

Building connections: Research, Theory and Practice — A view from a Practitioner

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I was at a conference in Amsterdam a few years ago watching as people joined a small group of delegates. They appeared to be talking German to each other, but when another man joined the group the language quickly changed to Dutch. I was at a loss to connect with this group, as I didn't speak any of their languages. Most Europeans learn English as their second language, and when the conversation eventually turned to English I was relieved, and suddenly I was connecting with these people and establishing myself as a

The other day I took my class to practice our item for assembly. We needed to use the microphone. The whole sound system was on, the lights on the panel were working, the wires all appeared to be connected, the kids were waiting eagerly to get on with it...but something wasn't getting through, something wasn't connecting. We were all standing around in a state of confusion, not really knowing why it wasn't working. After some jiggling and suggestions from the class techos there was a bit of a buzz, then it was all systems go and we were wired for sound.

Within a recent research project, the teachers were selecting their 'final eight' from a list of twelve children who were struggling with their mathematics. These would be the children who would be offered a ten-week Intervention program in Term 3. Four children would miss out and become the control group. The researchers could not understand the hesitation from the group of teachers, and suggested we just rule a line in the data after the eighth child. What the researchers viewed as a data set, the teachers were considering as little people who deserved the opportunity to improve their learning. I think an important connection between research and teachers is that teachers can put the 'heartbeat' into the data.

When we talk about building connections between research, theory and practice these analogies seemed particularly powerful to me. I think working with researchers has given us (both teachers and researchers) a shared language, which allows us to be part of the same conversations! I think that some important connections can be made that allow teachers and researchers (the techos?) to get that system working and make some beautiful music together! And I think that as teachers, we tell the stories that explain the 'variables' in the data.

Why Get Involved In Research Projects?

As the new mathematics Coordinator at a small Catholic primary school in 2001, I was looking forward to getting a few extra resources and inspiring the classroom teachers to move away from texts and become a little more enthusiastic and passionate about their mathematics sessions. Our Principal had a grander vision. She wanted to make the programs at our school reflective of best practice in Victoria. Well, actually, the world. Her idea of how to go about this centred on accessing current thinking in the teaching and learning of mathematics and getting involved in cutting edge research.

Being involved as a classroom teacher working with researchers has been a rewarding experience that has impacted on me personally, but more importantly has

made a difference to the children I teach. Having held the widely accepted view teachers have about researchers, that they are so far removed from the realities of everyday teaching and what was really going on in the modern classroom, I was going to go in to bat for primary teachers and set things straight. My first experience with researchers involved the team from RMIT.

A particular aspect that I would like to share was my involvement in the Behind The Screens sessions that was a component of the *Researching Numeracy Teaching Approaches Project*. These sessions were similar to the *Reading Recovery Training* format where a teacher teaches a student behind a one-way viewing window while the tutor comments on what is happening to a group of trainee Reading Recovery Teachers.

Our research sessions involved teaching a small group of children while the researchers and other teachers tried to identify approaches that REAL teachers use in their classrooms. Behind The Screens is probably the closest I've come to 'lab rat'. It's the scariest thing I have ever done in my teaching career.

Although you expose yourself professionally to a critical review of your teaching, what you gain is the most incredible opportunity to really reflect on your practice and engage in mathematical conversations that normally do not happen in the busyness of the school day. In the process we developed a tangible trust, and an understanding that we were still all learning together (even after 20 years of teaching).

The experience of the researchers and their pedagogical knowledge was the catalyst to motivate us all to deepen our own understandings and to make a few connections that we otherwise would not have made. We talked extensively about the scaffolding practices as we developed a language of mathematics related to a common understanding of particular approaches, which we had personally witnessed. See why I was talking about those conference delegates?

The opportunity to view eight other teachers as they worked on a multitude of activities to reinforce or develop mathematical understandings with children from their own class was a privilege. We constantly use modelling as an effective teaching approach, but we rarely have the opportunity to watch other teachers doing what we do all day every day, even if it was from the other side of a screen of glass.

What Did I Learn That was Relevant to me as a Classroom Teacher?

A number of points come to mind:

- 'Fail to plan, plan to fail'! I actually learned this way back when I was in teacher training, but it was reinforced as I really thought carefully about what and why I was planning. I was not just saying that I had carefully selected activities that targeted the children's point of need ...I really had.
- I learned the importance of 'wait time'. Sometimes a child appeared to take a long time to answer, but what we observed was the hard thinking that was going on. Often in a classroom situation if a child is not spontaneous with an answer, we ask another child to ease their discomfort or to speed things up. Creating the expectation that we value everyone's attempts and that we will give them thinking time has become accepted in my classroom.
- I observed first hand what 'classroom culture' looks and sounds like. Different teachers' work routines were apparent. Different teachers' expectations were evident. Different strengths and challenges were seen. I saw effective strategies for teaching problem solving, transformations, money, chance and

data. This was so much richer than reading about an activity in a resource book.

- I learned that the discussions the children had as they developed their understandings were probably more important than finished ‘bookwork’
- I learned that we have to develop the children’s mathematical language so they will be able to express themselves and articulate their problem solving strategies.
- Journal writing is an effective way to monitor the children’s understandings and encourage them to become reflective learners.
- I learned that I needed a clear understanding of the concept I was teaching so that I was prepared to take the children where they needed to go next.

