level composite score for Data-Based Planning (DBP) was 4.31 (SD = 0.44), with a median of 4.30, corresponding to 86.21% of the maximum possible score. Using the study's predefined classification criteria, this score fell within the very high category. Of the 329 respondents, 181 (55.02%) were classified in the very high category and 146 (44.38%) in the high category. The remaining two respondents were classified in the low and very low categories, respectively. Thus, 99.40% of respondents reported high or very high DBP implementation.

For a clearer interpretation, the overall composite should be distinguished from the positively framed practice items and the original barrier-frequency scores. The mean across the seven positive-practice dimensions was approximately 4.49, whereas the mean frequency of implementation barriers was 2.41. The overall composite of 4.31 incorporated the reverse-scored barrier items, so that higher values represented more favorable reported implementation conditions. These measures represent different aspects of DBP and should therefore be interpreted separately as well as in relation to the overall composite.

Table 2. Overall Level of Data-Based Planning Implementation

| Category | Frequency | Percentage |
|---|---|---|
| **Very high** | 181 | 55.02% |
| **High** | 146 | 44.38% |
| **Moderate** | 0 | 0.00% |
| **Low** | 1 | 0.30% |
| **Very low** | 1 | 0.30% |
| **Total** | **329** | **100.00%** |

**Overall M = 4.31; SD = 0.44; Median = 4.30; Achievement = 86.21%.**

Source: Authors' analysis of survey data.

### *Patterns across Data-Based Planning Dimensions*

The seven positively framed dimensions showed consistently high mean scores. Data-based leadership commitment recorded the highest mean (M = 4.66; 93.19%), followed by stakeholder participation and collaboration (M = 4.52; 90.49%) and reflection and root-cause analysis (M = 4.50; 90.03%). Program planning and follow-up (M = 4.47; 89.43%), data-based decision-making culture (M = 4.45; 88.96%), and data-based problem identification (M = 4.44; 88.86%) also fell within the very high category. Data literacy and analytical capability recorded the lowest mean among the seven positive-practice dimensions (M = 4.39; 87.73%), although it remained in the very high category. This indicates a relative area for further development rather than a low overall rating of respondents' data literacy. The reverse-scored implementation-barrier dimension had a mean of 3.59 (71.79%), classified as high, indicating less favorable conditions than those reflected in the positive-practice dimensions.

Table 3. Descriptive Results by Data-Based Planning Dimension

| Dimension | Mean | Achievement | Category |
|---|---|---|---|
| Data-based leadership commitment | 4.66 | 93.19% | Very high |
| Data literacy and analytical capability | 4.39 | 87.73% | Very high |
| Data-based problem identification | 4.44 | 88.86% | Very high |
| Reflection and root-cause analysis | 4.50 | 90.03% | Very high |
| Program planning and follow-up | 4.47 | 89.43% | Very high |
| Stakeholder participation and collaboration | 4.52 | 90.49% | Very high |
| Data-based decision-making culture | 4.45 | 88.96% | Very high |
| Low implementation barriers[1] | 3.59 | 71.79% | High |

[1]Barrier items were reverse-scored for the composite dimension; therefore, a higher score indicates fewer implementation constraints.

Source: Authors' analysis of survey data.

At the item level, the highest mean was recorded for the statement that school programs and activities should be planned according to data and actual school needs rather than merely repeating previous routines (M = 4.75). Of the 329 respondents, 255 strongly agreed and 71 agreed with this statement. In contrast, the lowest mean among the 40 positive-practice items concerned the ability to analyze relationships among different educational indicators to identify problems affecting learning quality (M = 4.29). Although this item remained within the very high category, it represented the lowest-rated positive-practice item and was consistent with the comparatively lower score for data literacy and analytical capability.

### *Implementation Barriers*

Implementation barriers were examined using the original, non-reversed frequency scores for the ten barrier items. The overall mean was 2.41 on a five-point frequency scale, corresponding to the rarely category. Across all responses to these items, 21.61% were reported as never, 32.10% as rarely, 32.01% as sometimes, 12.19% as often, and 2.10% as very often. Thus, although barriers were generally reported infrequently, a substantial proportion of responses indicated that constraints occurred sometimes or more frequently.

