



ACT Department of Education and Training

***Teachers and school leaders: making a difference  
through evidence-based practice***



Australian Capital Territory  
EDUCATION AND TRAINING

**A research paper for ACT Government schools**

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## Introduction

The purpose of this paper is to provide a research base for the ACT Department of Education and Training's discussion paper for ACT government school teachers: *Teachers and school leaders: making a difference through evidence-based practice*.

Evidence-based practice is defined as the collection and analysis of relevant data and research and the application of this evidence to teaching and learning and to whole school improvement.

The conceptual framework of the School Excellence Initiative underpins the paper. This places student achievement and learning at the centre of any discussion.

In the research literature, there are many, often contradictory definitions of data, information and knowledge. This paper will use 'data' as a collective (singular) noun and define terms as follows:

- data: a collection of facts from which conclusions may be drawn and judgements made
- research: a thorough inquiry and investigation into a subject, including the collection and application of data
- information: the result of processing, manipulating and organising data
- knowledge: information that is shaped, comprehended and embedded in meaningful contexts
- practice: the application of knowledge to effect change in teaching and learning and school leadership.

## Evidence-based practice

As a term in use in professional fields, 'evidence-based practice' is most commonly associated with medicine. However, Groundwater-Smith suggests that "education can lay claim to a broader and richer understanding of the term growing out of a tradition of action enquiry and practitioner research" (Groundwater-Smith 2000:1). She discusses reforms in Australian school education in the 80s and 90s, particularly the growth of 'action research', partnerships with university researchers and the rise of the 'reflective practitioner'.

In recent years there has been a renewed research focus on the importance of the teacher as "the key to student success" (ACT Department of Education and Training 2004). This research has important implications for evidence-based practice. "We need to ensure that this greatest influence *i.e. the teacher*, is optimised to have powerful and sensationally positive effects on the learner" (Hattie 2003: 3).

Many speakers at the 2005 Australian Council for Educational Research Conference (ACER) spoke of the need to link what we know about the importance of good teaching and assessment practices with the need to use quantitative and qualitative data more effectively. Control should be in the hands of the professional educators – but they need to be informed professionals. "The unique and specialised knowledge, skills,

experience and professional capacity of teachers must be valued as fundamental components of any evidence process. That is, the way in which evidence is obtained, collated, interpreted and results strategically utilised, must be interlinked with, and influenced by, the profession” (Bruniges 2005:102).

## **Professional and accountable teachers**

Another significant historical factor is the contemporary information context, i.e. the ready availability of data and of tools to collect and analyse data. Within an information-based society, it is no longer acceptable for teachers and leaders to rely on experience, intuition and tacit knowledge alone to make decisions. Parents and communities expect more.

Earl comments that the exponential rise in the availability of data has been paralleled by a rise in accountability requirements. “Accountability and data are at the heart of contemporary reform efforts worldwide” (Earl 2005: 6). She discusses the difference between ‘accounting’ which comprises the gathering, organising and reporting of information that describes performance and ‘accountability’ which is the conversation about what the information means, how it fits with everything else and how it is used to make positive change (Earl 2005:7).

Teachers and school leaders have always been accountable – in the sense of having a professional and moral responsibility to be open and fair in dealings with students, parents and carers and the wider community. Tools now available to educators allow this responsibility to be carried out more effectively. A reliable base of school information on student progress and whole school improvement then facilitates accountability to parents (directly and through school boards), to system-level agencies and through them to the Australian public through elected governments.

Greater explicitness in defining student outcomes and specifying standards has strengthened the relationship between curriculum intentions, improved student assessment and more informative reporting (accountability). Agreements on standards form the basis of meaningful performance measurements. Any judgements of student achievement and progression need to be grounded in a shared understanding of the outcomes to be achieved and on explicit standards against which student progression can be monitored. For example, national and state/territory benchmarks in literacy and numeracy have enabled reporting of student achievement on both a state/territory and national scale and facilitated identification of sub-groups of the student population who need additional educational support.

