

An Interview with Alexandra Randolph

Alexandra Randolph née Neville CMath MIMA is a teacher at St Paul's Girls' School in London. Her PhD was on the reaction and diffusion of chemicals within tumours. When Alex became a chartered mathematician, Rick Crawford CMath MIMA caught up with her for this interview.

I'd be interested to know about your voluntary work for the UK Mathematics Trust.

I help mark the Maclaurin Olympiad paper, set questions for the Junior Mathematical Olympiad and Senior Team Challenge and help at teacher meetings. I've also helped out at their summer schools and given a lecture to 200 teachers about stretch and challenge in the classroom.

It's really good to work closely with such great mathematical material for the classroom, but also to meet mathematicians from a range of backgrounds.

There's a team challenge?

Yes! The ethos of the event is that they work together. Pupils can work separately and then share ideas, but in my experience the teams that are successful work together.

You've had a lot of variety in your career. Why did you choose to go into credit and risk analysis after your PhD?

I wasn't sure what I wanted to do. Having been a student for seven years I needed some money! I decided to take the first job I got and found myself working for Alliance and Leicester as a Credit and Risk Analyst.

It definitely taught me more about the applications of mathematics in business, and that we should all take note of the small print! I also learnt to program in SAS, which I had never done before.

But you couldn't stay away from academia?

After a year, my PhD supervisor contacted me and asked if I wanted to do a post-doc. So in 2004 I went back to Nottingham University as a post-doctoral research fellow. I worked with a small team looking at blood vessel formation in tumours.

The thought of spending every day thinking about the applications of mathematics really appealed, so too working with like-minded people and having the privilege to work with first-class academics. I was modelling cancer and felt a huge sense of purpose to what I was doing. Having been a credit and risk analyst, I realised I needed a job that felt it was about more than making money.

How did you decide to go into teaching in schools?

I had worked with undergraduates through my PhD and post-doc and really enjoyed teaching them. As my post-doc was coming to an end, I thought I'd try teaching but in a school. One of the reasons I opted for a school environment was the permanent nature of the job. At the time, I found the uncertainty of academic life difficult. For example, I could not get a mortgage.

I was not a qualified teacher, but I could apply to independent schools. I found myself at Uppingham School, a mixed boarding school in Rutland.

I felt a little fraudulent calling myself a teacher without being qualified! I worked for my teaching qualification whilst continuing teaching full-time.

How has teaching been?

People often say to me 'Don't you get bored with the level of mathematics?' But every day is different and the questions the pupils ask often make you see things in new ways. Thinking about how to explain things so that every child understands is an interesting challenge. I have been fortunate enough to work in excellent



schools, where I have always been encouraged to read around the subject and pass on this knowledge to the pupils. My pupils have typically been very enthusiastic.

And yet you went for chartered mathematician, rather than chartered mathematics teacher.

I obviously love teaching. But my work has ultimately been, and continues to be, about mathematics and my passion for it. I hope to take time to study mathematics in more detail in the future. I'd really like to publish again too. Although I have no idea what I will publish on!

Research posts are quite competitive nowadays. But if I was offered a job looking into something I was interested in (like cancer modelling and PDEs), I would definitely consider going back. And I could teach the undergraduates too!

It looks like you think it is important to keep an open mind and be aware of the opportunities as they arise.

Definitely! I think we are extremely lucky as mathematicians to have such flexibility in what we can get involved in. As I'm sure you know, it can be a very frustrating subject and so it's important that we always remain passionate about what we do. Therefore, having options for change is a very positive thing and we should remain open to new possibilities.

So what does mathematics do for you?

Although I love sitting down with a problem just for solving its sake, being able to visualise the practical relevance of what I am working on really holds my interest. I enjoy forming models and looking at the mathematical results compared to the real situation. Applied mathematics also really highlights the power of the subject. For example, predicting how diseases may spread or drugs react and diffuse in a tumour, is very exciting. Ultimately, we are able to predict the future with some degree of certainty and give insight to scientists and engineers about why things happen, how they might happen and how we can make a difference.

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