

Using data for inquiry and improvement

Data use involves the systematic collection and organisation of information and evidence to inform key decision-making in schools. It includes student achievement data from standardised and informal tests, assignments and pieces of classwork, as well as teacher observations, conversations with students, and student voice and feedback. The use of data is central to [strategic planning](#), [teacher inquiry](#) and wider improvement work. It forms the basis of formative and summative evaluation of teaching programmes and student progress and achievement.

Data are essential in supporting teachers and schools to make changes to teaching and learning that will significantly impact on student achievement. Data reveal gaps in student achievement and corresponding instructional practices, helping teachers and leaders to understand what is working and for whom and which areas of teaching and learning are in need of improvement. The effective collection and analysis of data informs decisions on how to prioritise teaching time, where to target additional instruction, and how to adapt curriculum and pedagogy in line with students' learning strengths and needs.

While the use of data is **integral to every planning and decision-making process** in schools, data alone do not answer questions or provide solutions. Data may be seen as a tool to use or lens to look through in order to think about and understand teaching practice and student learning more fully. Interpretation is paramount and data are the starting point: there is a story behind the data that explains why particular situations or outcomes are occurring. Working with data involves **identifying patterns and relationships** and then constructing a story or theory for what is happening in student learning. This story or theory is then tested by examining other sources of data and collecting further evidence. Data use is a process, not a one-off event.

What kinds of data can I collect and how?

You might gather data related specifically to your own classroom practice or teacher inquiry, or as part of a syndicate, department or school-wide improvement effort. You might also gather data that pertains to a particular aspect of school life or student experience, such as how safe they feel in the playground, or whether they feel that their culture is recognised and celebrated in the school. There are four main kinds of data that you might gather and utilise:

- **demographic data:** information about the student, staff and school community population
- **student achievement data:** standard assessments, norm-referenced tests, classroom assessments and student work
- **perceptions data:** information gathered through questionnaires, surveys, observations and student voice
- **school processes or programmes data:** the programmes students have experienced, classroom practices and assessment strategies

When gathering information about student learning, **search for data that serve your purpose rather than accumulating data for its own sake**. Use as much relevant data as you possibly can, as using too little

data can lead to incorrect conclusions (although too much data can make analysis labour and time intensive). Decision making should not be based solely on student achievement data, which describe results but not their underlying causes. To understand the causes, use formative assessment data including students' class work, your own observations of students, and [student voice](#) data, as well as classroom observations.

Here are some key kinds of data you can collect and how to do it:

Observations: These can be broad as well as specific. For example, you might observe students' engagement during particular lessons by measuring time spent on task, or make a note of which self-choice activities are most popular. You can make a record of the feedback that you give during a lesson and to which students by making notes or videoing yourself. For a more specific insight into individual students' learning, you can ask them to talk through their thinking while working through a maths problem, or observe their strategies for decoding an unfamiliar word while reading, making a note of the substitutions they use and what these tell you about their reading skills. You might also ask a colleague to observe you in the classroom and provide feedback on your teaching, or on what the students are doing.

Exit cards: You can collect students' perceptions and summaries of lessons on index cards or post-it notes as they leave the classroom. Pose a question or ask students to list three things they most remember about the lesson. Do these match your learning intentions?

Test results: You can use the results of standardised tests such as e-AsTTle, PAT and STAR as well self-designed and administered tests as part of a broader picture of student learning and achievement. In addition to recording the total score of each student in a test, it may also be useful to note which questions were generally answered correctly by a given group of students and which questions they struggled with. Do these patterns give you an insight into areas of strength as well as gaps in students' knowledge and understanding?

Samples of work: You can use a range of students' work to evaluate the effectiveness of teaching and learning. It is also useful to compare work completed in class with the results of standardised and informal tests to look for consistencies and inconsistencies.

