

---

# LEARNING TO TEACH – GILL'S STORY

Gill Hatch, with Tim Rowland

Gill Hatch was a very fine mathematician. Indeed, following her undergraduate studies in Cambridge in the late 1950s, she was one of the elite who went on to the notoriously difficult Part III of the Mathematical Tripos. But what did she do next?

The origins of this article, and another to follow, lie in a remark made by Gill at the BCME5 conference at Keele in July 2001. It was a throwaway comment about her having *begun* her teaching career in teacher education, as an Assistant Lecturer in Mathematics that caught my (Tim's) attention. Straight from Cambridge, Gill's first appointment, and her practical and intellectual induction to mathematics teaching as a career, had been at Matlock College of Education, in Derbyshire. My career had begun in a similar way and, later in 2001, I invited Gill to join me in compiling a record of our recollections of our experiences. She readily accepted the invitation and our correspondence towards that shared goal continued until her death in November 2005. The two accounts to follow, in this *MT* and the next, are descriptions of and reflections on our own somewhat non-standard education as teachers. The focus of this article is to be Gill's story. But first, a few words to set the scene.

## The assistant lecturer in colleges of education

In the years following the 1939-45 war, the critical shortage of teachers in England and Wales was met by various forms of emergency training. This resulted in improved teacher supply by the late 1950s, creating the opportunity in 1960 to extend two-year courses in the 'teacher training colleges' to three years. These colleges were either LEA-maintained or in the 'voluntary' (church) sector. As a result of the 1963 Robbins Report on higher education, these colleges were renamed Colleges of Education and in time the possibility of a fourth year of study and a Bachelor of Education degree became available, the first being awarded in 1968. The prior educational attainment of College of Education students in the 1960s was typically modest, amounting to a few General Certificate of

Education (GCE) Ordinary level passes. A pass in English was a requirement, but not in mathematics. The introduction of a category of Assistant Lecturers in the Colleges of Education in the 1960s was a solution to the problem of providing enhanced academic input into a system in transition from a two-year course to a three-year teacher's certificate and thence to the BEd and an all-graduate profession. Assistant Lecturers, normally recent university graduates, were appointed to short-term, temporary posts, supplementing or providing the 'academic' subject expertise in those areas where the colleges lacked it.

The stories which will follow – below and in the next *MT* – are autobiographical accounts of our experiences as novice teachers in two different colleges. Here, first, is what Gill wrote. It is nothing less than her own story of how she began as a mathematics teacher. It captures something of

the spirit of a different age, now nearly half a century ago. Equally, if not more, precious, it recounts some of Gill's earliest formative pedagogical influences and experiences. Those who were fortunate enough to know Gill might well hear her speaking the words.

### **Gill's story: an eccentric way to train to teach**

The introduction by recent governments of 'new' employment-based routes into teaching has caused a certain amount of controversy. The route I took into teaching, at a time when the PGCE was not compulsory for graduates, gave me a panoramic view of teaching. It was, however, an employment route into teaching. In this short account I attempt to describe my experiences and how I feel my 'training' worked.

I recently asked myself how I would have responded to the question I had asked many others. "Why did you become a teacher?" For much of my school and sixth form period I know I would have said it was the last thing I wanted to do. I realised that the truth was that I was set on the road by an honorary aunt who happened at that time to be the Principal of a College of Education. She said to me, "Why don't you get a job as this new kind of lecturer – an Assistant Lecturer – at a College of Education? You only have to teach mathematics, you do not have to train the students to teach." And so it was I found myself on the staff of Matlock College of Education in Derbyshire. The college was founded in 1946, based in two converted hotels perched high up overlooking the valley. The view from my room was absolutely incredible. I think I basically opted for the job as a way of holding directly onto reasonably high level mathematics since, unlike many mathematics graduates (Anderson *et al*, 2000), I had retained a passionate interest in my subject. I had done a little bit of teaching prior to that – three weeks part-time supply in the vacation before my fourth year (for Part III mathematics) at Cambridge, although I cannot now remember why I chose to do this.

