

Research-Informed Practice: Learning from innovative approaches in NSW schools

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# Abstract

The NSW Department of Education is conducting a research project to investigate innovative and research-based initiatives that are taking place in NSW. Through a process of recommendations from departmental Directorates, several schools and educational institutions were identified and invited to an interview to discuss their innovative program or practice. The interview was intended to elucidate the rationale and features of the program or practice, its intended outcomes, where it took place and under what conditions and how it was implemented.

The aim of this research was to produce a set of case studies to document the types of successful innovative practices in learning and teaching are taking place in schools, how these innovative practices have been informed by research findings, the kind of evidence used to identify success, and the potential for scaling.

Commencing in September 2015, 14 interviews were conducted and are continuing. Initial findings have documented a varied and interesting range of programs including whole-school approaches to problem based learning, transformative leadership and culture changes, and integrated curricula. The research that has informed these initiatives was found to be multi-disciplinary in nature, synthetic in its consolidation of collections of evidence, with a focus on the clear communication of complex and sophisticated concepts.

Practitioners were found to be active users (rather than passive consumers) of research. A strong interest in the ideas behind the practices discussed in research – a valuing adoption of recommendations was highly conceptual (they provided inspiration and guidance, rather than direct instrumental support). An interest in the ideas behind practice was evident across case studies – valuing the reasons behind research recommendations, rather than a direct application of methods. An activity space was revealed in which research production and research use tends to be mediated by third parties and often takes the form of research-practitioner partnerships between schools and cultural and knowledge institutions such as museums and universities.

A combination of different evidence of success was typical across interventions with no obvious reliance on either quantitative or qualitative data alone.

# Introduction

The purpose of this research was to examine the relationship between research, evaluation and innovative educational practice. The research questions were as follows:

1. What types of successful innovative practices in learning and teaching are taking place in schools?
2. How have innovative practices been informed by research findings?
3. What kind of evidence is used to identify successful innovations?
4. Have the innovative practices been scaled up? (e.g. to another classroom, across the school or to other schools)

Participants were invited to describe an innovative program or practice – in terms of its rationale, intended outcomes, where the program took place and under what conditions; when the program took place; the broad features of the program; the “target audience” for the program and how it was implemented.

The participants then described any research that informed the practice, or more generally, any ideas that may have informed the practice or program. Participants were asked how they knew that their program/initiative was successful to elucidate the kinds of criteria that have been or could be used to evaluate the success of the initiative or programs.

# Innovation

One defining feature of the research-informed practices that were investigated as part of the case studies is that they can be understood as innovations. Innovation should not to be confused with change, improvement or trying something new. Rather it needs to be an original, disruptive, and fundamental transformation of an organization’s core tasks in which deep structures are permanently altered ([Lyn, 1997, as cited in Earl & Timperley, 2015](#_ENREF_2)). This is a useful frame for us to explore the documented practices.

The tendency for educational programs to engage in innovation is a necessary adaptation to the changes and challenges in the contemporary world ([Earl & Timperley, 2015](#_ENREF_2)).

Importantly, it should be recognised that each time an innovation is enacted it is unique in its context, development and trajectory. This is exemplified by the programs that were included in the case studies, some of which fall under the same type of innovation.

The educators that were interviewed for the case studies enacted original, disruptive, and fundamental transformation of an organization’s core tasks - changing deep structures and changing them permanently. In this sense, they can be understood as innovative educational programs.

Another aspect of innovation is that it can be understood as resulting in irreversible change that becomes inherited over time. One way to understand this idea is by interpreting innovation as a biological concept – seeing an innovation as an adaptation. Organisational innovation relates to how organisations evolve and adapt to changing circumstances.

Underpinning Darwinian accounts of adaptation is a generative heuristic, in which entities (or variants) are generated, and later subjected to tests. Entities which survive the testing are regenerated, and so on ([L. Schaverien & Cosgrove, 1999](#_ENREF_7); [L. Schaverien & Cosgrove, 2000](#_ENREF_8)). Applied to innovations, ideas are generated and later subject to tests (evaluation or selection). Ideas that survive the testing are regenerated.

Innovations as adaptations are inherited by subsequent generations, and thus there is no going back. Going back is, in some sense impossible.

A practice may be inherited – in the sense that the practice leaves a cultural legacy. This is likely to occur when the practice is passed on from generation to generation, and that school staff, students and the community perceive the *benefits* of the practice and *invest* in the practice. This creates the conditions for the practice to become part of the heritage for the next generation to build on.

## Innovative practices in NSW schools

Innovative characteristics were present in the programs or practices that formed the case studies. The following section discusses the nature of these innovations and the way in which they can be understood as disruptive and irreversible.

### Project Based Learning

Three of the programs were enactments of Project Based Learning. Project Based Learning is an inquiry-based pedagogy in which students work in groups to respond to a driving question. This work is authentic in its context, methods, and intended audience, the project has explicit learning goals focused on key knowledge, understanding and success. Students plan and execute their own research activities, coordinating their group as needed and requesting explicit instruction in response to need. Reflection occurs throughout and the project culminates as a public product which is explained, displayed and presented beyond the classroom.

### Imagination First

The Imagination First program was a whole school endeavour which was focused on student-led innovation design projects with the motto “Make things better and different”. These projects were designed to promote student “authorship” in whole school planning, generate co-creative thinking and problem solving skills among staff and students, improve higher-order communication and team building strategies with the school’s leadership and SRC teams, and promote the school’s legacy.

