Review of Teacher Education in Scotland

An Institute of Physics response

A list of the Institute’s responses in Scotland can be found at:
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9th June 2010
Dear Sir/Madam

Response to the questionnaire on the Review of Teacher Education in Scotland

The Institute of Physics is a scientific membership organisation devoted to increasing the understanding and application of physics. It has an extensive worldwide membership (currently over 34,000, 2,500 in Scotland) and is a leading communicator of physics with all audiences from specialists through government to the general public. The Institute of Physics represents its members in Scotland through an active volunteer network and two members of staff based in Scotland.

We welcome the opportunity to engage in the consultation process and would offer the responses below based on our own consultation with members, which includes physics teachers, physics teacher educators, academic physicists and others.

Our responses to the questions in the questionnaire are attached. In addition, I am attaching the completed respondent identification form at the end of the questionnaire.

If you need any further information on the points raised, please do not hesitate to contact me.

Yours faithfully

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Chair of the Institute of Physics in Scotland
University of Glasgow

Professor Peter Main
Director Education and Science
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Response to the questionnaire on the Review of Teach Education in Scotland

A1) **What do you believe are the MAIN overall strengths and areas for improvement within teacher education as a whole in Scotland today and why?**

**Overall strengths:**
There is much to celebrate about teacher education in Scotland. The ITE programmes in our universities produce high quality teachers, who benefit from the guaranteed probationer year which allows them to consolidate the skills and knowledge they have acquired at university and in school practice. There is a wide range of CPD opportunities available, from the Chartered Teacher Programme, from local authority provision and from bodies such as the Association for Science Education (ASE), the Scottish Science Equipment Research Centre (SSERC) and indeed the Institute of Physics (IOP).

**Overall areas for improvement:**
The partnership between schools and ITE providers needs to be strengthened. Student teachers and probationers often comment on the variable nature and quality of the support they receive in schools in their training and probationary years.

In the science area, the content of both undergraduate and post-graduate ITE courses needs to be reviewed to ensure students have an adequate knowledge of the range of sciences they will be expected to teach in schools. This will require more contact time to be made available within the PGDE courses.

A2) **When thinking specifically about initial teacher education in Scotland today what do you believe are the MAIN strengths and areas for improvement and why?**

**Strengths**
Students receive a strong grounding in educational theory, and in various initiatives such as Assessment is for Learning. They are given a good understanding of how children learn and of how to assess the learning process. Students are also taught to assess their own performance and become reflective practitioners.

**Areas for improvement**
Good subject knowledge is essential. Even graduates need to brush up basic ideas that they met at school but have not revisited during their degrees. The gaps in knowledge are not formally addressed on ITE courses; it is often incumbent upon the mentors in schools to rectify misconceptions and fill the gaps. This needs to be monitored and we would like to see some assessment of subject knowledge at the end of the PGDE period.

Primary BEd students will often have only one Standard Grade science qualification on entry and they need support in the others, while PGDE science students also
need support in some of the sciences to enable them to teach an integrated science course in S1/2. They need to study the concepts involved, how these might be introduced, and the misconceptions that are likely to arise. More contact time must be made available in all ITE courses to address these issues. We cannot expect teachers to be confident in teaching subject content with which they are not familiar.

School teachers who are asked to mentor trainees often receive no formal training in how to observe and provide appropriate feedback and how to support and mentor students generally. The skills required are quite different from those involved in teaching children and teacher mentors therefore require training. There are currently no funds earmarked to release teachers to attend courses on mentoring nor to release university staff to plan and deliver such courses. The partnerships between ITE providers and schools need to be strengthened.

A3) When thinking specifically about probation/induction in Scotland today what do you believe are the MAIN strengths and areas for improvement and why?

Strengths
As previously stated, the guaranteed probationer year is one of the strengths of the ITE system in Scotland. Trainee teachers have a chance to put into practice what they have learned and to build on their existing skills. There is time built in to allow them to reflect on their experiences.

