



Building a Smarter Future

Towards a Sustainable Solution for the Future of Higher Education

**Institute of Physics response to a
Scottish Government Green Paper**

**A full list of the Institute's submissions to
consultations and inquiries can be
viewed at www.iop.org**

25 February 2011

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Building a Smarter Future

Scottish Government - Higher Education and Learner Support Division
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

IOP | Institute of Physics
In Scotland

Dear Mr Russell,

The Institute of Physics in Scotland is a scientific membership organisation devoted to increasing the understanding and application of physics. It has nearly 3000 members and is part of the Institute of Physics.

The Institute of Physics in Scotland aims to promote the role of physics in education, health, the environment, technology, and scientific literacy. Its membership is wide-ranging and multidisciplinary, including the educational, industrial, medical, and general public sectors. The institute seeks common purpose with other organisations to promote science and science-based learning and to influence science policy. Special emphasis is placed on supporting physics teachers by promoting in our schools the value, joy and benefits of a knowledge of physics and its applications.

The Institute of Physics is a scientific charity devoted to increasing the practice, understanding and application of physics. It has a worldwide membership of around 40,000 and is a leading communicator of physics-related science to all audiences, from specialists through to government and the general public. Its publishing company, IOP Publishing, is a world leader in scientific publishing and the electronic dissemination of physics.

The Institute welcomes the opportunity to respond to the Scottish Government's paper on higher education. The attached annex details our response to the questions listed in the call for evidence.

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

Yours sincerely,



Professor Andrew Long
Chair IOP Scotland



Professor Peter Main
Director, Education and Science

IOP Response to Building a Smarter Future

LEARNING, TEACHING AND ACCESS

Teaching Excellence

Could our universities be required to demonstrate how the quality of their teaching leads to graduate employment opportunities or other forms of outcomes?

With an increasing emphasis within universities on research excellence (e.g. via the RAE) any process that leads to a greater recognition of the importance of high-quality teaching is one to be welcomed, provided that care is taken to avoid linking the quality of teaching to employability without considering the choice of subjects studied, the quality of the accepted applicants and the perceived status of the institution

With greater competition for students, which will be exacerbated across the UK by the lifting of the tuition fee cap in England from 2012-13, students will be more savvy and more discerning in the choice of degree they undertake and at which institution, so any advantage that Scottish universities can have in maximising the student experience and demonstrating strong links to employment opportunities would be good. On this note, we would suggest that it would be better to have a centralised objective-based system in Scotland for this purpose as opposed to requesting each university to have an identical process.

How would they do this and how would we incentivise and reward it?

Linking excellence to teaching with an incentive of reward is reminiscent of an exercise akin to the RAE, which would no doubt be unwieldy, cumbersome, and time and cost intensive. It also runs the risk of driving down academic standards if too much emphasis is given to the student voice. We are therefore of the view that there is no need for the Scottish government to demand demonstration and then subsequently to reward. Scottish universities will naturally have to adapt their strategies to entice a more well-informed and demanding student market in the UK.

Widening Access

Within the new Scottish Solution where should we focus our investment and activity to raise aspirations and widen access to university?

On low socio-economic groups and ethnic minorities, with funding provided to both local authorities and universities. Positive efforts should be made to correct the sectoral segregation between genders by encouraging a more equal take up by men and women in all subjects.

Should more work be done to encourage young people at school to aim for higher education and by so doing seek to increase access?

Yes, most definitely. We suggest that any encouragement is based on evidence that higher education leads to a wider range of employment opportunities coupled with higher salaries, particularly if subjects such as physics are studied at university. That said, there is an argument that schools should be doing more to deal with such socio-economic issues and there is a limit to the influence of the universities without robust partnerships with schools.

Within the wide range of occupations and roles in the UK economy, STEM graduates are commanding salaries above the national average. The Institute together with the Royal Society of Chemistry published a report, 'The economic benefits of higher education qualifications'¹, which revealed that physics and chemistry graduates in the UK earn more than graduates from most other disciplines.