The ACT currently has three key system-wide processes for the accountability of student outcomes. The Department of Education and Training manages the ACT Assessment Program (ACTAP), completed every year by students in Years 3, 5, 7 and 9 at all government, Catholic and most independent schools. ACTAP assesses students' abilities in literacy and numeracy. The Office of the ACT Board of Senior Secondary Studies (BSSS) manages a moderation process for ensuring comparability of grades on the Year 12 Certificate. The Australian Scaling Test (AST), completed by all students seeking university admission, supports the scaling of school-based scores and the ranking of students across the ACT.

The ACT also participates in the National and International Assessment Program (NAP), agreed to by all Australian states and territories through the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA). The NAP is designed to monitor progress towards the *National Goals of Schooling in the 21<sup>st</sup> Century*. It is currently a triennial cycle of national testing of science literacy (a sample of students in Year 6), civics and citizenship (a sample of students in Years 6 and 10) and ICT literacy (a sample of students in Years 6 and 10). The NAP also includes participation in the Programme for International Student Assessment (PISA) and in the Trends in International Mathematics and Science Study (TIMSS). From 2008, an agreed national assessment process will replace current state and territory assessments of the literacy and numeracy achievements of all students in Years 3, 5, 7 and 9.

Under Australian Government regulation, the ACT (along with other states and territories and non-government bodies) is required to report to the Australian Government on student achievement in relation to national benchmarks at a system and student level and on a number of dimensions of school performance. Schools must also provide relative and comparative reporting of a student's progress and achievement against the performance of the student's peer group at the school.

## **The concept of 'value-add'**

The research literature on evidence-based practice highlights legitimate concerns by stakeholders about the potential misuse of educational data, by the media and governments. Researchers such as Rowe and DeCourcy have commented on the dangers of 'league tables' that compare the performance of schools without adequate analysis of demographic data.

Rowe has commented on misleading tables that identify 'winners' and 'losers'.

Once the losers are deemed to be 'failing' or 'ineffective' it is difficult to find ways of helping them in a prevailing social and political atmosphere of blame, recrimination and retribution. Moreover, such atmospheres are not conducive of the formulation and implementation of within-school improvement strategies.

(Rowe 2005:133)

... producing league tables which amplify tiny and statistically non-significant variations between schools into large differences in rank is not effective in improving student performance.

(DeCourcy 2005:99)

Such concerns have led to greater consideration of 'value-added' approaches. In its most sophisticated form, ascertaining the value that a school adds to student achievement means analysing input variables

such as socio-economic status and parental education levels and using this in multidimensional modelling to compare the progression of different student groups within and across schools. This approach is taken by a number of Australian researchers, such as Hill (analysing the 'learning gain' of students), Rowe (the progress maps in the ACER longitudinal literacy and numeracy study) and Smith (the SMART data initiative in NSW).

A simpler definition of value-add for schools and systems is the measure of difference between the knowledge and skills that students have at a particular stage of schooling (measured against a particular benchmark), compared to a later stage i.e. comparing the achievement of students in literacy in Year 9 to their achievement in Year 7. This type of analysis is more readily available to systems, schools and teachers. Such analysis can be used to answer questions about student progression and about teacher and school effectiveness. It can be used to determine how well groups of students progressed compared to other groups.

The ACT currently uses a model that enables schools to track the progress of individual students in literacy and numeracy in the compulsory years. The model also provides system data that facilitates analysis of how effectively different schools progress student groups in literacy and numeracy.

## **What evidence?**

What evidence might be used to support practice? Evidence falls into two broad categories – data and research (which includes and makes sense of data). In selecting the evidence, teachers and school leaders need to be clear about what aspect of learning they are seeking to improve and what they hope to achieve.

Broadly speaking, evidence will be used in two ways. Firstly, soundly based research will inform teaching practice and school policy, support innovation and help teachers and school leaders address key educational issues. Examples include research on the most effective methods of literacy development, what works best for the education of Indigenous students, motivating and engaging disaffected students and whole school approaches to tolerance and racial harmony.

Teachers and school leaders draw on recent research papers and reports from the educational field relevant to an issue that is the focus for improvement. International research is important but so is research that places the issue in an Australian, or ideally, an ACT context. This will include, where possible, examples of good practice and research undertaken by practitioners for specific groups of students in specific settings (action research).