Table 4. Distribution of Responses to Implementation Barriers

| **Frequency category** | **Percentage** |
|---|---|
| **Never** | 21.61% |
| **Rarely** | 32.10% |
| **Sometimes** | 32.01% |
| **Often** | 12.19% |
| **Very often** | 2.10% |

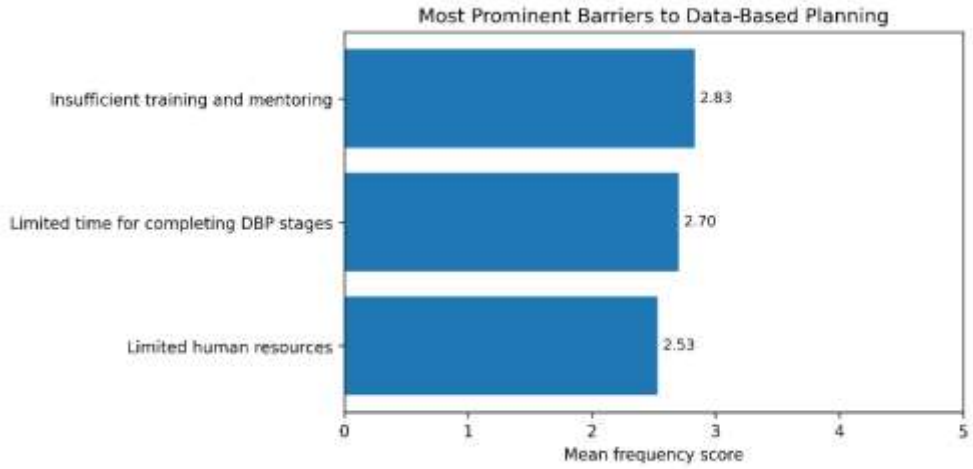
Source: Authors' analysis of survey data.

Insufficient training and mentoring support for DBP was the most frequently reported barrier (M = 2.83), followed by limited time to complete all stages of DBP (M = 2.70). Both fell within the sometimes category. Limited human resources ranked third (M = 2.53), within the rarely category. These results identify professional support and time allocation as the most prominent reported constraints, while the overall frequency score indicates that barriers varied in how often respondents experienced them.

Table 5. Most Prominent Barriers to Data-Based Planning

| **Barrier** | **Mean** | **Category** |
|---|---|---|
| Insufficient DBP training and mentoring | 2.83 | Sometimes |
| Limited time to complete all DBP stages | 2.70 | Sometimes |
| Limited human resources | 2.53 | Rarely |
| **Overall barriers** | **2.41** | **Rarely** |

Source: Authors' analysis of survey data.




Source: Authors' analysis of survey data.

Figure 2. Most Prominent Barriers to Data-Based Planning

Overall, the descriptive results show that respondents reported particularly high levels of data-based leadership commitment, stakeholder collaboration, reflection, and planning practices. Data literacy and analytical capability received the lowest mean among the positive-practice dimensions, while insufficient training and mentoring, limited time, and human-resource constraints were the most prominent reported barriers. These findings provide the empirical basis for examining the implications of leadership, analytical capacity, and organizational support for sustainable DBP implementation in the Discussion section.

## Discussion

### *Overall DBP Implementation and the Institutionalization of Evidence Use*

The very high overall DBP score indicates that evidence-based planning is widely reported among the participating respondents, but it should not be

interpreted as proof that data use has been fully institutionalized or has produced measurable school improvement. Effective data-based decision-making requires evidence to be interpreted alongside professional judgment and translated into appropriate action (Mandinach & Schildkamp, 2021; Visscher, 2021). In the Indonesian context, the Education Report can support problem identification, reflection, and priority setting (Dwikawati & Prasojo, 2025; Musakirawati et al., 2023; Sudadi et al., 2025). However, high self-reported implementation does not necessarily demonstrate that planning decisions improve school performance, since interpreting data and selecting effective responses are distinct processes (Visscher, 2021). Performance data may also serve accountability and governance purposes rather than improvement alone (Prøitz et al., 2022). From a sensemaking perspective, the significance of DBP therefore depends on how evidence is interpreted and incorporated into organizational decisions (Coburn & Talbert, 2006). This study contributes a broader descriptive account of reported DBP practices in Indonesia, providing evidence of an important foundation for improvement rather than proof of sustained outcomes (Rääk & Eisenschmidt, 2025).