The report shows that over a working life, the average graduate will earn around 23% more than their equivalent holding two or more A-levels, compared with 30% more for physics and chemistry graduates. The figure of 30% compares between 13-16% for graduates in subjects including psychology, biological sciences, linguistics, and history. According to the report a graduate in physics or chemistry earns between £185,000 £190,000 (compared with the average for holders of degrees of all subjects of £129,000) more during their career than someone with A-levels but no degree, whereas history and english graduates earn between only £89,000 and £92,000 more. The report also demonstrates that physics and chemistry graduates pay approximately £135,000 more in tax than those with A-levels alone and £40,000 more than the average graduate during their working lives. Furthermore, the report assessed the costs associated with undertaking a degree, trading them off against the economic benefits. It concluded that the individual rate of return to the average degree holder, relative to their investment in terms of fees and lost earnings, etc., is about 12% per annum. This compares with an individual rate of return for graduates in physics and chemistry of 15% per annum.

The Institute of Physics in Scotland published a report in November 2009 "Physics in Scotland : the brighter minds go further"² which came to similar conclusions based on the experience of physics graduates from Scottish universities.

What is the role of early years intervention in driving up access?

Early intervention, particularly for STEM disciplines, has shown that stimulating the interest of young students in the exciting nature of physics leads to a greater interest throughout their schooling which may lead to increased uptake at Scottish Highers and undergraduate level.³ In addition, it is vital to emphasise the important role that well-informed, good quality teachers will play in inspiring students to strive towards higher education, coupled with the aspirations of parents. Driving up access should focus on subjects that equip students with the skills they need to become valued members of society, making them more employable for a wide variety of careers, and enabling them to contribute to economic growth. It is at the school level that we believe the most difference can be made

RESEARCH AND KNOWLEDGE EXCHANGE

Encourage a different research/teaching balance in each university

Do we need to retain research in all of our universities?

Yes, but not necessarily in traditional fields. With an increase in research concentration possible as a result of research council grant funding policies, a number of universities may miss out on very competitive research council funding for traditional physics. A lot of time and resources that are spent chasing such income might be more usefully allocated to an institution's obvious strengths which could be in teaching and/or services for businesses in their locality. If a policy of teaching-only institutions was introduced, a sustainable financial model would have to be developed. This should include research and development in fields directly related to

¹ http://www.iop.org/publications/iop/2005/page_38258.html

² http://www.iopscotland.org/activity/policy/Science_policy/page_30933.html

³ Johnston, J. (2005) *Early Explorations in Science 2nd Edition*. Maidenhead: OpenUniversity Press

university-level teaching, such as physics education research (PER) which itself would need to be adequately funded. Any transition to this model would need to be planned carefully to avoid unintentional closures of departments.

How would we continue to ensure that teaching is informed by research? What impact would this have on reputation?

Separating the two would have negative consequences, as high-quality, up-to-date teaching is often linked to advances in research, especially in STEM disciplines. However, there may be a need to recognise that some institutions will not be able to entice or hold onto academics, who are drawn to institutions that offer a more financially stable environment for traditional research, and thus will have to rethink their missions as to whether they wish to continue to undertake teaching alongside research, perhaps in a narrower set of areas, or focus solely on teaching and the associated pedagogic research. Any that did focus on the teaching and teaching related research should be linked with high quality research schools in traditional areas; each kind of institution might then benefit from the other.

Concentrate funding on research excellence

Is it a more sustainable approach to move towards even greater concentration as opposed to supporting a spread of research?

The RAE2008 revealed that excellence is spread across the physics base, and it is dangerous to think that excellence can only be found in big departments, i.e. those that are highly populated with academic staff. The Scottish Universities Physics Alliance (SUPA) is an excellent example of collaboration when appropriate, while maintaining the research base. Most universities are excellent in some subjects with the result that greater concentration at university level will be difficult to achieve.

