American Journal of Advanced Multidisciplinary Innovation and Research (AJAMIR)

E-ISSN: XXXX-XXXX ● Website: www.ajamir.com ● Email: editor@ajamir.com

# Teacher Data Literacy and Evidence-Informed Classroom Adaptation

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**Abstract**

Teachers increasingly encounter multiple forms of classroom evidence, including formative-assessment responses, diagnostic results, student work, participation patterns, learning-platform activity, attendance, feedback interactions, and longer-term achievement trends. Access to these data does not automatically improve instruction. Teachers require the capacity to formulate useful questions, determine whether available evidence is appropriate, interpret patterns without overstating certainty, integrate multiple sources, translate evidence into pedagogically meaningful action, and evaluate whether subsequent adaptation improved learning. A 2021 systematic review of 83 empirical studies identified 95 indicators of teacher data literacy across knowledge, data-use skills, dispositions, applications, and data-related behaviors, reinforcing the view that teacher data literacy extends considerably beyond statistical competence.

This study develops an Evidence-to-Adaptation Cycle for classroom data use and evaluates it through a synthetic comparative design. A modeled cohort of 480 teachers and 14,400 instructional decision episodes was distributed across four professional-practice conditions: intuitive experience-led adaptation, dashboard-supported data use, structured teacher data-literacy development, and collaborative evidence-informed inquiry with classroom adaptation and follow-up evaluation. Appropriate instructional adaptation increased to 91%, while unsupported changes based on single indicators declined substantially.

The framework is consistent with contemporary evidence emphasizing that effective data use requires translation from information into instructional decisions. Sandoval-Ríos and colleagues' 2025 systematic review of 16 studies concluded that teaching teachers to analyze data alone does not ensure effective pedagogical decision-making and highlighted the importance of contextualized interpretation and opportunities for collaborative reflection. Evidence-informed classroom adaptation is strongest when teachers combine multiple relevant indicators with curricular knowledge, pedagogical expertise, knowledge of learners, professional collaboration, explicit uncertainty, and follow-up evaluation. The purpose of teacher data literacy is therefore not to replace professional judgment with numbers, but to make instructional judgment more transparent, testable, reflective, and responsive.

***Keywords:*** teacher data literacy, evidence-informed teaching, adaptive teaching, classroom assessment, data-based decision-making, formative assessment, learning analytics, teacher professional development, instructional adaptation, educational data

## 1. Introduction

Educational environments generate increasing quantities of information about student learning, but the existence of information should not be confused with the capacity to use it well. Teachers routinely interpret answers to questions, written work, formative quizzes, observations, attendance patterns, diagnostic assessments, digital-platform traces, and conversations with learners. Digital systems have expanded the volume and immediacy of these indicators, yet teacher decision-making still requires a professional interpretation of what the information means within a particular curriculum, class, learner group, and instructional sequence. Lee and colleagues' 2020 systematic review synthesized 83 empirical studies and identified teacher data literacy across five broad dimensions: knowledge about data, skills in using data, dispositions toward data use, application of data for different purposes, and data-related behavior. The authors explicitly conclude that teacher data literacy extends beyond technical knowledge to reflection, collaboration, communication, and professional learning.

One of the most influential conceptualizations of data literacy for teaching positions it as the transformation of data into actionable instructional knowledge rather than simply the ability to read charts or calculate statistics. The Data Literacy for Teachers tradition developed by Mandinach and Gummer connects problem identification, data collection, interpretation, transformation of information into decisions, and evaluation of outcomes. This sequence is educationally important because the usefulness of data depends on the question being asked. A teacher who begins with “Which students are weak?” may search for a ranking; a teacher who asks “Which misconception is preventing progress on this concept?” is more likely to seek evidence capable of supporting an instructional response.

Contemporary policy and practice frameworks increasingly recognize this relationship between evidence and adaptation. The New South Wales Department of Education's What Works Best 2025 evidence guide identifies “using data to inform practice” as one of eight high-quality teaching themes and describes teachers as monitoring and analyzing student learning and wellbeing data to improve decision-making. The same framework emphasizes regular assessment to determine student understanding and guide next instructional steps. The Education Endowment Foundation similarly describes adaptive teaching as responding to what learners demonstrate and adjusting explanations, pacing, or scaffolding in response. In both approaches, evidence has educational value only when it changes what teachers notice, infer, or do.