For the first few days at Matlock I was sick with apprehension. I am reminded of the reaction of many trainee teachers who desperately need to get the act of standing up and teaching a class for the first time over, so that they know that they can do it. But my position was worse, for I realised that I did not know what a College of Education lecture was like. I had never experienced one and I was too daunted by the age and experience of my colleagues to ask. My confidence returned only when I gave

my first lecture and somehow understood that if only I had been told to think of it as a sixth form lesson, I would have known from the start how to plan. From that point began two years during which I regularly wondered how I could be paid to do something I enjoyed so much. The exhilaration of working with adults, whether training to teach or already teaching, has been with me ever since.

My arrival at Matlock in 1960 was at the significant moment when the move from a two-year teaching certificate to a three-year certificate was taking place and the level of mathematics which we were going to be teaching increased significantly. The trend throughout the 1960s was to require non-graduate certificate student teachers to undertake more academic training – one can see parallels in nurse education in the 1990s. Conversely, by the early 1970s, university graduates, supposedly with good knowledge and understanding of their subject, were *required* to follow a one-year postgraduate certificate course in order to achieve qualified teacher status. Various government initiatives in the 1990s have weakened both of these trends. We have seen the move to the partnership model of ITT and to wholly school-based routes. The employment based routes are growing in popularity. My route into teaching, as an Assistant Lecturer, was also in a sense employment based, but it had in abundance the element of requiring one to step back and reflect from a generalised point of view on the teaching process.

### **Interaction with students**

The first thread in my 'training' was just interacting with the students themselves. They offered a wide range of opportunities to develop my teaching skills in a context in which there were not usually any discipline problems to distract one from consideration of the teaching challenge. Recruitment to mathematics teaching, whether primary or secondary, was a problem even then, so main subject mathematics was taught in small groups which were not differentiated into primary and secondary. I did not find teaching these students very problematic, since the students had chosen to study mathematics and were, usually, interested in it.

I was also asked to teach school level mathematics to groups of students whose main subject was not mathematics and who at this stage were not required to have an O-level in mathematics in order to become teachers. They did, however, have to pass a college mathematics test and get a high percentage on it as part of the course requirements. This idea of mastery was an important one and

therefore the test was about a school year below the level which was required to gain an O-level at that time. This teaching was the first element in my training to teach. I met one student who had no concept of division and so I had to learn about ways of teaching that. Then there was Pat, who was training to teach secondary English, but who had to get through the mathematics test just the same – there are portents here of the current QTS skills tests. Now Pat had attended a secondary modern school [the pre-comprehensive route for the majority of pupils who were not selected for the grammar schools] and done no algebra – again, there are parallels with the different kinds of knowledge implied by a ‘pass’ C grade in GCSE mathematics obtained by the different routes (intermediate and higher papers) to obtaining that grade. We wrestled with simultaneous equations, Pat and I. It was a thing I felt great sympathy with, since they had been a stumbling block for me too. We arrived at the point where she had a method which she understood and could carry out – I recollect her precise method to this day: suffice it here to remark that it was effective but inflexible and rather inefficient. She was inordinately proud of herself when she passed the test. She taught me much about the nature of teaching for understanding, about decisions that have to be made about when to leave a particular topic and about the amount of time it takes for learners to become so comfortable with a method that they can let it go and consider other ways of doing the same process.

There were also my self-styled ‘older backward children’, a group of students who had done most of a university degree and then failed, taking a one year shortened course leading to the three year certificate. This appears to have been a device in 1961-62 to provide some output of teachers in a year when the introduction of the three year certificate meant there would be no qualifiers from that route. They were probably all older than me, but this was a regular occurrence, of which the most extreme case was the student who accounted for his difficulty with something by saying “You see I left school in 1936” – before I was born! It was one of these students who perhaps most astonished me by being unable to conserve area. In fact, I had just been reading Piaget: I went in with some irregular pieces of newspaper, roughly amoeba-shaped and asked them to find the area of these pieces. Having established that ‘length times breadth’ would get us nowhere, someone suggested that we cut the paper up and made an approximate rectangle. “Oh,” said one of the group, “that would change the area”.

