The assertions of the title were intended to be catchy, provocative and even irritating. This ... is a brief exploration of the mental scratching that arose as a result of encountering them and is offered as a particular case illustrating a general principle: ... catchy assertions are a useful device for working on one's assumptions and beliefs. (*Teaching takes place in time; learning takes place over time. MT126*)

As the first paragraph (above) of the article I am reflecting on suggested, the title did provoke a number of reactions in me. I found myself thinking: What does this actually mean?; Is it really profound or just catchy?; Is it an over-simplification of a complex issue or a beautifully simple way of getting to the heart of a complex issue?

These conflicting thoughts went through my head, but the key thing was that it stayed with me and kept me thinking.

Maybe that is the point of the title and partly what John Mason intended when he first coined the phrase, “Teaching takes place in time; learning takes place over time”. Whether it was intended or not, this musing has had an impact on me and got me thinking about my job. I think the fact that it was re-published so long after it was written means that teachers and academics are still enjoying thinking about and interpreting it for their context today and that is the wonderful thing about writing such as this.

Let me set the context: I teach 10- and 11-year-old learners and I am in my second year in the profession. I am responding to the article that my father wrote all those years ago because we both thought that mine was an interesting perspective from which to consider the title 30 years on. To help me reflect on the phrase I needed to break it into two parts and think about each one a bit more deeply.

*Teaching takes place in time*: This suggests that teaching is an act, an observable and tangible skill that can be witnessed.

*Learning takes place over time*: This suggests that learning is, by contrast, not observable or tangible and cannot be witnessed. It is the product of a wide range of events, influences and experiences all of which play a part in enabling learning to take place.

Initially, I thought of the title as an argument for teaching mathematics conceptually (that is, for deep and sustainable understanding) and against teaching to the test (that is, for mere short-term retention). Often learning that takes place in the run up to a test is a temporary fix to offset a lack of conceptual understanding and teachers work very hard to make sure learners have the procedural understanding necessary to achieve an extra mark or two. When practising the formal method of multiplication, for example, teachers may be tricked into thinking that learning has taken place, “in time” as they witness a child remembering a procedure and solving a calculation that they could not solve ten minutes earlier. However, I think that if this is learning at all, then it is temporary and will be forgotten without an understanding of the structures that underpin the procedure. This happens “over time” thanks to that, “wide range of events, influences and experiences all of which play a part in enabling learning to take place” mentioned earlier. At first glance then, the title seems to suggest that learning is a long-term project and that teaching should facilitate conceptual understanding and therefore deeper and longer lasting learning.

I was reminded of an article by Kirschner, Sweller & Clark (2006) which stated that, “the aim of all instruction is to alter long-term memory” and Mike Askew’s initial response to this in the October 2018 edition of the Mathematics Association newsletter:

> At first sight it seems quite neat: I want my learners, whoever they are, to recall something of what I teach beyond the confines of the time we have together. (Askew, 2018)

It makes sense to me to think about learning as recalling something of what has been taught after the lesson. This seems to support the assertion that learning takes place over time, but it raises some uncomfortable questions about the complex relationship between teaching and learning.

1. If learning takes place over time, is there ever a point where you can say that something has been learnt?
Teaching takes place in time; learning takes place over time: A response

2. If learning takes place over time, is it possible to observe it, know if it is happening or even if it might happen one day?

3. If learning takes place over time, how can you be sure if someone or something is helping or hindering the process?

These questions are uncomfortable because I entered the profession to enlighten, inspire and excite. I have to believe I am important and that I make a difference, but these questions sow seeds of doubt.

This leads me to further questions.

**What is learning, what is teaching and how important are teachers?**

If I accept the view that the aim of teaching is to alter long-term memory, then learning could be seen as the state one reaches once long-term memory is altered. In this explanation, the verb “alter” seems to put a great deal of emphasis on the teacher and little on the learner. It sounds as though teachers forcefully make children learn and I must admit that teaching does sometimes feel like that. It also suggests that the best teachers are those who can alter long-term memory most quickly. I suggest that this is a view that is sometimes held by people who observe lessons. They wish to come to a judgement about the quality of teaching by trying to quantify children's learning (or progress) within that lesson rather than “over time”. There is a danger then that teaching which results in superficial and procedural learning may look better than teaching for deep and sustainable learning when observed “in time”.

