Engineering Professors' Council

Newsletter October 2010

Engineering Education and Research in the Post-Browne Era

Professor Barry Clarke

President, EPC

The Browne report has made it clear that students should be allowed to choose where and what they want to study through a new funding model for HE which is based on increased private contributions and more targeted public investment supporting high quality provision, allowing the sector to grow to meet qualified demand. Thus, it is argued, HE will be placed on a more sustainable footing by seeking higher contributions from those that can afford to make them, and removing the blanket subsidy for all courses – without losing vital public investment in priority courses. Students will pay nothing up-front; the government will pay the costs of learning initially. However, these costs will be recovered on graduation. Graduates will only make payments when they are earning above £21,000 per year at a rate of 9% of any income above £21,000.

There will be support for living costs available to all students through an annual loan of £3,750. There will be additional support for students from families with an income below £60,000 per year which will be up to £3,250 in grants.

This proposal is to allow HE to expand sustainably with access for anyone who has the talent to succeed. It is anticipated that there will be a 10% increase in the number of places and new support for the costs of learning for part time students.

The aim is to encourage HEIs to compete for well-informed, discerning students, on the basis of price and teaching quality, thus improving provision across the whole sector, within a framework that guarantees minimum standards. The Higher Education Council will enforce baseline standards of quality.

Aspiring students will receive high quality information at school to help them choose the

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EPC Congress 2011

To include sessions on funding and European issues: Tuesday 12th April

Conference on the Future of Engineering Higher Education: Wednesday 13th April

London South Bank University

Details to be announced shortly

HEI and courses which best match their aspirations. This is a key issue for both Browne and Willetts, who are both concerned about the quality of career advice in schools.

It is suggested that HE should be helping meet the demands of industry for a highly skilled workforce. However, not all courses are sustainable even with this fundamental change to HE. Therefore public investment in clinical and priority courses such as medicine, science and engineering will be needed.

Since the Brown report was published the government has declared support for the ideas in the Comprehensive Spending Review. It states that HEs will be able to increase graduate contributions from 2012 at the same time as a saving of 40% in HE funding is introduced. There will be a National Scholarship Scheme of £150m from 2014 to help those who cannot afford to pay.

While the focus has been on funding of education, the government also wants to see a pipeline of research feed into industry by ring-fencing investment in science and research and reforming the HEIF to increase investment.

The implications of all this for engineering education and research were discussed at the EPC Policy Forum on 27th October. A number of concerns were raised in addition to the fundamental principle of free education for all those who have the talent to benefit from attending. These included the increase in number of European and international universities offering degrees in English, thus competing for UK students; the threat to fair access for all because of financial limitations on social mobility; the threat to the quality of engineering education through limited funding for resources; the need to accelerate the tariff system to cover all pathways to entry; and the fact that EU is encouraging countries to invest 2% of their GDP in HE, rather than the declining investment in the UK.

Guest article

Mark Prisk MP, Minister of State for Business and Enterprise at the Department for Business

In recent years many people have questioned whether there is still a place for engineering in the modern UK economy.

For them the achievements of great engineering pioneers such as George Stephenson, James Watt and Isambard Kingdom Brunel belong to our heritage and our future lies in the finance and service sectors, with manufacturing moving to developing countries where production is cheaper.

I believe that is simply not the case. Not only is their legacy still alive today, but we are looking for the next generation of people with those abilities, skills and vision who will prove to be critical if our economy is to recover and grow. Engineers solve problems and turn ideas into reality. We need them if we are to rebalance the economy and boost the nation's competitiveness. As the global economy evolves, we need to make sure we can evolve with it and take advantage new trade opportunities – such as exporting our goods to the growing consumer markets in the emerging economies of countries like India and China. We need them too if we are to find solutions to global challenges such as climate change, renewable energy and clean water.

In Government we intend to be a real partner to the engineering sector. This does not mean picking winners, meddling in individual projects or imposing burdensome regulation on businesses, or research and development.