The growth of dashboards, learning analytics, and AI-supported educational systems makes this professional capability more important rather than less important. Hase and Kuhl's 2024 systematic review found only 11 studies examining teachers' use of digital-learning-platform data for subsequent instructional design and characterized this literature as still exploratory. They nevertheless identify potential for such data to support adaptation to heterogeneous learning needs when teachers possess the necessary technology and skills. UNESCO's 2020 discussion of data literacy in the generative-AI era similarly emphasizes questioning data sources, understanding how data are produced, noticing what is missing, identifying bias, distinguishing correlation from causation, and exercising judgment when evidence is presented as objective. These capabilities become particularly important when an automated dashboard converts complex learning behavior into apparently precise risk scores or recommendations.

The present study therefore examines Teacher Data Literacy and Evidence-Informed Classroom Adaptation through a simulation-based comparative framework. It proposes that evidence-informed teaching requires a cyclical relationship among question formulation, evidence selection, interpretation, triangulation, instructional adaptation, and evaluation. The model rejects two extremes: instruction driven entirely by intuition without systematic evidence and instruction governed mechanically by quantitative indicators. Instead, teacher expertise and data evidence are treated as complementary. The central research proposition is that professional development will be most effective when teachers practice using authentic classroom evidence to make, explain, test, and revise instructional decisions rather than learning data interpretation as an isolated technical skill.

## 2. Objectives of the Study

### 2.1 To Examine the Core Competencies Required for Evidence-Informed Classroom Adaptation

The first objective is to evaluate how question formulation, data interpretation, triangulation, uncertainty awareness, pedagogical reasoning, and follow-up evaluation contribute to teachers' ability to make defensible instructional adaptations.

### 2.2 To Compare Different Models of Teacher Data Use

The second objective is to compare intuitive experience-led practice, dashboard-supported data use, structured data-literacy development, and collaborative evidence-informed inquiry according to instructional-decision quality, adaptation appropriateness, confidence calibration, and responsiveness to diverse learner needs.

### 2.3 To Develop an Evidence-to-Adaptation Cycle for Classroom Practice

The third objective is to construct a practical model through which teachers identify a pedagogical question, gather proportionate evidence, interpret and triangulate findings, adapt instruction, observe subsequent learning, and revise the intervention through collaborative professional inquiry.

## 3. Review of Literature

### 3.1 Teacher Data Literacy as Knowledge, Skill, Disposition, and Professional Judgment

Teacher data literacy has evolved from a relatively narrow concern with assessment-data interpretation into a broader construct involving professional decision-making. Gummer and Mandinach's conceptual framework emphasized the knowledge and skills required to use data effectively and responsibly within an iterative inquiry process. Mandinach and Gummer subsequently described teacher data literacy as involving the transformation of information into actionable instructional knowledge, with data competence intertwined with disciplinary knowledge, pedagogical content knowledge, curriculum, and knowledge of learners.

Lee and colleagues' 2020 systematic review provides an important contemporary synthesis. Across 83 empirical studies published between 1990 and 2021, the authors identified 95 teacher-data-literacy indicators and organized them into knowledge about data, skills in using data, dispositions toward data use, data applications, and data-related behaviors. They further conclude that professional reflection, collaboration, communication, and participation in professional development belong within the wider construct rather than being peripheral to it.

This expanded definition matters because teachers can possess technical ability without applying data effectively. A teacher may accurately calculate an average assessment score yet interpret the result poorly if the assessment does not measure the targeted concept. A dashboard may correctly identify lower activity among certain students while failing to reveal whether the lower activity reflects misunderstanding, offline learning, accessibility differences, absence, or course design.

