

Tackling the teacher shortage – near-peer mentoring of STEM students for outreach and engagement using trainee teachers

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Abstract

This poster outlines a pilot scheme for delivering CPD training to undergraduate STEM students, utilising trainee science teachers as “near-peer” mentors to enhance student volunteers’ ability to undertake science outreach activities in local schools and the wider community.

The driving force for this project is to tackle the teacher shortage in STEM subjects, which it is hoped can be achieved in a number of ways. The trainee teachers themselves will develop their professional skills by acting as mentors while STEM students will become more closely engaged with the profession, current pedagogy and young people within schools. This effectively serves as a marketing tool which potentially increases the likelihood of these students applying for Initial Teacher Training (ITT). Finally, the long-term goal is to enhance children’s enthusiasm for science at an early stage, with a view to widening participation and improving uptake of STEM subjects at A-level and in Higher Education – nurturing the interest and talent of a future generation of teachers.

Teacher Shortage

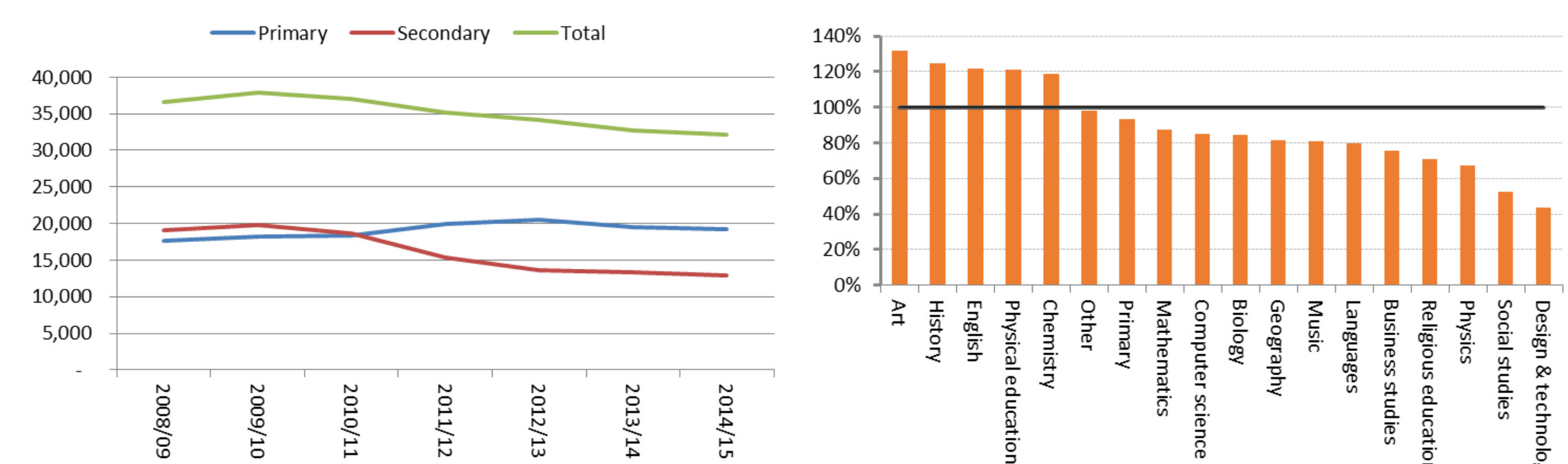


Fig. 1: New entrants into ITT by course type since 2008 (DfE, 2014). Fig. 2: New entrants into ITT by subject, compared to target, for academic year 2014/15 (DfE, 2014).

Since 2009, entries into ITT have fallen by 17% (Fig. 1) and were 7% below demand in 2014/15 (Ofsted, 2014). Recent changes to recruitment into ITT courses have led to “instability” for many universities, with the number of training places allocated directly to HEIs falling by 23% since 2012 (UUK, 2014). Meanwhile, data shows that the new School Direct training route recruited only two-thirds of its allocation in 2013/14 and, while it has been more successful in recruiting trainee English and history teachers, it has been less successful for STEM subjects (Fig. 2) which has “contributed to a shortfall in the number of trainee teachers recruited into... mathematics and physics” (TES, 2014).