Should critical mass or minimum size of research unit be considered when allocating research funding?

The RAE2008 physics sub-panel reported in its findings that large groupings don't necessarily lead to a higher quality of research output, thus as much of the science base as possible should be preserved to aid the UK's economic recovery. Furthermore, landmark discoveries such as C_{60} were the result of the efforts of small, self contained research groups and that their invaluable contributions in the future could be threatened by favouring grant funding for groups. We believe that the SFC should continue to support research excellence wherever it was found by RAE2008 or will be found by REF2013, in much the same way as it does now and has promised to continue in 2011-12.

One proven method of achieving excellence in research and innovation is to encourage and finance collaboration and coherence between university research groups, such as the successful Scottish Universities Physics Alliance (SUPA). SUPA should continue to be supported with sufficient funding to carry out its excellent work.

Would a focus of funding on Government priorities have a greater impact on increasing sustainable economic growth?

Not necessarily. Economic growth will be dependent on a balance being found between funding both curiosity-driven research in disciplines such as physics which have a proven ability to deliver economic prosperity (predominantly funded by research council responsive mode programmes), and priority areas, which the research councils have stated will dominate when budgets are tight.

Curiosity-driven research has an essential role to play in Scotland's science base for the foreseeable future. All agenda changing technological advances ultimately have

their origins in curiosity-driven research, where the outcomes of the research cannot be easily predicted. Such research in physics often leads to significant economic and societal benefits, usually after around a 15 year time period from essential breakthrough in the science to the application. For example, PET, MRI, X-rays, GPS, lasers and semiconductors are all technologies that are widely used and are enormously beneficial to society; it was not so long ago that the laser was dismissed as a physicist's toy and not many people thought that atomic clocks would lead to the ability to navigate to within a metre at any point on the Earth's surface.

Scotland has a strong and vibrant research base and with sufficient investment curiosity-driven research will reap significant benefits within and beyond the next 15-25 years. However, there are pressures being placed on research council responsive mode grants, the means by which much curiosity-driven research is funded, as research is being prioritised towards targeted areas and demonstrable evidence of the economic and societal impact of such curiosity-driven research as remains is being sought. It is not clear whether focusing on select, thematic areas will result in short-term economic gains, but it is obvious that in the medium- to long-term, it will undermine the UK's ability to retain the highly trained, inventive and innovative scientists and engineers who will maintain and strengthen Scotland's international competitiveness. It is these people, particularly those that have been attracted to Scotland by a funding system and academic ethos that allow them to pursue curiosity-driven research, who will enable Scotland to pioneer new discoveries for which the economic and societal impacts will eventually be manifold, but which are broader and harder to quantify than for example, year-by-year profits in a manufacturing company.

In addition, universities will often be incentivised by income so a good approach is to offer financial incentives to companies for R&D collaborations with universities. This is a better approach than attempting to pick winners.

Is it even possible to match areas of research to Government priorities?

Yes, but the priorities should not drive science and the research objectives of Scottish universities to the exclusion of other themes and areas.

Many physicists are already engaged in research that maps to the priority areas such as energy, medicine, and IT. For example, physicists are leading the way in improving the efficiency and cost of photovoltaic cells, in the development of novel strategies involving magnetic nanoparticles to aid the treatment of disease, and in the use of quantum dots to make communication between banks, for instance, more secure.

What impact would such an approach have on our basic research?

It would send a message that the Scottish Government places more value on priority areas over basic research, which we believe would not be in the national interest. The Scottish Government needs to find a healthy balance between the need to fund curiosity-driven research and the translation of knowledge into products and services that can contribute to GDP and the need to prioritise research to address the major societal challenges such as global warming. Without curiosity-driven research the development of breakthrough technologies is much less likely.

Are there further opportunities to strengthen the impact of research on SG priorities through enhancing collaboration with organisations outside the university sector and if so how could this be achieved?