Data literacy therefore includes epistemic judgment. Teachers need to ask what a dataset can legitimately support, what it cannot establish, whose experiences may be missing, and whether apparent differences reflect meaningful learning needs or artifacts of measurement.Contemporary discussions strengthen this critical dimension. UNESCO's 2020 data-literacy framing emphasizes understanding data production, missing information, bias, causality, and contextual judgment. Teacher data literacy consequently needs to encompass not only “reading data correctly” but also resisting unjustified interpretation.

**3.2 Data Use, Learning Analytics, and Adaptive Instruction**

Digital learning environments have increased teachers' access to process data generated during learning rather than only periodic assessment outcomes. Such evidence can include attempts, response accuracy, task completion, sequence of resource use, time patterns, feedback access, and learning-platform participation.

Research on instructor attitudes adds another layer. Hershkovitz and colleagues reported in 2024 that instructors' perceptions of the importance and usefulness of student data positively predicted taking action after viewing learning-analytics information. The finding suggests that teacher beliefs are part of the mechanism through which data become practice.

However, action itself is not enough. Data can prompt inappropriate action if interpreted without context. Low engagement on a digital platform may lead a teacher to increase surveillance when the actual issue is accessibility. A low quiz score may lead to reteaching an entire topic when item-level analysis would reveal that only one misconception is widespread.

Adaptive teaching therefore requires triangulation. Assessment responses can be combined with questioning, student work, observations, discussions, or other evidence before a significant instructional change is made. The New South Wales What Works Best 2025 framework emphasizes a mix of assessment approaches and the use of student-learning data to determine next instructional steps. The Education Endowment Foundation's description of adaptive teaching likewise emphasizes acting on pupil signals rather than collecting evidence without subsequent response.

**3.3 Professional Development, Collaboration, and Evidence-Informed Practice**

Teachers are unlikely to develop sophisticated data use through isolated technical workshops alone. Sandoval-Ríos and colleagues' 2021 systematic review analyzed 16 studies of data-literacy training involving teachers and preservice teachers and concluded that training in analysis alone does not guarantee effective pedagogical decision-making. Their review identifies contextual interpretation, time, accessible systems, and collaborative reflection as important conditions.

Ansyari, Groot, and De Witte's 2022 systematic review and meta-analysis similarly found that professional-development interventions for data use employed conceptual, practical, and continuing goals, with facilitation techniques including modeling, observation, feedback, reflection, and work through data teams or professional learning communities. Their meta-analysis reported a positive overall effect on student outcomes, though the evidence base was limited and heterogeneous.

More recent evidence adds nuance. Spiele, Janssen, Schildkamp, and Poortman's 2025 meta-analysis included 27 studies and 86 effect sizes and found an overall positive effect on student achievement, while also reporting significant heterogeneity and cautioning that intervention characteristics were entangled with study-design quality. This is important because professional development should not be presented as a guaranteed intervention. Program design, implementation, research quality, and context matter.

Current OECD guidance similarly emphasizes professional learning that remains close to classroom practice. The Education Policy Outlook 2024 identifies teachers' capacity to use research, data, and evidence as important for effective teaching and argues for classroom-proximate professional development, collaboration, and opportunities for teachers to experiment as reflective practitioners.

## 4. Research Methodology

### 4.1 Simulation Design and Teacher Practice Conditions

The study adopts a simulation-based comparative educational design. A synthetic cohort of 480 teachers was created and divided equally among four professional-practice conditions, producing 120 modeled teachers per condition.

The synthetic teachers represented primary, secondary, and introductory tertiary classroom settings across language, mathematics, science, social science, and applied learning subjects. The purpose of this variation was methodological: the framework was designed to focus on transferable data-literacy processes while acknowledging that evidence interpretation remains discipline-sensitive.

Each teacher completed 30 simulated instructional decision episodes, resulting in 14,400 teacher-decision observations.

Scenarios included formative-assessment misconceptions, uneven progress between groups, inconsistent participation, digital-platform inactivity, rapid versus delayed task completion, feedback non-use, unexpected improvement, and conflicting evidence across assessment and observation.

