



The Challenges Ahead

**Professor Helen Atkinson FREng
President, EPC**

As the new EPC president, firstly I would like to formally thank Barry Clarke for his huge contribution over the last two years. He has played a very important role in helping us to understand how government works and in ensuring the concerns of EPC about developments in higher education, as they affect engineering, are on the table with policymakers.



Visas

In the consultation phase on visas, both for students and staff, Barry and Fiona made sure we were in talking to the Department of Business, Innovation and Skills about the potential impact on engineering in higher education of a more restrictive UK Border Agency position.

Engineering is one of the subjects with the highest overseas intakes, both at undergraduate and at postgraduate levels. We are grateful to everyone who responded to our requests for information on the proportions of students from overseas at undergraduate level. As a result of those responses, we estimated this at about 30% of the undergraduate engineering population. Of those students, about 30% had come from other forms of UK provision such as language schools and 'A' levels in independent schools and Further Education Colleges. This sub-degree provision was a key target for the visa changes.

Included in this issue:

- ***EPC Congress 2011 and Conference on the Future of Engineering Education***
- ***AGM 2011: Helen Atkinson takes over as EPC President***
- ***New EPC office arrangements and addresses***

We were relieved that the final proposals on student visas (Tier 4) were less stringent than they might have been (see <http://www.ukba.homeoffice.gov.uk/sitecontent/newsarticles/2011/march/54-student-visas>) with some key points being the facts that:

- There are no changes to current work rights for university students during term time and vacations.
- Postgraduates, and government-sponsored students, will be able to bring their dependants, who will be able to work.
- Students will not be required to return home between different degree programmes to renew their visas.

For academic staff and postdocs (Tier 2 visas), where engineering as a subject has one of the widest recruitment profiles in international terms, as a result of the estimates departments provided us with about the proportions of overseas staff, we contributed strongly to the discussions which the Campaign for Science and Engineering (CASE) led with government on this. There was significant movement in relation to the

original proposals. There was a very real danger with the original proposals that a postdoc on a typical starting salary just below £30,000 would have been much lower down the priority list for allowing entry than someone without a PhD on a higher salary. In the government announcement this position was reversed. There are undoubtedly still going to be difficulties but some mitigation has been put in place.

Risks of the New Fees Regime in England

At the EPC Congress in April, Chris Millward, the HEFCE Associate Director responsible for SIVS (Strategically Important and Vulnerable Subjects) asked us specifically to consider the possible risks facing engineering departments with the introduction of the new fee regime in England from 2012. We intend to respond by the end of May. Our initial list of potential risks includes:

- Will the four-year M.Eng. continue to be able to attract students or will they increasingly opt for the 3 year B.Eng? If this happened what would be the repercussions?
- Will foreign universities, including those in continental Europe, offer much cheaper degree programmes, taught in English? If so, what share of the market could they expect to take?
- Will engineering be financially viable in future? Will it depend on a minimum recruitment of students?
- If undergraduate engineering courses at the moment survive because of cross-funding from the fees paid by non-EU students (particularly those on one year's Master's courses) how will any reduction in the numbers of overseas students affect engineering departments?
- Although overseas students taking degree courses should be able to get visas, those taking lower level and/or English courses may face some problems. How will this affect recruitment into engineering? Will the discussion about visas make overseas students feel that they are unwelcome in the UK and hence encourage them to apply elsewhere?
- Will the data on the number of unemployed engineering graduates (the

rate is 13% in HESA data published last year) make sixth formers opt for other subjects?

- Will overseas students opt to study in other countries if they think it will be harder to remain and work for a period in the UK at the end of their degree course (with the replacement of the Post Study Work entitlement with the ability to switch (outside the cap) to Tier 2 having secured a graduate-level job)?
- Will the uncertainties facing engineering departments make it more difficult to recruit suitable academic staff? Will there be adequate funding for research? Will it be possible to have sufficient staff with any industrial experience?
- Do private providers have any role in engineering education? Can engineering degrees be offered more cheaply in the FE sector? If so, are there any issues for university departments?
- Could degrees in engineering be made shorter? would a two year degree be possible?
- Will the cuts in capital funding have an effect on the provision of engineering?
- Is there any possibility of securing additional funding from industry?

We would welcome any input (by the 24th May to PBaker@epc.ac.uk) as we frame our response to Chris. In particular, we need to propose how to monitor what is going on, so any suggestions on this will be gratefully received.