Yes, most definitely. More attention needs to be given to where the barriers actually are within the science and innovation base, such as the lack of investment in

transitional research and industrial capability that would allow the more direct products of curiosity-driven research to be widely exploited by Scottish companies operating within the UK. Organisations outside the university sector will need to be incentivised to get involved, perhaps through R&D tax breaks.

Promote international collaboration as an integral aspect of research pooling

How best can we ensure research pools increase their focus on international collaboration and knowledge exchange?

SUPA already focuses on international collaboration and knowledge exchange. Also SUPA provides a knowledge transfer service which aims to provide a single interface for researchers and global businesses.

In a more narrow sense of research pooling, the photonics sector in Scotland has set up an international project, SU2P, which is designed to capitalise on leading research in the field and on commercial opportunities.

Promote a collaborative approach to training researchers

How could existing good practise in researcher training be more widely adopted?

How would postgraduate researchers benefit from shared training?

SUPA's Scottish graduate school in physics is an example of a successful initiative. It makes use of video conferencing facilities to share expertise throughout the SUPA institutions. Reviews of the SUPA Graduate School have commented on its excellence. This success has led to the award of two EPSRC doctoral training centres, which are also examples of good practice in shared training.

Is it appropriate to develop single Scottish 'schools' where all postgraduate researchers in a particular discipline or group of disciplines are trained?

The Scottish Government should closely look at the Scottish Universities Physics Alliance (SUPA) Graduate School, which runs an intensive postgraduate training programme for Scottish physicists. The programme offers significant benefits in terms of efficiency and breadth of coverage. However it works on the basis of sharing expertise from the contributor institutions, not by transferring staff to a single central research school, which would be too bureaucratic and expensive in the current climate.

Should training include, as an integral element, business awareness skills or work placements to encourage researchers to consider future collaborations with or careers in industry?

Yes, both suggestions are fine and have long held a place in Scottish research student education.

Increase support for research where impact is greatest

Is it appropriate for Scotland to adopt a radically different approach in applying the REF to funding?

No, as it is hard to see what the justification would be for such a proposal. The underlying principle of the REF must remain to reward quality based on peer-review assessment.

Could the impact aspect of the REF be used as an alternative mechanism for distributing funding for knowledge transfer?

No. While it is entirely appropriate that impact should be taken into account in evaluating the effectiveness of research funding, there are two main reasons why this proposal is ill judged. First, such a proposal would run the risk of stifling novel research as the only driver would be impact. Second, the REF has not yet run at all so the impact measures are untried and certainly cannot be considered sufficiently

robust to support a change of this magnitude to the funding system. On that note, we urge the Scottish Government to ensure that impact is not given too high a rating by the SFC as the initially proposed 25% is simply too high for an indicator that is not a measure of *current* research, which will be the aim of the REF. The HEFCE pilot on the physics impact statements recommended that a lower weighting should be used until it can be demonstrated that impact will be able to be measured in a way that has the full confidence of all stakeholders. We support that recommendation.

Improve collaboration between Scottish businesses and university researchers

How do Scottish SMEs unlock the potential within our universities research departments? How can universities support them in this?

Knowledge exchange between universities and businesses can be a complex process; however, a strong research base, comprising both pure and more applied science is necessary to create the ecosystem which will result in knowledge being exchanged between academia and industry in a way that is beneficial to both players, and also to Scotland as a whole. Continued support for Interface, commercialisation offices and Knowledge Transfer teams should continue to produce good results in this area.

How do we make it more attractive for university researchers to engage with SMEs?

There are many issues relating to career progression that could currently be seen as hindrances to university researchers spending time working with SMEs. These relate to both the career structures and requirements as much as a culture clash between SMEs and universities. To address the latter, we support the further development of science parks that are closely integrated with universities. Academics within university departments often have little time for business engagement; technology transfer offices within universities have a role to play as brokers but they are not involved in the research itself. Science parks provide opportunities for interaction between staff in university departments and start-ups and more established companies and have shown great successes. Further, for this process to succeed, it is important to clearly enunciate the benefits that can be derived by academic research from interacting with SMEs.