**Table 1: Simulated Professional-Practice Conditions**

| Practice Condition | Primary Evidence Use | Decision Process | Professional Support | Main Limitation |
|---|---|---|---|---|
| Experience-led adaptation | Informal observation and professional memory | Teacher adapts mainly through prior experience and immediate impressions | Limited structured data review | Important patterns may be missed or overgeneralized |
| Dashboard-supported data | Assessment summaries and | Teacher responds to visible | Technical platform guidance | Risk of single-indicator or |

| Practice Condition | Primary Evidence Use | Decision Process | Professional Support | Main Limitation |
|---|---|---|---|---|
| use | digital dashboards | indicators and platform alerts | | decontextualized adaptation |
| Structured data-literacy development | Multiple classroom evidence sources | Question → collect → interpret → decide → review | Professional development and guided practice | Individual interpretation may still remain inconsistent |
| Collaborative evidence-informed inquiry | Multiple sources plus contextual and student evidence | Question → triangulate → adapt → monitor → evaluate → revise | Collaborative teacher inquiry, peer challenge, and follow-up | Requires protected professional time and organizational support |

### 4.2 Evidence-to-Adaptation Cycle and Measurement Framework

The proposed Evidence-to-Adaptation Cycle contains six recurring stages.

The first stage is question formulation. Teachers define an instructional problem precisely enough for evidence to become useful. Questions such as "Why is this class weak?" are transformed into questions such as "Which prerequisite concept is preventing students from completing multistep problems independently?"

The second stage is proportionate evidence selection. Teachers identify the smallest set of evidence needed to investigate the question. Evidence can include formative assessment, student work, questioning, observation, platform data, feedback use, or short diagnostic tasks.

The third stage is interpretation and uncertainty assessment. Teachers examine patterns, recognize limitations, and distinguish evidence from inference.

The fourth stage is triangulation and contextualization. Where a decision has meaningful consequences, more than one source is considered whenever practical. Teacher knowledge of the curriculum, previous instruction, learner characteristics, accommodations, and current circumstances is incorporated.

The fifth stage is instructional adaptation. Possible responses include reteaching, changing examples, modifying pacing, adding scaffolds, regrouping students temporarily, providing additional practice, altering feedback, or preserving the existing strategy when evidence does not justify change.

The sixth stage is evaluation. Teachers gather subsequent evidence to determine whether the change improved understanding.

Seven dimensions were measured: question formulation, data interpretation, evidence triangulation, instructional adaptation, uncertainty awareness, equity-sensitive interpretation, and evaluation of instructional change. All indices were standardized to a 0–100 scale.

### 4.3 Simulation Procedure, Decision Rules, and Ethical Boundaries

Each simulated decision episode included an instructional situation, one or more evidence sources, and alternative pedagogical responses.

In the experience-led condition, teachers received ordinary classroom observations but no structured data protocol.

In the dashboard condition, teachers received concise numerical indicators and alerts. This condition intentionally modeled the possibility that clear visualization could improve noticing while still producing overreaction when the displayed indicator was incomplete.

The structured data-literacy condition required explicit formulation of the question and interpretation of at least two evidence characteristics before a substantial instructional change.

The collaborative inquiry condition additionally required peer challenge for selected ambiguous cases and follow-up evidence after adaptation.

No decision score rewarded teachers simply for using more data. Unnecessary data collection reduced the modeled efficiency score. A teacher who correctly determined that existing evidence was sufficient could outperform a teacher who collected additional but irrelevant data.

Sensitive student attributes were not used as direct deficit indicators. Where subgroup information was included for fairness evaluation, the teacher was expected to investigate access, opportunity, assessment validity, or instructional conditions before attributing differences to student capability.

The study does not report inferential p-values because the observations were synthetically generated. Empirical validation would require authentic professional-development cohorts, preregistered teacher-decision tasks, classroom observations, repeated measurements, and student-learning outcomes.

## 5. Analysis

### 5.1 Comparative Teacher Decision Quality

The experience-led condition produced a composite evidence-informed decision score of 61.0. Teachers demonstrated relatively strong contextual understanding but lower consistency in formal evidence interpretation and evaluation.