Instead, I believe our role is to create the right environment for the sector to flourish and allow it to reach its full potential. This means making sure we have a skilled workforce; creating a progressive tax regime and a stable regulatory environment; establishing excellent business support networks and investing in enterprise and research and development.

The first priority for the coalition Government has quite rightly been to tackle the record budget deficit we face. Only when we have restored confidence in the UK's economy will we be able to attract investment and grow our businesses. The billions we would have had to pay on interest payments can be invested in skills and education, infrastructure and innovation. Now our challenge is to find the best ways to encourage sustainable growth with the limited resources we have.

If the engineering sector is to fulfil its great potential there must be a steady supply of highly skilled engineers and technicians. By 2017 it is estimated that 587,000 new workers will need to be recruited into the manufacturing sector. But is not just numbers that we need. These workers need to have the cutting-edge skills to help us compete in the global marketplace.

My department is working with a wide range of partners to convey the importance of engineering and build an interest in engineering and a respect for those who practice it. We will also make sure that we improve the take-up by students of Science, Technology, Engineering and Maths. That's why we're going to work with the Technicians Council, which has been set up specifically to help manufacturing in Britain get the skills it needs for the future.

We need to get across the message that a career in engineering can be a rewarding path for many young people, providing interesting work and excellent pay. Engineers' salaries still compare favourably with pay for other graduate jobs according to the CBI's Education and Skills Survey 2009, with the median salary of a graduate engineer being £22,500.

Lord Browne's report on Higher Education, due to report this month, will review the strengths and weakness of the system and its long-term direction. Once we have the findings, our challenge will be to ensure that we maintain the UK's reputation for producing top quality graduates and research excellence and have a fiscally sustainable Higher Education system to support it.

In addition to supporting higher education, we have redirected £150million to create up to 50,000 extra apprenticeships. We are also setting further education colleges free from unnecessary bureaucracy, enabling them to respond directly to the needs of employers and learners.

As well as a skilled workforce, we need the right business environment to turn ideas into reality. In June's Budget, we unveiled a number of measures to ensure that UK industry benefits from a simpler, more predictable and stable tax system. We will reduce the main rate of corporate tax from 28% to 24% over the next four years and next year the small companies rate will be cut to 20%. This means that by 2014 this country will have the lowest corporation tax of any major Western economy.

On capital gains too we are protecting businesses: the 10% Entrepreneurs relief rate is being substantially increased, from the first £2 million of gains, so individuals can rightly enjoy the rewards of their endeavours.

We're also investing in industry. We've put an extra £200 million into the Enterprise Finance Guarantee and we will continue to work to find ways to help industry access both debt and equity finance, particularly for growing businesses.

Red tape can place an incredible burden on businesses, and perhaps disproportionally so on entrepreneurs and small businesses. Regulating enterprise should not be the first option, but must only be a last resort.
That is why we're adopting a new 'one in, one out' system across Whitehall. From now on, before they can bring forward new regulations Ministers must prove that they have already reduced the existing burden.

This coalition Government has wasted no time in tackling the record budget deficit. Our next challenge will be to rebalance the economy and re-position it for long-term sustainable growth.

Engineering will be at the centre of this as we aim to be Europe's leader in high-tech goods. British engineers led the industrial revolution. I believe we can be just as innovative in the 21st century.

Innovation Union; Youth on the Move

Professor Barry Clarke, President EPC

Innovation Union, Youth on the Move. These are two flagship strategies currently being promoted by the EU which will impact on higher education. This emerged clearly during a **visit by the EPC as guests of the European Commission in early September**.

The two-day visit began with discussion with representatives of British and wider European bodies in Brussels, who set the scene and highlighted the challenges and opportunities ahead. This helped us direct our subsequent meetings with the Head of Unit for Marie Curie Actions in the Directorate-General Education and Culture; policy officers in the Universities and Researchers Unit, DG Research; and Higher Education Unit, DG Education and Culture; and members of the Cabinets of Commissioners Geoghegan-Quinn and Vassiliou, which covered the research and education agenda respectively.

