Using assessment data for improving teaching practice

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Abstract

Fundamental to teachers becoming responsive to student learning needs is the availability of detailed information about what students know and can do. High-quality assessment data can provide that information, but much more is needed to improve teaching practice in ways that have a substantive impact on student learning. A set of conditions are identified that result in such an impact, based on a synthesis of the international literature on professional development that has demonstrated a positive impact on student outcomes and a professional development program in over 300 New Zealand primary schools. This professional development program is focused on the interpretation and use of assessment information, building relevant pedagogical content knowledge in literacy and developing leadership for the change management process. These developments occurred within systematic inquiry and knowledge-building cycles based on assessment data for both teachers and leaders. Student achievement gains in reading and writing have accelerated at a rate averaging more than twice that expected, with even greater gains for the lowest-performing students. Both the projects have led to the identification of a set of conditions necessary for assessment data to result in improved teaching practice.

Introduction

For a long time we have known more about the potential for using assessment data to improve teaching practice and student learning than how to do it. Ten years ago we did not have the right assessment tools, we did not know enough about their use to make a substantive difference to teaching practice and we did not know what else teachers and their leaders needed to know and do to improve teaching practice in ways that benefitted students. Many of us reflected on the difference between the hope and the reality. This situation has now changed. We have now identified a number of conditions required for the use of assessment data to have the impact we hoped for:

- The data needs to provide teachers with curriculum-relevant information
- That information needs to be seen by teachers as something that informs teaching and learning, rather than as a reflection of the capability of individual students and to be used for sorting, labelling and credentialing
- Teachers need sufficient knowledge of the meaning of the assessment data to make appropriate adjustments to practice
- School leaders need to be able to have the conversations with teachers to unpack this meaning
- Teachers need improved pedagogical content knowledge to make relevant adjustments to classroom practice in response to the assessment information
- School leaders need to know how to lead the kinds of change in thinking and practice that are required for teachers to use the data
- All within the school need to be able to engage in systematic evidence-informed cycles of inquiry that build the relevant knowledge and skills identified above.

These tasks are not easily accomplished. However, examples of how they can be achieved has been identified in a systematic review of the international evidence of the kinds of professional learning and development experiences that have resulted in improved student outcomes (Timperley, Wilson, Barrar & Fung, 2008) and also in the outcomes

of a professional development project in New Zealand involving 300 schools, which has been built around this evidence (Timperley & Parr, 2007; in press). In this professional development project, student achievement gains have occurred at a rate beyond that expected over the two years of the schools' involvement in the project, particularly for the lowest-performing students. The average effect size gain for all schools that focused on writing was 1.20 and for reading it was 0.92. The rate of gain was greater for the students who were in the bottom 20 per cent of the distribution at Time 1 (2.25 in writing; 1.90 in reading). Expected average annual effect size gains, using national normative cross-sectional sample data to calculate, in writing is 0.20 and in reading is 0.26 .

Teacher inquiry and knowledge building cycles

The final bullet point above identifies the need for engagement in systematic evidence-informed cycles of inquiry that builds the relevant professional knowledge, skills and dispositions. The process for this inquiry is illustrated in Figure 1. The cycle begins by identifying the knowledge and skills students need to close the gaps between what they already know and can do and what they need to know and do to satisfy the requirements of the curriculum or other outcomes valued by the relevant community. Curriculum-related assessment information is required for a detailed analysis of students' learning needs. These kinds of data are more useful for the purposes of diagnosing students' learning needs than assessments focused more on identifying normative achievement, but not related to the curriculum. Within the Literacy Professional Development Project, for which the outcomes above are described, the assessment Tools for Teaching and learning (asTTle, Ministry of Education, 2001)[1] are used because they are mapped to the New Zealand curriculum and also provide normative data about expected rates of student progress in each curriculum area.

