THE MEMORANDUM ON ENTRY REQUIREMENTS FOR INITIAL TEACHER EDUCATION PROGRAMMES IN SCOTLAND

A RESPONSE FROM THE LEARNED SOCIETIES' GROUP ON SCOTTISH STEM EDUCATION TO THE GENERAL TEACHING COUNCIL FOR SCOTLAND

December 2018

Summary

There is currently no requirement for those aspiring to become primary teachers to have any level of formal science qualification. This is despite a range of sources having reported on primary teachers as lacking confidence in teaching science. The Learned Societies' Group believes that applicants to ITE Primary Education programmes should be expected to achieve at least one SCQF level 5 qualification in a science as a minimum requirement. This would provide consistency and certainty, while aligning with the stated desire of universities to increase expectations and enhance the quality of applicants.

It is crucially important that the work of the GTCS in setting teacher education standards is led by the evidence of what is required to maintain and enhance a high-quality teaching workforce. Proposed changes to ITE entry criteria should not be driven by current external pressures.

The current research evidence does not suggest that Scottish ITE students with SCQF level 6 mathematics qualifications before entry are necessarily better teachers than their peers with SCQF level 5 mathematics qualifications. On this basis, we believe that the current minimum entry requirement for mathematics should remain. However, we recommend further research with a view to identifying which qualifications, or combinations of qualifications, would give a more accurate indication of teacher quality.

'Teaching Scotland's Future' was clear on the need for science and mathematics to feature prominently in initial teacher education programmes for primary teachers. We recommend that the Scottish Government and the GTCS should review the provision of science and mathematics within ITE Primary Education programmes. The review should cover both the disciplinary content and pedagogy of science and mathematics.

ITE is the starting point in teachers' career development. This emphasises the importance of access to high-quality and continuous career-long professional learning (CLPL) covering both subject-specific knowledge and pedagogy, to the ongoing development of teachers. CLPL is the means for addressing competence and confidence levels in science and mathematics among currently serving primary school teachers. Sustained funding will be needed to support the step-change in CLPL envisaged by the Scottish Government and its partners.

Those applying to become secondary school teachers through a PGDE programme are required to have 80 SCQF credit points as part of their degree in a subject relevant to that which they plan to teach. To ensure flexibility while maintaining standards, the GTCS should consider revising the Memorandum to make clear to ITE providers that the 80 SCQF credits need not come from a single degree and can comprise credits 'topped-up' from another suitable programme.

Background

1 The Learned Societies' Group on Scottish STEM Education (LSG) brings together the learned societies and professional associations with a focus on the provision of STEM education at school.[1] We welcome the opportunity to respond to the General Teaching Council for Scotland (GTCS) consultation on proposals for revising the Memorandum on Entry Requirements for Initial Teacher Education (ITE) Programmes in Scotland. Our response primarily focuses on the Primary Education component of the Memorandum. The LSG has appreciated the opportunity to engage with the GTCS from the outset of the review and we would be pleased to meet again with GTCS colleagues to discuss our comments. While relevant to the issues being considered, some of our comments extend beyond the specific questions posed by the consultation. We therefore intend to share our response with the Scottish Government and other key decision makers and policy influencers in Scottish education.

1 This response has been signed off by the LSG membership comprising: The Association for Science Education; BCS, the Chartered Institute for IT; Edinburgh Mathematical Society; Institute of Physics; Royal Society of Biology; Royal Society of Chemistry; Royal Society of Edinburgh; and the Scottish Mathematical Council. More information about the LSG is available at: https://www.rse.org.uk/policy/standing-committees/learned-societies-group/

Introduction

2 The following aspects, which we comment upon in this response, are central to building the professional capacity of teachers and, in turn, improving the learning of young people in Scotland.

- ITE entry requirements, and the quality of trainee teachers;
- Content of ITE courses; and
- Providing continuous career-long professional learning (CLPL)

3 The literature review [2] accompanying the consultation on the Memorandum demonstrates the lack of a clear international consensus regarding what constitutes suitable mechanisms for assessing entry to ITE and, in turn, highlights the complexity of this issue. It also makes clear that minimum academic standards, which are the subject of the GTCS consultation, are only one component of this complex picture, given that the research indicates that it is very difficult to specify precisely what academic levels, personal competencies and attitudinal dispositions are required to be an effective teacher.