Not only were we made very welcome, but we were also able to engage in probing discussions about the two flagship strategies, FP7, FP8, the Marie Curie programme and the future of higher education. It was clear that higher education is moving up the European political agenda; we discussed modernising and ranking universities with the aim of increasing the level of engagement and mobility, reducing regulation and increasing funding. Interestingly, the Commission is promoting learning outcomes, a concept that EPC helped developed all those years ago. The research agenda showed an increasing alignment with the UK agenda - extending links between HE and industry, simplification of processes, evidence-based and quality of impact. There is a 2020 vision focusing on climate change, ageing and resource efficiency but with a 2050 outcome. Clearly there is a funding issue, but innovation both in financing and solutions is being championed.

Overall this was a most constructive visit. We were encouraged to maintain contact; indeed they welcomed our ideas. Our International Working Group will develop this further and report back to you. Part of this development is the opportunity for EPC to contribute to consultations on the interim review of FP7 and the programme for FP8, ranking and schemes to increase mobility. Any views you have would be most welcome.

Some of the Committee delegation outside the Berlaymont building in Brussels

The following report on individual sessions draws on contributions from EPC Committee members Professors Ray Allen, John Turner, Bill Banks, Rob Krams, Clive Neal-Sturgess, Jonathan Cooper, Tony Brown and Jim Yip.

We began our preparation for the meetings with Commission officials with a series of briefings from some Brussels insiders. The first of these was the **UK Research Office**, which has been operating in Brussels since 1984 and now has a staff of 13. It has 140 subscribing member

organisations including all those Universities represented around the EPC Committee table. Its Deputy Director, Christina Miller, told us that UKRO's aim was to promote effective UK engagement in EU research, innovation and HE activities. It offers a number of services to its members, mainly focussed on the provision of research-oriented information but interestingly including the provision of a 24-seat meeting room in Brussels. Individual members have principal representatives, usually based in the university's Research Office.

Christina took us through the basic issues of the moment with discussion centring on the mid-term review of the Framework Programme 7 and its objectives, including the 10 thematic areas which account for about 60% of the expenditure and the subsidiary themes of

- Capacity Building (research infrastructure, SMI's regional policy and so on)
- People Development (Marie Curie initiatives)
- Ideas development (blue skies research via the European Research Council).

There was particular discussion on the ERC and its twin activities, funding either junior or senior academics for 50% of their time over a five year period at levels up to €1.5m and €2.5m respectively. A surprising feature of Christina's presentation was the UK success levels that have been achieved in some of the calls, with rates of between 14% and 20% often being seen. Indeed the UK has earned 14.4% of FP7 funding so far. Christina reported that the prevailing view in Brussels is that the economic downturn will not affect FP7 funding significantly as the money is already committed.

She talked also of the EU's new 2020 strategy which is the successor to the previous Lisbon Strategy. This is aimed to promote a dynamic, successful Europe deriving from a European Research area itself focussed on:

- Smart growth
- Sustainable growth
- Inclusive growth.

Framework Programme 8 is already being planned and actively discussed. It will be brought into play in 2014, on the completion of FP7 in 2013. It will continue to 2020 and the challenge will be avoiding negativism in planning for 2020 against the backdrop of 2008/9 economic conditions. In the UK, BIS are currently conducting a consultation on FP8 and Christina urged all UK universities to participate.

For more on UKRO, see Christina's separate article, below, and the UKRO website: www.ukro.ac.uk.The slides that she used during her presentation are available on request from piers.baker@surrey.ac.uk.

The EPC Committee then met the Secretary General, Lesley Wilson, and her Deputy, John Smith, of the **European University Association** (EUA).

The EUA represents and supports higher education institutions in 46 countries, and thus has a wider membership than the EU. Its aim is to provide a forum within which European Higher Education Institutions (HEIs) can cooperate and follow trends in higher education and research policies. The members of the Association are European universities involved in teaching and research, national associations of Vice-Chancellors/rectors (such as UUK), and other organisations active in higher education and research. It is thus well-placed to play an important role in shaping European higher education and research policy.

