

Using Evidence in the Classroom for Professional Learning

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For teachers to use evidence to improve teaching and learning in their classrooms they need information about what their students know and can do, evidence about their own practice and its impact on students, and knowledge of the research evidence and that from other established sources to give direction for improvements to practice. Teachers, however, cannot be expected to know and do all this on their own, but need the support of well informed leaders who have sufficient knowledge both to lead teachers' evidence-informed inquiry and to engage in their own inquiry into the effectiveness of their leadership practice in promoting teacher and student learning.

For a long time we have known more about the potential for using evidence to improve teaching practice and student learning than actually how to do it. Even 10 years ago, we did not have the right assessment tools, did not know enough about their use to make a difference to teaching practice and did not know what else teachers and their leaders needed to know and do to improve practice in ways that benefitted students. This situation has now changed. We now know much more about what is required if evidence in the classroom is to have a significant impact. What is involved is the integration and interpretation of several kinds of evidence.

- Formal and informal curriculum-relevant evidence of teachers' own students' learning that is seen as a source of information to improve teaching and learning
- Evidence of teachers' own knowledge and skills so that the evidence about students can be interpreted in terms of the implications for teaching practice
- Knowledge of the research and other evidence relevant to specific practices to inform further directions and changes to practice in response to the evidence.

Unfortunately none of this evidence provides absolute answers but rather potential insights in how to improve. Given the complexity of integrating multiple sources of evidence and the uncertainty of their implications, it is too much to expect teachers to satisfy the demands involved by themselves. They need the kinds of leaders who can help them to develop relevant skills to use the evidence in effective ways. Thus, school leaders need to be able to do the following:

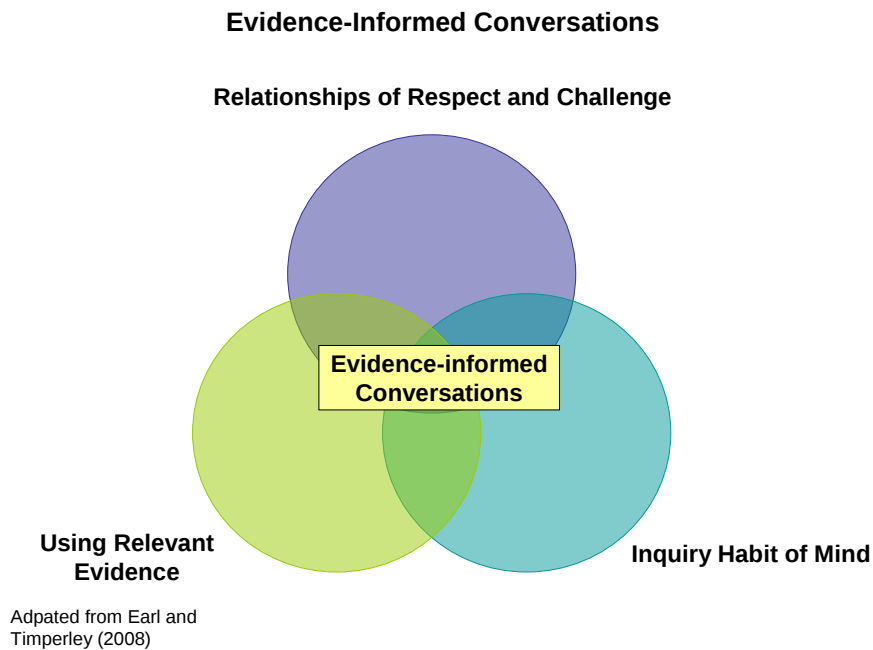
- Support teachers to interpret and use the available evidence to improve practice while at the same time use similar kinds of evidence to inform and improve their own leadership practice
- Develop school-wide systematic, evidence-informed cycles of inquiry that build the relevant knowledge and skills.

None of this is easy, and requires particular mindsets (Kaser & Halbert, 2009) on the part of leaders and teachers. One mindset is that the evidence, despite the uncertainties involved, can actually be useful. Earl and Katz (2006) have referred to this mindset as an inquiry habit of mind that involves an ongoing process of seeking out and using evidence to make decisions. While the evidence never provides absolute answers and all decision-making includes a certain amount of guessing, ignoring it limits the opportunities to shape the guessing and make it as informed as possible.