### Action Learning

Action learning is a method of work-based learning in which a group of colleagues collaborate on a project while simultaneously using the project as a vehicle for their own professional development. It thus involves working on real problems or issues in a real workplace context with real outcomes. Action Learning is a cyclical process of plan; do; reflect; and modify.

### Students as teachers

The *Digital Leaders program* is a student technology leadership group. The main role is for students to deliver professional learning in technology to teachers. Students were trained in using Google Apps for Education and Office 365. These leaders assisted the Technology Coordinator to provide professional learning to teachers on these platforms.

Inquiry-based learning is an approach premised on teacher’s collection and use of data to inform teaching practices.

### Whole School Reform

One of the programs included changes to standard schooling practices, such as the use of school bells, restrictions on learning spaces and physical tools for learning.

In an attempt to turn around a school culture that was recognised as being detrimental to learning, both for students and teacher’s professional development, a series of changes were implemented which were designed to empower teachers to own and develop projects to improve student outcomes. Positive Behaviour for Learning was also implemented to address deep-rooted challenges to student behavioural problems, stemming from the interplay between teacher compliance, community disinterest and student disengagement.

### Innovative Science Pedagogy

Another program constituted a whole-faculty transformation of the teaching of high-school science in which lessons were made personally relevant, rigorous and structured by involving industry professionals and academics.

### Big Picture

The Big Picture program is a secondary education framework based on principles of personalised learning which works on the basis of student passion and interest. One key distinguisher is that schools and classrooms are designed to be smaller in scale. Class ratios are 1:17 with an advisory teacher. There is a focus on soft skills, “learn-tos” rather than the “learn-abouts” and research skills, which are developed through each student’s personal interest project.

### Nurturing Democracy

Nurturing Democracy is a program to assist students practically understand how Australian democracy operates. It also provides opportunities for students to be leaders starting with the implementation of school elections and participate in their democracy.

### Visible Learning

There has been an increased interest in the application of John Hattie’s research. ([Hattie, 2012](#_ENREF_4)) Two schools that have been documented in our case studies apply different Visible Learning strategies to effect change: the use of feedback and the use of data – both instances of making learning intentions and outcomes explicit and visible.

## The qualities of innovative practices

### Project Based Learning

While all of the educators cited similar research as having shaped their practice, the ways in which the enactments can be understood as disruptive varied considerably across case studies.

Across all case studies, PBL resulted in disruption to teacher-centric practice. At one primary school, PBL was gradually integrated into a whole-of-school approach. Teachers were required to rethink their teaching practice as being student-driven, rather than teacher-driven. This meant relinquishing much of the control they were accustomed to and allowing lessons to be guided by the particular learning needs of each student group.

In the high school setting, this was referred to as “Just in Time teaching” which is the teacher’s opportunity to deliver a lesson when the students recognise a gap in their understanding – they will typically “book in” time for the teacher to deliver a lesson. The teacher themselves is also able to intervene in this way if they recognise student need.

The disruption of PBL was also felt in the area of assessment. In a high school which adopted PBL, one of the main challenges was to the assessment regime which was dictating the learning experiences and expectations of students. PBL was being implemented as an enrichment activity in which the assessment was organic to the discover-create-share structure. Students presented their findings to a panel at the “share” stage and received feedback, not grades. This is a disruption to school practice but also to the generationally-entrenched expectations of students and parents.

These programs demonstrate a developing legacy. The educators have worked hard to secure investment of staff within their school and their network of educators. As the practice has grown in impact and intensity, it has resulted in adaptations of the schooling ecosystem to either attracting teachers who support these practices as well as changing the acceptance of teachers and students.

### Imagination First

The disruptive quality of this program was in the challenge to a teacher-centred school culture. The students were directing aspects of their education that had previously been left to teacher discretion.

### Action Learning

Action Learning challenges the individualist approach to teaching, with teams of teachers working together on projects that relate to over-arching school improvement goals, all of which are focused on teaching and learning. It also disrupts the conservative approach to teaching practice by encouraging risk-taking, trying new ways to achieve results by constructing a collaborative environment in which risk-taking is supported. Students also participate in Action Learning Teams; having student input into what are typically a teacher-led planning activities is also disruptive to standard teaching practice.

### Students as teachers

In the *Digital Leaders* program the teacher-centric teaching approach was inverted as students became the experts in teaching about technology.

Inquiry-based learning disrupted regular power structures at one primary school by shifting authority away from teachers. This form or reciprocal teaching changes this power relationship between students and teachers such as where students take on the role of a teacher – starting with inquiry and socialising the students into how to take the lead in the classroom.

### Whole School Reform

In the program that challenged to teaching space and teaching time, the changes disrupted the standardised delivery of education, within the bounds of a public school.

The changes which included Positive Behaviour for Learning disrupted prevalent punitive and stagnant school practices that rejected growth and the recognition of excellence.

The program has left a positive legacy beyond the duration of the individual leader’s role.

### Innovative Science Pedagogy

Transformations to science teaching disrupted the norms of lesson delivery, both in terms of time-tabling and in medium, to the isolation of the school environment from the way in which science is conducted in a professional setting.