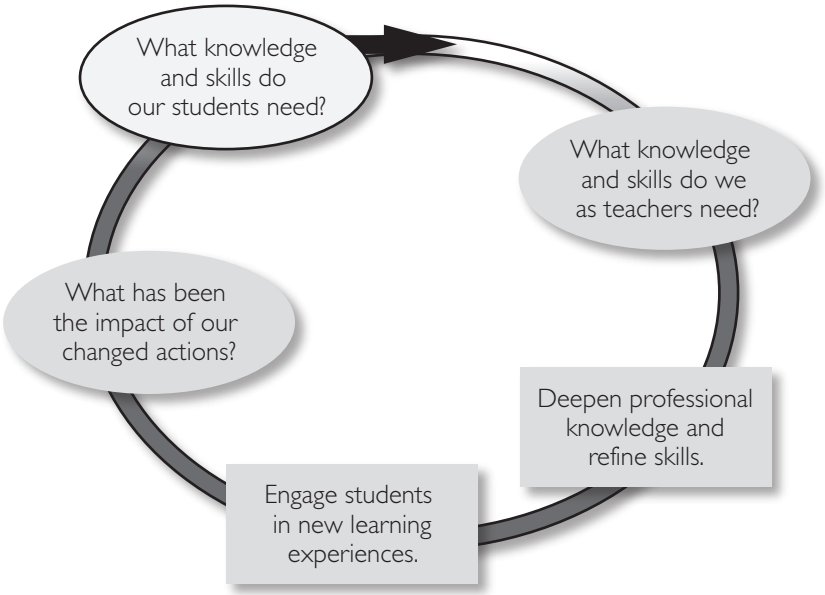

Figure 1: Teacher inquiry and knowledge-building cycle to promote valued student outcomes

Previous assumptions were that once teachers had this kind of information, they would be able to act on it in ways that enhanced student learning. Many teachers' previous training and approaches to teaching practice did not require them to interpret and use these kinds of data, because assessment information was about labelling and categorising students, and not for guiding and directing teaching practice. The interpretation and use of assessment data for guiding and directing teaching requires a mind shift towards professional learning from data and a new set of skills.

For this reason, the second part of the cycle in Figure 1 requires teachers to ask, with the help of relevant experts, what knowledge and skills they need in order to address students' identified needs. More detailed questions ask:

How have we contributed to existing student outcomes?

What do we already know that we can use to promote improved outcomes for students?

What do we need to learn to do to promote these outcomes?

What sources of evidence or knowledge can we utilise?

In this way, teachers begin a formative assessment cycle that should mirror that of students, which has long been recognised as effective in promoting student learning (Black & Wilam,

1 These tools are part of Project asTTle (Assessment Tools for Teaching and Learning), which provides detailed assessment against curriculum objectives in reading, writing and mathematics for Years 4 to 12. (A full description of this project, along with technical reports and publications is available at http://www.tki.org.nz/r/asttle/.) It is an electronic assessment suite that gives teachers choice in the design and timing of assessments and access to a range of reporting formats, including comparisons to norms.

1998). It is also effective in promoting the learning of teachers. Answering the questions above requires further use of assessment data. Considering teachers' contribution to existing student outcomes, for example, requires teachers to unpack student profiles within the data and relate them to emphases and approaches in their teaching practices. Student profiles of reading comprehension on different assessment tasks can help teachers to identify what they teach well and what requires a different or new emphasis. Most important is that co-constructing the evidence to answer the questions, with relevant experts, assists teachers to identify what it is they need to know and do to improve outcomes for students.

Deepening professional knowledge and refining skills

The next part of the cycle in Figure 1 requires teachers to deepen their professional knowledge and refine their skills. In the synthesis of the evidence of the kinds of teacher learning that are associated with changes in teaching practice that impact on student outcomes, three principles were identified in terms of the content of the professional learning in addition to using assessment information for professional inquiry (Timperley, 2008). The first was a requirement to focus on the links between particular teaching activities, how different groups of students respond to those activities, and what their students actually learn. Without such a focus, changes in teaching practice are not necessarily related to positive impacts on student learning (e.g. Stallings & Krasavage, 1986; Van der Sijde, 1989). It should be clear to participating teachers that the reason for their engaging in professional learning experiences is to improve student outcomes. Similarly, success is judged on improvement in student outcomes.