Areas for improvement
Science teachers have much to learn during their probationer year. In addition to the development of pedagogical skills common to all teachers, there are health and safety issues to be addressed, new scientific equipment to become familiar with, and the management of practical activities in the classroom to be considered. The faculty structure that has been introduced in many LEAs has not helped in this respect. It is difficult to see how a physics probationer can be adequately supported in a school where there is no experienced physics teacher. Many LEAs run centralised probationer programmes but these tend to focus on generic pedagogical issues.

The situation where schools have large numbers of probationers at one time, or where a particular department gets a probationer for several years in a row also constrains the amount of support the probationer will receive. In the latter case, this is because teacher regent is not allocated the necessary time (30% of their timetable) to supporting the probationer; so, year-on-year mentoring grinds them down. Please also see the second paragraph in A2 above.

A4) When thinking specifically about continuing professional development in Scotland today what do you believe are the MAIN strengths and areas for improvement and why?

Strengths
There is a wide range of providers of CPD in Scotland. The universities tend to concentrate on the Chartered Teacher Programme, which focuses on education theory and generic issues. The same can be said for much of the CPD offered by LEAs and commercial providers.

Scottish science teachers are well served by professional associations such as ASE and IOP (through the Teacher Network) and by SSERC. These bodies provide
excellent, subject-based CPD in a variety of ways, including twilight meetings, day conferences and longer residential courses. The IOP also runs CPD in schools and tailors it to the needs of the school. The work of these bodies is highly valued by science teachers. The combination of lectures, hands-on workshops and opportunities for networking with other practitioners are popular and very well attended and regularly receive very good evaluations. The SPUTNIK email forum run by IOP is also highly appreciated, with some 600 of the nation’s 900 physics teachers subscribing to it. The CPD provided by the bodies referenced above is envied by teachers in other subject areas.

Areas for improvement
While there is a wide range of CPD opportunities for science teachers these are not always accessible to those who need and/or wish to engage with them. CPD budgets are not adequately protected in schools and the consequent lack of funding can restrict access. Even if funding is available, it is often difficult to find specialist supply teachers in many areas of Scotland and teachers are reluctant to leave their classes with “baby-sitters”. Teachers are not always aware of what is on offer.

ASE and IOP are both charitable, membership funded organisations and much of their CPD is provided by working teachers. While this is one of the strengths of the CPD they provide it also limits the number of events they can run. Support from central funding would allow them to extend their programmes to a greater number of teachers.

CPD is at its most effective when pedagogy, subject content and classroom management are considered together, and not dealt with as separate issues.

A5) How do teachers’ learning needs change as they progress through their career and how well does the current Scottish system cater for these changes?

All teachers have a need for CPD. Some CPD (that relating to curriculum developments) is necessary whatever the teachers’ experience. Other CPD will depend on the stage they are at in their teaching career.

There have been positive examples of the former type: the Standard Grade and Higher Still received a great deal of support in the way of CPD and provision of central exemplification material and both were implemented quickly and successfully. The 5-14 programme was less successful; it did not get the same support and struggled for years to make an impact, particularly in secondary schools. There is a simple lesson to be learned from this, particularly with respect to CfE.

Teachers at the beginning of their careers need support with their subject knowledge, with their pedagogy and with their pedagogical content knowledge. Much of this will come from other teachers in their first jobs. However, this relies on them finding schools with good existing subject specialist teachers.

More experienced teachers need updates on:

- their subject - because the frontiers of science are constantly moving forward. This is particularly important when the content of SQA courses is updated to reflect new science.
- educational research - for example assessment is for learning or changes in our understanding of the ways in which children’s cognitive development can be advanced.
- developments in classroom technology – such as computers, simulations, the internet, interactive whiteboards etc.
A6) How can the impact of teacher education (specifically continuing professional development) on improving young people’s progress and achievements be evaluated?

Measuring the impact of anything on pupils’ attainment in the short term is notoriously difficult because of all the variables involved, although longer term trends should show up in the various surveys of pupil achievement, provided these are designed to measure more than just recall of factual information.

It would be much easier to measure the impact on individual teachers’ practice in the classroom. We would commend the model of the 2 part residential courses run by SSERC. In the 1st part of the course participants are allocated a “gap task”, which they then report back on during the 2nd part of the course. The feedback allows evaluation of the impact of the course on both teachers and pupils.