Dashboard-supported data use increased the composite to 69.4. Pattern detection improved, but inappropriate adaptation remained comparatively common when dashboard signals were treated as definitive.

Structured data-literacy development increased the composite to 82.3. Strong improvements appeared in question formulation, interpretation, and adaptation quality.

The collaborative evidence-informed inquiry condition produced the strongest simulated composite score of 89.1.

**Table 2: Simulated Teacher Data-Literacy and Adaptation Outcomes**

| Practice Condition | Question Formulation | Data Interpretation | Triangulation | Appropriate Instructional Adaptation | Uncertainty Awareness | Equity-Sensitive Interpretation | Evaluation of Adaptation | Composite |
|---|---|---|---|---|---|---|---|---|
| Experience-led adaptation | 58 | 61 | 52 | 69 | 48 | 67 | 72 | 61.0 |
| Dashboard-supported data use | 64 | 75 | 60 | 74 | 55 | 70 | 88 | 69.4 |
| Structured data-literacy development | 83 | 86 | 80 | 86 | 76 | 84 | 81 | 82.3 |
| Collaborative evidence-informed inquiry | 90 | 91 | 92 | 91 | 86 | 89 | 85 | 89.1 |

### 5.2 Why Better Data Interpretation Does Not Automatically Produce Better Teaching

The dashboard condition provides the most important cautionary result. Data interpretation improved substantially compared with experience-led practice, yet instructional adaptation improved by a smaller margin.

This difference illustrates the gap between recognizing a pattern and knowing what should be done about it.

A dashboard might show that a group of students completed fewer online activities. That evidence identifies a difference but does not establish why the difference occurred or what response is appropriate.The teacher may need to determine whether the lower activity reflects conceptual difficulty,

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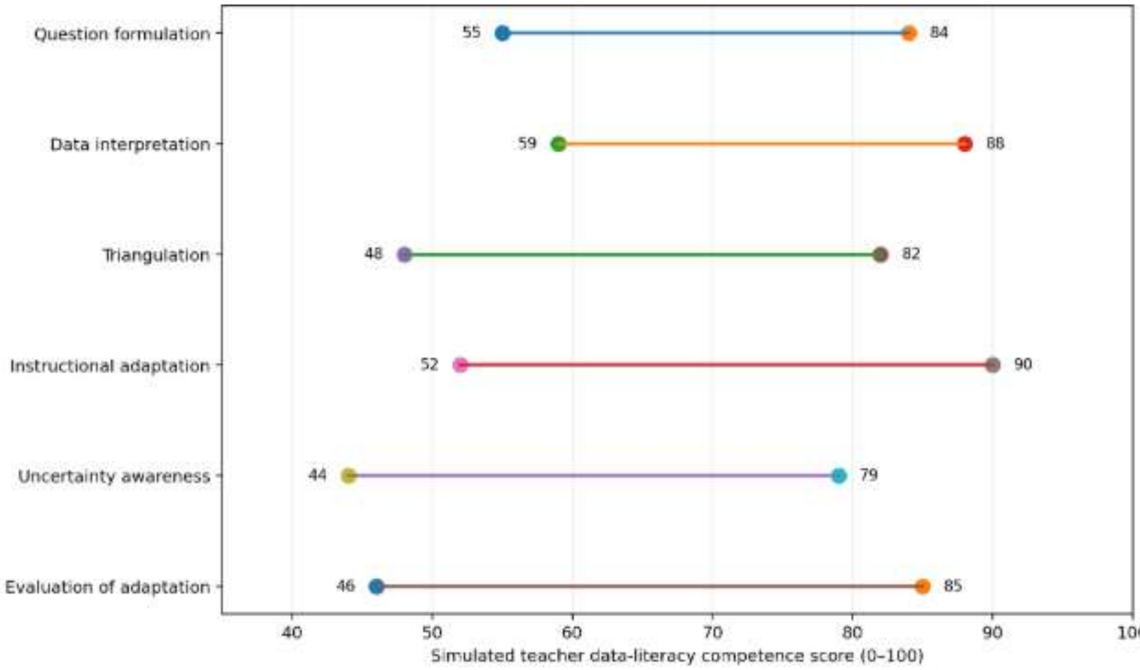
offline work, late enrollment, accessibility barriers, incomplete synchronization, task irrelevance, or a temporary pattern.