### *Leadership Commitment and Collaborative Data Use*

Leadership commitment was the strongest DBP dimension (M = 4.66), accompanied by high stakeholder participation and collaboration (M = 4.52). This pattern supports the view that school leaders influence data use not only through their own analytical practices but also by establishing the organizational conditions for collective inquiry. Principal data literacy includes fostering a data-use culture and supporting school improvement (Lee et al., 2024), while effective data teams depend on leadership vision, distributed responsibility, expertise, and organizational support (Schildkamp et al., 2016, 2019). The findings are also consistent with research linking collaborative data use to professional inquiry and instructional decision-making (Jimerson et al., 2021; O'Connor & Park, 2023) and identifying professional learning networks as opportunities for knowledge exchange (Poortman et al., 2022). Nevertheless, collaboration alone does not guarantee meaningful improvement. Data teams may become procedural or accountability-oriented when expertise, shared goals, and contextual support are insufficient (Schildkamp & Datnow, 2022). The implication is that school leaders need to create collaborative routines in which stakeholders critically interpret evidence, examine assumptions, and connect findings to specific improvement actions, supported by accessible data systems, training, and organizational alignment (Kerr et al., 2006; Wayman & Stringfield, 2006).

### *Data Literacy across Identification, Reflection, and Planning*

Data literacy and analytical capability received the lowest mean among the seven positive-practice dimensions (M = 4.39), while analyzing relationships among educational indicators was the lowest-rated positive-practice item (M = 4.29). Both scores remained within the very high category; therefore, the findings indicate a relative development priority rather than generally low data literacy. This distinction suggests that accepting and using data in planning may be more established than integrating multiple indicators to diagnose underlying problems. Data literacy involves progressively developing the capacity to access, interpret, integrate, and apply evidence in decision-making (Beck & Nunnaley, 2021; Gummer & Mandinach, 2015; Mandinach & Gummer, 2016). Because the meaning of educational data depends on professional knowledge, beliefs, and organizational interaction, indicators cannot be interpreted in isolation (Goffin et al., 2022). Likewise, digital data availability does not eliminate the analytical work required to make evidence useful (Alonzo et al., 2024), and data literacy is associated with meaningful use of digital information (Michos et al., 2023). Accordingly, strengthening DBP requires professional learning that enables school leaders to connect indicators, assess alternative explanations, identify plausible root causes, and formulate targeted interventions. This priority is consistent with evidence that translating diagnosis into appropriate improvement action remains a persistent challenge (Helms-Lorenz & Visscher, 2022; Visscher, 2021).

### *Persistent Barriers and the Sustainability of DBP*

Although implementation barriers were generally reported infrequently (M = 2.41), insufficient training and mentoring (M = 2.83), limited time (M = 2.70), and limited human resources (M = 2.53) were the most prominent constraints. The results indicate that these issues remain relevant despite high reported levels of leadership commitment and collaborative planning. Previous research has identified training, organizational support, data accessibility, and institutional capacity as important conditions for effective data use (Kerr et al., 2006; Wayman & Stringfield, 2006). More recent studies likewise emphasize sustained professional learning rather than one-off technical training (Sandoval-Ríos et al., 2025; Washburn et al., 2022). Although professional development focused on data use can contribute to student achievement, its effects vary according to intervention and implementation conditions (Spiele et al., 2025). The practical priority is therefore to provide sustained, practice-based mentoring using schools' own data, allocate sufficient time for collaborative analysis, and distribute analytical responsibilities among relevant staff. These measures can help connect evidence, professional dialogue, decisions, implementation, and evaluation within recurring organizational routines (Rääk & Eisenschmidt,

2025). However, because this study used a cross-sectional descriptive survey, the findings identify reported constraints and development priorities rather than establish causal effects on DBP quality or school improvement outcomes.

### *Limitations*

This study has several limitations. First, its cross-sectional descriptive design cannot establish causal relationships or capture changes in DBP practices over time. Second, the findings rely on self-reported data and were not independently verified against school planning documents, observations, or school performance outcomes. Third, the concentration of scores in the upper categories raises the possibility of a ceiling effect and social desirability bias, although neither can be confirmed from the descriptive results alone. Finally, Cronbach's alpha indicates internal consistency but does not establish the construct validity of the eight dimensions. Future studies should combine construct validation, broader sampling where feasible, and independent or longitudinal evidence of DBP implementation and school improvement.