Secondly, evidence will be used to monitor progress including the outcomes and development of individuals, groups and cohorts, the effectiveness of policies and programs and the performance of schools and education systems. In monitoring progress, the effective collection, management and application of school and system data is crucial.

Data may be qualitative (for example, formal and/or informal observations, structured discussions) or quantitative (for example, standardised achievement tests). Streifer (2002) suggests that data may be separated into three categories for analysis and interpretation:

- input variables (over which the school has little or no control), including the demographic composition of the student body (gender, age, ethnicity, socio-economic status, previous educational experiences etc), the training and experience of existing staff
- process variables (currently applying to the issue under consideration and subject to change) such as levels of funding, class sizes, teaching skills, curriculum structures, assessment choices, student participation in curricula and co-curricula activities, discipline referrals, parental involvement, school culture, retention rates
- outcome variables, typically student work samples and results from teacher assessments (including practical performances, projects and tests), results from standardised tests conducted within the school or externally, unit and subject marks and/or grades, certification processes and results from observations and surveys.

Ideally, practitioners will use qualitative and quantitative data, including research evidence, to inform professional conversations and improvement programs. Practitioners will also use a combination of methodologies to gain different perspectives on the same issue and compare and corroborate their findings. For example, the evidence could include structured observations, standardised tests and interviews. Evidence could be drawn from a number of different sources and/or from different times. This approach, known as 'triangulation', enables teachers and school leaders to be more confident about taking action.

The outcomes of effective evidence-based practice are improved student learning, improved professional practice, whole school improvement and accountability to parents, community and government.

## Using evidence productively

First and foremost, teaching and learning needs to be at the centre of the evidence-based cycle. The ACT School Improvement Framework identifies four domains for school review: teaching and learning; leadership and management; student environment; and community involvement.

Whatever the focus, the driver should always be improving learning for all students. In the conversation, as Hattie says, all should be talking about 'the language of progression' (Hattie 2005). It is never the data per se that is important. What is important is the questions practitioners ask about the data, the ways in which they turn data into information and knowledge, and the actions that they take to use this knowledge wisely and effectively.

Fiscal accountability (the value of the educational investment) is a legitimate concern. However, it should not be the sole, or even the principal focus at the school level. If the focus of the school remains on improving learning, the outcomes of the evidence-cycle can readily be used for other accountability

purposes. Reeves (2004) uses the term 'student-centred accountability' to discuss practices that provide careful documentation of student progression at the classroom level.

Student-centred accountability includes a balance of quantitative and qualitative measurements such as the "stories, case studies, and vignettes that define great teaching and leadership" (Reeves, 2004: 10). Such an approach requires teachers to know where students' starting points are and how to accurately assess the progress each student is making against expected standards.

Another way of putting this is to talk about 'data-informed' rather than 'data-driven' practitioners and schools (Rowe 2005; Richardson 2005). The term 'data-driven' gives a sense of external requirements rather than the proper acceptance of a responsibility to be informed – to use relevant information to acquire and apply knowledge in a professional and timely way.

Gruenert, Painter, Quinn and Valentine (1999) also comment that using data and research in schools is often driven by a deficit model. In a deficit model, the processes undertaken and the tools used are designed to "fix problems". This approach may bring short term results but rarely results in sustained improvement. By contrast, in a 'values-driven approach', schools develop a sense of shared purpose, underpinned by agreed values. Evidence on identified issues is collected and analysed and changes undertaken within this framework, building on and extending the values of the school community. School and teacher relationships with academic researchers also make productive contributions to evidence-based practice.

## **Overcoming practitioner concerns**

As well as discussing the history and productive practice of using data and research to support learning, the research literature identifies a number of challenges that arise when teachers and school leaders seek to embed evidence-based practice in the school culture. Most of these challenges relate to practitioner perceptions and all of them need to be addressed in the change process.

Many teachers and school leaders were trained when intuitive judgements were considered to be all important. There was a greater stress on the art rather than the science of teaching. These teachers and school leaders are concerned that the use of data on its own narrows the scope and pertinence of questions and answers about the educational process. They understand that teaching and learning is complex and not amenable to simple solutions.