### Big Picture

Big Picture disrupts the essence of what a teacher is: from the guru of all knowledge to the conduit between the learning and the material for learning. Schools are designed away from the industrialised model of one-size fits all towards smaller academies of no more than 200 students per site.

Big Picture puts the student at the centre by considering the interests of the child first and then looking at curriculum. There is a backwards mapping from the interests of the child to the curriculum. This is a reversal of the mainstream approach to curriculum planning.

It also gives students more power about what they learn and has the potential to disrupt BOSTES in the form of indicative hours. You could spend several days a week on a PIP rather than allocating proportional hours to different subjects.

The staff, parents and students involved in this school have are heavily invested in this approach – strongly supporting its continuation at the threat of leaving the teaching profession or pulling out of schooling altogether. This is indicative of of the level of investment and shared identity as an inherited quality of schooling.

### Nurturing Democracy

This program is a challenge to the Controversial issues policy, particularly since it states “schools are neutral grounds for rational discourse and objective study… not arenas for opposing political views or ideologies”. Having local members participate in the program is a form of complying with policy.

The school deputy principal has made successful efforts to encourage others within the school to continue the practice. Students, staff and the wider community seem to be invested in its continuation beyond the duration of the instigator’s role.

### Visible Learning

The application of Visible Learning has resulted in disruption to prevalent accountability structures, especially those driven by NAPLAN, by making use of multiple sources of data to inform decision-making at the school.

It has also disrupted the way that teachers communicate with their students.

In one school, prevalent practices relating to homework were disrupted as the school questioned the efficacy of homework as documented in Hattie’s research.

Visible learning also challenges the idea of teachers working in isolation – instead encouraging collaborative work both across schools and across faculties within a school.

Disruption should not be understood according to the traditional notion of an organisation. Today an organisation is not solely defined according to the physical boundaries of a school, or even the hierarchy of a system. It is best understood in a networked system of interconnected spaces in which individuals connect across levels in a hierarchy, across physical institutions and across learning areas. Technology makes this possible (e.g., creating facebook groups that reach teachers across Australia, being prompted to change practice as a result of the DER, being able to learn from the Buck Institute and download resources online, creating resources such as videos that can be watched remotely and re-watched, means you don’t need to be co-located). Technology also makes conducting research more feasible by offering alternatives for recruitment, data collection and dissemination.

Technology has also made it possible for teachers to access and collaborate with a wider group of colleagues than was previously available. Whereas in the past, professional learning was limited to peers within a teacher’s school, technology has the potential to disrupt a school’s influence over professional learning and support available to teachers.

# How does research inform this?

In the exemplary practice that was documented in the project’s case studies, there was no evidence of a research practice gap; practitioners who led these programs were informed by research. The individuals who led these programs do not fit your typical practitioner definition – they are often in supervisory or leadership positions in which the application of research is an expected (or acceptable) part of their work. The classroom teacher practitioner, who is usually the focus of debates about research use in schools, may not have been the primary user of research, although they were likely implementers of evidence-based practice by having the leader act as a conduit.

The teachers/leaders we spoke to were all active consumers of research. Our interviews confirmed the conclusion that practitioners must not be thought of as passive receptacles patiently waiting to receive insight from research and researchers. Practitioners are active agents and the potential for research to be meaningful lies in their reaching out for it rather than it being dumped on them ([Figgis, Zubrick, A., & Alderson, 2000](#_ENREF_3)) ([Cited in Rickinson, 2016, p. 8](#_ENREF_6))

 Features of research-practice relationship

Our interviews confirmed the existence of an important activity space between research production and research utilisation (‘the connecting web’ ‘ the evidence ecosystem’). A complex range of players were active in this space (‘research mediators’, ‘evidence synthesisers’ ‘evidence distributors/ transformers’) In some cases the research mediators and evidence synthesises were organisations such as the Buck Institute or Edutopia. In other cases it was researchers themselves (for example, John Hattie or Carol Dweck) in books intended for a teaching audience. In some cases the teachers/leaders themselves occupied the connecting web.

The interviews revealed a wide range of ways in which end users can encounter and interact with research ideas ‘face to face, print, electronic and other vehicles, formal and informal’

Within this complex activity space most of the connections happen through third party mediation.

A number of the schools we visited had *Research- Practitioner partnerships. S*ome schools have multiple partnerships with a range of partners. Others appear to have a closer and more intense relationship with a single partner.

As anticipated in the “connecting web” model, a research partnership tends to inform practice more strongly than a one way communication such as a book for teachers. “One way messages have to be very powerful to connect to practitioners, and the most effective way of connection is two-way enabling substantive conversations between researchers and practitioners.” ([Lingard & Renshaw, 2010](#_ENREF_5))

Two way connections tend to have a more direct impact on practice.

The teachers/leaders we interviewed named 70 researchers or research organisations in total who informed their practice – an average of 5 per respondent. Some researchers were mentioned more than once – John Hattie received six mentions, Carol Dweck, five, Ken Robinson, four and Yong Zhao, Michael Fullan and Jane Hunter, two mentions each.

Amongst the researchers or research organisations referred to by our respondents ten were organisations. Several were what might be referred to as “knowledge brokers” in the weak sense of the term - intermediaries between researchers and practitioners. These include:

• The Buck Institute - dedicated to showing teachers how to use Project Based Learning in all grade levels and subject areas.