This is consistent with contemporary professional-development research. Sandoval-Ríos and colleagues conclude that training in data analysis by itself does not guarantee strong pedagogical decision-making because teachers need to connect interpretation with pedagogical, curricular, sociocultural, and resource considerations.

Hase and Kuhl similarly argue that digital learning-platform data can contribute to adaptive instructional design only when teachers are equipped to use the data appropriately. The proposed framework therefore treats the move from information to adaptation as its most important stage.

### 5.3 Competence Shift Following Evidence-Informed Data-Literacy Development

**Graph 1: Simulated Competence Shift After Evidence-Informed Data-Literacy Development**




The slope graph compares modeled teacher competence before and after structured evidence-informed data-literacy development across six dimensions.

This aligns with current implementation concerns. The Education Endowment Foundation noted in 2020 that teachers may feel more comfortable interpreting familiar assessment data than dealing with variability and uncertainty, suggesting that reporting tools require interpretation support rather than merely greater automation.

The central analytical conclusion is therefore that teacher data literacy becomes educationally valuable when it changes the quality of the entire instructional inquiry cycle, not simply the accuracy with which teachers read a dashboard.

## 6. Discussion

### 6.1 Teacher Data Literacy Should Strengthen Professional Judgment Rather Than Replace It

The most important implication of this study is that evidence-informed teaching should not be interpreted as instruction controlled mechanically by data. Teacher judgment remains essential because classroom evidence is incomplete, contextual, and generated within specific instructional conditions. Lee and colleagues' systematic review reinforces this broader understanding by showing that teacher data literacy includes dispositions, applications, behavior, reflection, and collaboration alongside technical knowledge and skills. Professional judgment is therefore not an alternative to data literacy; it is one of the contexts in which data become meaningful.

The relationship can be expressed as disciplined judgment. A teacher observes that several students are struggling, but instead of immediately concluding that the content is too difficult, the teacher formulates a testable instructional question. Evidence is then used to challenge or refine the initial interpretation. The teacher retains responsibility for deciding whether the evidence is relevant and what response fits the curriculum.

This approach also protects education from a simplistic notion of objectivity. A numerical indicator may look precise while reflecting questionable assumptions about what counts as participation, mastery, or engagement. UNESCO's current data-literacy discussion explicitly emphasizes understanding what data omit, recognizing bias, and distinguishing correlation from causation. Teachers therefore need the confidence to question dashboards and automated recommendations when the evidence conflicts with meaningful classroom knowledge.

Professional judgment should also remain revisable. Evidence-informed teaching is stronger when the teacher can state, “Based on these three indicators, I believe this misconception is widespread, so I will reteach using a different representation and check again tomorrow.” The decision is explicit enough to be evaluated.

A weaker form of judgment would be, “I know this class and this is what normally works.” Experience is valuable, but the absence of an observable proposition makes the decision more difficult to challenge or improve.

### 6.2 Evidence-Informed Adaptation Requires Triangulation, Uncertainty, and Equity Awareness

The second implication concerns the risk of single-indicator teaching. Digital education systems can encourage teachers to respond to whatever is easiest to count. Clicks, completion percentages, quiz scores, and attendance may become disproportionately influential simply because they are immediately visible.Yet one indicator can support several explanations.

A low score may reflect misconception, language complexity, misinterpretation of instructions, inaccessible formatting, insufficient prerequisite knowledge, rushed completion, or a poorly functioning item.

Triangulation therefore operates as an instructional safeguard. Teachers can compare a short assessment with student explanation, written work, questioning, or another low-cost evidence source. The objective is not to collect a large dataset but to determine whether the interpretation is stable enough to justify action.

The emphasis on proportionate evidence is important for workload. OECD's recent education-policy analysis emphasizes the need for teacher professional learning to remain close to classroom practice, while EEF work highlights time as a major practical constraint on teacher inquiry. A sustainable evidence cycle should therefore fit ordinary instructional routines.