What is the role of Scottish Enterprise and Highlands & Islands Enterprise in this?

In promoting knowledge transfer, the government should enable models that work – for example, easing the way for 'technology innovators' (who demonstrate the feasibility of a technology and then sell on) which is a growing model (but less job-creating than full start-ups). The government should do more to reinforce the support for businesses that can see the need for new solutions, i.e. a market-led approach.

Given the likely reductions in Technology Strategy Board commitments, along with a more general financial tightening within industry, there is a strong case for both Scottish Enterprise and Highlands and Islands Enterprise, rather than create new initiatives, to look to strengthen existing programmes that have shown some promise over the past few years, such as the Knowledge Transfer Partnership programmes. Additionally, consideration should be given to expanding the Innovation Voucher schemes⁴, such as that operating in Northern Ireland.

⁴ Invest Northern Ireland: Innovation Vouchers
http://www.investni.com/index/grow/technology_and_process_development/develop-newpage-3.htm

*How do we engage the SME business base and overcome any cultural barriers?
What specific approaches do they need/would they welcome?*

The 'Lambert Toolkit'⁵, which includes template agreements for collaborations, has had a significant positive impact on knowledge transfer in the UK over the past decade. There is perhaps scope for similar framework contracts to be provided for the exchange of people, or through secondments of academic research in SMEs.

Maximise funding from Europe

How can we increase Scottish universities take of EU research funds?

UK support services are poor compared with those of other European nations, such as Ireland, and there is a need to improve firstly, the level of support provided in helping academics make and submit applications, and secondly, the dissemination of key information and contacts. Currently, the UK, overall, is plagued by a support system that largely just passes on European Commission information unfiltered or without added value.

In addition, the proportion of overheads funded by FP7 is not appropriate nor acceptable. However, it is doubtful whether the European Commission will look favourably on increasing the overhead contribution to a level commensurate with FEC, but the Scottish Government should lobby hard for this, as the current regime requesting matched funding and giving very small overheads makes it extremely difficult for Scottish universities to participate.

We also need to encourage more involvement of Scottish scientists and government officials in Brussels helping to shape FP8.

What more can the Scottish Government and the SFC do to help universities?

The Scottish Government's recognition that Universities are an essential investment to the Scottish economy and cultural life is welcomed and should be maintained. That recognition should be reflected in maintaining the funding for Universities. Funding should be planned on a three year basis rather than year by year, so that strategic planning is made more feasible.

The removal of VAT on consumables/equipment purchased through Framework Grants is desirable; this is done in other EU countries and would put us on a more level playing field.

Should past success in securing European funding be considered when distributing our own research funding?

No it should not. Applications should be assessed on their merit at the time of submission, otherwise there is a risk that emerging groups are excluded from funding.

INTERNATIONAL CONTRIBUTION

Promote the quality of the international student experience and graduate outcomes

How can Scotland retain more international students after graduation?

The most important change needed to promote retention of overseas talent after graduation is an increase in the number of visas allowed for tier 1 and tier 2 workers.

⁵ <http://www.ipo.gov.uk/lambert>

STUDENT SUPPORT

A simpler system

Should we operate a simpler bursary system with one bursary pot weighted on a range of circumstances?

In the Institute's experience, personal incentives, such as grants and bursaries to students, are of limited influence. A better strategy would be to give extra UCAS points for strategically important and vulnerable subjects (SIVs). Also, more funding could be allocated to schools and colleges that recruit into SIVs, and to incentivise universities to increase undergraduate numbers.

Should students be given more choice on whether they receive loans or grants – or a mixture of both – to support them in their studies?

