Building connections:
Research, Theory and Practice — A View from the Profession

Will Morony
Executive Officer, Australian Association of Mathematics Teachers Inc.
<wmorony@aamt.edu.au>

Dear Alexzandra

I have been asked to talk to a group of important people and thought I would write to you about it. I have put your picture at the top of the letter so everyone knows what you look like. It is the picture I have on my desk at work. It is an old photo of you in the bath, but I think you will agree it does look like you even now you are eight.

Some of the people in the audience I will be talking to are teachers in schools. Most of them are people who are teaching the people who are learning to be teachers in places called Universities. They all do something called 'mathematics education research'. I only have about 10 minutes to talk to them, so I will send them a copy of this letter in case I speak too fast, or don't get a chance to say everything I would like.

The talk is called "Building connections: Research, theory and practice", and I will be talking about the 'perspective of the profession'. One of the things I will have to do in this letter is to try to explain some of the big words to you, and there are quite a few in that first sentence!

Perspective of the profession — this means what the Australian Association of Mathematics Teachers (it is where I work — the organisation of teachers of mathematics in schools) thinks about things. It is a pretty hard thing to do. Although I work for the AAMT, I can't talk for all of the teachers who are our members. They are all different and some of them probably think differently from me. I hope so, anyway, as it would be a boring place to work if everyone agreed all the time! So I have decided to make sure the people listening understand that I can only really talk for myself, even though I hope lots of members of the AAMT agree with me.

The other thing I should explain here is about the idea of *profession*. Doctors are a profession because, among other things:

- they have worked out what it means to be a doctor and everyone agrees
- to be a doctor you need to measure up to some *standards* (rules), and if you don't they (the other doctors) kick you out and you can't be a doctor any more

- the doctors who are working have a say about the study others need to do to become a doctor and that they need to do to continue to be a doctor
- they have ways that allow new doctors to learn from older ones

Some people aren't sure whether mathematics teachers (or any other teachers) are a profession. I think they are. Or at least they can be if they work together and try to organise themselves more like doctors. I don't mean with all the blood and yuk because that is doctors' work. I mean in the work they do in teaching mathematics. The place I work and the people in it are working really hard to try make sure teachers of mathematics are really appreciated as a profession. We think it will help with a lot of problems we have got such as getting people to want to be teachers of mathematics, making them want to stay as teachers and getting everyone to understand what a great job good teachers of mathematics actually do. Maybe the people in the audience can help us with that.

Back to the words I need to explain. *Research* is finding out new things. You will do a lot of it over the next few years at school, and it is a good thing to learn how to do. Mummy is doing research to find out about our family tree, although with the new baby she probably won't have much time for a few months! To do research you have to ask a really good question that you want to work out the answer to. But it is not much good if you can't find out the information that helps you answer the question! So a lot of the time people need to work with other people to do their research. For the people I will be talking to, that often means teachers of mathematics.

Theory is like the 'perfect' way for something to be. For example, the theory is that the new baby needs to be fed every four hours. And we all know that doesn't always happen! But having the theory helps because it gives Mum a starting point when she is planning the day. She knows she will have to make changes in what she does because the baby will want to be fed after three hours, or sleep a couple of extra hours (if only!) or whatever. If the baby gets sick, of course, the theory won't work at all. It is the same thing for teaching and learning mathematics. The theory is really good for teachers to have as a starting point and as a way of working out what is going on. Of course, research (new knowledge) helps develop the theory (what is going on). So the theory is always getting better.

Practice is what gets done. In this case, I think they mean teaching of mathematics. On the other hand, there is doing research and that is a *practice*; and even developing theory is a *practice*. This is a case of *ambiguity* — that is a big word that means that what is actually meant is not clear from the words that are written. Lots of times it is not good to have ambiguity — it wouldn't help to say to someone that to get to the park from our house you need to go to the front gate and turn onto the footpath. You'd have to say which way to turn! But sometimes it is good that there is some ambiguity as it gets people talking and thinking. For example the way you turn at the front gate really depends…if you want to get there the quickest you turn left; if you want to have a chance of seeing the tram go past then you'd turn right. You'll get to the park in the end!

Teaching mathematics is a bit the same — there are lots of ways of doing it and what teachers actually do depends on a lot of things. They are making decisions all the time and their practice (their teaching) relies on what they know about research, theory and what they have found out before in their teaching. And what they have found out before can be heaps. They will know about their students (what they can and can't do in maths; how they learn best and so on) and they will have their experience as a teacher. They will also know about the mathematics itself and ways to get kids to learn it, although it is very worrying for me that some of them may not

know as much as they should or would like to know about this. But that is another story for another letter.