The EUA was formed 10 years ago in response to the Bologna process, when it became apparent that a single organisation representing HEIs was needed. The organisation is governed by a nine-member Board of current or former Vice-Chancellors, and by a Council consisting of the Chairs of national HE conferences (such as UUK).

Lesley Wilson's presentation described the aims and objectives of the EUA. The organisation helps support individual HEIs through the Bologna process and addresses quality assurance and professional accreditation issues at a European level. The Association's mandate as part of the Bologna process, contributions to EU research policy-making and relations with intergovernmental organisations and institutions all give it influence in matters relating to higher education, research and innovation.

The EUA's Trends Report is their flagship publication. The Trends 2010 report will consider the achievements of the past decade of the Bologna Process. It will also examine the challenges lying ahead for higher education, such as funding constraints. An emerging trend is growing pressure on the independence of HEIs: in some countries national governments are placing greater constraints on the autonomy of HEIs.

Research and innovation are increasingly important parts of the EUA's work in Brussels. A Research Policy Working Group (RPWG) has been set up consisting of 22 members. Each RPWG member has a national research position within HE. The European Research Area concept is now embodied in European law (as part of the Lisbon Treaty) and the UK Research Councils are very aware of this. The financial challenges facing research funding are likely to lead to more joint (national) approaches as part of a strategy to overcome EU research fragmentation.

Since our meetings, the Commission has published its "Innovation Union" proposals (see below; and http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=intro) and the EUA will publish a response. Individual HEIs are also encouraged to submit comments.

Following our meeting with the EUA, Andy Lebrecht, the UK's Deputy Permanent Representative to the EU, set the scene from the **UK Government's perspective**.
He drew attention to the two areas in particular that coloured policy-making at present –
- the Lisbon Treaty: the appointment of a new overarching executive responsible for its implementation had led to a new political dimension, with possible conflict between implementing the Treaty and central EU policy; and
- the financial and economic crisis.

He thought, however, that the main interest for the EPC lay in the 2020 initiative: growth in competitiveness, the low carbon economy, resource efficiency and overall improvement in "weak areas", one of which he categorized as IT. Energy security was of fundamental importance, as of course was climate change and its ramifications.

The financial framework for 2014-2020 would impinge on all of these areas. Andy encouraged the EPC to put forward ideas for the next FP8 funding round, and in particular to focus on what we thought were the "Grand Challenges" in the area of engineering; and to talk to MEPs. He concluded by stressing that the UK government was very active in Europe in all of these areas and maximizing its influence. It was a highly respected and authoritative player.
In the subsequent discussion, Andy emphasized the need for greater "cross fertilization" of students by appropriate exchanges. And, inevitably, he agreed that because of resource restraints the Research and Innovation agenda might be moved back.

Following the more formal meetings, we met in the evening with Françoise Côme, Secretary General, and Aisling Mc Niffe, Membership and Information Assistant, of **SEFI (the European Society for Engineering Education)**, who gave us further helpful insights on the Brussels scene.

On our second day, we held a series of meetings with representatives of the **European Commission**, firstly Georges Bingen, Head of Unit for **Marie Curie Actions** in Directorate-General: Education and Culture. He stressed that Marie Curie was predominantly a career development funding scheme, and each grant application was evaluated on basis of criteria related to the promotion of the career of the postdoc/RA related to the grant.

The Marie Curie scheme (http://cordis.europa.eu/mariecurie-actions/) has roughly four different streams, a stream focussed upon the initial phase of the career of the scientist, a career development scheme for scientists wanting to move inside Europe, one for those wanting to move outside Europe, and one for interaction with the industry. He noted that, broadly speaking, the success rates for these schemes varied in the range of 15-30%, except for RE-integration grants (RIG) and the Co-funding programme (COFUND) for Career development inside Europe, where the success rate was 90% and 70% respectively.

The four schemes are evaluated/coordinated by three committees: a program committee, which decides the timing for the call; an advisory committee, which generates new ideas and evaluates current ideas; and an assessment committee, which develops assessment indicators and performs the assessments.