The Institute does not favour a funding system that in any way discourages students from families of modest means participating in higher education if they have the ability to benefit from it.

It is essential that there is a system of charging that is not financially disadvantageous to those who study subjects like medicine, engineering and laboratory-based sciences such as physics and chemistry. In addition, for subjects like physics, chemistry and engineering a significant fraction of the undergraduate cohort is enrolled on five-year courses, so further financial pressures exist.

Supporting lifelong learning

Should a new support product be considered to encourage more lifelong learning?

Yes. The need to encourage lifelong learning has been well established but care is needed about the products used as indicated in the comments about part-time study below.

Part-time

Should we provide more loans to cover part-time fees?

The Institute welcomes efforts to increase part-time provision. However, there needs to be a feasibility study undertaken first as there is some evidence that some part-time fees are suppressed because there are no loans. If fees increase, then the main effect will be to increase student debt.

How could businesses be incentivised to support part-time study?

Businesses need to be made aware that part-time study is a viable route by which people, especially those that are more mature, can be trained in subjects for which there is greater demand. Part-time study also lends itself well for students to be sponsored and/or employed by businesses, so that students get an opportunity to apply their knowledge immediately in a business environment.

Another option, mentioned in the consultation document, is one where student placements are offered to SMEs in order to support work pressures. This is fine but there is a serious risk that it becomes a drain on their limited resources. Another option for establishing operational links for them (and perhaps even larger companies) is industry-related projects incorporated as part of the undergraduate curriculum. The projects, established jointly by the university and placement company, would be aimed at developing certain key skills and knowledge including physics content, collaborative work practices, literature searches, data collection, management and data interpretation. A project with a local company undertaking an appropriate and scientifically acceptable topic would benefit students, universities and physics-based companies. However, such projects would need to be quality controlled.

But, ultimately, companies have to see benefit in any scheme and the Scottish Government could help by facilitating companies to express their needs so that universities can respond.

Should we encourage more part-time study?

Yes, as it is a means by which to increase participation from the lower socio-economic groups and mature students, amongst others, which the Institute supports wholeheartedly. For instance, the Scottish Government could incentivise those in work to consider part-time study via the tax system.

FUNDING

Do you agree that the prime responsibility to funding should lie with the state?

The general matter of the source of funding is not a matter on which we wish to comment. However, we would argue that students should not be deterred from courses in subjects like physics due to them being offered on a cost basis making them more expensive than, say, those in the arts and humanities. Since science and engineering subjects do cost more to teach than their arts equivalents, it is appropriate that the state has the responsibility for funding the difference for STEM subjects that are of strategic and national importance.

The most important priority for the funding scheme which is to be introduced in 2012 and perhaps modified further down the line is that it should be properly planned and costed. As is becoming increasingly evident, the time to put in place even an interim solution is limited. It is incumbent on all political parties in their manifestos for the 2011 Scottish elections to be realistic about their proposals and to ensure that they are properly realistic financially.

State retains the prime responsibility but requires some form of graduate contribution

The Institute does not offer any views as to exactly what financial model should obtain in Scotland. However further draconian cuts of HE budgets without any compensatory sources of income being found are certainly to be avoided as they will destroy one of the jewels of Scottish society. Informed opinion within HE is that it will be difficult to avoid such cuts without requiring students to make some contribution to their own higher education.

Increasing income from cross border flows of students

Do you agree that we should rebalance the fee levels in Scotland to broadly maintain current levels of cross border flows within the UK?

Ideas for controlling 'cross border flow' could entail some risk—if Scottish universities, hard-pressed for income, are able to attract higher income from English students than from Scottish ones, then the potential consequences are obvious. Similarly, it would surely be unhealthy if access arrangements for English students were seen to be punitive. The future financial arrangements for English and Welsh students should be set in conjunction with the overall settlement for Scottish students.

Increasing support from business

If you believe that Scottish businesses should invest more in higher education, how do you envisage this happening?

