Teaching needs confident biochemists

Jane Thomson (Science Education Manager)

Over the past year, TV programmes set in schools have included *Waterloo Road*, *Bad Education*, *Educating Yorkshire*, *Harrow: A Very British School* and *Tough Young Teachers*. The highs and lows of the classroom can be compelling viewing, but do they make you want to join the ranks at the chalk face or do they make you glad you’ve left all that behind?

In our survey of biology A-level teachers at the Association for Science Education Annual Conference in January 2014, biochemistry topics were found to be some of the trickiest parts of the biology A-level specifications. Our interviews with new teachers suggested that such topics were not taught as confidently as other simpler biological concepts. This snapshot is not particularly surprising, indeed, the Science Learning Centres put a strong emphasis on biochemistry topics in their courses for teachers who are ‘getting to grips with teaching A-level biology’ in response to delegate feedback.

Steve Jones of the Science Learning Centre Consortium based in Hertfordshire says, “Biochemistry topics on A-level biology specifications are absolutely essential for learners to get a really good in-depth understanding of biology. Key topics such as biomolecules, membranes, enzymes, cellular respiration and photosynthesis are some of the most difficult parts of the A-level curriculum to teach and very challenging for teachers without a biochemical background. Professional development leaders at the Science Learning Centre Consortia have specifically designed courses which support teachers with developing their subject knowledge and suggest pedagogical approaches for effective teaching of conceptually difficult areas such as the electron transport chain.”

So it would appear that the teaching profession would benefit from a steady supply of teachers who can explain biochemistry topics clearly, but what does teaching have to offer a biochemist? Well according to research by the Department for Education Teaching Agency, twice as many teachers described their work as ‘extremely enjoyable’ when compared with professionals with careers in marketing, IT and accountancy. Teachers were also far more likely to show high levels of absorption, enjoyment and motivation. Through observations of 57 teachers at work over a half hour period, the average teacher:

- smiles ten times
- laughs three times
- enjoys a good banter five times
- praises someone nine times
- has seven in-depth discussions.

**Entry**

To teach in the public sector, you must have qualified teacher status (QTS) gained by completing an initial teacher training (ITT) course or programme. For secondary schools, you will usually need a degree in a related subject to the one you intend to teach.
Skills

You must be able to relate to young people and enjoy working with them. Any evidence of this, through work experience as a volunteer or classroom assistant, will be an advantage. Teaching in secondary education also requires strong subject knowledge and self-confidence.

Qualifications

Employment-based training

With the School Direct Training Programme (salaried), you are selected by a school from day one. Your school, which could be one of the best in the country, will have a job in mind for you and you will receive a salary on the unqualified teacher pay ranges. You must have three or more years’ experience of working life to apply.

Teach First participants only work in schools in low-income communities, developing teachers and leaders to close the attainment gap between the richest and poorest children. Participants are guaranteed a full-time salary, paid by the school they are working in for a minimum of 2 years. There are no tuition fees. You must have a degree or A-levels that satisfy the teaching subject requirements, but there is no minimum working experience.

Higher education institution-based training

PGCE (Postgraduate Certificate in Education) courses take about 1 year and include 18 weeks in a school for trainees wanting to teach at primary level, or 24 weeks for those wanting to teach at secondary level. At the end of the course, assuming you meet the standards, you will be awarded QTS, and become a newly qualified teacher (NQT) ready to undertake your induction year. You can apply via the Universities and Colleges Admissions Service (UCAS) Teacher Training website.

School-led initial teacher training

School-centred initial teacher training (SCITT) is a programme for graduates, run by and based in schools. All SCITT courses lead to QTS and many, but not all, award the PGCE. The unsalaried School Direct Training Programme is a popular option, but although your training is based in a school, they are not your employers, and in many ways your training will be similar to training programmes in universities and colleges. You’ll pay fees, but you might be eligible for funding through tuition fee loans, training bursaries or scholarships (see below).

Financial incentives for those who train in 2014/2015

Bursaries are available for trainees on many unsalaried postgraduate teaching courses (amounts are dependent on the subject you wish to teach and the class of your degree).

The Royal Society of Chemistry (RSC) has teacher training scholarships of £25 000 available to chemistry trainees starting their teacher training in the 2014/2015 academic year. Trainee teachers in biology with a 2:1 or first are able to apply for a bursary of £4000 and £9000 respectively. The bursary scheme is flexible and can also recognize other achievements such as work experience and higher degrees. More information can be found on government Department for Education websites and from individual university and higher education institution education departments.
Progression

Becoming a head of a department, head of year or taking additional roles such as careers or special needs will add responsibility points and financial rewards as you progress in your career. Senior management positions such as deputy head and head teacher are the top roles. Future Leaders and Tomorrow’s Heads schemes are available to accelerate your careers once qualified.

Opportunities

Starting salaries for NQTs are around £21,500, rising to £27,000 in London. Salaries are then subject to a set scale. Deputy Head or Head Teachers can earn from £40,000 up to £100,000.

The Society hopes to support the Science Learning Centres with their programme of biochemistry-related CPD (continuing professional development) for school teachers in the coming months.

CASE STUDY

Dr Nick Dixon is Head of Science at Magdalen College School in Brackley. He currently serves as a member of the Biochemical Society Education Committee.

I chose science A-levels because I found them to be my favourite subjects at GCSE. For a variety of reasons I didn’t do as well in my A-levels as I had hoped, but was lucky enough to get in to De Montfort University to study an amazing Applied Biology degree. With hindsight, I think not doing brilliantly at my A-levels taught me the importance of second (and third…) chances in education. I then moved to the University of Birmingham to complete my PhD in epidemiology (the virus infection of a filamentous seaweed to be specific). After 7 years in academia I wanted to try something different so spent a year travelling through Central and Southern America. Along the way I taught English as a foreign language (so didn’t escape entirely).

I returned from travelling to begin my PGCE at Oxford University. As a part of this year I was placed in the school that I still teach in. This course had an extremely well-judged balance between the theory of education that I was taught at Oxford and the practical learning you can only get from standing in front of a class. I taught my first lesson in my second week of school. It was to a Year 8 class, using Visking tubing to model the digestive system. I look back on it now and think it was a bit of a disaster; we overran into break and it didn’t really work for some groups. My teaching mentor explained that some teachers regularly fake the results of this experiment by squirting glucose outside of the tubing! Lesson learned there then.

Training as a teacher was certainly a steep learning curve. Before teaching that first lesson I remember sitting in my mentor’s teaching laboratory looking at how easily she interacted with her students, personalized their learning through questions and resources, and engaged and motivated them by telling funny stories and anecdotes. I had no idea how complex leading the learning of 30 teenagers was. And, of course, this complexity is part of what makes teaching so rewarding. I was extremely lucky to work with amazing teachers early in my career from whom I learned an awful lot by laughing at failures and celebrating successes. Nine years later I still love my job every day. Science is such an amazing exciting and relevant subject to teach. I cannot remember the last school day that I didn’t enjoy seeing my colleagues, love teaching my classes and just laughing with my students. Teaching really is a tremendously rewarding career.

Oh, and for as long as there have been teachers and schools, there have been older folks saying, “The youth of today…” Don’t believe them. In my experience the vast, vast majority of students are engaging, hardworking and really do care about their education.

Nick Dixon with schoolchildren in Uganda