Another mindset is that evidence related to students is something that informs teaching and learning, rather than being seen as a reflection of the capability of individual students that is most useful for sorting, labelling and credentialing. Without the mindset that evidence is for improvement purposes, the evidence tends to remain in filing cabinets, computers and other places at a great psychological and emotional distance from what is actually happening in the classroom.

Using evidence for improvement requires that this mindset extends to examining how particular leadership and teaching practices are influencing the trends in evidence about students. Such an examination usually requires in-depth conversations to integrate the evidence from students, teaching practice and research or other sources and give it meaning in ways that provide guidance to what to do next. Earl and Timperley (2008) developed a diagram that summarises the essential conditions for such conversations to take place.

Figure 1



Examples of how evidence can be used in these ways have been identified in the Best Evidence Synthesis iteration summarising the international research about the kinds of professional learning and development that have resulted in improved student outcomes (Timperley, Wilson, Barrar & Fung, 2008). Other examples have come from my ongoing research with Associate Professor Judy Parr about the processes and outcomes of a national professional development project in New Zealand involving 300 schools. Much of the form and content of this project (developed by Learning Media Ltd) was based on evidence from the best evidence synthesis iteration. 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% of the distribution at Time 1 was greater (2.25 in writing; 1.90 in reading). These gains were significant when compared with expected average annual effect size gains nationally. These are 0.20 for writing and 0.26 for reading when

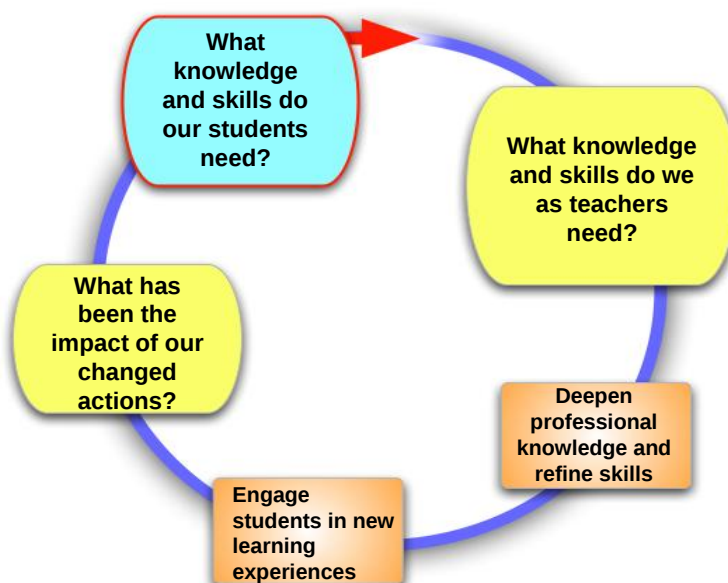
calculated on national normative cross-sectional sample data (Timperley & Parr, 2008).

Teacher Inquiry and Knowledge Building Cycles

Both these projects have identified that using evidence for improvement in classroom teaching and learning involves cycles of teacher inquiry through which professional knowledge and practice are built. The cycle begins by identifying the knowledge and skills students need to close the gaps between what they 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 community in which students live and learn (see Figure 2). It is best to use curriculum-related assessment information to get a detailed analysis of students' learning needs. This kind of evidence is more useful for the purposes of diagnosing students' learning needs than assessments focused on identifying normative achievement, but not related to the curriculum. Informal evidence collected by teachers as they observe students and mark their work can be just as powerful in this process as formal assessments. Given the uncertainty of the validity and accuracy of any individual piece of evidence, what is important is that evidence from multiple sources is integrated to provide a picture of where students are at in relation to the outcomes valued by the community in which they live and learn.

Figure 2

**Teacher inquiry and knowledge-building cycle
to promote valued student outcomes**



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

To enable this process, teachers need to ask, with the help of relevant experts, what knowledge and skills they require in order to address students' identified needs, through some more detailed questions. 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 more effectively? What sources of evidence or knowledge can we utilize?

By asking these questions, teachers begin a formative assessment cycle that mirrors that of students (Black & Wiliam, 1998). Answering them requires further use of evidence about student learning. Considering teachers' contribution to existing student outcomes, for example, requires teachers to unpack student profiles within the evidence and relate them to emphases and approaches in their teaching practices. Student profiles of, say, reading comprehension on different assessment tasks can help teachers to identify what they teach well and what requires a different or new emphasis. By co-constructing the evidence to answer the questions with relevant experts, teachers can 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 requires teachers to deepen their professional knowledge and refine their skills. In synthesising the evidence of the kinds of teacher learning that are associated with changes in teaching practice that usefully affect student outcomes, three fundamental ideas were identified in the synthesis of the research evidence (Timperley et al., 2008).