Primary Education

4 *Teaching Scotland's Future*[3] recognised that weaknesses in the performance of children in primary education can stem in part from low levels of confidence among primary teachers about their own knowledge, particularly in mathematics and science. Similarly, Education Scotland has reported that a lack of confidence in teaching the sciences remains an issue for many primary teachers.[4]

Science

5 Currently, there is no requirement for applicants to Primary Education ITE programmes to have any level of formal science qualification. Rather, the GTCS encourages universities to expect at least an SCQF level 5 qualification in a science subject. The GTCS conducted a survey of universities in session 2014-15 on entry qualifications to ITE for foreign language, science and mathematics. The figures for primary students showed considerable variation between the universities. For those studying to become primary school teachers through a full-time degree, those possessing an SCQF Level 5 in a science varied from 35% at one ITE provider to 89% at another.[5]

6 In line with the Donaldson Report recommendation that selection for entry to ITE programmes should be more rigorous and to help ensure that teachers have a grounding in scientific concepts and methods, the LSG is of the view that Primary ITE applicants should have achieved at least one SCQF level 5 qualification in a science as a minimum requirement. Such a move would provide consistency and certainty, while aligning with the stated desire of universities to increase expectations and enhance the quality of applicants. Furthermore, with learners tending to take fewer qualification courses at S4 following the introduction of the National Qualifications in 2013, it is important that learners, particularly those who have ambitions to teach, recognise the importance of gaining a formal science qualification.

Mathematics

7 The current position is that mathematics at SCQF level 5 is required for entry to ITE programmes. While there have been calls to raise the minimum requirement to SCQF level 6, including from the Making Maths Count Group[6] which was established by Scottish Government, the GTCS is of the view that SCQF level 5 mathematics provides teachers with a sufficient level of numeracy skills to support numeracy across the primary curriculum.

2 S. Parker, School of Education, University of Glasgow, Literature Review on Teacher Education Entry Requirements, commissioned by the GTCS, 2018 http://www.gtcs.org.uk/web/FILES/research/GTCS-Literature-Review-on-Teacher-Education-Entry-Requirements.pdf

3 Graham Donaldson, Teaching Scotland's Future: Report of a review of teacher education in Scotland, 2010 http://www.gov.scot/resource/doc/337626/0110852.pdf

4 The Sciences 3-18 (update), Education Scotland, September 2013 https://education.gov.scot/improvement/documents/sciences/sci14_sciencescurriculumimpact/sciences-3-to-18-2013-update.pdf

5 Final Report of the Science, Technology, Engineering and Mathematics Education Committee (STEMEC), 2016 https://www.gov.scot/publications/stemec-report-2016/

6 Transforming Scotland into a Maths Positive Nation: The final report of the Making Maths Count group, September 2016 https://www.gov.scot/publications/transforming-scotland-maths-positive-nation-final-report-making-maths-count/

8 It is clear from the consultation document that the potential adverse impact on teacher recruitment from any increase in the entry requirements is a consideration for the GTCS. However, it is crucially important that the work of the GTCS in setting teacher education standards is led by the evidence of what is required to maintain and enhance a high-quality teaching workforce. Proposed changes to ITE entry criteria should not be driven by current external pressures.

9 The current research evidence does not suggest that Scottish ITE students with SCQF level 6 mathematics qualifications before entry are necessarily better teachers than their peers with SCQF level 5 mathematics qualifications.[7] On this basis, we believe that the current minimum entry requirement for mathematics should remain. However, we would recommend further research with a view to identifying which qualifications, or combinations of qualifications, would give a more accurate indication of teacher quality. Maintaining the current entry requirement does not negate the need to ensure that mathematics content and coverage within all Primary ITE programmes is appropriate, and that teachers are able to access continuing CLPL. We return to these points for science and mathematics in the sections that follow.

10 The Making Maths Count Group was convened to make recommendations to address the deep-rooted negative public perceptions of mathematics. In advocating an increase in entry requirement to SCQF level 6 mathematics, the group was seeking parity with English. While this should be distinguished from the research evidence we refer to above, it will arguably be very difficult to achieve the cultural change required while mathematics is treated differently from English when considering entry to ITE.

Content of ITE Primary Education Programmes

11 Teaching Scotland's Future was clear on the need for science and mathematics to feature prominently in initial teacher education programmes for primary teachers. While the Scottish Government has reviewed the number of hours dedicated to literacy, numeracy, health and wellbeing, equality and data literacy in ITE programmes in Scotland, this did not consider science.[8] To address this gap, we recommend that the Scottish Government and the GTCS should review the provision of science and mathematics within ITE primary programmes. The review should cover both the disciplinary content and pedagogy of science and mathematics. The LSG has collected preliminary information from ITE providers that we would be pleased to share in helping to inform such a review. As well as considering the extent to which science and mathematics feature within the primary programmes, the review should consider how ITE providers identify and support student teachers in addressing any subject knowledge shortfalls in these subject areas. Evidence from Teaching Scotland's Future made clear that the placement component of the ITE programmes is what student teachers find most useful. The review should therefore consider to what extent the placements give student teachers exposure to teaching science and mathematics as part of ensuring broad curricula content coverage during their studies. Our suggested review would also support the ongoing implementation of the *STEM Education and Training Strategy*.[9]

