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Inquiry into Effective Strategies for Teacher Professional Learning

Papers to support presentation by:

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Learning from the Past

From circa 1985-1988, the Mathematics Curriculum and Teaching Program (MCTP), through the Curriculum Development Centre (CDC), Canberra, researched, developed and recorded definitive responses to the question of effective strategies for teacher professional learning in mathematics education. Its findings were published in:
Lovitt, Charles & Clarke, Doug (1988) MCTP (Professional Development Package) *Activity Bank Volumes 1 & 2*, CDC, Canberra.

When CDC closed, these books, associated resources and the pursuit of quality professional development in mathematics were assimilated into Curriculum Corporation. The volumes are now out of print but, none-the-less, they contain, important material to inform the Inquiry, especially in the Overview pages of Volume 1. The work of MCTP (itself built on work in mathematics professional development which can be traced to the 1970s) has continued and expanded through Mathematics Professional Services of Curriculum Corporation.

Mathematics Professional Services (MPS) is responsible for a suite of professional learning experiences such as Maths300, Mathematics Task Centre Project and Maths on the Move. On a day to day basis these are largely managed through Black Douglas, which also gives MPS access to the Calculating Changes project.

Page 13 of the Overview above lists key features of successful professional development. With very little change, these are also published in Maths300 at:

http://www.curriculum.edu.au/maths300/profdev.htm

At this link you will read:

Research suggests that professional development most likely to succeed:

- is requested by the teachers
- takes place as close to the teacher's own working environment as possible
- takes place over an extended period of time
- provides opportunities for reflection and feedback
- enables participants to feel a substantial degree of ownership
- involves conscious commitment by the teacher
- involves groups of teachers rather than individuals from a school
- increases the participant's mathematical knowledge in some way
- uses the services of a consultant and/or critical friend

Given that even some of these criteria are in place, the professional learning session itself must still model the principles of quality teaching. Teachers respect presenters who 'practice what they preach'. On Page 4 of the Overview, MCTP records that:

Quality teaching is characterised to the extent that the learning environment:

- starts from 'where the pupil is at'
- recognises that pupils learn at different rates and in different ways
- allows pupils time to reflect on their own thinking and learning
- involves pupils physically in the learning process
- encourages pupils to expand their mode of communicating mathematics
- responds to the interests, concerns and personal world of the pupil
- conveys the wholeness of mathematics, rather than presenting it as a disjointed collection of topics
- recognises the importance of risk-taking for effective learning
- encourages pupils to learn together in cooperative small groups
- invokes the power of visual imagery
- recognises the power of story-shells

- is non-threatening and encourages participation of all pupils
- encourages a wide variety of strategies in problem solving and investigation
- recognises the key role parents play in the pupil's development
- uses the full range of available and appropriate technology
- recognises the special needs of particular pupils
- uses a range of assessment procedures which reflect the approaches to teaching and learning mentioned above.

Substitute 'teacher' for 'pupil' and think of the context as the professional learning environment and clear guidelines for effective teacher professional learning are revealed.

Teachers' Views on Professional Development

When invited to present to the Inquiry, I felt it would be inappropriate to only present my own views. Surely teachers would know much about effective strategies for their own professional learning. So, I emailed over 400 Victorian teachers who have listed for eNews from the Mathematics Task Centre Project and asked:

- What do you value when you attend professional development?
- Are there ways of developing professionally which don't involve attending sessions or courses?
- What are the factors which you think support high quality professional development.

I received 20 replies which, unedited, are recorded below. I believe these reflect the current relevance of the MCTP research. Perhaps Committee staff could be asked to analyse these responses for common threads and their connections with the MCTP work.

What do you value when you attend professional development?

- Meeting other staff, networking, getting new ideas, getting confirmation you are on the right track.
- Networking opportunities! We learn so much from each other. Older staff who have been using Peel or Maths300 for years have so much to share not to mention younger staff with great new ideas.
- If the budget at your school can handle it, it is best to go to PD in pairs at least so that when you come back to school you can work together to develop and share what you've learnt. Often the budget does not allow it.
- I value ideas I can USE in my own teaching. These may include:
  - practical activities that I can teach (to a mainstream class or larger group) with very little further preparation on my part;
  - suggestions for using physical materials and ICT and non-standard resources (e.g. novels, music, art, etc.);
  - effective methods and materials for assessing what students know and can do, or surveying their attitudes or abilities; and
  - effective remedial intervention for specific topics or specific difficulties.