The first is a focus by the teacher 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, teachers cannot tell whether changes in their teaching practice are necessarily related to positive impacts on student learning.

The second is that the knowledge and skills developed have been identified through a rigorous process of research and / or scrutiny by professional bodies. This helps to ensure that what is learned is worth learning. I noted in the introduction that our understanding of what is needed to use evidence from assessing students has taken forward leaps in the last 10 years. In the same way our understanding of the kinds of approaches to teaching and learning needed to reach those students who typically do not respond well to traditional forms of instruction has also increased markedly in the last 10 years. Keeping up with this information is demanding and teachers cannot do this alone as well as teach students throughout a full school day, week and year. Opportunities to synthesize these new understandings and develop the implications for their classroom practice must be provided for them and developed with them. Ways in which the research community engages with teachers has not always been helpful.

Another challenge for teachers is to contextualise these understandings within their own classrooms. To do this effectively, teachers need to know about new ideas concerning curriculum and how to teach it effectively in both theoretical and practical ways so in the process of making meaning within their own classrooms, the inevitable adaptations remain true to the original underlying theoretical ideas. This way of thinking about teaching is consistent with Bransford and colleagues (2005) portrayal of teachers as adaptive experts, that is, they are able to flexibly retrieve, organise and apply knowledge to new problems and are not restricted to executing established routines of practice. Adaptive experts know what to do when known routines do not work, and when they need to expand the depth and breath of current expertise by integrating knowledge from various domains to solve new problems that cannot be solved by what they did previously. Taking a purely practical orientation with a skills-only focus does not develop the deep understandings teachers need to link the three forms of evidence I have promoted in this paper: Evidence from students, evidence from teaching practice and evidence from research and other established sources to guide practice.

An additional problem arises when teachers do not have a thorough understanding of the theoretical ideas underpinning practice. Hammerness and colleagues (2005) have identified that they are apt to believe they are teaching in ways

consistent with the theory and evidence when the resemblance is actually superficial and may even be in contradiction to the theory underpinning particular practices.

This focus on adaptive expertise requires that the knowledge building aspect of the inquiry cycle is developed by searching for new knowledge and integrating new and existing knowledge in flexible ways to meet particular teaching and learning challenges, rather than just simply applying existing knowledge more efficiently.

The third idea is that learning at this depth is difficult and requires multiple opportunities to learn and apply new information and to understand its implications for teaching practices. Interpreting evidence from students and teaching practice, understanding the implications for future 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 and the extent of change required to make a difference to student outcomes.

Part of the reason for this length of time is that using evidence for the purposes of improving teaching and learning requires changing prior assumptions about the purposes of evidence about student learning and the implications for practice. If teachers' prior theories are not engaged, it is quite possible as Coburn (2001) has pointed out, that they will dismiss the new ideas as unrealistic and inappropriate for their particular classroom context or reject the new ideas as irrelevant. 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 the Impact of Changed Actions

The final part of the cycle also involves evidence – this time about how well the students have understood the processes and outcomes identified as important in the first phase of the cycle. Given the varied contexts 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. We identified in the best evidence synthesis of professional learning and development that the effectiveness of particular changes depends on the knowledge and skills of the students, their teachers and their leaders. Without attention to these dimensions of classrooms and schools,

changes in teaching practice are not necessarily related to positive impacts on student learning (e.g. Stallings & Krasavage, 1986; Van der Sijde, 1989). Judging impact requires the use of assessment evidence on a daily, term-by-term and annual basis. To be effective, teachers need a range of ways to assess their students informally and formally.

