

Niamh McMahon
Head of Secretariat
Advisory Committee on Maths Education
Royal Society
6-9 Carlton House Terrace
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22 April 2015

Dear Niamh,

Thank you for the opportunity to respond to your consultation on initial teacher education (ITE) of teachers of mathematics at primary and secondary level. And also for including two of us (Peter Main and me) to join your round table discussion on 18th March at the Royal Society. I am writing to reinforce and follow up on some of the points made at that meeting and to outline some of what the IOP considers to be the core principles of our work in developing specialist physics teachers.

- There is strong evidence for the importance of teachers having secure subject knowledge and pedagogic content knowledge for the progression and deep learning of students, particularly in physics and maths¹. As such, we are strongly in favour of the development of subject specialist teachers, and continued efforts should be made to increase their numbers. We would urge that all existing efforts to enhance teachers' subject specialism should be maintained.
- However, it is important to note that the definition of specialism is not confined to graduates of the specific discipline. Graduates in cognate subjects can make excellent subject specialists, as can graduates in unrelated subjects but with a subject background at A-level so long as they go through a subject knowledge enhancement (SKE) course before their PGCE. The important point is that they are educated in physics (and/or maths) to an appropriate level before they start teaching; i.e. they do not become a subject specialist by osmosis on the job. In order to support long-term viable SKE courses for teachers to teach maths and physics well, there needs to be stability of the provision, including but not limited to ensuring that there is significant investment in – and support of – the infrastructure.
- Successful completion of ITE should at a minimum qualify students to teach a specified subject (or subjects) up to a particular level, rather than just provide a general qualification to teach. In other words, QTS should explicitly certify a teacher in a subject (or subjects) at a given level. It would be interesting to explore the idea of teachers continuing training (in an organised way) into their first few years of

¹ Department for Education and Skills (2007) - *Progression to post-16 science: interim report*:
http://dera.ioe.ac.uk/6661/2/sc_progression_rpt_0037207.pdf

teaching to allow them to accumulate further certifications in subjects at different levels to supplement their QTS.

- Student teachers' experience should be monitored to ensure a consistent standard across different providers. However, whilst assessment systems should be consistent they should also be designed to allow for the fact that individual student teachers will develop at different rates.
- In general, all student teachers should be provided with mentoring support and guidance during their studies, including within the schools in which they carry out their placements and externally.

The IOP supports the notion that maths and physics sit very effectively together as part of a teaching qualification. Graduates in maths, physics or engineering are all likely to be able to teach both disciplines (with the appropriate backgrounds and training). And, in many cases, they will prefer the combination of physics and maths than the combination of physics and biology or chemistry. We are strong advocates of the Physics with Maths training route. However, there are still cultural barriers to these courses within placement and employing schools, including a reluctance to adapt timetables. We should work together to overcome these barriers to take advantage of the valuable people who can teach both these shortage subjects.

We look forward to any opportunity in which we can cooperate with ACME and other organisations supporting mathematicians and mathematics education in the near future. We would welcome the opportunity to meet to discuss our mutual interest in this subject.

Yours sincerely,

A handwritten signature in black ink that reads "Charles Tracy". The signature is written in a cursive style with a horizontal line underneath the name.

Charles Tracy,
Head of Education, Institute of Physics