  I also value being able to TAKE STUFF AWAY that I can USE.
- High quality presentation that directly relates to the learner. Practical. Hands-on. A presenter who can relate to where teachers are coming from. Short, sharp and shiny. Something to take back to the classroom and implement straight away.
- practical and relevant professional learning
  - clear direction about how this new learning can assist/further develop my students
  - examples of how it has worked in other classrooms
  - links to what we already know (if possible)
  - links to recent research

- I like to come out with practical comments - not just theoretical ideas - when I attend a PD. For example, theoretical ideas could be translated into practical activities *during* the PD by the attendees , under the guidance of the presenter. This way, each attendee 'owns' their PD and can use it in their own practice. I also like to meet other teachers in a 'different' environment and I like to be able to discuss with them. It makes me reflect on my own practice. It also shows me other perspectives.
- The thing I value most about any professional development is walking away with something I can try in my class in the next couple of days. It doesn't matter if it is an activity, a process, a particular way of teaching a bit of maths, or anything else. If I am thinking and adapting to deliver it to my class, then the PD has some flow on and I feel my time spent there has been of value.
- On going PD not one day wonders! PD from experts that has practical applications in the classroom. Targeted PD to improve teacher strategies and practice. Coaching tied to demonstration which is usually best done with a teacher's own class. Visiting other schools to see programs and strategies in action. Good organisation.
- Professional development which is relevant to me and my students is of high value. It must also bring about effective change to my teaching as well as increase student participation in Mathematics. Follow up professional development is vital. Teachers need a forum to exchange ideas as well as discuss what they can improve on and some of the difficulties they have experienced in implementing ideas or maths tasks. By focusing on the whole staff , as a team we can all bring about effective change by engaging in high quality ongoing professional development.
- Opportunities for ongoing support from presenters. Connections made to the curriculum and/or teaching and learning programs. Activity based material which can be utilised immediately.
- Teachers love to be able to bring back fresh ideas for their classroom. Learning how to introduce concepts in exciting hands on activities. Assistance and examples of planning curriculum.
- Hands on activities that you can use in the classroom. Hands on activities students can use.
- Practical, useful and tested items. Ability for follow up with colleagues at my school or in the district. Knowledgable presenters. More than a 1 off wonder - again links for further usage.
- Professional Development needs to be practical, needs to provide motivation and engagement for teachers and learners. I value better more efficient ways of doing things.
- I value gaining knowledge of specific strategies and activities I can use in the classroom to enhance my students' learning. I also value meeting other teachers and sharing knowledge and experiences with colleagues.

Are there ways of developing professionally which don't involve attending sessions or courses?

- Professional reading, Internet sites, talking to other staff about how they teach.
- A lot of very valuable PD occurs when observing other teachers, or working together with other teachers within your own school. However the staffing formulas are so tight that we are worked to the bone with teaching load and yard duty and then voluntary supervision of time out rooms etc. (Coordinators get nowhere near enough time to do their roles and end up using all of their frees doing admin work, ie: discipline!, and must do all prep and correction at home.) So the time to do this valuable PD is so small. I believe the staffing formulas need to be changed.
- Yes. These are effectively do-it-yourself equivalents of formal PD sessions or courses. They include (rather obviously):

- using printed materials as stimulus and background and reference sources: newspapers, books, magazines, encyclopedias;
- using on-line materials, as per printed materials (e.g. Wolfram's web-site, and the Mathematics Task Centre, and NCTM and AAMT and MAV web-sites, and Mathforum), plus using search-engines such as Google;
- using on-line listserv subscriptions, such as the AAMT list, and Jerry Becker's news-clipping service, and MAV's on-line newsletter;
- using non-print, non-on-line materials, such as TV documentaries, and films, DVDs, CD-ROMs.

Ideally teachers become self-directed, life-long learners. Beyond passing time, and recreational activities, and general personal housekeeping and life-maintenance, teachers should be continually reading, not just in their specialised areas of professional interest, but in diverse areas of personal interest, that may, by lucky coincidence or serendipity or synchronicity, happen to connect with something they need, or could use, in their professional work.