Leading Change

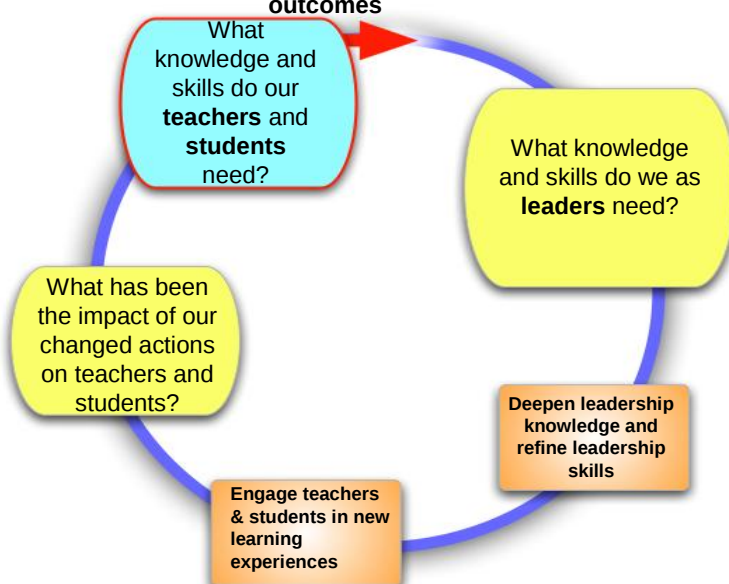
Recent research analyses demonstrating that it is teachers who have the greatest system influence on student outcomes (Bransford, Darling-Hammond & LePage, 2005; Scheerens, Vermeulen & Pelgrum, 1989; Nye, Konstantanopoulos & Hedges, 2004) have led to an increasing focus on classrooms and ways to promote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

We can draw a parallel between teachers as adaptive experts (Bransford et al., 2005) and leaders who need to develop organisational adaptive expertise. In such organisations leaders have systems for identifying what is working well and should remain, and what is not working so well and needs to change. Part of this adaptive expertise involves identifying the professional learning required to meet the challenges involved in improving what is not working so well.

For many leaders, this is a relatively unfamiliar role as moves towards greater school self-management have swept much of the developed world. School leaders have, in effect, needed to become school managers as they have taken on financial, property and human resource responsibilities. For leaders to execute this new role effectively, they also have to learn new knowledge and skills. In effect, it involves leaders thinking of the teaching staff in their schools as “their class”. How does one become a leader of learning of their class of teachers? What does this involve? What

skills are needed? In large schools there may be tiers of classes of senior and middle managers. Leaders with whom I have worked who have contributed to the acceleration in students' literacy achievement in their schools have found they need to engage in their own inquiry and knowledge-building cycles in which they focus on the learning needs of their class of teachers and students in order to identify on their own learning needs. The form of inquiry and knowledge building cycles for leaders, and the multiple sources of relevant evidence is depicted in Figure 3.

Figure 3. Leader inquiry and knowledge-building cycle to promote valued teaching and student outcomes



Conclusions

Research on teacher change has shown that previous assumptions about teachers' use of evidence were unreasonably optimistic. It is difficult to change from traditional ideas where evidence about student learning was considered to reflect *students' abilities*, about which little can be done, to one where evidence about students is considered to be information to guide *effective teaching* and what changes need to be made. Making such a shift involves changing mindsets and is a complex process. Not only are changes in professional knowledge and skills in the use of evidence about students required, but teachers also need deeper pedagogical content knowledge established as effective through research and other forms of professional

inquiry so that they are able to respond flexibly and constructively to what the evidence is telling them about the changes they need to make to their practice.

To undertake this kind of change, teachers need opportunities to develop their knowledge as they delve into the evidence from student learning, evidence of the effectiveness of their own practice and evidence from research on effective practice. Changing teaching practice in ways that benefit students means we have to check constantly that the changes are having the desired effect because effectiveness is dependent on context; these students, these teachers, this school.

Many teachers and researchers consider this process to be one of teacher research into practice. I have framed it more in terms of evidence-informed inquiry into practice because I believe that to be effective every teacher needs to be engaged in such a process every day that they teach. Through doing so they will discover new ways to do things that will inform our wider knowledge of effective practice. For their efforts to be labelled “research”, however, I consider that the new understandings need to be situated in the wider body of knowledge about teaching and disseminated in a form that systematically builds and challenges that knowledge. I believe that this agenda is too demanding of teachers who must also face the complex job of teaching students every day of the week.

The stance I have taken on evidence-informed inquiry and research is demanding rather than demeaning of teachers. When teachers are provided with opportunities to use and interpret a range of evidence in order to become more responsive to their students’ learning needs, the impact is substantial. Teachers cannot be expected to do this alone, but require organisational 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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