What incentives do we need to provide to employers?

How do we encourage more meaningful interaction and stronger collaboration between universities/business schools and employers?

There needs to be a clear understanding that industrial investment should not be seen as straight replacement for existing public funding of research and teaching, but must be seen as an additional stream in specific areas. For specific project-based interactions, the issue is not so much incentive-driven, but is instead limited by opportunity and availability. To facilitate this, a first step must be to ensure good university-industry links across the piece, perhaps fostered through the setting up of Business Advisory Boards in physics departments -- this is an area where other disciplines such as engineering and chemistry have already made some progress.

Increasing efficiency

What more could the sector do to realise efficiencies?

The sector is already being driven to make efficiency savings in 2011-12 by the planned reduction in SFC teaching grant. Further savings in subsequent years will consequently have a disastrous effect and will significantly impair core teaching and research functions even in successful departments.

Creating more equal treatment of other UK and EU students

Should we be looking to create a fairer system of support where other UK and EU students are treated more equally?

Yes; as the consultation document points out, it is not fair, and frankly quite ridiculous, that EU students have their fees paid by the Scottish Government if they study in Scotland, whilst the same does not apply to English and Welsh students.

The proposed Welsh system, where all students pay fees irrespective of origin but Welsh students are given credits to reduce their contributions, is interesting and would be worth considering.

Learner-driven funding

Should any new funding mechanism look to put more funding behind the learner to make student demand the key driver of provision?

If so, how do we continue to protect provision in areas of strategic importance?

There has been some indication in England that the funding council will continue to provide some level of state support for STEM subjects. Of course, if this is the case, as the forthcoming White Paper will make clear, similar protection should be extended to subjects of strategic and national importance in Scotland. State support not only guarantees a certain level of teaching income for subjects, but also sends a strong signal to the student market of the value of these subjects to society and the economy.

SHAPE AND STRUCTURE

Sector-led institutional change

How do we encourage and incentivise sector-led institutional change?

By increasing collaboration in research pools and possibly by extending pooling to teaching. Pooling leads to more awareness of what is needed in the sector.

Centrally planned change

Is a more centrally planned approach to funding desirable?

The key issue in any funding process is that universities have the flexibility to drive, and respond to, local issues and demands. Individual institutions are best placed to determine and meet local needs and to maximise their own efficiency.

Number of institutions

Should Government and the SFC proactively look to reduce the number of institutions we have whilst of course protecting provision for existing students?

There is an argument that Scotland, has too many institutions and it would improve efficiency to have fewer. But provision must be maintained especially in subjects that produce students with the high-level skills of great value to employers, whilst bearing in mind that more students are tending to live at home and that enough local University places should therefore be provided. It should also be remembered that different institutions have developed different markets and that shotgun marriages between institutions without the appropriate synergy will most likely be counter-productive.

Map of provision

Do we need a map of provision and institutions? How should this be used?

A map of provision would be helpful for strategic planning. SUPA went through this exercise on a subject basis and has found it useful in providing a coherent approach to staffing strategy, research training, research initiatives and funding opportunities.

A national research database would also be a useful tool.

Who should be responsible for developing this?

If done on at a subject level the research pools might be the favoured avenue for developing this. However, if a map of provision is more wide ranging, the SFC might be best placed to undertake such a review.

Student numbers

Should we be considering the level of student numbers in light of the recent spending announcements?

If the Scottish Government considers adjusting student numbers, it should be very careful not to introduce perverse financial drivers that militate against strategically important subjects.

Ideas on quality and standards

What areas should we be focusing resources on to ensure continued quality enhancement in Scotland?

Encourage more pooling, possibly extending it to undergraduate teaching at the final year level.

The Institute of Physics is a scientific charity devoted to increasing the practice, understanding and application of physics. It has a worldwide membership of over 40,000 (3,000 in Scotland) and is a leading communicator of physics-related science to all audiences, from specialists through to government and 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.

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