• Edutopia - a website focusing on six core learning strategies "Comprehensive Assessment, Integrated Studies, Project-Based Learning, Social & Emotional Learning, Teacher Development and Technology Integration" focussing on evidence based successes.

• Big Picture Education Australia – researches, evaluates and disseminates findings relating to Big Picture Schools

• Scientific organisations, Australian and International – the CSIRO, the Australian Nuclear Science and Technology Organisation, NASA, CERN - all of whom have school education missions. All support project based learning approaches to Science and technology education in schools

• A museum – with both research and school educational missions

Several of our respondents were knowledge brokers themselves who hosted successful blogs on education.

While most of our respondents named education research as informing their practice, many of the practitioners also referred to research in psychology, business, philosophy and politics as informing their practice. For example Carol Dweck, a Stanford University psychologist, was named as informing the practice of five of our practitioners.

Psychologists such as Lev Vygotsky, Jerome Bruner, Jean Piaget, Ken Wilber, Jane Loevinger and Edward de Bono informed some of our practitioners. Philosophers such as John Dewey and John Ralston Saul informed others. Many of these thinkers deeply informed educational thinking.

The practice of one of our respondents was informed by political commentators such as Don Watson and by pollsters such as the Lowy Institute.

Writers on business and leadership were on the professional reading lists of other practitioners. Researchers included:

• Peter Senge – an American systems scientist

• Stephen Covey – author of The 7 Habits of Highly Effective People

• Jason Clarke – a writer on innovation and problem solving

• Susan Cook Greuter – a writer on business leadership

• Ken Blanchard – Management/leadership expert

• Thomas Sergiovanni – leadership theorist

• Jim Collins – leadership

• William Torbert – developer of Action Inquiry leadership

One of our respondents had research partnerships with corporations, for example, prototyping furniture designed by furniture companies.

The education researchers on the professional reading lists of the practitioners we interviewed were highly varied. Ten of the 43 were Australian researchers. The work of these researchers, particularly those most referred to by our practitioners have some common characteristics:

• The audience for the works is primarily teachers, and secondarily other researchers. Our practitioners tend not to read academic journals since the primary target audience for these is academic researchers

• The works tend to be synthetic. The authors synthesise research of other researchers, to identify broad implications for practice. Hattie’s book Visible Learning for Teachers: for example, reports on 800 meta-analyses of 55,000 research articles. While Visible Learning is perhaps an extreme example, many of the texts contain critical summaries of research

• The works, while practical, provide a balance of theory and practice – focussing on reasons for recommended practices.

• The content is challenging, and the authors tend to have high expectations of their audience, as befits professionals

• The authors manage the tension between clarity of communication and sophistication of argument

• The works are not simple “how to” guides to practice. The research findings tend to have a more indirect relationship to practice

# Different kinds of research use

Rickinson distinguishes between three uses of research:

* Instrumental: “providing specific and immediately applicable technical solutions, and sees research as the main or only knowledge source to guide practice”
* Conceptual: ‘research may change one’s thinking but not necessarily one’s particular action’ With conceptual use, research is providing concepts which come to play a part in how practitioners define problems and research is one among several sources of knowledge upon which practitioners can draw…’ and
* Strategic: the application of research as a persuasive or political tool for legitimating a position or practice. ([Rickinson, 2016](#_ENREF_6))

*Most of our respondents made conceptual use of research*. Our practitioners looked at the ideas behind practice – there was a valuing of the “why”. They connect what students are doing with bigger picture values. There was little evidence of instrumental use of research either. The relationship between research and practice tended to be indirect – practice was research-informed rather than research-based.

The programs were not implemented by an individual, although there was an argument mounted by an individual who was the leader of the change.

Practitioners did not make selective use of research for strategic purposes.

The programs or interventions started first with the identification of a problem, or an issue that was seeking to be addressed and then research was brought in to attempt to solve that problem. It was not the other way around. It is not that research is read by the practitioner and they think to attempt it without a driving reason.

Much the way we talk about the technological tail not wagging the pedagogical dog, we should also consider that research should not come before the problem to be solved – findings should not be applied arbitrarily. It is important for the practitioner to therefore be knowledgeable about a range of research and to know how to use it, in order to avoid being biased by a single (and popularised) piece of research evidence.

Practice was never based on research – only ever informed by research. In addressing problems in relation to practice, practitioners would combine the (conceptual) knowledge provided by research with the tacit knowledge gathered through personal experience working in the school.

## Interpreting effect sizes

A teacher we interviewed told us that a university lecturer urged her to reconsider her deep commitment to Project Based Learning since it is shown by Hattie to have a low effect size. Her response to this was that in using Project Based Learning she was practicing approaches to teaching that were identified by Hattie as having high effect sizes. In particular, this teacher embodied each of the mind frames identified by Hattie as being likely to have major impacts on student learning.

