

ON LEARNING TO TEACH... AND TEACHING TO LEARN

Mike Ollerton describes the value of letting learners play before getting down to work.

*“We don’t need more knowledge we need more wisdom
Wisdom comes from our own attention.”* Kornfield, J. (1994)

The other day, 17 October 2011, I had the pleasure of working with a group of third year Primary ITE students at York St John University. I was invited to offer input into the Creativity module and one part of the day involved working with a group of twenty-three students. My plan was to offer a range of problem-solving type activities, to discuss the wider implications for

their use in primary classrooms, and to consider how such tasks might be adapted to support creative approaches to teaching and learning mathematics. One of the tasks I have used in a variety of contexts - classrooms, conferences, INSET courses, ITE sessions; as such I was offering something I had used many times before.

The task is as follows:

EXPLORING ADDITION

You have the digits

1

2

3

 and

4

 together with one addition sign

+

 and the equal sign

=

The idea is to arrange the cards to make different totals

E.g. when you add two 2-digit numbers together, e.g. the total below is 55

4	2	+	1	3	=
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How many different totals can be made?

How do you know you have found them all?

What are the minimum and maximum totals?

Explore the totals created.

What totals can be generated with four other consecutive values?

There are, of course, other questions - and with adaptations and further extensions the task is appropriate for use across the 7-16 age range, leading to algebraic generalisation.

On this particular occasion something different happened. This was mainly because the group were so keen and clued-in they began making number sentences the moment they received their sets of cards - before I had explained what the task was. Noticing this playing around was taking place I held back from explaining what the task was, and this meant the students began to devise a range of number sentences. After a couple of minutes I celebrated their inventiveness, and their engagement, and explained how they had proceeded was important with regard to my learning. I then asked students how they might use the idea of giving pupils a restricted number of cards with numbers and symbols. Collectively - students offered the following:

- Using two symbols, taken from $+$ $-$ \times and \div
- Using $>$ and $<$
- Using decimal points
- Using brackets
- Using blank cards

What became clear was the use of the cards was enough to generate mathematical activity well beyond the task I had originally planned. However, had I presented the task as I always had done in the past - as described previously - then I would not have extended my existing range of teaching ideas, and further opportunities would not have been realised.

There are of course issues here about standing back and learning the value of noticing, about actively engaging with what John Mason wrote about almost a quarter of a century ago: *Only my awareness is educable, in the sense that my power to notice can be developed and refined, and my noticing can be focused and directed. Only when I notice spontaneously, for myself, can I choose. Only when I notice my self, do I become awake and free.* (1987, 30)... and, of course, Caleb Gattegno before him.

Each lesson is a complex experiment in a human laboratory, which should teach me something new about what is, in truth, the mathematical dialogue for the minds I am about to meet. The only failure I can possibly experience is my failure to learn something... (1963, 63)

Thanks to these YSJU students, who got stuck-in before I did any further 'teaching', they reminded me of the ATM guiding principles, see page 2; of the value of letting learners play with a resource before posing a task. I was reminded of the value of looking for other possibilities, of using a resource in ways I may have overlooked. The students helped me both to learn, and to extend my range of possibilities.



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References

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- Gattegno, C. *For the teaching of mathematics* (Volume One), (1963) Great Britain, Lampport, Gilbert
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