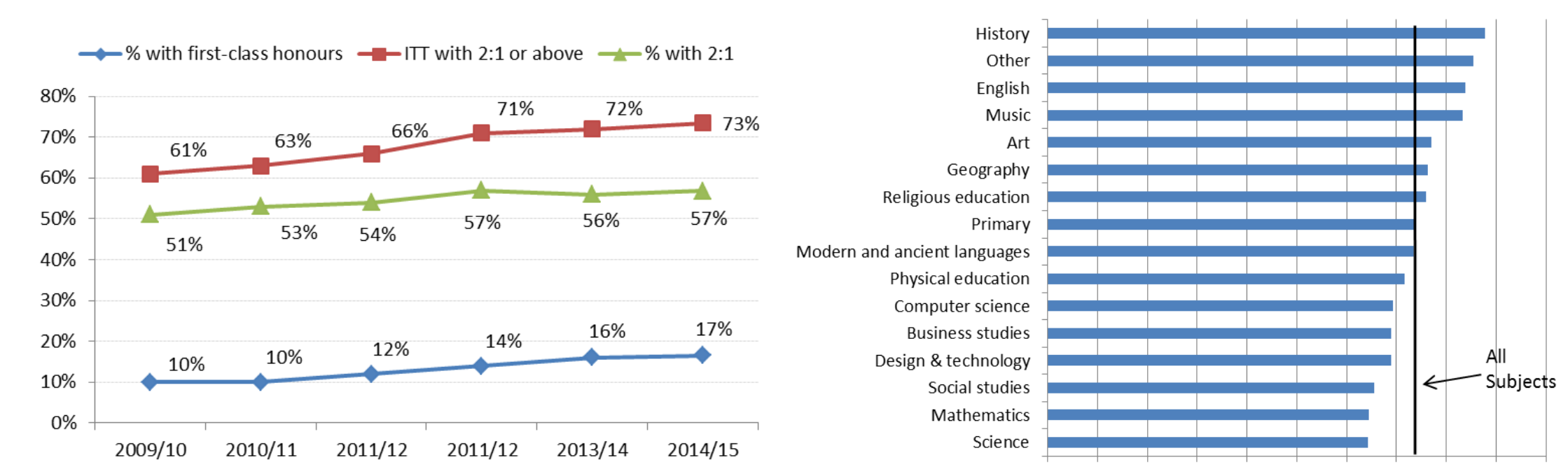


Fig. 3: Trends in qualifications of new postgraduate entrants into ITT (DfE, 2014). Fig. 4: Qualifications (2:1 or better) of new postgraduate entrants into ITT by subject (DfE, 2014).

While the overall calibre of entrants into ITT is increasing (Fig. 3), data shows that trainee mathematics and science teachers are the least qualified (Fig. 4). Indeed, data from NCTL shows that approximately a third of STEM applicants have a degree in an unrelated subject and require Subject Knowledge Enhancement.

Stakeholder Benefits



Graduate Trainee Teachers:

- Development opportunity for PGCE students
- Provides evidence towards *Teachers’ Standards*
- Develop teaching skills
- Gain confidence
- Reinforce and expand subject knowledge
- Opportunity for reflection



STEM Students:

- Transferrable skills for STEM students
- Improved communication and presentation skills
- Increased exposure to teaching profession
- Support from a more knowledgeable mentor



School Children:

- Educational activities
- Increased engagement with science
- Renewed / ignited interest in STEM subjects
- Positive adult role models (particularly girls)
- Widening participation in science
- Increase aspiration for Higher Education

Rationale and Outlook

Student societies for STEM subjects at the University of Warwick are engaged in outreach activities, such as providing science workshops for local schools. The Centre for Professional Education (CPE) is partnering with these societies to support their work by recruiting trainee science teachers (postgraduate PGCE students) to act as near-peer mentors.

Peer teaching has long been accepted as a valuable and effective approach for adult learning, having found particular success within medical, dental, and healthcare courses. The success of peer teaching is thought to be related to the ability of peers to empathise and relate to one another more easily (Evans and Cuffe, 2009). Near-peer teaching involves students acting as tutors or mentors for less experienced students, typically one step removed in terms of their educational or professional development.

Previous studies have demonstrated that near-peer mentoring is an effective model to promote career advancement and the psychosocial support associated with the acquisition of professional behaviours (Anderson et al., 2015), while also providing positive role models for the less experienced students (Bulte et al., 2007). Additionally, near-peer mentors themselves report that they feel more prepared for teaching in future (Naeger et al., 2013). Despite this success in the healthcare sector, this model does not appear to have been adopted in mainstream education.

A key aim of this work is to enhance the quality of workshops provided by STEM students by equipping them with the basic tools of education: planning, presentation skills and elementary pedagogy. This will also develop the students’ transferrable skills for employability, including communication and team working, while also building confidence. By working with trainee teachers, STEM students will gain an insight into life in a school environment and associated issues such as safeguarding. Through participation in this project, trainee teachers will gain valuable experience in their development as practitioners and build evidence toward meeting the *Teachers’ Standards*.

The final aim of this project is to strengthen the partnership between CPE, STEM departments and representatives from professional associations (IoP, RSB and RSC), with a view to raising the profile of the teaching profession and improving recruitment and retention into teacher training for shortage subjects. Some of the workshops were trialled in 2015 and in 2016 CPE will be launching a full pilot scheme to support students in running STEM days for local schools.

References

Anderson, M.K., Tenenbaum, L.S., Ramadorai, S.B. and Yourick, D.L., 2015. Near-peer Mentor Model: Synergy within Mentoring. *Mentoring & Tutoring: Partnership in Learning*, pp.1-17.

Bulte, C., Betts, A., Garner, K. and Durning, S., 2007. Student teaching: views of student near-peer teachers and learners. *Medical teacher*, 29(6), pp.583-590.

DfE, 2014. *Initial teacher training census for the academic year 2014 to 2015*, London: Department for Education.

Evans, D.J. and Cuffe, T., 2009. Near-peer teaching in anatomy: an approach for deeper learning. *Anatomical sciences education*, 2(5), p.227.

Naeger, D.M., Conrad, M., Nguyen, J., Kohi, M.P. and Webb, E.M., 2013. Students teaching students: evaluation of a “near-peer” teaching experience. *Academic radiology*, 20(9), pp.1177-1182.

Ofsted, 2014. *Annual Report of Her Majesty’s Chief Inspector of Education, Children’s Services and Skills 2013/14*, Manchester: Ofsted.

TES, 2014. TES Online [online], Available at: <https://www.tes.com/news/school-news/breaking-news/school-direct-causing-shortage-maths-and-science-teachers-report> (Accessed: 25th January 2016).

UUK, 2014. *The Impact of Initial Teacher Training Reforms on English Higher Education Institutions*, London: Universities UK.