A number of our respondents expressed scepticism about the value of Hattie’s effect sizes. The teacher just mentioned was sceptical that a low effect size of a pedagogical approach was sufficient reason to abandon it, but a challenge to improve it. As Hattie himself notes “the most important thing to remember when [talking about higher and lower effects] is that Visible Learning has summed up what has happened – the imperative here is the past tense”. ([Hattie, 2012, p. 14](#_ENREF_4))The finding of a low effect size, then, “should be an invitation to change how we do [a practice]”…”a wonderful opportunity for schools to try something different” ([Hattie, 2012, p. 14](#_ENREF_4)) – to refine and develop the practice. Hattie is not prescriptive about particular pedagogies. “The messages in Visible Learning are not another recipe, another quest for certainty, another unmasking of truth. There is no recipe…no new teaching method, and no band-aid remedy. It is a way of thinking.” ([Hattie, 2012, pp. 22-23](#_ENREF_4))

One respondent described Hattie’s research on effect size as a synthesis of “thousands of flawed studies” suggesting that the findings should be treated with some caution.

# Evaluation/ criteria for success

In his book *Visible Learning for Teachers* John Hattie states that one of eight mind frames for practitioners is “Teachers/leaders believe that their fundamental task is to evaluate the effect of their teaching on students’ learning and achievement.” ([Hattie, 2012, p. 182](#_ENREF_4))

In summary “KNOW THY IMPACT”

Each of the teachers and leaders we interviewed embodied this mind frame. In this sense, each of the teachers/leaders we interviewed evaluated the effect of their teaching on students’ learning.

Earl and Timperley suggest that educational evaluation involves the systematic collection and analysis of data needed to make decisions and identify effects of educational initiatives ([Earl & Timperley, 2015, p. 10](#_ENREF_2)) In this sense our respondents evaluated their practice.

Earl and Timperley distinguish between summative and formative evaluations. “Summative evaluations…examine the effects or outcomes of some object -- they summarize it by describing what happens subsequent to delivery of the program or technology; assessing whether the object can be said to have caused the outcome; determining the overall impact of the causal factor beyond only the immediate target outcomes; and, estimating the relative costs associated with the object.” ([Earl & Timperley, 2015, p. 11](#_ENREF_2))

By contrast “Formative evaluations strengthen or improve the object being evaluated -- they help form it by examining the delivery of the program or technology, the quality of its implementation, and the assessment of the organizational context, personnel, procedures, inputs, and so on.” ([Earl & Timperley, 2015, p. 11](#_ENREF_2))

Earl and Timperley also cite Patton in distinguishing developmental evaluation - “an extension of the summative/formative repertoire focused on using evaluation within the process of innovation in which both the path and the destination are evolving, as a mechanism for bringing rigorous inquiry to development by being intentional about using data in a meaningful way to inform innovation in progress.” ([Earl & Timperley, 2015, pp. 14-15](#_ENREF_2))

The teachers/leaders we interviewed were focussed on strengthening and improving their practice, None had any doubt that their innovative practice actually worked. Rather, their focus was on refining their practice to make it work better.

Carl Bereiter describes Principled Practical Knowledge. ([Bereiter, 2014](#_ENREF_1)) Principled practical knowledge has characteristics of both practical know-how and scientific theory. It meets standards of explanatory coherence. Its main function is practical guidance. It grows out of efforts to solve practical problems. It requires additional effort invested in producing knowledge that goes beyond what is required for the task at hand yet not so far beyond as to be unusable by practitioners. It may be defined as: know-how combined with “know-why”; explanatorily coherent practical knowledge. In formatively evaluating their practice our respondents were developing and drawing upon principled practical knowledge.

Earl and Timperley suggest it may not be appropriate for teachers and leaders to evaluate their own innovations. They write “It is not unusual for different members of the innovator group to imagine that they are able to conduct their own internal evaluation, given that the innovation will often move quickly and they possess intimate knowledge of the theory and the enactment of innovation on the ground. These conditions make them essential to the evaluation but their inherent biases can often stop them from seeing outside their existing perspectives.” ([Earl & Timperley, 2015, p. 17](#_ENREF_2))

These “inherent biases” may hinder the capacity of teachers/leaders to undertake a summative evaluation of their own innovations, but it may not impact their capacity to conduct a formative or developmental evaluation of their innovation – in line with their fundamental task of knowing their impact. An innovator has a strong interest in identifying ways to refine and further develop their innovation to “inform innovation in progress” and being completely impartial about this - even if abandoning their innovation is never in question.

Earl and Timperley state that “evaluative thinking is a necessary component of successful innovation and involves more than measurement and quantification.” They note that “the evaluation community has developed innumerable mechanisms for collecting information that are potentially applicable to evaluating innovation.” They note that these methods can range from stories and vignettes; surveys, focus groups and interviews; to students’ just-in-time responses using digital technologies and social media. ([Earl & Timperley, 2015, p. 17](#_ENREF_2)) Being “fit for purpose” means selecting methods that take into account the evaluation purposes and practicalities in a particular context.

Our teachers and leaders used a wide variety of data to evaluate their innovations and their effect on student learning more generally. Depending on the nature of the innovation, teachers/leaders used a range of data that is “fit for purpose” in the particular context.

Many teachers/leaders we interviewed used quantitative data to evaluate their program/practice. NAPLAN is sometimes a part of this, but some who used NAPLAN did not regard it as sufficiently “diagnostic”. One leader used results from other standardised tests such as the South Australian Spelling Test and a standardised reading fluency test for more “diagnostic” assessments of student achievement. One leader in evaluating whole school reform focused less on measures of academic achievement and more on success in “extra-curricular” domains such as sport, employment (e.g. establishing a start-up) the arts.