It is important to recognise and value teachers' experience and tacit knowledge in any evidence-based approach. Research supports the appropriate use of both quantitative and qualitative data and emphasises the value of professional judgements at all stages of the evidence-based practice cycle. Thomas (2004) suggests that different people have differing and valid approaches to the collection of evidence. Some begin with an intuitive 'hunch' which they need to test; others begin with a detailed plan. What is essential is that all approaches address the relevance of evidence, corroborate evidence collected and establish its veracity.

It is important to acknowledge the importance of the affective dimensions of schooling and to gather data that can, for example, give insights into the perceptions students have of their teachers, the ability of teachers and/or students to work in productive groups, and the perceived characteristics of a school community.

Hopkins (2004) refers to the affective factors that operate in any change process. The feelings of teachers and leaders are real and need to be accommodated. There may be complacency, cynicism ('this too will pass'), or a genuine fear of change. There may be anxiety (even denial) about what the data that is collected will reveal about the school, or the individual. Healthy scepticism will contribute to constructive debate but resolute resistance or destructive conflict within the school are challenges that need to be addressed as part of any process of reflection and improvement.

Practitioners also have concerns about poor statistical practices, simplistic analyses or the misuse of data. For example they may have seen how partial use of data and/or selective reporting can be used to support a particular position (Holmes 2000). They may have seen how league tables can give a false impression of a school's (or student group's) achievement. They may have seen how dissemination of data can be used in a punitive, rather than a constructive way, either within a school or across a system or nation. They may have seen how data can be manipulated to promote a school's image in a competitive educational environment. These legitimate concerns need to be addressed where a school commits itself to evidence-based practice.

There are concerns too, about the skills needed to gather and interpret data and research (Creighton 2001). Data collected haphazardly or collated inappropriately will not support effective decision-making. One way in which these concerns may be overcome is to identify a small evidence-based practice team within a school. All members of such a team should be committed to student learning as the driver for reform. The team should include those skilled in the collection and analysis of both quantitative and qualitative data and those with strong research interests. Above all, team members need communication skills to interpret and share information so that they can build knowledge collaboratively in the school community and provide a platform for change.

Another challenge is the uncritical use of poor research. Essential though research is to support the education enterprise, results of research are, and should be, contestable. Alton-Lee (2000) comments that particular research conclusions may become very influential in school education, without a strong evidence base of student improvement. Teachers and school leaders should not be misled by poor research.

Alton-Lee (2000) suggests an approach where local contexts are compared to international research findings and where conflicting evidence is examined to deepen understanding. The New Zealand Ministry of Education has developed a 'best evidence synthesis' website, with a steadily increasing bank of topics. In the ACT, the Schools Excellence Initiative website has a number of links to reputable research and best practice for specific areas of education.

Johnson (1997) notes important differences between academic and action research, commenting that academic researchers strive for objectivity and design and control events while teachers observe activities as they occur in classrooms and maintain a close relationship with the subjects of their research. Academic

researchers seek to globalise results while action researchers accept that their findings (and decisions arising from these findings) can only apply to a particular group of students, although the findings may provide useful insights for other settings. In using research, it is useful for teachers and school leaders to identify areas where they need to access national and international research and ways in which they can explore the applicability of such research to their own context.

Another challenge is time. Teachers and school leaders are time-poor, so any change in practice needs to be supported by realistic timelines and appropriate professional development. Gathering evidence needs to be built in to the culture of the school and the application of evidence needs to be seen to be effective. Commentators such as Hattie note that schools do not need more data or more system-driven demands for data. Rather, schools need clearer purposes for the collection of data, they need to 'own' the data and the improvement process and they need effective data collection, analysis, storage and retrieval tools. Evidence-based practice should support teachers and support student learning, not make busy lives more difficult.

