

Focussing on Learning in the Classroom

Mark R. O'Brien

Background:

“As teachers, it’s not about how well we teach, but the quality of the learning experiences and learning environment we create in our classrooms”.

I wrote this quote for myself while listening to a presentation at a conference. It reminds me of my focus as I go about trying to reconstruct my mathematics classroom, and help other teachers make similar changes in theirs.

It’s not that I don’t believe our job is vitally important and that having a quality teacher in a classroom doesn’t make a huge difference to students’ learning, it’s just that I think we may have been spending too much time over the years looking at how we teach and not enough time on looking at how our students learn.

I’ve come to this realisation as I have followed a journey over the last six years towards getting students in mathematics classes more connected to their learning and reducing the incidence of; “when are we ever going to use this?” or, “maths is my worst subject”.

The beginning of this journey was in 1999 when after 20 years of teaching in state schools and a year in a private school I decided that students were becoming less and less interested in mathematics lessons, including my own. I was relying on the students respect for myself as a teacher and my management skills to keep them on task, rather than them having a real sense of purpose and being intrinsically motivated towards maths lessons.

It was also disappointing to find that a lot of the advances in mathematics education in Western Australian classes that had happened in the 80’s and 90’s were being forgotten as teachers struggled with increased workloads and demands and began to use resources that encouraged pedagogies which were not those they would have preferred to use.

In light of these thoughts and with the freedom of a *Curriculum Framework (1)* that espoused seven key teaching and learning principles “*which should guide learning and teaching*” I decided to restructure my maths lessons.

Researching best practise in teaching, learning and education these days has been made easy by the advent of the Internet. Rather than try and find time for postgraduate study teachers can now use the Internet to read articles, papers, excerpts from books and a wealth of quality information about any issue, theory or research. It was in this way that I tackled the task of designing a restructured classroom that focussed on learning.

The following material will summarise the structure that developed with brief justification of methods and give some support for implementing these pedagogies. It would be useful for teachers interested in this structure to research each of the pedagogies further.

Key Learning Principles:

The learning environment is structured around three principle pedagogies. It is **constructivist** learning in a **student (learner) centred** environment with students **working cooperatively**.

Support for constructivist based learning in our classrooms can be found in *The National Statement on Mathematics for Australian Schools (2)*, *Principles and Standards for School Mathematics (3)*, and many other papers, articles and books. Put simply, it means that students need to be given the opportunity to construct their own understandings.

Tied in with constructivist learning is the philosophy that the classroom should be learner centred. In a learner centred classroom, each student is encouraged and empowered to take responsibility for their learning. This requires a change in the way the classroom is run so that students can work with a greater degree of independence.

The third principle, cooperative learning, is advocated in the *Curriculum Framework (1)* and supported in many publications. For example, Alice Artzt and Claire Newman in *How to use Cooperative Learning in the Mathematics Class (4)* state: “Research on how people learn has also suggested that learning is a social process and that cooperative learning activities are essential if students are to be able to construct their own knowledge”.

It may not be possible in a maths classroom to implement all of these pedagogies fully all of the time. However, a structure that is based around these principles will better reflect what is being advocated by many educational bodies and supported by research into how people learn.

The Learning Cycle:

It would be difficult to implement these types of pedagogies in a traditional mathematics classroom learning cycle. Because of this I looked for a learning cycle that better suited the structure I was trying to enable and supported the types of changes in classrooms that were being advocated in our *Curriculum Framework (1)* and other similar documents.

The cycle I settled on was: **Exploration** ▶ **Formalisation** ▶ **Application**.

Although I have since found this learning cycle suggested in many places by many people over the last thirty or more years I had first seen it in action in the Curriculum Corporation Task Centres and had felt it would be both suitable to the pedagogies and in keeping with my aim of getting greater student connection to their maths lessons. The increased emphasis on immersion of students (Exploration stage) before formalisation enables them to be more involved and motivated when formalising concepts later on in the cycle. As well as this I strongly believe in the idea that students need to be given constant opportunities to apply what they have learnt to non-routine, contextual situations. By doing this their ability to make use of their mathematics is enhanced and their interest in what they are learning improves.

The Classroom:

A combination of, a learning environment based around these three pedagogies, and presenting learning experiences to students in this learning cycle, was the result of my research, my prior knowledge and experience, and my trials with students.

I first implemented this classroom structure in 2000 and trialled materials with students that supported their learning in this way. Over time refinements were made and I became more skilled at running a classroom where I was the facilitator rather than the “centre of knowledge”.

This classroom has students working in groups of 3 or 4 with materials developed to allow them to construct their own knowledge and understandings and take responsibility for their own learning. I am still the manager of the classroom and it is still a place where both the group and individuals must be catered for in an ongoing compromise of abilities, desires, timetables, outcomes and all the other factors. However, it is a classroom in which myself and other teachers who have adapted it have found students are more connected to their learning, develop deeper understandings, are more positive about learning mathematics and ask the question “when are we ever going to use this?” a lot less!

Further:

It would be remiss of me to not mention that there were a lot of other objectives and influencing factors that were considered in the development of this classroom structure.

These other objectives included my desire to:

- Have greater variety in the learning experiences
- Get each student individually involved in lessons
- Reduce the level of teacher focus and teacher talk
- Promote the principles of “learn to learn”
- Increase classroom focus on higher order thinking

Other influencing factors in what developed were:

- The work by Geoffrey and Renate Caine on the Transformation of Education
- Theories and research on Brain Based learning and how the brain works
- Work on Learning Styles especially the 4MAT project
- Work on Rich Tasks by Gary Flewelling of Canada
- PD that I undertook with Lane Clark of Ideasys
- The advent of graphic calculators and other technology into our classroom

If you wish to find out more about any of these factors those that are on the Internet can be accessed from my home page mentioned after the references. If it comes from a publication you can find further details of the publication via my home page mentioned after the references.

Please feel free to email me at: markrobrien@otrnet.com.au if you have further questions, want any other information, or simply wish to discuss an issue further.

References:

1. Curriculum Framework – Curriculum Council of WA, 1998
2. The National Statement on Mathematics for Australian Schools – Curriculum Corporation & ACER, 1991
3. Principles and Standards for School Mathematics – NCTM, 2000
4. How to use Cooperative Learning in the Mathematics Class - Alice Artzt and Claire Newman – NCTM 1990.

Further information:

You can find most of the Internet material I used and a wealth of other sites via a page I constructed for teachers on my website. Just go to my home page at www.otrnet.com.au and click on [Pedagogy Web Links](#).

You can also find a “library” as part of the web site where you will find full referencing to the publications I have found useful. Just go to my home page at www.otrnet.com.au and click on [Library](#).