In addition to academic achievement data, the success of some innovations might be assessed by student behavioural data, such as attendance, behavioural referrals, frequency of suspensions and expulsions, even the prevalence of graffiti. Student engagement data may be relevant to the evaluation of many educational innovations. Student engagement might be measured by standardised tests such as *Tell Them From Me, Quality of School Life* or locally developed surveys. The success of a program to improve Science teaching might be evaluated by looking at retention data in Science subjects in later years or perhaps beyond school. The success of a civics program might be measured by the percentage of informal/donkey voting at SRC elections, perhaps compared to the larger electorate, the number of students standing for election to positions within the school each year, or the number of students nominating for taking on leadership roles.

The success of an innovative practice (such as whole school reform) may also impact on teachers and parents as well as students. Changes in staff retention or attendance are cited by some of our interviewees as indicators of the success of whole school reform in particular. Changes in teacher participation in innovative programs were also cited as an indicator of the success of these programs (teachers may vote about its success with their feet). Teachers and parents may indicate their perception of the success of an innovation through surveys. An increased participation of parents in school events (e.g. awards ceremonies, a culminating event, parent-teacher nights) was cited by some interviewees as an indicator of the success of a whole school innovation.

So our teachers/leaders use a wide variety of quantitative information to evaluate the effect of their teaching on students’ learning and achievement. But quantitative data, especially test scores, only takes us so far in evaluating an innovation. Quantitative data alone is not always perceived as “fit for purpose”. Our teachers/leaders also used a variety of qualitative data to evaluate the effect of their innovations on students’ learning.

One teacher evaluated the effect of their teaching on students’ learning and achievement by observing the quality and richness of communication in the form of dialogue, conversations, and questions. Students’ enthusiasm for learning can be evaluated through their behaviour, such as enjoying talking about their learning, running to school, unwillingness to take breaks, and expressions of pride in their publicly displayed works.

A number of teachers/leaders we interviewed suggested that an indicator of the success of an innovation – particularly a whole school reform – is the feel at the school. Some of the teachers/leaders referred to the hum of excitement in a school; or the vibes – “when you walk into schools you get the feeling of what a school is like.” One innovator suggested that “Educators can pick up a “Vibe” of whether students are engaged in their learning. This vibe is conveyed by talking and listening.” Through experience teachers and leaders pick up on sub-conscious cues that are indicators of success. A range of cues may be integrated into a “feel”.

In relation to whole school reforms, some innovators evaluated the success of their innovation by observing changed practice. This can provide evidence for the success of an innovation ahead of changes in student achievement. (One leader noted that there was frequently a dip in student achievement after a new practice was introduced but a subsequent improvement in achievement well beyond baseline levels before the new practice was introduced.)

Some of the changes in teacher practice indicative of the success of whole school reforms included: changed practice, for example, teachers talk less and listen more, as they shift from didactic teaching and passive learning. Another indicator relates to how teachers think about their practice, for example, thinking in a really rigorous way about how they can improve their practice; sophistication of evaluation reports and the depth of analysis. Yet another indicator relates to how teachers collaborate with each other; working collaboratively to collect, collate and reflect on evidence and data; enjoying collaboration across subjects; level of team work; feeling safe taking risks (trusting colleagues); Connection with teachers outside the school e.g. on social media.

Teachers may provide very useful feedback about the success of an innovation through informal conversation or a more formal interview or survey.

Where parents and the wider school community are directly involved in an innovative practice or program, community members may provide valuable feedback about the success of the program. For example, parents may provide feedback to leaders/teachers about what their children told them about their enjoyment (or otherwise) of a project they were involved in. Parents and community members may attend and participate in a culminating event of a school project. Even by their presence and participation, this may provide feedback about the new pedagogy. Parents may also feedback through the school/teachers’ social media. An event involving the wider school community may attract feedback from community members. It may attract positive comment in the media, or even in the parliament – dependent on the nature and scale of the event.

All of this varied feedback can be used by leaders/teachers to refine their innovations – building on success.

In evaluating an innovative practice, leaders/teachers relied on a range of feedback, both quantitative and qualitative from a range of sources (students, teachers, parents and the wider community). None of our respondents relied on any one source of data – e.g. NAPLAN results – but considered a range of data data/feedback from a range of sources, in relation to each other. Our respondents did not prioritise any one type of data (e.g the results of standardised tests) over another type. The type of data used to evaluate an innovation depended on the nature of the innovation. It was always “fit to purpose” and not “one size fits all”.

Hattie writes “The role of the teacher is to evaluate the effect the teacher has on students – Know thy impact. This requires that teachers gather defensible and dependable evidence from many sources, and hold collaborative discussions with colleagues and students about this evidence, thus making the effect of their teaching visible to themselves and others.” ([Hattie, 2012](#_ENREF_4))

Our respondents showed plenty of evidence of realising this role. In their own ways, depending on the context, they gathered defensible and dependable evidence (quantitative and qualitative) from many sources, and held collaborative discussions with colleagues and students about this.

Teachers/leaders evaluation of the effect of their innovations varied in their formality.

At an urban secondary school serving a low socioeconomic community, the school has established Action learning teams. The school invites Expressions of interest from teachers across the school to participate in Action Learning projects. Teams focus on an over-arching issue or concept. The teams follow the Action Learning model: defining research questions and sub-questions; planning; evaluation methodology for the team; who does what, when. Teams work over the period of 2 terms to plan and implement their action learning projects. Team leaders support action learning teams and then the Principal support those team leaders. The overarching evaluation of the projects themselves happens in term 4 and it is aligned to their evaluation plan. They unpack the evidence to find out what works and why, and what the next steps might be, and then start the process again.