Working with researchers gave me the first experience of discussing a single lesson in detail and reflecting on the different components of that single lesson. We were able to discuss activities that worked well, but far beyond this we were able to discuss the things that we actually SAID that were impacting on children’s learning, supporting them in one way or another to try again, make a connection, do it another way.

My classroom today is very different to what it was even five years ago. I had my mathematics groups nicely split into low, middle and high. I had my CSF¹ and away I went. When I started teaching a Grade 3 class I would get straight into 4 digit numbers because they should know these by the end of Grade 2. I worked through my Rigby¹ program and felt confident that I was a good mathematics teacher. I administered my Diagnostic Maths Test in November to let next year’s teacher have information on what the children did not understand (not what I hadn’t taught them). I went to occasional professional development, but literacy was the main focus.

Through access to the *Early Numeracy Research Project*² and our subsequent involvement in *Success In Numeracy Education*³, I know that this was probably not the best way to develop children’s mathematical understandings.

I now value the focus on assessment to inform my start points with the children. This impacts on my planning, and three groups would now be a luxury. We reassess in July to inform our teaching for the second semester and to measure the children’s growth in the first half of the year.

I feel like I know what the children are thinking and how I can build on this thinking to help them become more confident and efficient mathematicians. Because my knowledge has improved, I feel more confident in helping my colleagues, discussing children’s progress with parents and driving the direction of the curriculum.

This knowledge of the individual child has now impacted on our reporting to parents. The teacher and child identify individual goals in numeracy and prioritise things they can do to achieve these goals. The children have become more involved in identifying areas they need to improve. Their remarkable level of self-awareness has astounded me.

¹ Victoria’s current curriculum guidelines

¹ Popular mathematics program published by Rigby

² Research program run in Victoria

³ Another research program run in Victoria that heavily involved teachers

Impact on Professional Development at school

Through our involvement with research, especially the action projects, the approach to teaching and learning mathematics at my school has drastically changed. So much that a recent update of our mathematics policy resulted in a total rewrite.

The problem with new learning is that you just can't keep it to yourself. As different researchers have presented new ways of teaching, learning, assessing and reporting in mathematics, we have had to evaluate our current methods and respond to this new thinking.

We are better at presenting consistent language across the grade levels when teaching mathematics. We have a common understanding about the importance of mental computation. We have made a conscious effort to delay formal written recording. We selectively identify excellent learning activities which double as assessment tasks. We collect data to inform our teaching programs, how we group children, which areas we need to target in our teaching, not just in individual classes, but also across grade levels and across the whole school. All these changes have been directly associated with our involvement in research initiatives.

Being involved with researchers provides teachers and schools with a structure and a purpose for change. Not that we implement change for the sake of jumping on the latest 'you beaut' trends coming out of universities. The teachers at our school were confident and capable in their teaching of literacy. We had evidence through testing and ongoing data collection that we were making a big difference to the literacy learning of the children at our school. We knew we could do the same with mathematics, but needed guidance and support. Research projects are an excellent way to receive both!

Being involved with research projects has forced me to develop administrative and leadership skills in my role as school based co-ordinator during different projects. I have learned how to implement and manage significant change programs at school level. How to convince already busy teachers to take on extra recording, different structures and teaching approaches, extra meetings. I have learned how to delegate, when to involve the leadership team, when to push and when to back off.

Some Recommendations for Strengthening the Connections

I would like to have all this learning by teachers recognised in a formal way. I have studied some master's units at university and have been involved in projects with researchers from universities. The work required for the projects is colossal. The learning and impact on my teaching is equally colossal. The research is based in real life, with real children in whom I have a vested interest. If I could impact on formalising this connection between research, theory and practice it would be to recognise teachers for their contribution to the equation.

Researchers also need to recognise that teacher involvement in their projects is often 'as well as' not 'instead of'. Funds need to be allocated to support your school-based coordinators to be released from their normal teaching load to do the best job for your project.

Whole school professional learning days are also a fabulous way to build connections between research and practitioners. These days allow for sharing knowledge, discussion of practice and are a great opportunity to review and evaluate the impact of the project. The *Researching Numeracy Teaching Approaches in Primary Schools* offered four whole school days over the two years of the project and

our staff really appreciated the time out to reflect on what we were doing and to share in current thinking from researchers.

Fortunately, the most rewarding impact has been on the children. To improve the learning of all children embraces the essence of our purpose as teachers. Previously we were able to suggest that children were ‘improving’ in their learning through the use of pre and post topic tests generally left to individual teachers to determine. Now we have consistent internal assessment data and improving AIMS⁴ as evidence.

What we are now able to offer the children at our school is a program that is ‘tailor made’ to their learning needs. The positive impact of this is children who are actively engaged in the task they are doing as it provides just the right level of challenge. More able children work on tasks that are equally as challenging at their level, and less able children get the support they require to consolidate their understandings. We still have refinements to make, and are constantly adjusting our programs as we develop deeper understandings about how children best learn mathematics.

And that view I had about researchers? With the current emphasis on action research projects where researchers and teachers are able to work together as co-researchers and co-learners, perceptions can change significantly. My knowledge of teaching and learning mathematics has been greatly enhanced through discussions with researchers. I have been encouraged to take risks, have a go, do things differently, explain my thinking, identify and prioritise goals, justify my position, embrace further learning ... sounds just like what research is telling us that effective teachers do with the students in their class. If a school wants some assistance with improving the quality of their mathematics program, I usually advise them to get involved in a research project.

⁴ General assessment of ability, that includes a numeracy test, administered across the system