- Coaching. As a literacy coach in the Hume Region I can certainly advocate getting into classrooms. I can see changes in teacher practice as a result of the coaching.
- Collegiate visits between teachers. Focussed and effective Professional Learning Team (PLT) meetings at school level. Coaching.
- I believe the gathering in a different location and for a given time allows better focus, away from daily teaching constraints. It is important to meet with people - not just on line.
- Coaching tied to demonstration which is usually best done with a teacher's own class. Coaching can be done by in school experts or outsiders. Visiting other classrooms in the school to see best practice. Visiting other schools to see programs and strategies in action. Looking up the Internet using such programs as E Learning to see examples of best practice.
- Professional development in mathematics requires a whole school approach in order for it to bring about effective change in our schools. It cannot be done solo, independently, as we need a team approach if we want long term effective change. Attending courses by yourself may bring about change in my classroom but when theses students change teachers their enriched mathematical experiences will not necessarily change. These students may lose interest in maths. Continuity in engaging rich tasks is important at all levels.
- Ways of developing professionally without attending sessions and courses are difficult, because the 'experts' give you some starting point and opportunities to see, incorporate, develop new and engaging practice. Certainly collegial teams can then refine, develop and enhance this professional development at their individual bases.
- Sending out to schools resources of practical ideas that we can use in classrooms.
- Taking time to look through, for example, the Maths 300 material and trialing it. We have done this and have now implemented activities in our term schedules.
- Collaboration within districts - time needed. On line can be useful - if high quality.
- I enjoy on line PD because I can do it in my own time and I can take or leave what I want.
- There are numerous ways to develop professionally without attending sessions and courses. By reading journal articles and education magazines you can learn about what others are doing in the classroom and try to incorporate their ideas in your classroom. By meeting formally or informally with other staff you can reflect on your own practices and learn from the practices of others. By individually reflecting on your own teaching practices and thinking about what could have been done to enhance lessons you can develop professionally.
- Job swaps for extended periods would be another way of keeping teachers fresh and exposing them to new ideas/methods/challenges and cost virtually nothing.

What are the factors which you think support high quality professional development.

- You have to be able to see a use for what you are being told about. You have to be able to visualise how you are going to implement it. You have to have some flexibility to implement it without cutting into so called core work, or you need to be convinced that if you are replacing curriculum, then the students are going to benefit.
- Sessions should be practical with lots of resources provided and ideas to take away and trial in your class.
- Several factors spring to mind. These are related to the PD-presenter, the PD-topic and materials, and the PD-attender.
  For the PD-attender:
  - low-cost (or free, or paid to attend);
  - time-release, with minimal impact on continuity of professional working (that is, time spent in attending PD does not have a negative effect: topics do not have to be caught up because they were missed: the teaching of a substitute teacher does not conflict with the PD-attender's later teaching);
  - professional recognition of effective attendance of PD: e.g. the principal or subject-coordinator values the PD-attendance, and draws on it for in-house follow-on activities: or promotion is partly dependent on good use of PD;
  - personal and professional choice of what PD to attend: the flip-side of this is that PD is attended willy-nilly, for the sake of being able to tick the PD-box, regardless of anyone being interested;
  - genuine interest in and engagement with the PD.
  For the PD-presenter:
  - sensible support for the presenter (remuneration, time-release, costs covered);
  - knowing the subject, and the audience, and connecting positively, constructively, with what the attenders NEED;
  - being well -prepared;
  - ability to communicate, and empathise: a certain showmanship or charisma that makes the PD entertaining and practical.
  For the PD-topic:
  - practicality;
  - novelty (even where the topic is very familiar, finding a different way of approaching it);
  - affordable materials (e.g. cheap, widely available, easily home-made, everyday materials);
  - intrinsic interest;
  - a needed topic.
- I think there has to be a change or upgrading of one's philosophical basis if change is to occur. Professional reading, research papers can provide this. Opportunities for professional dialogue should also be considered as we often clarify our own thoughts and ideas through this process. I also believe that exemplary PD is a model of what it is preaching.
- Presenters who are highly skilled and passionate about their role. Relevance to whole school strategic plan and goals - PD will support teachers in their focus on improved outcomes. Time back at school to further understand and take on board the new learning.
- *Usefulness:* How directly 'useful' I believe the PD will be for teaching practice. *Conducive to reflection:* How much it makes people reflect. *Sharpness and clarity:* How well it is presented (sharp and clear) *Richness and depth:* How 'rich' the PD is - in term of ideas presented. *Enthusiasm:* How motivational it is - will people come out with at least an idea that they *will want* to implement the next teaching day.
- Consistent support from Principal and colleagues to implement changes. An open mind! Discussion with colleagues. Professional Team Meetings. Staff meeting discussions.

Individual Action Research projects tied to teacher reviews. Discussion and presentation of Action Research Projects with staff.