At an urban primary school, in addition to NAPLAN data, the school uses a range of standardised tests such as the South Australian spelling test, Dibble’s standardised test for reading fluency and Maths Facts, to elicit feedback from students about the effectiveness of the programs at the school, to tailor what to teach and how, and in a formative way to inform the students’ own learning goals.

At an urban secondary school serving a high socioeconomic community a teacher uses her observations of the quality and richness of communication in the form of dialogue, conversations, and questions and students’ enthusiasm for learning as reflect in their behaviour to evaluate the impact of her teaching and to inform a modification of her practice.

Lingard and Renshaw ([2010](#_ENREF_5)) suggest that while researchers have the need to adopt a “pedagogical disposition”, teachers should conversely adopt a “researcherly disposition”.

Each of our practitioners certainly embodied a researcherly disposition. They were researchers and practitioners in one body – pragmatic intellectuals.

A component of a researcherly disposition is conducting philosophical investigations of the purposes of education, and how these purposes can be realised (i.e. implications for practice). The critical evaluation advocated by Hattie as what is asked of teachers and school leaders, is philosophical investigation.

Philosophical investigation is also required of practitioners in assessing a range of considerations to inform their practice. In considering research evidence to inform practice, practitioners need to weigh quantitative evidence, qualitative evidence, benefits, costs, (including side effects) ethical considerations (what is morally/ socially/ politically acceptable) as well as contextual factors (for what other populations can we expect these same conclusions to hold?) This is about combining evidence to inform practice. Practitioners would not wish to exclude evidence that may be relevant to their practice.

We have no experts on combining disparate kinds of evidence (apart from some neat meta-statistical techniques, which do not stretch very far). But doing so is at the heart of scientific epistemology when that epistemology is directed at establishing results we can use – the relationship between research and practice. It involves philosophical analysis.

# Conclusions

There were major educational innovations occurring in the schools we visited. These innovative practices weren’t just changes, they were disruptive and they were designed to last. Our innovators did not enact their innovations alone - they brought others on-board early.

Our innovators were active consumers of research and used research to inform their practices. This research indirectly informed their practice. They read and engaged with a wide range of literature.

They also used a broad range of qualitative and quantitative data to evaluate their practice. In doing so they were vitally concerned with evaluating the impact of their practice on student learning.

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**Appendix A - Research Informed Practice – Reference to researchers**

|  |  |  |  |
| --- | --- | --- | --- |
| Researcher | Frequency of reference | Discipline | Notes |
| John Hattie | 6 | Education | Visible Learning |
| Carol Dweck | 5 | Psychology | Mindset (Book) |
| Ken Robinson | 4 | Education/Psychology | Creativity |
| The Buck Institute | 3 | Education | Website |
| Yong Zhao | 2 | Education | Entrepreneurial Education and creativity |
| Michael Fullan | 2 | Education | School Effectiveness |
| Jane Hunter | 2 | Education | Use of IT in classroom |
| Robyn Ewing  |  | Education | AGQTP |
| Wayne Sawyer |  | Education | Partnership |
| Stephen Heppell |  | Education | Futures thinking |
| School Furniture companies |  | Corporate | Prototyping furniture |
| Corporate sector |  | Corporate | Partnerships involving research |
| Lev Vygotsky |  | Education |  |
| Jerome Bruner  |  | Psychology |  |
| Geoff Petty |  | Education | Book on evidence based practice |
| Andy Hargreaves |  | Education | School Effectiveness |
| David Hargreaves |  | Education | School Effectiveness |
| Louise Stoll |  | Education | School Effectiveness |
| McKinsey |  | NGO | Organisational development |
| Peter Senge |  | Leadership  | Organisational culture |
| Edutopia |  | Education | On project based learning |
| Stephen Covey |  | Leadership/ Business |  |
| Jason Clarke |  | Psychology |  |
| Ken Wilbur |  | Psychology | Transpersonal psychology |
| John Dewey |  | Philosophy, Education |  |
| Jane Loevinger |  | Psychology |  |
| Susan Cook-Greuter |  | Leadership |  |
| Ken Blanchard |  | Change Management |  |
| Sergiovanni |  | Transformational Leadership |  |
| Jim Collins |  | Leadership |  |
| Willian Torbert |  | Business | Leadership |
| Denis Liptke |  | Education |  |
| Elliot Washor |  | Education |  |
| John Hogan |  | Education |  |
| Viv White |  | Education |  |
| Big Picture Education Australia |  | Education |  |
| Steve Walley |  | Education |  |
| Deb Hayes |  | Education |  |
| CSIRO |  | Science | Partnership |
| Stephen Dinham |  | Education |  |
| ANSTO |  | Science | Partnership |
| NASA |  | Science | Partnership |
| CERN |  | Science | Partnership |
| MAAS |  | Applied Arts and Sciences | Partnership |
| Elaine Gurian |  | Museum Curator/adviser |  |
| Dan Rothsstein |  | Education | Teaching Students to ask the right questions |
| Luz Santana |  | Education | Teaching Students to ask the right questions |
| James Paul Gee |  | Education | The Anti-Education Era |
| Musical Futures |  | Music Education |  |
| Ron Berger |  | Education | An ethic of excellence in education |
| Harvard University, Project Zero |  | Education | Thought routines |
| NFS Grundtvig |  | Education | Danish Education Reformer |
| Lowy Institute |  | Pollster | Broad social issues |
| Don Watson  |  | Politics  | American Politics in the Time of Trump – Quarterly Essay |
| John Ralston Saul |  | Philosophy, Politics | managerialism, corporatism |
| June Maker |  | Education | Gifted and Talented Education |
| S N Kaplan  |  | Education | Gifted and Talented Education |
| Dylan Wiliams |  | Education | Formative assessment |
| Paul Black |  | Education | Formative Assessment |
| Linda Darling-Hammond |  | Education |  |
| Seymour Papert |  | Education/ Technology |  |
| Lane Clark |  | Education |  |
| Kelly McGraw |  | Education |  |
| Edward De Bono |  | Psychology/ Business |  |
| Geoff Petty |  | Education |  |
| Bianca and Lee Hewes |  | Education |  |
| Bull, G.  |  | Education |  |
| Anstey, M |  | Education |  |
| Benjamin Bloom |  | Education | Bloom’s taxonomy and Mastery Learning |
| Jean Piaget |  | Psychology/ Education |  |
| MelbourneDeclarationon EducationalGoals forYoungAustralians |  | Education  | National Goals for schooling |

