

Data Literacy for Teachers

by Nancy Love

There is little dispute that educators' effective use of school data is a hallmark of improving schools. But all the data in the world will have little impact on student achievement unless teachers feel comfortable, knowledgeable and skilled in using a variety of data on a regular basis to improve teaching and learning. This reference guide provides a simple framework for strengthening data literacy and answering these questions:

- How can schools move away from over-reliance on national assessments and from using data as either a carrot or a stick?
- What kinds of data do teachers analyse, individually and with colleagues? For what purposes? How often?
- How can data use have an immediate and direct impact on instruction and achievement?

What is Data Literacy?

Data literacy is the ability to accurately observe, analyse and respond to a variety of different kinds of data for the purpose of continuously improving teaching and learning in the classroom and school. Data-literate teachers need not be experts in statistics or data collection methods. However, they do need to demonstrate three critical competencies: (1) the ability to make use of multiple data sources, (2) the skill to interpret data accurately, and (3) the capacity to engage in productive collaborative inquiry with their colleagues.

Using Multiple Sources of Data

- Formative assessments – assessments for learning that occur while lessons and learning are still underway – to diagnose student learning needs, plan next steps in instruction and provide students with descriptive feedback on how to improve their performance
- Demographic data to identify characteristics of students, teachers and the community
- Data about people, practices and perceptions to verify causes of student-learning problems and take effective action

- Summative assessments – assessments of learning that happen after learning is supposed to have occurred – to determine whether learning has taken place and to inform program changes
- Achievement data disaggregated by race/ethnicity, gender, and economic, language, mobility, and educational status to uncover and address achievement gaps

Interpreting Data Accurately

- Distinguishing between observation and inference
- Critically examining the assumptions and cultural biases that influence one's data interpretations
- Applying basic metrics accurately (e.g., percentage, percentile, percentage change and percentage point change)
- Accurately interpreting line graphs, bar graphs and scatter plots
- Acting as critical consumers of tests based on an understanding of the importance of reliability (consistency, or likelihood of producing similar results again), validity (measuring what is intended), cultural sensitivity and fairness

Engaging in Collaborative Inquiry

- Exhibiting habits of mind associated with productive collaborative inquiry (e.g., willingness to share practice with colleagues, continually learn, rely on data to test hypotheses, and take a moral stand for each and every student's achievement)
- Utilising data as a catalyst to reflect on one's own practice, not to blame students or their circumstances
- Generating and testing out solutions to student-learning problems through frequently monitoring both the implementation (process) and the results (product)

The Data Pyramid*

The front of the pyramid illustrates five different types of data that are important to school improvement. Each layer represents a different source of school data, with the width of the layer representing suggested relative frequency of use. The bottom and widest layer illustrates the data that teachers use most frequently, while the top layer shows the data source used least frequently. The side of the pyramid labelled "Frequency" offers rough guidelines, not rules, for how often teachers engage with each different type of data.

Examples:

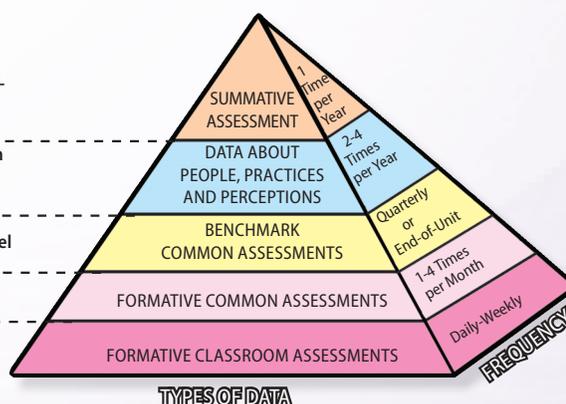
Region and national tests (disaggregate-, aggregate-, strand- and item-level and student work)

Demographic, enrollment, survey, interview and observation data, curriculum maps

End-of-unit, common year-level tests reported at item level

Maths problems-of-the-week, writing samples, science journals, other student work

Student self-assessments, descriptive feedback, use of rubrics/criteria, student products/performances, checking for understanding



The Data Pyramid is a framework for answering these questions:

- (1) What kinds of data do teachers use?
- (2) For what purposes are the data helpful? and
- (3) How often should the data be analysed?