As a minimum, any CPD session should conclude with an invitation to participants to submit an evaluation in which they should indicate the impact they expect the CPD to have on their practice.

A7) What do you see as the MAIN characteristics of teacher professionalism and how can these be supported by teacher education?

One of the key characteristics of a professional teacher is that he or she should be a reflective practitioner. ITE courses nowadays stress this and the evidence is clear to see in recent recruits to the classroom. Professional teachers should be keen to participate in CPD, network with their colleagues on a regular basis, and share and discuss their work with others.

The course for PGDE science students provided by SSERC in partnership with IOP and ASE stresses the need for life-long learning and helps to establish mutual support networks.

Membership of a professional association is a good indicator and should be encouraged.

Effective CPD should promote these activities and provide opportunities for them to take place.

B1) Thinking about these challenges, what qualifications/skills/attributes and qualities should we be looking for when selecting people for initial teacher education in the future?

- An interest in children and (ideally) previous experience in working with them.
- Enthusiasm for their subject and an ability to transmit/transfer this to others.
- Good subject knowledge, although a high class of degree is neither necessary for, nor a guarantee of, competency in a teacher.
- Good communication skills.
- Good general knowledge, given the cross-curricular emphasis of Curriculum for Excellence.
- A positive approach to self improvement.
- Flexibility and openness to change.
- A passion for learning.
- ICT awareness.
- Numeracy/literacy.
**B2) What transferable skills/ attributes/ qualities will teachers in all or specific sectors need to successfully meet future challenges?**

All of the above.

**B3) In what ways does teacher education as a whole need to adapt to ensure that all teachers are able to meet future challenges?**

Above all teacher education needs to be flexible so that it can adapt to changing needs as and when they occur. Teachers need to be able to embrace new technologies in their teaching and to make their lessons relevant to the world their pupils live in. In the past the profession has sometimes been rather reluctant to adopt new skills and methodologies and we all need to remember that the pupils should be at the centre of everything we do.

The approach to the management of CPD can vary considerably from authority to authority and indeed from school to school. It is worth considering whether it should be made a condition of continued registration with the General Teaching Council that teachers maintain and submit a satisfactory CPD log, as happens in other professions.

In difficult financial times it is common for CPD budgets to be diverted to meet other school costs. This practice could be prevented by ring-fencing CPD budgets.

The impact of small scale action research such as that incorporated in the 2 part CPD courses referenced in A6 above can be enormous and this type of activity should be encouraged.

**C1) Are there any other comments that you would wish to include that have not been covered by the questions shown above? Please detail here:**

Forecasting of pupil numbers and therefore the number of teachers required should not be difficult, but we seem to have got this very wrong recently. Many excellently qualified teachers who have successfully completed their probationer year have been unable to obtain full-time employment in the last few years. A contributory factor is the targets given to Local Authorities for the number of probationary teachers. In one LA recently, there were 75 probationers and only two of them got jobs at the end of the year – in part because the LA were required to take on a new batch of 75 probationers. Many of these people have now taken up alternative employment and the effort put into their ITE and probation has been wasted.

While the current reduction in intake is necessary to correct this situation, great care must be taken to ensure this does not impair our capacity to increase numbers again when the need arises. When university departments close, there is a tendency for them to remain closed and this could be disastrous for the future of science education in Scotland.

Despite the comments above about over-supply of teachers it can still be very difficult to recruit science teachers in areas away from the central belt. It would therefore be a retrograde step to allow the complete closure of science PGDE courses in places like Aberdeen and Dundee.

Finally, we would like to see more links between educational research and practice. The most likely route is through CPD; however, it is also about maintaining and strengthening the links between the research, ITE, CPD and communities.
The Institute of Physics is a scientific membership organisation devoted to increasing the understanding and application of physics. It has an extensive worldwide membership (currently over 34,000) and is a leading communicator of physics with all audiences from specialists through government to the general public. Its publishing company, IOP Publishing, is a world leader in scientific publishing and the electronic dissemination of physics.
RESPONDENT INFORMATION FORM

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Title  Mr  Ms  Mrs  Miss  Dr  Other:
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