Equity adds another layer. When data show that one group performs differently, the ethical response is not automatically to classify that group as lower ability. Teachers need to consider opportunity to learn, language, accessibility, assessment validity, task design, prior exposure, and other contextual explanations.

The same reasoning applies to AI-generated recommendations. Automated systems can identify patterns but may not represent the full educational context in which those patterns emerged. Teacher data literacy in the AI era consequently requires an ability to interrogate both student evidence and the systems summarizing that evidence.

**6.3 Professional Development Should Be Organized Around Repeated Classroom Inquiry**

The third implication concerns how teacher data literacy should be developed. Short workshops on spreadsheets or dashboard navigation may improve technical comfort but are unlikely to produce durable evidence-informed adaptation unless teachers repeatedly connect analysis with authentic teaching decisions.

Ansyari and colleagues' 2022 review found that effective data-use professional development commonly included modeling, feedback, reflection, collaborative data teams, and sustained goals rather than isolated technical instruction. Sandoval-Ríos and colleagues similarly emphasize collaborative reflection and contextualized decision-making.

The 2020 meta-analysis by Spiele and colleagues provides further reason for careful implementation. Their analysis of 27 studies found a positive overall effect on student achievement but substantial heterogeneity and methodological complexity. This means professional-development design should remain evidence-informed itself rather than assuming that any data-literacy intervention will improve student outcomes.

A stronger model resembles an inquiry cycle. Teachers bring a current classroom question to professional learning, examine relevant evidence, explain their interpretation, propose an instructional change, receive peer critique, implement the adaptation, and return with follow-up evidence.

Collaboration is valuable because another teacher can challenge assumptions that appear obvious to the original decision-maker. One colleague may ask whether an assessment item actually measures the target concept; another may identify that a pattern began after a change in instructional format.

Professional learning communities can consequently become spaces for evidence critique rather than meetings devoted only to comparing scores.

Technology can support this process, but simplicity is essential. A data platform should help teachers identify evidence relevant to a pedagogical question, not overwhelm them with every available metric. OECD and EEF guidance both emphasize professional support, classroom proximity, and manageable inquiry processes.

The strongest long-term goal is therefore not to create teachers who depend on dashboards. It is to develop teachers who can decide which evidence deserves attention, which evidence should be questioned, and which instructional adaptations should be tested.

## 7. Conclusion

Teacher data literacy is increasingly important because contemporary classrooms generate more evidence than teachers can reasonably interpret without a coherent decision framework. The challenge is no longer simply gaining access to student data. Teachers must determine which evidence is relevant, what it supports, how certain the interpretation is, which contextual factors matter, and whether instructional adaptation subsequently improves learning. Contemporary systematic reviews support this broader conceptualization by locating knowledge, skills, dispositions, applications, reflection, and professional behavior within teacher data literacy.

The simulation developed in this study demonstrates the difference between data availability and evidence-informed adaptation. The experience-led condition achieved a synthetic composite decision score of 61.0, dashboard-supported practice 69.4, structured data-literacy development 82.3, and collaborative evidence-informed inquiry 89.1. The strongest improvement occurred when teachers were required to triangulate evidence, recognize uncertainty, connect interpretation with pedagogy, and evaluate the effect of the resulting instructional change. These numerical values are illustrative and require empirical testing.

The proposed Evidence-to-Adaptation Cycle therefore frames teacher data literacy as a recurring professional inquiry process: formulate the question, select proportionate evidence, interpret and assess uncertainty, triangulate with contextual knowledge, adapt instruction, and evaluate the consequences. This structure allows quantitative, qualitative, formative, observational, and digital evidence to contribute without allowing any one source to dominate professional reasoning.

The central conclusion is that evidence-informed teaching should make professional judgment more disciplined, not less human. Data should help teachers notice patterns they might otherwise miss, question assumptions, justify changes, and determine whether those changes worked. The purpose of teacher data literacy is not to produce classrooms governed by numbers. It is to develop educators who can use evidence critically and responsibly to make teaching more responsive to what learners actually need.

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