## CONCLUSION

This study indicates that school leaders report strong implementation of Data-Based Planning (DBP), particularly in leadership commitment, stakeholder participation, and collaboration. However, data literacy and analytical capability remain relative areas for development, while insufficient training and mentoring, limited time, and human-resource constraints continue to challenge implementation.

Strengthening DBP requires moving beyond commitment to data use toward deeper analytical capacity and sustained organizational support. Education authorities and school supervisors should provide continuous, practice-based coaching that enables school leaders to interpret educational data, identify root causes, and translate findings into prioritized improvement programs. At the school level, structured data-team meetings, protected time for collaborative analysis, and systematic monitoring of follow-up actions are essential to connect evidence with implementation and evaluation.

These findings should be interpreted in light of the study's cross-sectional descriptive design and reliance on self-reported practices. They do not establish causal relationships or demonstrate measurable improvements in school performance. Future research should examine how DBP practices relate to school improvement outcomes through longitudinal designs and independent evidence of implementation and performance.■

## REFERENCES

Alonzo, D., Quimno, V., Townend, G., & Oo, C. Z. (2024). Using information and communication technology (ICT)-based data systems to support teacher data-driven decision-making: Insights from the literature (2013–2023). *Educational Assessment, Evaluation and Accountability*, *36*, 433–451. https://doi.org/10.1007/s11092-024-09443-8

Beck, J. S., & Nunnaley, D. (2021). A continuum of data literacy for teaching. *Studies in Educational Evaluation*, *69*, 100871. https://doi.org/10.1016/j.stueduc.2020.100871

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health*, *6*, 149. https://doi.org/10.3389/fpubh.2018.00149

Coburn, C. E., & Talbert, J. E. (2006). Conceptions of evidence use in school districts: Mapping the terrain. *American Journal of Education*, *112*(4), 469–495. https://doi.org/10.1086/505056

Dwikawati, D. K., & Prasojo, L. D. (2025). Analisis Perencanaan Berbasis Data pada Aplikasi Rencana Kegiatan dan Anggaran Sekolah. *JDMP (Jurnal Dinamika Manajemen Pendidikan)*, *9*(2), 135–151. https://doi.org/10.26740/jdmp.v9n2.p135-151

Goffin, E., Janssen, R., & Vanhoof, J. (2022). Teachers' and school leaders' sensemaking of formal achievement data: A conceptual review. *Review of Education*, *10*(1), e3334. https://doi.org/10.1002/rev3.3334

Gummer, E. S., & Mandinach, E. B. (2015). Building a conceptual framework for data literacy. *Teachers College Record*, *117*(4), 1–22. https://doi.org/10.1177/016146811511700401

Helms-Lorenz, M., & Visscher, A. J. (2022). Unravelling the challenges of the data-based approach to teaching improvement. *School Effectiveness and School Improvement*, *33*(1), 125–147. https://doi.org/10.1080/09243453.2021.1946568

Jimerson, J. B., Garry, V., Poortman, C. L., & Schildkamp, K. (2021). Implementation of a collaborative data use model in a United States context. *Studies in Educational Evaluation*, *69*, 100866. https://doi.org/10.1016/j.stueduc.2020.100866

Kerr, K. A., Marsh, J. A., Ikemoto, G. S., Darilek, H., & Barney, H. (2006). Strategies to promote data use for instructional improvement: Actions,

outcomes, and lessons from three urban districts. *American Journal of Education*, *112*(4), 496–520. https://doi.org/10.1086/505057

Lee, J., Alonzo, D., Beswick, K., Oo, C. Z., Anson, D. W. J., & Abril, J. M. V. (2024). Data literacy of principals in K–12 school contexts: A systematic review. *Educational Research Review*, *45*, 100649. https://doi.org/10.1016/j.edurev.2024.100649

Mandinach, E. B., & Gummer, E. S. (2016). What does it mean for teachers to be data literate: Laying out the skills, knowledge, and dispositions. *Teaching and Teacher Education*, *60*, 366–376. https://doi.org/10.1016/j.tate.2016.07.011

Mandinach, E. B., & Schildkamp, K. (2021). Misconceptions about data-based decision making in education: An exploration of the literature. *Studies in Educational Evaluation*, *69*, 100842. https://doi.org/10.1016/j.stueduc.2020.100842