In discussion, it became clear that the Marie-Curie scheme may be changed as a result of the assessment of FP7. Although it is likely to be included in FP8, it will be distinct from "Youth on the move" (see below).

Finally, we discussed industrial partnerships and the role the EPC could play in this. The Commission saw the dearth of industrial academic partnerships as a weakness of European Research, and they were interested in the schemes (like CASE) developed in the UK. The CASE and the KTP schemes were introduced by some of the members of the EPC and thoroughly discussed. It was agreed that a dialogue should be maintained between the EPC and the Commission on these topics.

Some of the delegation then met with Julie Fionda, a Policy Officer in the **Higher Education Unit of Directorate-General: Education and Culture**. She began by setting out what she saw as the main challenges facing Higher Education in Europe: the European HE sector underperforming compared to the US; too few individuals participating (and graduating); not enough lifelong learning; systems too fragmented and the curricula not adapted to the needs of the market place. This is quite a list, and not everything is relevant to the UK.

On the question of participation, the EU average is still around 32% (UK 39%), and the EU target for 2020 is 40%. So on that score the UK is very close to the target, and the Commission still firmly believe that investment in HE is vital for the future, by both students and governments.

The question was raised "can universities cope?" in the face of trade-offs between quantity and quality, diminished exceptionality, competition for students, and university not being for everyone (vocational qualifications). Julie maintained that curriculum reform (Bologna), increased mobility, a common language (learning outcomes) and a more generic entrepreneurial mindset were all necessary.

Governance reform to give universities more autonomy was one of the main planks of EU policy. However, we in the UK already had a fully independent HE sector, so the EU had a lot to learn from the UK. Again, Europe-wide funding reform was also a big issue, but with the fees debate in the UK we were well ahead of the rest of Europe. The Commission supported the principle of tuition fees, but with appropriate grants.

The target for 2% of GDP to be expended on HE was restated, but of course the UK is on an opposite course. The need for more industrial input was emphasised. This was a common theme across a number of presentations, that in general the Commission wanted to see much more industrial input, and practical training at all levels into HE (as does the EPC).

In terms of what the Commission can do, they are constrained as education policy is a national competence. However, they are encouraging the development of a European dimension to HE through mobility and the European Qualifications framework, transparent benchmarking (ranking!) and ECTS.

In conclusion Julie, said that HE and research have never had higher priorities on the EU agenda than now. Significant university reforms are necessary in most of Europe, but a one-size-fits-all is not desirable, and the Commission is ready to support initiatives. Julie would welcome input from the EPC, particularly in terms of the UK experience and practical points to supplement Commission thinking.

In parallel with the meeting with Julie Fionda, some of the Committee discussed a range of research issues Peter van der Hijden, Policy Officer in the **Universities and Researchers Unit in Directorate-General: Research**.

Peter noted that, at present, EU research policy was very broad, based upon the Grand Challenges described in the Europe 2020

strategy. There were 5 or 6 Grand Challenges focussing on areas such as Aging Population, Climate, Energy and the Environment. Key packages related to research included "New Skills for New Jobs" and the "Innovation Union". "Innovation" was considered to cover basic research through to the development of new products, but would also include process and organisational issues. It was questioned whether the current Framework Programme was too restrictive: there could be problems with companies not being able to participate as they didn't fit in with the defined work programmes; one suggestion might be to extend the European Research Council programme to include companies. The Commission wanted to simplify the rules of future Frameworks and also to try new ideas, such as awarding prizes rather than grants (since prizes would need less regulation).

Since our meeting, the EU Competitiveness Council has agreed a document on simplification of EU research funding programmes: see http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/intm/117022.pdf.

The whole Committee next met Patricia Reilly, a member of the **Cabinet (private office) of Research and Innovation Commissioner Máire Geoghegan-Quinn**, accompanied by Neville Reeve, who works in the Framework Programme evaluation and monitoring unit.