In April 2018, Sean Harford, Ofsted's national director for education, published a blog (Harford, 2018) in which he stated that “knowing more and remembering more” is central to progress. This view seems similar to Kirschner, Sweller & Clark’s idea (2006) that the aim of teaching is to alter long-term memory and appears to have its roots in cognitive science which many seem keen to apply to classroom practice even though we are at the early stages of understanding its implications for teaching. If, as Ofsted suggest, we think of progress as “knowing more and remembering more” then it would follow that the best teachers transfer knowledge most effectively. But surely, teaching must involve more than just facilitating a large vocabulary or the memorisation of a wide range of number facts. As Mike Askew (2018) aptly put it in his response to the Kirschner, Sweller & Clark (2006) article “might not some instruction be aimed at changing hearts as well as minds?”.

**What are the implications of the title for the relationship between teaching and learning?**

If learning happens over time, and teaching happens in time, and teaching and learning are co-operative activities, then teaching is the only observable part of the co-operative activity and judgements about the quality of teaching and learning must relate to the teaching. But how can we be sure of what works and what does not work and what good teaching looks like? I have seen didactic, teacher-led lessons which have felt appropriate, inspiring and successful. I have seen collaborative, interactive and highly resourced teaching where the children have not got a clue what they are learning and vice-versa. So, is there anything objective that we can say about good teaching?

The following questions seem pertinent to ask.

- Can good teaching look different in different classrooms?
- Can good teaching in one classroom be bad teaching in another?
- Can good teaching for one child in a classroom feel different to a different child in the same classroom?
- Is it true that good teaching 50 years ago is still good teaching now?
- Is it true that an outstanding lesson in Shanghai would be an outstanding lesson in Singapore or in London and vice versa?

In an attempt to find something objective that can be said about good, or bad, teaching, I was moved to think about some things I have learnt. I have 3 examples:

1. I recently learned how to solve a Rubik's Cube. It took days of what can only be described as torture. I found it physically painful, frustrating and demoralising at times. This led me to think that maybe learning does not always have to be fun, interactive, collaborative, playful or real. Maybe you just have to want to learn something.

2. I am a self-taught guitarist and pianist. When I hear a song that I like, I learn the notes and the techniques or tunings that I need to know in order to play it. I seek very little external validation and I am sure that I will keep playing and improving. This led me to think that children do not need to be told what to learn and it does not always require external feedback or any particular structure or timeframe.
3. I also thought about one of the most powerful learning experiences most of us share: that of learning to walk and talk. Did we do this for the praise? Was it fun? Was it interactive? Was it collaborative? Or did we do it quite simply because we wanted to?

I suppose the most important questions for me are: could I have learnt these things more quickly or more meaningfully with the help of a teacher? Could a good teacher have ensured I became a concert pianist, a professional hiker or an expert linguist or would their influence have been minimal in comparison to the complex range of social, political and personal influences that act upon learners “over time”?

I do not and cannot know.

**Does the focus on teaching detract from the learning?**

Over the last few years, there has been a clear move towards finding models of good practice from around the world and trying to imitate their methods for the UK’s context. I can think of several new initiatives that teachers are trying to come to terms with currently:

- Teaching for mastery.
- CPA approach including greater use of manipulatives.
- Mixed attainment classes/seating.
- More direct teaching.
- An awareness of cognitive overload and the constraints on working memory.

It sometimes seems to me that schools strive to find a formula for teaching that does not rely on a theoretically knowledgeable and practically experienced workforce to ensure high standards. I wonder whether this emphasis on the act of teaching may actually be detrimental to learning as new teachers try to apply all these elements of good teaching at the expense of nurturing their learners.

One of the ATM guiding principles is that “teaching and learning are co-operative activities” and as Laurinda Brown has said (I paraphrase from my father’s recollection of this), “the pupils’ job is to learn the mathematics and the teachers’ job is to learn the pupils”.

The original article highlights a difference between having well prepared lessons: feeling in control and having a good idea of how the lesson will go; minimising the chance of something going wrong and being well prepared for a lesson: having good subject knowledge; knowing misconceptions; knowing your pupils and being open to situations that will challenge everyone in the classroom including you. Being well prepared for a lesson allows you to respond to feedback from your learners, without which you cannot have any sense of whether learning is likely to take place over time. It is very difficult to say what good teaching looks like without knowing the child and if every child is different then good teaching could, and should, look different in different classrooms. Therefore, it seems confusing to me that we can think we can be so sure that we know what works and what does not work and that it can and should be packaged.

So, what is good teaching and how is it related to learning?

Gattegno (1975) argued that there is virtually no limit to what children can self-learn and in a talk to the 1988 ATM conference in Winchester (Gattegno, 1988) called for teaching to “inspire not to inform”. It is this way of thinking that represents the shift I am hoping for. A way of thinking that sees the act of teaching as subordinate to the act of learning, without trivialising the importance of my role in the relationship. The title has generated a lot of questions which I will continue to ponder, and after much reflection, I have settled on one pre-requisite of good teaching: it should motivate children to learn.

**References**


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