## Modes of professional development and engagement with ‘theory’

Mention of Piaget gets me to the second strand in my training. I found myself surrounded day in and day out by staffroom conversation. In order to have any chance of joining in and not making a fool of myself, I did a lot of reading. I needed also to know what the students were talking about when they spoke to me about the professional parts of the course. I read their set educational textbook, I think it was by Kenneth Lovell [a professor at Leeds at that time]. Of course, since it was the current gospel, I also read Piaget. I do not think that there was much potted Piaget yet produced, so I read him in the original. I found some of his background discussion pretty hard, but the transcripts of children always seemed to make his point with admirable clarity. I also became interested in the very able child and have remained so ever since through decades in which this was very unfashionable. So I read Terman (1925) and Terman *et al* (1947), which were at that time the most comprehensive works on the subject. It has been amazing to discover that this area of my eccentric training, enhanced by years of taking any opportunity to work with able pupils that came my way, has at long last become highly topical!

The third thread in my training was the staffroom conversation itself. We were still in the leisured days when people did stop for coffee, lunch and tea breaks, and of course much of the conversation was ‘shop’. This meant that I found myself listening to discussions of educational issues involving colleagues who taught many different subjects and areas of the course and who held varied viewpoints. One of the themes of the moment, which has remained with me, was that of having a single main subject in primary courses and whether depth in one subject compensated for lack of breadth. I have never wavered from the view I developed at that time which is that to learn one subject at a high level should enable you to study other material that you need to teach in a primary school, provided you have studied the other subjects up to say GCSE level. Clearly some established competence in the core subjects is necessary and GCSE, for all its limitations, should provide this. At this time there was a main subject study component in the Certificate courses and later within the BED. Later, for much of the 1980s and 1990s, the Council for the Accreditation of Teacher Education (CATE) stipulated that half of undergraduate teacher education courses should consist

of study of one or more subjects at the student's own level.

I think my colleagues realised, as I did not at the time, that they were training me to teach, as I regularly accompanied tutors on school visits, thus getting experience of many different classrooms and a chance to talk to pupils. Oddly, I remember almost nothing of this. I think it has been swallowed by all the many visits I have made since, but it did give me a back-drop to work against when students came knocking at my door – I was resident in the college and so available in the evening – for help with preparing lessons. Of course this was a part of the work I was not supposed to do, but a worried student would not remotely have understood had I said that I couldn't help! I always felt tentative, but discovered that my better grasp of the mathematics meant that I could suggest more ways of approaching things, even though I had never tried them out in the classroom. This too was a thread in my training. I learnt about making short term and medium term plans, admittedly without having to live with the consequences!

The other positive way in which they trained me to teach was to send me on courses. The legendary Edith Biggs was our local HMI and this was the time when she was working with primary teachers promoting the idea of a more problem solving based curriculum. One of her starting points was challenging pupils to answer the question 'Are you worth your weight in gold?' I was sent, with my head of department, on a course for primary teachers on Edith's approach. My head of department was supposed to be chairing one of the discussion groups and to my utter horror, when she was absent for one of the sessions, I was asked to take over this task. I found myself, aged 23, facing a group of primary head teachers. I was terrified that they would ask when I had last been in a primary classroom, the answer being, at that time, when I was a pupil. In fact during my second year at Matlock I actually appeared as an official member of staff on one of these courses! Perhaps my enduring interest in in-service work has its roots in this experience. No later challenge in this area has ever seemed quite so daunting.

I was also encouraged to attend the annual conference of the very active mathematics section of the Association of Teachers in Colleges and Departments of Education (ATCDE; see Browne, 1979). Again this gave me access to a form of training not normally part of initial training to teach. It was another real ordeal, since my answer to "Where do you work?" from friendly conference members, almost always meant I had to tell them about being an Assistant Lecturer and left me

feeling like a second class citizen. But as training to teach, it meant a demand to participate in unusually high level discussion and required me to have a good breadth of understanding.