- Engaging and relevant. It must be motivational and at the cutting edge of staff needs. There must be some type of follow-up. Structured as well as a presentation which has variety. Presenter must be sensitive to staff and cultural issues of that school.
- Organisation (pre, during and post) session delivery. On going support. Delivery mode (theory, data, hands-on, relevant material). Relevance to new ideas. Connection to Education Dept directives (ie VELS). Opportunities for participant contributions, clarifications, questions, etc. Understanding of issues facing participants (eg teachers teaching teachers)
- High quality PD includes ideas that work, interesting presenters, activities that directly link in with VELS.
- Hands on activities, research basis, discussion.
- Must dovetail into daily work not be too big an add on.
- I think relevance is the key factor that supports high quality professional development. If it is not relevant to your situation then you don't find it to be of a high quality. That said, what is relevant to one teacher may not be relevant to another.
- (NB: A contribution indicating a connection between initial teacher training and career-long learning through professional development.) Amazed at the short time that student teachers spend at the 'chalk face'. At home in Scotland they spend 6 week blocks, giving them a chance to develop a relationship with the pupils which is, I believe , the key to a good school.

Some teachers added further information. One wrote the following (again, unedited) highlighting a particular issue which relates to using 'the full range of available and appropriate technology'. It also says a lot about teacher commitment - at all levels.

Dear Doug,

As a teacher of some 20+ years (Maths/Science trained- but teaching mainly maths, my husband is also a maths teacher of more experience) I am honoured to be asked how I feel about effective teacher pd.

The Pd has to be aimed exactly at what the teachers of the students need! E.g. in 2010 CAS will be compulsory in year12 Methods – this does not affect all teachers because they do not all teach year 12 however in our school we have 1 year 12 methods class but we have a number of year 11 classes whether they be general or methods. Year 10 students need to get used to these new tools! The MAV have great pd at the end of year conference – but not everyone gets to go BECAUSE OF COST, TIME OF YEAR, BUDGET CONSTRAINTS.

Our year 11 team are teaching themselves how to use the CAS cals. – in the deep end! The students are quick learners and they often bring into the class shortcut!

The Texas instrument team are quite willing to come out to schools at no charge (or minimal fee) because of course we have purchased their calculators! I also have a contact at Texas who I email if there is a type of problem that I know I should be able to do but can't work out how to press the right buttons!

This may be not truly relevant but could we work on the enthusiasm of the Universities. Schools are highly technical in their teaching. We have been using computers and graphical calculators for years and now we use CAS.

With 2 daughters who achieved well at year 12 and went onto Uni only to be turned off Maths because of the lack of technology – my eldest has a boyfriend who is doing a computer engineering course but would not be allowed to use the new Casio or Nspire calculators.

Don't people use computers or calculators in the real world? What is the point of us giving all our passion and passing this on if the students get turned off when they leave us and won't carry on with the enthusiasm we try and often succeed in passing on! No wonder there is a shortage of Maths teachers! Sorry to get on my high horse!

Another teacher recommended, and sent me a copy of:
Cole, Peter (2004) *Professional Development: A Great Way to Avoid Change*, IARTV, Melbourne

and another, a copy of the Department of Education and Training publication *Professional Learning in Effective Schools: The Seven Principles of Highly Effective Professional Learning*

I presume the Committee is aware of both of these documents.

Examples of Best Practice in Teacher Professional Learning

Two examples follow of professional learning programs which have had significant success in changing teacher practice and thereby creating improved student learning.

Improving Numeracy for Indigenous Secondary School Students (INISSS)
INISSS was initiated by the Aboriginal Education Unit in Tasmania. Its focus was shifting the curriculum vision of secondary mathematics teachers so that the day to day classroom experience became more inclusive of Indigenous students. The professional learning program was paralleled by a research project to assess outcomes which was co-managed by educational researchers from Melbourne University and the University of Tasmania. The 'teacher talk' version of the project's outline and results is included. The outcomes for students, over a four year period, are stunning. The paper also lists both one researcher's and some teachers' views of the key elements which created this success.
The article is printed from: http://www.blackdouglas.com.au/taskcentre/inisss.htm

Reflection on 6 Day PD Program
This article is one primary teacher's view of the effects of a particular professional learning course involving six days in three groups of two spread over three terms. The course , *Engineering 'aha' Moments K-8* is one of the two six day courses available to systems through Maths on the Move, and in this case it was organised through the Riverland Region of the Department of Education & Children's Services in South Australia. Teachers views are as valid as research results and comparison of this personal story with the research above will highlight many common strategies which led to the demonstrably effective teacher professional learning.
The article is printed from: http://www.blackdouglas.com.au/taskcentre/nicdale.htm

(Note: Web-based documents do no necessarily print with neat page breaks as found in Word Processing software.)