Getting back to the point, what I am trying to say is that teachers aren't robots! They have often been teaching for a while. Through thinking about what they do they have *wisdom of practice* that helps them to decide how to do their teaching. Sometimes, in fact, they can even be a bit stubborn and not want to listen to new ideas. That is not good, as everyone should always be trying to learn new things. Don't you agree?

So what am I going to talk about? There are a couple of things:

Professional teachers of mathematics are also researchers. In fact they do a very complex job that involves doing 'research' in their classrooms (they are always trying out new things and working out how well they worked), developing theory (maybe that is really what the *wisdom of practice* really is) and using that theory in their teaching. Some of them are better at all this than others, of course, and they would all say they can be better — if they are professional they try to do something about it. That is where many of the people in the audience can and do come in. They are the teachers' friends. They get teachers involved in other projects to do research and they provide lessons for teachers in which they learn new things. All this is called *professional learning*; it used to be *professional development* or *PD*. I hope people see that the difference is not just in the name. The idea of *learning* is that the person has to do it for themselves. You are the one doing the learning of Spanish — the teacher can't do it for you! *Development* can be something done by one person to another. It is much more professional to be a learner than to be developed. But I am getting off the point.

One of the other things I will talk about is *helping teachers learn about new research and theory*. It would be really easy if we could open up the top of a teacher's head and pur in new knowledge about research and theory. But as you know it doesn't work like that in school for you, so why should it work for teachers' learning? Funnily enough, some teachers say "Just tell me what to do and I will do it." It is crazy for anyone to think that will work! The fancy word that is often used for getting information out to teachers is *dissemination*. This means to spread information. But it is interesting (to me anyway) that part of the word is the Latin word (olden days language) for 'seed'. So the idea of dissemination is more than spreading the information. It means also for the information to be like a seed and to grow. Like a plant grows from a seed. So what everyone should be trying to do is to make the ideas from research grow in the teachers' minds. It is a bit like if you get an idea for a story you think about it for a while; maybe discuss it with other people in your class; then you begin writing, think about it for a while, then change it until your idea grows into the story. Or like making a picture…

Now I am sure the people in the audience really want to help teachers do a good job. In my mind, the thing that needs to be worked on all the time is for them and the teachers to have good relationships with each other. That means they have to respect each other, and the work that the other ones do. Sometimes people think they are respecting others but they aren't really. So teachers who say to the people who do research "Come and tell me what to do" aren't being fair, or respecting what the researchers have been working on. And any researchers who say, "I told the teachers what I found out and they should just do it" aren't respecting that teachers need time to think about the information and what it means for them and their class.

Sometime researchers and teachers have really good relationships and work as partners. Other times it is harder and needs to be worked on. I think that is one of the

roles the AAMT and other groups like it can play. We can provide ways for teachers and researchers to get together and learn from each other. We can help information about research get to teachers as ‘seeds’ that grow. We can argue with the really high up people for those things that will help teachers and researchers.

So the profession of teachers of mathematics can play a big role, I think, in forming the partnerships between researchers and teachers that can really help teachers do a better job. And the professional associations like AAMT can be really important in that. I’ll be telling the people about that.

However, the most important thing I want to tell the people about *Building connections: Research, theory and practice* is that it all doesn’t add up to anything important unless we all — teachers, researchers, teacher educators, bureaucrats, people who work for AAMT — get one thing straight. That is that it people like you who are the reason for doing those jobs. What is best for kids and their learning of maths to become good citizens in the world is what has to be behind everything they do. Who cares if a researcher gets another grant…*unless it is clearly about improving kids’ learning of mathematics?* Who cares if a teacher spends a lot of time involved in professional learning… *unless it is clearly about improving kids’ learning of mathematics?* Who cares of the AAMT has a successful conference on mathematics in the middle years… *unless it is clearly about improving kids’ learning of mathematics?*

No, the only thing we really should care about is you and all your friends in all the schools in Australia. Even if the work we do is a long way away from the classroom (as mine is) we should still be able to say each day when we finish work “Today I did… and I know that will help kids learn maths better”. Maybe I’ll try to get the audience thinking like that. If we all did, we would easily make the connections that matter.

I think when I give the talk I will start with this last point. It is the most important connection for everyone in the room to remember. See you soon.

Love from Wa Wa XXX