## Outcomes

After two very happy years I left, as I was getting married and moving to Leigh near Manchester, where I obtained a post in the local grammar school. So what do I believe were the main outcomes of this eccentric training to teach? I would summarise them as follows.

First, a sense of having learnt about the art of teaching because it was of genuine interest as an academic study, together with the knowledge that much literature existed that could be of value to me as a teacher. This was supported by experience of a wide range of discussion about the nature of teaching from many points of view. My colleagues were a rich resource for learning to teach. I also had the opportunity to appreciate the value of membership of a professional association.

Secondly, a sense of the similarity which exists in the nature of teaching all ages and abilities. I was exposed to a greater range of this than a normal trainee and emerged with the deceptively simple rule that you find out where the pupils are and seek ways to lead them on from there. This was related to what I still believe is the crucial acceptance for a teacher of mathematics – the belief that even if I thought idea A was right next to idea B there would be children for whom there was a chasm between them and that it was the teacher's job to provide scaffolding, to use the topical word.

Thirdly, the confidence that I could plan and deliver a sequence of lessons in a way which would be moderately successful and the knowledge that I could relate to the learner and understand their point of view.

Finally I had had much experience of dealing with the subtler aspects of discipline. I was at a real disadvantage if I reached the point where I needed to control my classes in a direct sense, since many were older than me and knew it. But I certainly learnt to work with adults and I believe that in many ways this influenced for good that way I later came to deal with pupils in school, seeing them as people rather than children.

I have just one regret, that I had never experienced a formal teaching practice. This left a long-standing feeling of insecurity, which survived well beyond the completion of my probationary year in school. The only reports that I have on my teaching are in letters from students after I left, kept all these years in a scrapbook. They were often



expressed rather back-handily:

*It was quite a job keeping up with all the work you gave us but I know now that I prefer it to what we have now.*

*One of the knacks our last lecturer had was that she made us feel that we knew something.*

I know the former has remained a characteristic of my teaching as others over the years have made similar comments. I hope that I have not lost the 'knack' either!

Overall I believe that my two years at Matlock developed and established my fundamental beliefs about teaching in a way that has continued to serve me well ever since, while at the same time allowing me to learn most of the skills of teaching.

## Postscript

I was pleased to receive Gill's testament to her 'eccentric' induction to the world of the teacher of mathematics when she first sent it to me and to compare it with my own. In the first instance, we wrote our accounts 'just for fun': the notion of having them published came somewhat later. It is now timely to share Gill's story and extraordinary to reflect that the teachers she first 'trained' – Pat and the others – will have retired by now! I believe

that we could still see Gill, the 23-year-old novice, in the mature and authoritative teacher educator we knew much later, who surely wondered to the end 'how I could be paid to do something I enjoyed so much'.

Gill Hatch retired from Manchester Metropolitan University in 2003 and died on 11th November 2005.

Tim Rowland works at the University of Cambridge.

In *MT197* (July 2006) Tim Rowland will add a sequel to Gill's story – about his own experiences as an assistant lecturer in another college of education.

## References


Anderson, J., Goulding, M., Hatch, G., Love, E., Morgan, C., Rodd, M. and Shiu, C. (2000) 'I went to university to learn mathematics ... Reflections by PGCE students on learning mathematics at university.' *MT173*, 50-55

Browne, J. D. (1979) *Teachers of Teachers: a History of the Association of Teachers in Colleges and Departments of Education*, London: Hodder and Stoughton

Terman L. M. (Ed) (1925) *Genetic Studies of Genius, Vol 1: Mental and Physical Traits of a Thousand Gifted Children*, California: Stanford University Press

Terman L. M., Ogden M. H., Bayley N., Marshall H., McNemar Q. and Sullivan, E. B. (1947) *The Gifted Child Grows Up*, California: Stanford University Press


# ATM **NEW** SOFTWARE PUBLICATIONS



## Geometry Interactive

Three whole class programs that bring interactive geometry to the Classroom: Geoboards, Colouring squares and Triangles *plus*  
Three parallel pupil programs that pose numerous problems at different levels of difficulty, providing the opportunity to reason geometrically and to find solutions

