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Institute *of* Physics in Ireland

Northern Ireland Skills Strategy Consultation Response from the Institute of Physics in Ireland January 2005

The Institute of Physics in Ireland (IOPI)* is the professional organisation for Physics in Ireland, both Northern Ireland and the Republic. It is a key educational stakeholder and welcomes the opportunity to contribute to the Skills Strategy for Northern Ireland

Throughout the Strategy document there is a clear recognition that the future economic direction of Northern Ireland needs to be targeted on becoming a knowledge based economy. The Institute strongly concurs with this and accepts much of the analysis of the skills challenges facing the region as outlined. However, there are a number of additional points, which we feel that that Department of Employment and Learning should take into account.

1. Increase the low spend on research in Northern Ireland

It is widely accepted that one of the driving factors for economic success is investment in research. Indeed in a bid to make the EU the most competitive economy in the world, the EU leaders agreed a specific target in Barcelona 2002 to bring Europe's investment in research and development to 3 per cent of Gross Domestic Product per annum by 2010 (from approximately 1.8 per cent at the time). However, government-financed expenditure on research and development in the UK is just 0.62% of GDP (2002) compared with the equivalent figure of 0.82% in France and 0.80% in the USA¹. When the figures are examined on a regional basis within the UK, the situation is actually much worse for Northern Ireland. For example in 2003, per capita investment in the science base was: **£75 in England, £88 in Scotland but just £29 in Northern Ireland**². While according to the OECD², investment in R&D per capita per year in universities is £44 for the Republic of Ireland but just £23 for Northern Ireland.

The government has recently set a welcome target of increasing the total investment (public and private) in research from 1.9% to 2.5% over the next decade³. However, if Northern Ireland does not substantially increase its proportion of the spend, there is simply no possibility of the region becoming a knowledge based economy. This issue has not been adequately addressed within the document.

The Northern Ireland Regional Innovation Strategy, Think, Create, Innovate in 2003, drew attention to the need for investment in R&D and strongly encouraged the development of business and academic links, however, there appears to be a significant lack of awareness at government level of the huge disparity in research funding between Northern Ireland and its competitors.

2. Increase the fraction of the Northern Ireland population with higher level skills

This low spend on research has a direct bearing on the skills levels in Northern Ireland. For example in Table 1 of the document, while it is noted that Northern Ireland has the highest percentage of people of working age with no qualifications in the UK (and considerable attention in this document is focused on addressing this serious issue) it also has the lowest percentage of people with the highest qualification level (i.e. Doctoral and Masters). At a European level it is recognised that the increased investment in research as outlined in the Barcelona target will lead to a Europe wide requirement of an additional 700,000 researchers by 2010.⁴ In the Republic of Ireland this suggests an increase of some 8000 researchers over this period.⁵ Concerted action is currently being taken by the ROI government to achieve this goal with, for example, sustained targeted funding being made available to third level institutes through Science Foundation Ireland. Such issues are not even mentioned within this document. Similar focused action is required in Northern Ireland if the region is not to be totally left behind.

3. Enhance the uptake of Physics in NI schools and universities

While it is accepted that Northern Ireland schools produce high numbers of students with good qualifications, as demonstrated in the document, it is important to also concentrate on the subjects which they are taking. In common with many developed countries there is concern at the low numbers of students taking science subjects both at school and at university. For example, in Northern Ireland, only 4% of all degree students accepted for university in 2003 are studying Physics compared with 13.5% taking Business Studies.⁶

This low level of Physics uptake indicates problems not only for the future supply of researchers but also in relation to a significant impact on industry. It is calculated by the Institute that Physics underpinned 43% of UK manufacturing by 2000 and the percentage is growing.⁷ Hence the importance of supporting this subject.

The document acknowledges the significance of science and technology subjects, however, no specific measurable targets are set or strategies mapped out to achieve any increases. Given the critical importance of Physics to all forms of fundamental research and to industry, the Institute would suggest setting a goal of increasing the number of students taking Physics based subjects at third-level by 20% over the next 5 years. Such a target needs to be supported with focused actions at school level in relation to career planning and classroom support. One decisive action could be additional funding being made available to provide backing to teachers in implementing more innovative practical work in schools.

Much expertise exists both within the IOPI and other organisations in relation to teaching supports and we would be delighted to engage further with the Department of Education and the Department for Employment and Learning to assist with this. For example the Institute is currently implementing a plan throughout Great Britain to have a network of Physics co-ordinators to support schools in the teaching of Physics and enhance the overall educational experience in Physics. If matched government funding was made available this could be extended to Northern Ireland.

In relation to career planning it is likely that school students are unaware of all of the benefits in studying science. For example, a recent report from the Royal Society of Chemistry and the Institute of Physics⁸ noted that chemistry and Physics graduates will earn, on average, over 30% more during their working lifetimes than 'A' Level holders. This figure of 30% compares with between 13 and 16% for graduates in subjects including psychology, biological sciences, linguistics and history. In addition despite the initial high costs of teaching Physics compared with non-laboratory intensive subjects, there is a significant net gain to the Exchequer over a Physics graduate's lifetime compared with that of other subjects. This 'rate of return' is calculated as 13% for Physics compared with 10.9% in psychology.⁸

4. Appointment of Northern Ireland Chief Scientist

Finally, the Institute strongly recommends that a Chief Scientist for Northern Ireland should be appointed with a remit to work closely with government at the highest levels to promote, support and co-ordinate the region's science and technology base. It is surely significant that in Scotland, the UK region with the highest per capita spend on science research there is a high level Science Advisory Committee. The chair of the SSAC acts as the chief advisor on science to the Scottish Executive. This ensures that science matters are fully considered across all policy areas and provides an excellent example of the importance with which the Scottish Executive regards its science base.

References:

1. UK Office of Science and Technology
2. Figures collated by the Save British Science Society, based on investment via the Funding Councils (including the Dept of Education in Northern Ireland) and the Research Councils
3. UK Science and Innovation Investment Framework, 2004-2014
4. European Commission Communication, 30 April 2003, Investing in Research: an action plan for Europe.
5. Building Ireland's Knowledge Economy – The Irish Action Plan for Promoting Investment in R&D to 2010.
6. UCAS
7. The Importance of Physics in the UK Economy, <http://industry.iop.org/pbireport/index.html>
8. The Economic Benefits of Higher Education Qualifications, Jan 2005. The Royal Society of Chemistry and the Institute of Physics

***The Institute of Physics in Ireland**

The Institute of Physics in Ireland (IOPI) is the professional and scholarly organisation for Physics in Ireland, both Northern Ireland and the Republic. It represents over 1300 physicists active in education, research, industry, the public service and commerce in Ireland. It is a branch of the London-based Institute of Physics, a leading international body and learned society with over 37,000 members in Ireland, the United Kingdom and elsewhere, which promotes the advancement and dissemination of a knowledge and education in the science of Physics, pure and applied.