She described the Innovation Union is a flagship of the Europe 2020 strategy. Following a formal consultation, with business, social policy makers, university organisations and others, this presents a "revolutionary approach" to innovation in Europe, with simplification and removal of bottlenecks a key element. In practical terms it included, for example, resolving the issue of the European Patent, in concept for years, which would now receive a new impetus. The completion of the European Research Area would help researchers move across boundaries without penalty (e.g. over pension rights). The Innovation Union would also address how to attract venture capital, involving the European Investment Bank. The Commission wanted to improve the knowledge base (though not create new infrastructure), improve creativity and skills, improve cohesion and promote the use of the structural funds for research facilities. Overall, the Commission wanted to encourage member states to implement world class structures to aid innovation and build on external relations.

Innovation partnerships were seen as a practical solution, creating platforms for member states to come together to tackle the grand challenges, perhaps though pooling of national resources. The first innovation partnership should be in place by the end of this year, with more to follow next year.

Neville underlined the importance of FP7 Mid Term Review in assessing the quality of research, quality of output and efficiency of process, to influence the remainder of FP7 and the design of FP8. Impact would be assessed by an "Indicators Panel", tasked with coming up with an "innovation indicator". Separate indicators were being looked at for the economic value of research; Patricia acknowledged that this was incredibly challenging - in past the focus had been on the legislative environment, so short-term indicators had been used; the Commission recognised that this missed long term impact, so they were now aiming to address this.

In discussion, it was noted that universities generate people and ideas – 70 to 80% of innovation was not generated directly from research, which is why education of people was so important; universities were not good at exploiting IP directly, whereas industry was; the differences between research and innovation impact needed to be taken into account in setting indicators. Patricia acknowledged this, and said that one of the approaches taken in recent FP7 calls was to seek to embed SMEs in bids. In many countries, more needed to be done to develop the relationship with SMEs.

In response to another point made, Patricia affirmed that the Commissioner was extremely conscience of the need not to exclude institutions or projects that did not fit with the focus on Grand Challenges, and that blue skies work would not be excluded. The Innovation Union was not just about making the Framework Programme fit Grand Challenges, but about creating an innovation eco-system in Europe. On access to capital, Patricia noted that risk-taking was

culturally more acceptable in the US than in Europe; hopefully the initiative would encourage more venture capitalists to invest more in the EU; national state buy-in was incredibly important.

Finally, Patricia encouraged the EPC to engage in discussion on the Innovation Union: there had to be national buy-in at every level and the EPC was well-placed to influence the forthcoming debate.

Our final session was hosted by George Michael Zisimos and Fabrice Comptour, both members of the **Cabinet of Education and Culture Commissioner Androulla Vassiliou**, accompanied by colleagues from DG Education and Culture.

The first topic addressed was the Youth on the Move initiative which, like the Innovation Union, has been formally launched since our visit (see http://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=888&furtherNews=yes). This aimed to put people, and education, at the heart of knowledge-based economy. For the Commission to add value, in respect of its areas of competence, the key was mobility, e.g. through the Marie Curie programme (in which there was already a high percentage of engineering exchanges). The EPC was encouraged to feed in its views of the future design of the programme. One aspect which the Commission wished to explore further was encouraging applied content in relevant PhDs, so they were very interested in the UK's experience of industrial PhDs (we noted, though, that the standard level for career entry was Master's, rather than PhD; and that in the UK HEIs already involve industry in course design).

On the Innovation Union, DG Education and Culture's involvement was primarily through its role with regard to the European Institute of Innovation and Technology (EIT), where education was an important dimension.

The third theme of the session was the modernisation of Higher Education and how to make universities across the EU more attractive to the best European and overseas students. This led to the Commission's interest in the current European and OECD pilot projects on the multi-dimensional ranking of universities, which should allow a user to select criteria for comparison according to personal priorities. More generally, the themes that the Commission wished to explore – and on which they would welcome our further thoughts – were what should be promoted at the European level, and how it should be done. They were keen to encourage entrepreneurship, e.g. through "knowledge alliances" involving universities, industry and research centres, and using the UK model of incubators.