Blogs

|  |  |
| --- | --- |
| Bianca Hewes | https://biancahewes.wordpress.com/ |
| Darcy Moore | http://www.darcymoore.net/ |
| John Goh | https://mepsprincipal.edublogs.org/ |

# Appendix B - Research Informed Practice – Evidence of Success

|  |
| --- |
| **Quantitative** |
| Student Outcomes Data | HSC (number/% of students in each band) |
|  | NAPLAN (number/% of students in each band) |
|  | Number of ‘N’ awards |
|  | Spelling age, reading age, maths age |
|  | Achievement in South Australian spelling test |
|  | Achievement in Other standardised diagnostic tests |
|  | % working above benchmarks |
|  | Achievement in Reading fluency test |
|  | Achievement in The Creativity Rubric |
|  | Value Added  |
|  | Submission of completed assessment tasks |
|  | Achievement in sports, employment, debating, arts, drama (other extra-curricular activities) |
| Student behavioural data | Attendance |
|  | Behavioural referrals |
|  | Suspensions |
|  | Expulsions |
|  | Graffiti |
| Student engagement data | Tell Them From Me |
|  | Other surveys of engagement |
|  | Retention |
|  | Choice of subjects |
|  | Quality of School Life survey |
|  | reading log for students – allowing “on the spot” data to inform teaching  |
|  | “bump it up” wall, goals clearly shown – teacher and student learning expectations |
| Student civic participation | Student informal/donkey voting at SRC elections |
|  | Student informal/donkey voting at SRC elections – compared to electorate |
|  | students standing for election each year |
|  | Number of elected official removed from their posts |
|  | Number of students nominating for or taking on leadership roles |
| System performance | Numbers in sport, artistic, entrepreneurial, scientific domains per head of population compared to other nations |
|  | School Excellence Framework |
| Teacher | Staff attendance |
|  | Teacher involvement in innovative programs |
|  | Retention |
|  | Surveys |
|  | Evaluation reports |
| Parents | Participation in school events e.g. parent-teacher nights  |
|  | Surveys |
|  | Participation in Parent Forums |
| **Qualitative** |
| Student engagement | Hum of excitement in a school |
|  | Vibes - when you walk into schools you get the feeling of what a school is like. |
|  | Educators can pick up a “Vibe” of whether students are engaged in their learning. This vibe is conveyed by talking and listening |
|  | Richness/quality of conversations |
|  | Number/Quality of questions |
|  | Quality of dialogue |
|  | On-task behaviours |
|  | students can answer their questions of “what are you doing?” |
|  | student engagement with political forum |
|  | SRC functioning successfully |
|  | Quality of decisions made by SRC e.g. on mobile phone use, anti-bullying |
|  | observation, conversations, creating mutual understanding and meaning |
|  | enjoy talking about their learning |
|  | Running to school |
|  | Unwillingness to take breaks |
|  | Pride in public displays of work |
|  | Photo-illicitation - They take series of photos and you see if they can group them. This way they can articulate how they’re learning what they’re learning. |
|  | Embodiment of museum artifacts in project work |
| Teachers | Changed/improved practicee.g. Teachers talk less, listen more. Shift from teaching and passive learning, to active learning in the classroom. Students teach as much as the teacher |
|  | Excitement about work |
|  | Thinking in a really rigorous way about how they can improve their practice |
|  | Working collaboratively to collect, collate and reflect on evidence and data |
|  | Sophistication of reports and the depth of analysis |
|  | Improvement in ability to evaluate and evidence the impact of their work |
|  | enjoying collaboration across subjects, |
|  | Level of team work |
|  | feeling safe taking risks |
|  | Connection with teachers outside the school e.g. on social media |
|  | feedback |
| Parents  | Feedback on parent-teacher nights |
|  | feedback about student enjoyment of school |
| Community | School social media hits |
|  | Buy in from broader school community |
|  | Positive mention in parliament, media |
|  | Feedback |