Michos, K., Schmitz, M.-L., & Petko, D. (2023). Teachers' data literacy for learning analytics: A central predictor for digital data use in upper secondary schools. *Education and Information Technologies*, *28*, 14453–14471. https://doi.org/10.1007/s10639-023-11772-y

Musakirawati, M., Jemmy, J., Anggriawan, F., Triansyah, F. A., Akib, A., & Tahir, A. (2023). Pemanfaatan platform Rapor Pendidikan Indonesia terhadap Perencanaan Berbasis Data. *JDMP (Jurnal Dinamika Manajemen Pendidikan)*, *7*(2), 201–208. https://doi.org/10.26740/jdmp.v7n2.p201-208

O'Connor, B., & Park, M. (2023). Exploring the influence of collaborative data-based decision making among teachers in professional learning communities on teaching practice. *Disciplinary and Interdisciplinary Science Education Research*, *5*, 17. https://doi.org/10.1186/s43031-023-00086-1

Poortman, C. L., Brown, C., & Schildkamp, K. (2022). Professional learning networks: A conceptual model and research opportunities. *Educational Research*, *64*(1), 95–112. https://doi.org/10.1080/00131881.2021.1985398

Prøitz, T. S., Novak, J., & Mausethagen, S. (2022). Representations of student performance data in local education policy. *Educational Assessment, Evaluation and Accountability*, *34*, 89–111. https://doi.org/10.1007/s11092-022-09379-x

Rääk, K., & Eisenschmidt, E. (2025). Sustainable evidence-driven school improvement: Routines and data use in Estonian schools. *Frontiers in Education*, *9*, 1517985. https://doi.org/10.3389/feduc.2024.1517985

Ranganathan, P., & Aggarwal, R. (2019). Study designs: Part 2—Descriptive studies. *Perspectives in Clinical Research*, *10*(1), 34–36. https://doi.org/10.4103/picr.PICR_154_18

Sandoval-Ríos, F., Gajardo-Poblete, C., & López-Núñez, J. A. (2025). Role of data literacy training for decision-making in teaching practice: A systematic review. *Frontiers in Education*, *10*, 1485821. https://doi.org/10.3389/feduc.2025.1485821

Schildkamp, K., & Datnow, A. (2022). When data teams struggle: Learning from less successful data use efforts. *Leadership and Policy in Schools*, *21*(2), 147–166. https://doi.org/10.1080/15700763.2020.1734630

Schildkamp, K., Poortman, C. L., Ebbeler, J., & Pieters, J. M. (2019). How school leaders can build effective data teams: Five building blocks for a new wave of data-informed decision making. *Journal of Educational Change*, *20*, 283–325. https://doi.org/10.1007/s10833-019-09345-3

Schildkamp, K., Poortman, C. L., & Handelzalts, A. (2016). Data teams for school improvement. *School Effectiveness and School Improvement*, *27*(2), 228–254. https://doi.org/10.1080/09243453.2015.1056192

Spiele, S., Janssen, J. J. H. M., Schildkamp, K., & Poortman, C. L. (2025). The effect of teacher data use professional development interventions on student achievement: A meta-analysis and qualitative comparative analysis. *Studies in Educational Evaluation*, *87*, 101528. https://doi.org/10.1016/j.stueduc.2025.101528

Sudadi, S., Rasiman, R., & Soedjono, S. (2025). Implementing data-based planning in elementary school: A case study at SD Negeri 2 Pamotan. *Journal of Educational Sciences*, *9*(5), 3676–3687. https://doi.org/10.31258/jes.9.5.p.3676-3687

Sullivan, G. M., & Artino, A. R. J. (2013). Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, *5*(4), 541–542. https://doi.org/10.4300/JGME-5-4-18

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Visscher, A. J. (2021). On the value of data-based decision making in education: The evidence from six intervention studies. *Studies in Educational Evaluation*, *69*, 100899. https://doi.org/10.1016/j.stueduc.2020.100899

Washburn, E. K., Bailey, K., Pierce, A., Stewart, C., Hawley, J., Blackman, J., &

Fenty, N. (2022). Collaborative professional development on data-based decision making for primary teachers of struggling readers: Responding and refining. *Journal of Research in Reading*, *45*(3), 425–446. https://doi.org/10.1111/1467-9817.12396

Wayman, J. C., & Stringfield, S. (2006). Technology-supported involvement of entire faculties in examination of student data for instructional improvement. *American Journal of Education*, *112*(4), 549–571.