The second principle is that the knowledge and skills developed are integrated into coherent practice. Knowledge of the curriculum and how to teach it effectively must accompany greater knowledge of the interpretation and use of assessment information. Identifying students' learning needs through assessment information is unlikely to lead to changes in teaching practice unless teachers have the discipline, curriculum and pedagogical knowledge to make the relevant changes to practice. Understanding theories underpinning assessment information, theories underpinning the curriculum and those underpinning effective teaching allow teachers to use these understandings as the basis for making ongoing, principled decisions about practice. A skills-only focus does not develop the deep understandings teachers need if they are to change teaching practice in ways that flexibly meet the complex demands of everyday teaching and to link the assessment data to requirements for new teaching approaches. In fact, without a thorough understanding of the theory, teachers are apt to believe they are teaching in ways consistent with the assessment information or they have promoted change in practice when those relationships are typically superficial (Hammerness et al., 2005).

The third principle is providing multiple opportunities to learn and apply new information and to understand its implications of teaching practices. Interpreting assessment information, understanding the implications for practice and learning how to teach in different ways in response to that information is a complex undertaking. It typically takes one to two years, depending on the starting point, for the professional learning to deepen sufficiently to make a difference to student outcomes. In the literacy professional development project described above, substantive gains were made in one year, but it took two years for the change to become an embedded part of practice.

Part of the reason for the length of time for change is that using assessment data for the purposes of improving teaching and learning requires changing prior assumptions about the purposes of assessment information. If teachers' prior theories are not engaged, it is quite possible they will dismiss the new uses as unrealistic and inappropriate for their particular practice context or reject the new information as irrelevant (Coburn, 2001). Engaging teachers' existing ideas means discussing how those ideas differ from the ideas being promoted and assessing the impact that the new approaches might have on their students. If they cannot be persuaded that a new approach is valuable and be certain of support if they implement it, teachers are unlikely to adopt it – at least, not without strong accountability pressures to do so.

Assessing impact of changed actions

The final part of the cycle in Figure 1 also involves knowledge about and use of assessment information. Given the varied context in which teachers work, there can be no guarantee that any specific activity will have the anticipated result, because impact depends on the context in which those changes occur. The Best Evidence Synthesis of Professional Learning and Development (Timperley et al., 2008) identified that the effectiveness of particular changes depends on the knowledge and skills of the students, their teachers and their leaders. Judging impact requires the use of assessment information on a daily, term-by-term and annual basis. Thus, to be effective, teachers need a range of ways to assess their students informally and formally.

Leading change

Recent research analyses demonstrating that it is teachers who have the greatest system influence on student outcomes (Bransford, Darling-Hammond & LePage, 2005; Nye, Konstantanopoulos & Hedges. 2004; Scheerens, Vermeulen & Pelgrum, 1989) have led to an increasing focus on what happens in classrooms and how to promote teacher professional learning. Teachers, however, cannot achieve these changes alone, but require the kinds of organisational conditions in which learning from data becomes an integral part of their practice. A recent meta-analysis by Robinson, Lloyd and Rowe (2008) has identified that the greatest influence of school leaders on improving student outcomes is their promotion of and participation in teacher professional learning. Creating the kinds of conditions in schools in which teachers systematically use data to inform their practice for the benefit of students requires that they teach in contexts in which such practice becomes part of the organisational routines.

Conclusions

Research on teacher change has shown that previous assumptions about teachers' use of assessment data were unreasonably optimistic. It is difficult to change from traditional ideas where assessment data was considered to be reflective of students' abilities about which little can be done, to one where assessment data is considered to be information to guide reflection about the effectiveness of teaching and what needs to happen next. Making such changes is complex. Not only are changes in professional knowledge and skills of the use of assessment data required, but teachers also need deeper pedagogical content knowledge so that they are able to respond constructively to what data are telling them about changes needed to their practice. To undertake this change teachers need opportunities to develop this knowledge as they delve into the assessment information, to find out what it means for their own learning and to engage in multiple opportunities to acquire the new knowledge and skills. Changing teaching practice in ways that benefits students means constant checking that such changes are having the desired impact. Effectiveness is context-dependent, so the knowledge and skills to check the impact must become part of the cycle of inquiry. When teachers are provided with opportunities to use and interpret assessment data in order to become more responsive to their students' learning needs, the impact is substantive. Teachers, however, cannot do this alone, but require system conditions that provide and support these learning opportunities in ways that are just as responsive to how teachers learn as they are to how students learn.

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