Surveys and scaled surveys: A scaled survey asks respondents to quantify their answers, so the information gathered can be easily organised in numerical form (for example, in a graph). However, the use of scales can sometimes limit the scope of the survey, and there is no way to ensure that different respondents mean the same thing when they grade the question with a 4. Unscaled surveys allow personal responses to open-ended questions, although they are more complex to organise for analysis. It can be a good idea to pilot your planned survey to see if your questions are easily understood and the results will provide you with the information you are seeking. It is also worth bearing in mind that professionally designed surveys will yield more reliable information than self-designed surveys. There are a number of useful surveys on a range of areas such as social emotional learning and school climate available free of charge from [Panorama Education](#).

Interviews: These can be useful for investigating perceptions, beliefs, attitudes and values, or for exploring complex issues that do not have a finite set of possible responses. Interviews might be informal and conversational, which means they flow through spontaneous questions, or they may be guided by a set of questions or points to discuss. Collecting data through interviews can be time-consuming, and the data generated may be difficult to compare and analyse. One way to counteract this is to interview only a deliberately selected group of students who represent a range of attitudes or levels

of ability. Bear in mind that interviews give a great deal of useful information about perceptions, feelings and understandings, but self-reports are limited in accuracy.

Analysing data

Once you have gathered a range of qualitative and quantitative data related to your strategic goals or your inquiry or improvement focus, it can be helpful to begin the work of interpreting and analysing it by starting with a question. In particular, **questions about differences, gaps, characteristics and qualities, or the impact of teaching practices and curriculum, provide useful starting points.** Look for a problem in the data that you care about and that engages your curiosity. It is also useful to **generate predictions for what you expect to see in the data and explore the assumptions that underlie these** in order to reflect on personal experience and gain an awareness of the beliefs and expectations you bring to the data. Predictions and assumptions should be developed concurrently – for example, if you make a prediction (for example, ‘most students can answer word problems correctly’), try to identify the assumption behind it (‘we’ve spent a lot of time practising these’). In addition, try to reframe your assumptions (‘lower-achieving students are likely to struggle with comprehension’) as predictions (‘the bottom third of my class will have scored low on the comprehension section of the test’) that are easily tested.

Look deeply at the data from multiple perspectives to generate thoughtful observations about what the data are telling you. This involves differentiating, sorting, comparing and contrasting data. Analyse the data by looking for what is surprising or unexpected. **Identify patterns, categories and trends**, but avoid jumping to conclusions or arriving at certainty, as this can lead to badly framed problems and premature solutions. Exploring data takes a long time. In fact, researchers can spend months analysing single data sets. Evaluate the quality of the data by using the 4 C’s of interpreting data:

- Do the data give the **complete** picture? Ensure you have a range of sources of data, both formal and informal, and not just numerical data.
- Are the data **consistent** with other sources of information, particularly teacher observation data or experience? Are the data compatible with what you know about your students from your ongoing classroom assessments? Are the overall results for your students consistent with your expectations?
- How do the data **compare** with the standard, your targets or other schools? This is not about making judgements, but instead about seeing how comparison helps you in your search for the meaning of data.
- Might the data be **concealing** something? Have you considered the full set of results and disaggregated the data in order to view the achievement of particular groups of students?

Once you have assessed the quality of your data, **create a data overview**, a succinct and well-organised summary of data relevant to your question, based on several data sources, in order to provoke thinking and discussion. Once you have completed your data overview:

- find someone to share this with, and ask what they notice and infer from the data
- select key observations patterns in the data
- generate inferences and potential explanations and conclusions for those observations, without jumping to conclusions (remember that the correlation between a set of events or behaviours and particular outcomes does not mean there is causality)
- create a range of data stories, which help you identify where you might need more information about specific problems or issues

Be aware that most sets of data do not tell the whole story, and you want to be reasonably confident of the cause of a given pattern in the data before determining a course of action to address it. Consider whether further data might help to confirm or verify your explanation or theory.

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