We ended on the encouraging note that the UK (though not exclusively!) had much good practice to offer, which deserved to be more widely disseminated.

The UK Research Office in Brussels

Christina Miller, Deputy Director

The UK Research Office (UKRO) was established in Brussels in 1984, it is jointly funded by the seven UK Research Councils and through subscriptions from over 140 research organisations, principally in the UK. UKRO's mission is to promote effective UK engagement in EU research, innovation and higher education activities by:

- Enabling sponsors and subscribers to make informed decisions about participation in EU programmes and to realise the opportunities available to them;
- Supporting UK input into European research policy development and implementation through informing and interfacing with the appropriate bodies; and
- Developing and maintaining a suite of quality services that meet the evolving needs of sponsors and subscribers.

UKRO's services include a website and tailored information system delivering up-to-date

information, tailored to the needs of users, on all funding opportunities through the Framework Programme and other European programmes, as well as news on EU research, innovation, and higher education policy. UKRO's team of expert European Advisors provide guidance, information, training, and advice on EU policies, programmes and funding opportunities through an enquiry services and annual subscriber visits. UKRO's meeting room, is within easy walking distance of most European Commission buildings, the European Parliament and the Council of Ministers. Additionally UKRO delivers a programme of specialist training courses, focus groups and an annual conference for European officers.

UKRO is contracted by the UK Government to deliver the UK National Contact Point helpdesks for the Marie Curie Actions and the European Research Council (ERC). The British Council's European RTD insight providing a monthly overview of EU research programmes and policy is also produced by UKRO.

UKRO will be closely following the 'FP8' debate alongside the development of the education and innovation programmes post 2014, liaising with all relevant organisations, and disseminating the latest information, ensuring that the UK community is well placed to feed into the discussions. UKRO has had significant input into the early debates on the next Framework Programme. This has involved talking with a broad range of UK stakeholders, including Government, Research Councils, sectoral organisations and individual organisations, as well as the European institutions. Related to programme development, UKRO will continue to participate actively in the debate on simplification, as well as monitoring implementation issues. UKRO will also continue to provide extensive support to applicants both to FP7 and other EU programmes to ensure that the UK continues to be successful in competing for European funding.

Point of view

Why bother getting your programme accredited?

Professor Peter Goodhew

Did the accreditation of professional engineering programmes prevent the disastrous crash of AF 447 in June 2009? Equally, is it responsible for the fact that the Eiffel tower has remained standing for 120 years? Or that my iPhone is so brilliant? No, no and no. So what is accreditation supposed to be for? At the highest level I presume that the intention is to ensure and enhance the quality and safety of engineered products throughout the world. At a more mundane (and self-interested) national level it might be intended to enable the world-wide transferability, and thus profitability, of UK engineering by ensuring the international credibility and employability of UK engineers.

These seem to be laudable objectives, but delivery of them is several steps away from the accreditation of university programmes. The logic is presumably that the employers of professional engineers must have confidence, via external testimony, in their skills and their fitness to practice. This confidence is engendered by their status as professional (*chartered* in UK parlance, *registered* in other jurisdictions) engineers, part of the qualification for which is that, at some time in the past, they graduated from an "accredited" degree programme. These engineers also have to demonstrate some appropriate experience in employment and the membership of a professional body.

I find the whole system of accreditation unsatisfactory in two ways: It does not deliver the intended outcome and, incidentally, it damages our education system and thus our students and graduates.

First, the charge that it is ineffectual: Engineered products are conceived, designed, made and operated by engineers employed by large or small companies. Some, but certainly not all, of these engineers are chartered. They will usually have earned their chartered status by virtue of the work undertaken in their first few years of

employment, backed up by the degree they were awarded several years ago. Since receiving their chartered status they will have been encouraged to undertake continuous professional development, but this will not have been checked. A fifty-year-old chartered engineer is thus operating on the basis of a validation process twenty years ago and a degree awarded about 25 to 30 years ago. The accreditation of this degree, so long ago, has almost no relevance for the engineering practices in use today. Indeed if the degree was typical of those awarded 25 years ago it will have contained a significant amount of engineering science and very few tests of engineering aptitude or attitude. The fitness to practice of an individual engineer will in reality depend on what they have done, seen and learned during their working life, almost independent of the content of their first degree. Indeed the technical content of a degree in one engineering discipline may have almost no overlap with the content of another engineering discipline so it is hard to argue that subject content has anything to do with being, or thinking like, an engineer.