## **Principles and key process in evidence-based practice**

The research literature referenced in this paper supports the development of principles for the use of evidence by teachers and school leaders. Such principles would include:

- relevance to student learning outcomes: the evidence is useful and can be used to inform teaching practice and program delivery
- values-based: collection, analysis and application of evidence is undertaken within a frame of values shared by the school community
- validity, reliability, rigour and depth: the evidence obtained is accurate, answers the questions that it purports to answer, is gathered from a range of sources and can be compared with other data collected at a different time
- skilled interpretation: teachers and leaders have or are developing the skills to analyse data effectively
- timeliness: the evidence is available when it is needed and the data that is used is current
- cost-effectiveness: accessibility and affordability of the evidence collection and analysis models
- constructive debate: the school community openly shares and debates the evidence
- confidentiality and ownership: these are respected in using data
- strategic decision-making: evidence is linked to informed decisions about classroom teaching and school programs and subsequent action
- continuous improvement: the evidence-based process is maintained over time, with each stage informing the other in a developmental cycle.

# The knowledge-creating school

Many researchers including Johnson (1997), Groundwater-Smith (2000), Hopkins (2001), Earl (2005), Hattie (2005), Boudett (2006) comment on the key features of schools that successfully implement evidence-based practice. From this research, it seems schools with the following features are able to build and sustain professional knowledge:

- the development of shared values and expectations about children, learning, teaching and the relationship of these to the local environment
- a collective focus on student learning, which becomes part of the normative control of the professional community
- collaboration which includes sharing expertise, a readiness for people to call on each other and the refinement of understandings about effective practice
- habits of inquiry and reflection – self-awareness of school community members and deep conversations across the community, debating issues and testing conclusions.

Evidence-based practice operates at two levels. The first level focuses on the teaching and learning process and on the classroom or its equivalent. Here the key evidence-based practitioner is the teacher. The second level focuses on the whole school community, leadership and management, the student environment and wider community involvement. Here, the key evidence-based practitioners are the principal and other school leaders.

Each level interacts with the other. A school priority such as improving the progress of children with special needs, or the education of boys may be identified. The factors impinging on this issue will be identified. Some will be specific to the classroom, others will involve wider information drawn from the school as a whole and from the students' backgrounds. Similarly, changes that are determined as a result of an evidence-based process will need to be implemented by individual teachers and/or by the school as a whole.

Classroom observations and decisions may focus on changing teaching practice. Decisions may also include changes to assessment practices, to better ascertain student progress. Key ways to organise data on student progress include:

- a focus on the individual
  - What knowledge/skills did students master?
  - What progress has been made since a previous assessment?
  - What should be the focus for intervention?
  - What should be the focus for enrichment?
- a focus on the distribution of student achievement compared to defined standards
  - Which students met the standards?
  - Who achieved very highly?
  - Who achieved very poorly?

- a focus on the distribution of student groups
  - Which sub-groups?
  - How did they perform?

(Fox 2001: 16)

There are different models for using data to improve learning. Most include four iterative elements that operate at both the classroom and whole school levels. The four elements are: identification and planning (What do we know?); systematic observations and synthesis of evidence (What do we do?); reflection about what has worked well and what has not worked (What do we know now?); and a commitment to replicating effective practices (What do we do now?).

These four elements may be elaborated into a more detailed process:

- What are we dealing with? What is the issue here?
- What baseline data do we have?
- What do we already know about effective solutions?
- What tools will we use to find out more (do we have these tools or do we need to access / develop them?)
- What is our plan? (people and processes, milestones, performance measures, timelines, costs)
- How do we gain buy-in (student, parent, school community)? How do we identify and overcome challenges?
- How do we interpret and assess the data?
- How do we disseminate the outcomes of the process?
- Is there evidence of progress? What should we do now?

(Masters 2005)

## Conclusion

Knowledge building schools are not driven by external accountability, although what they do supports such accountability. They are driven by the needs of all their students. They are driven by a commitment to doing the best by these students – facilitating their learning and their progress.

Transformative and sustainable change is only possible through the vision, knowledge, skills and commitment of teachers and educational leaders. Data and research provide tools that can be used productively to enhance the work of individual teachers, and the effectiveness of individual schools and of education systems.

Embedding evidence-based principles and practice in the culture of schools and systems is a gradual process, an educational journey towards greater effectiveness and greater accountability. Most importantly, evidence-based practice is a powerful means of improving the learning of all students.

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Conceptual framework for school excellence



<http://activated.det.act.gov.au/sei/index.htm>