7 See, for example, McKechan, S. & Day, S. (2015). Do advanced qualifications equate to better mathematical knowledge for primary teaching? *Scottish Educational Review*, 47(2), 59-77; and Henderson, S., & Rodrigues, S. (2008). Scottish Student Primary Teachers' Levels of Mathematics Competence and Confidence for Teaching Mathematics: Some Implications for National Qualifications and Initial Teacher Education. *Journal of Education for Teaching: International Research and Pedagogy*, 34(2), 93-107

8 Initial Teacher Education: Content Analysis, Scottish Government, May 2017 https://www.gov.scot/publications/initial-teacher-education-content-analysis-2017/

9 STEM Education and Training Strategy, Scottish Government, October 2017 https://www.gov.scot/publications/science-technology-engineering-mathematics-education-training-strategy-scotland/

Importance of continuous Career-Long Professional Learning

12 ITE is the starting point in teachers' career development, with research indicating that it takes seven years to become an 'expert teacher'.[10] This emphasises the importance of high-quality and continuous CLPL covering both subject-specific knowledge and pedagogy, to the ongoing development of teachers. Indeed, given that any changes to the Memorandum on Entry Requirements will apply only to new entrants, CLPL is the means for addressing competence and confidence levels in science and mathematics among currently serving primary school teachers, particularly as these subject areas are commonly identified by primary teachers as areas in which they need support. Professional Update, launched by GTCS in 2014, enables teachers, in partnership with their schools, to reflect on their professional knowledge, skills and development needs, and plan their future professional learning. If the aims of Professional Update are to be achieved, it will be crucial to ensure the provision of time, resource and support to enable teachers to engage meaningfully with it.

13 The Donaldson Report showed that the most powerful professional development is that which is built on teacher collaboration at the local level. The CLPL surveys of practitioners undertaken by Education Scotland in June 2017 to inform implementation of the *STEM Education and Training Strategy* clearly show that of the various forms of CLPL, teachers most highly value the opportunity to work collegiately in their schools and clusters. However, time availability, particularly when there is a shortage of teachers in STEM areas and difficulty obtaining supply cover, is a key barrier. Other constraints to CLPL include uneven provision, rurality and education authority budgetary pressures. We recognise that as part of the STEM Education & Training Strategy, Education Scotland, including the Scottish College of Educational Leadership is developing a national level career-long professional learning strategy for STEM. This is at a very early stage of implementation and it remains to be seen how it will provide for the CLPL required. The LSG continues to engage with Education Scotland as the national CLPL plans are rolled-out. What is not in doubt is that sustained funding will be needed to support the step-change in CLPL envisaged by Scottish Government.

Other Issues

Secondary Education Teaching Qualification

14 Those applying to become secondary school teachers through a PGDE programme are required to have 80 SCQF credit points as part of their degree in a subject relevant to that which they plan to teach. To ensure flexibility while maintaining standards, the GTCS should consider revising the Memorandum to make clear to ITE providers that the 80 SCQF credits need not come from a single degree and can comprise credits 'topped-up' from another suitable programme, which could include relevant Open University courses, for example.

Secondary Computing

15 In line with the recent decision made by SQA to change the course name from Computing to Computing Science, the LSG agrees with the GTCS that the Memorandum should reflect this change. This would help to demonstrate the focus on computational thinking as opposed to the acquisition of ICT and/or digital skills.

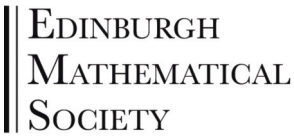
Broad General Education

16 The LSG supports the GTCS proposal to create a Broad General Education (BGE) category of registration. This would enable Scotland's education system to take advantage of more flexible deployment of teaching staff and offer opportunities for greater collaboration between primary and secondary schools, particularly within school clusters. This would enable more subject specialist teachers, including in science and mathematics, to teach in the primary sector.

10 D.C. Berliner, Expert Teachers: Their Characteristics, Development and Accomplishments, January 2004 https://www.researchgate.net/publication/255666969_Expert_Teachers_Their_Characteristics_Development_and_Accomplishments


The Association
for Science Education
Promoting Excellence in Science Teaching and Learning


bcs
The Chartered Institute for IT
Academy of Computing

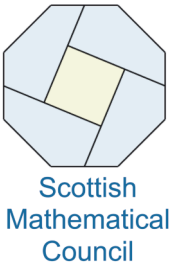

Edinburgh Mathematical Society


IOP Institute of Physics


Royal Society of Biology


Royal Society of Chemistry


RSE
The Royal Society of Edinburgh


Scottish Mathematical Council

Additional Information

For further information about the Learned Societies' Group, contact its Secretariat, William Hardie (whardie@theRSE.org.uk)