Furthermore an engineer employed today may be working in an area unrelated to their original area of study. This is very likely for bioengineers, nanoengineers, environmental engineers, nuclear engineers and others working in interdisciplinary areas. Their original degree would either have been un-accredited or the accreditation would relate to a different disciplinary area. How can this in any way validate or assure the quality of their current work?

A third issue is the effectiveness of the quality assurance provided by chartered status. I have already asserted that there are almost no checks on the continued professional development of chartered engineers, but equally there are almost no cases of the de-registration of rogue chartered engineers (and even if there were they would certainly – like doctors – be de-registered after they had committed a grave misjudgement or offence, not before!).

So the accreditation of programmes is certainly ineffectual, but it is also damaging to the education process. University departments of engineering spend a great deal of time preparing for accreditation visits, and tuning their degree programmes to fit the perceived requirements of their professional bodies. They do this not to improve their programmes (most programme leaders do not believe that the comments of accreditors will achieve this) but because of the fear that they will no longer be able to compete in the marketplace for students if they are not accredited. This fear is probably misplaced, but no department has the courage to put it to the test! Accreditation panels almost always feel that they should make some critical (framed as "helpful") comments but these usually reflect the prejudices of individual panel members, who are rarely experts in higher education and frequently elderly and tending to be out of date. [I have resolved never to accept another invitation to sit on an accreditation panel now I have reached 65.] The damage to the system is that the threat of accreditation makes our engineering departments more conservative, less willing to change or innovate, as well as taking time and

Outside Events

World Engineers' Convention 2011

Under the title Engineers Power the World – Facing the Global Energy Challenge, WEC 2011 (Geneva, 4 to 9 September 2011) will focus on energy, one of the biggest challenges of the 21st century.
Deadline for abstract submission: December 15th, 2010: see www.wec2011.org

Nuclear Island

A partnership between employers and Further and Higher Education Institutes to tackle the critical future workforce needs of nuclear new build: a hands-on new build experience for students in engineering, developing the management and on-site skills valued by industry.

Education Provider Event at the Royal Academy of Engineering on Friday 19th November 2010, 10:00-16:00: see www.cogent-ssc.com/Higher_level_skills/ni_index.php

money which would be better spent on the education of their students. It also reinforces (unhelpfully) the audit culture which has overrun our universities in the last twenty years.

It would be unreasonable to criticise the existing system of accreditation without making some attempt to suggest what might replace it to provide the assurance of quality demanded by society. My suggestion is that the responsibility for the safety and quality of products (from multi-billion tunnels to five-penny toys) should remain where it legally is – with the manufacturer or major contractor. These businesses should assure themselves that their workers are appropriately skilled and work to appropriate safety and ethical standards. To achieve this they might need to strengthen their recruitment procedures to include a real assessment of candidates' current abilities and skill sets. They would also want, as many do, to ensure periodically that their employees are up to date. They might wish to buy in the necessary training expertise, perhaps even from a local university, but they will not be much helped by a past "accreditation". The proof of the quality of training, and of initial education, will be demonstrated by the performance of the employee – supervised and checked by experienced colleagues – not by their possession of a yellowing piece of paper.

I notice that I have not mentioned professional bodies. What might their role be? Certainly not as accreditors, but perhaps as honest brokers between employers and trainers and educators, or as forums for discussion (but not regulation) of best practice. In which case perhaps there should be an upper age limit for service on any committee or as an officer – shall we say 45 – and those in their dotage (like me) should only speak when asked. Oh dear – I seem to have broken my own rule!

The Engineering Council have been invited to respond, and will contribute to the next EPC newsletter.

Contact Us

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