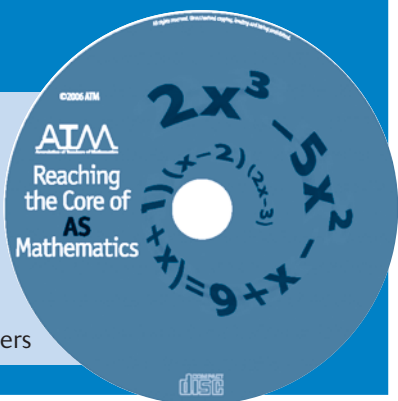
Site licence: £50 (£45.00 for ATM members)



**Reaching the core of AS Mathematics**

The CD contains six computer programs which include help to reinforce and consolidate algebraic skills in the context of solving problems, and three 'big picture' programs that can be used in many different ways. The CD also contains all the student resource sheets. The book includes student resource sheets and detailed teachers' notes.

Book and CD: £50.00 (incl site licence for the computer programs) £45.00 for ATM members



The attached document has been downloaded or otherwise acquired from the website of the Association of Teachers of Mathematics (ATM) at [www.atm.org.uk](http://www.atm.org.uk)

Legitimate uses of this document include printing of one copy for personal use, reasonable duplication for academic and educational purposes. It may not be used for any other purpose in any way that may be deleterious to the work, aims, principles or ends of ATM.

Neither the original electronic or digital version nor this paper version, no matter by whom or in what form it is reproduced, may be re-published, transmitted electronically or digitally, projected or otherwise used outside the above standard copyright permissions. The electronic or digital version may not be uploaded to a website or other server. In addition to the evident watermark the files are digitally watermarked such that they can be found on the Internet wherever they may be posted.

Any copies of this document MUST be accompanied by a copy of this page in its entirety.

If you want to reproduce this document beyond the restricted permissions here, then application MUST be made for EXPRESS permission to [copyright@atm.org.uk](mailto:copyright@atm.org.uk)

*This is the usual  
copyright stuff -  
but it's as well to  
check it out...*



The work that went into the research, production and preparation of this document has to be supported somehow.

ATM receives its financing from only two principle sources: membership subscriptions and sales of books, software and other resources.

### Membership of the ATM will help you through

*Now, this bit is  
important - you  
must read this*

- Six issues per year of a professional journal, which focus on the learning and teaching of maths. Ideas for the classroom, personal experiences and shared thoughts about developing learners' understanding.
- Professional development courses tailored to your needs. Agree the content with us and we do the rest.
- Easter conference, which brings together teachers interested in learning and teaching mathematics, with excellent speakers and workshops and seminars led by experienced facilitators.
- Regular e-newsletters keeping you up to date with developments in the learning and teaching of mathematics.
- Generous discounts on a wide range of publications and software.
- A network of mathematics educators around the United Kingdom to share good practice or ask advice.
- Active campaigning. The ATM campaigns at all levels towards: encouraging increased understanding and enjoyment of mathematics; encouraging increased understanding of how people learn mathematics; encouraging the sharing and evaluation of teaching and learning strategies and practices; promoting the exploration of new ideas and possibilities and initiating and contributing to discussion of and developments in mathematics education at all levels.
- Representation on national bodies helping to formulate policy in mathematics education.
- Software demonstrations by arrangement.

### Personal members get the following additional benefits:

- Access to a members only part of the popular ATM website giving you access to sample materials and up to date information.
- Advice on resources, curriculum development and current research relating to mathematics education.
- Optional membership of a working group being inspired by working with other colleagues on a specific project.
- Special rates at the annual conference
- Information about current legislation relating to your job.
- Tax deductible personal subscription, making it even better value

### Additional benefits

The ATM is constantly looking to improve the benefits for members. Please visit [www.atm.org.uk](http://www.atm.org.uk) regularly for new details.

LINK: [www.atm.org.uk/join/index.html](http://www.atm.org.uk/join/index.html)