Scotland, Northern Ireland and Wales

The EPC represents engineering in higher education throughout the UK. Each of the devolved administrations has different issues. We are having a real push this year on understanding those issues and where the pressure points are. I will be visiting Belfast in late August so would be delighted to have conversations then. We are holding the Committee's 'retreat' in Cardiff in early September and will be focussing on the issues in Wales. We also intend to include consideration of the Scottish funding situation at that meeting. If you have views do pass them to the EPC Office (v.elston@epc.ac.uk).

EPC Congress 2011

The EPC's annual Congress was held at London South Bank University on 12th April, with Dr Rob Best as the Congress Convenor. Following a keynote address by Professor Brian Collins, Chief Scientific Adviser to DfT & BIS, on issues and challenges, there were sessions on the funding of engineering education, the international agenda and engineering student satisfaction and employability; these are reported below by the EPC Committee members who chaired the respective sessions. The formal part of the day closed with a Distinguished Guest Lecture given by Mike Chrimes, Head Librarian and Director of Engineering Policy and Innovation, at the Institution of Civil Engineers, entitled *Coping with Change – a historical perspective of engineering achievements*. The event was rounded off with a dinner at a local restaurant. Copies of Congress presentations are available at <http://www.epc.ac.uk/meetings/presentations.php?id=68>.



Speakers at the first session of the Congress: (from left) Phil Baty, Paul Marshall and Les Ebdon, with Barry Clarke and Rob Best, Congress Convenor

Rather than the usual Congress held over two days, this year a one-day Congress was followed by a linked Conference on the future of engineering education, as part of the *Designing the Future* project reported on in the last newsletter. Denise Bower gives an update on the project below.

Next year's Congress will be held at the University of Leicester on 16th-18th April 2012.

Session 1: The Future Funding of Universities

Professor Barry Clarke EPC Committee



The arguments for and against university league tables have little impact on the fact that they are used by media to rank universities in various ways and by universities to set their strategies. League tables have proliferated in recent years but the best known in the UK are the Shanghai, various newspapers, the RAE and NSS. Critics of these tables may welcome the fact that two new tables are emerging that may be more representative. The first is that being developed in the EU which will provide a ranking using criteria input by the user. This is aimed at supporting student choice. The second is the THE World Reputation Rankings based upon academic opinion. Phil Baty, Editor of THE World

University Rankings explained these rankings and their purposes in the first session, showing the need for universities to be even more sensitive to their ranking as student choice becomes increasingly important.

Paul Marshall, CEO of the 1994 Group, set out a vision for HEIs as hubs of knowledge, a platform for education and creators of a new generation of innovative thinkers. Innovative research linked to industry, providing a workforce that resulted in social benefit, would enhance student experience, produce sustainable centres of higher education and place UK universities on the international stage. Those that have already embraced this agenda are highlighted in the World Rankings with three UK universities in the top 10 and ten in the top 100.

Professor Les Ebdon, Vice Chancellor of the University of Bedfordshire, put figures to the proposed changes in funding which showed that there could be an increase in income per student depending on the fees and HEFCE's support to engineering. However, this may not be enough

to create a financially sustainable HE sector. Therefore, efficiency savings, including shared provision and services, and accelerated degrees; and diversity in income including employer funding, increased part-time provision and increased international recruitment will be required. Hence the focus is on efficiency and capability.

Higher education in the UK is undergoing transformational change as part of a modernisation programme as it is across Europe. The impact on engineering is the same as on other disciplines but the opportunities for engineering are greater because of the need for engineers to deal with the challenges of environmental change in a low carbon economy. Hence, the positive contribution of the three guest speakers which led to an informed debate.

Session 2: Competition & Opportunity: the international agenda

Professor Fred Maillardet EPC Committee



Julie Fionda, a Policy Officer with responsibility for HE policy in the European Commission (EC), opened the session by outlining the current European agenda. Julie stressed how jobs were becoming more knowledge-intensive and estimated that by 2020 35% of all jobs will require HE qualifications. HE is expensive and there's no guarantee of a job at the end and - although medicine and engineering are the top earners, but evidence confirms that HE qualifications do provide an 'insurance policy' against unemployment.

Julie stressed that HE is at the centre of Europe's strategy for growth and prosperity; *smart*, *sustainable* and *inclusive* growth are the three key themes, with a number of specific initiatives already running under each theme. The EC does not have control or sanctions over education but works via encouraging mobility and cooperation between universities, together with reviewing developments and identifying future strategic directions. Differential growth rates between countries makes establishing targets a challenge, but the overall target is for 40% of all European 30-34 year olds to be qualified at HE level by 2020.

However, university is not for everyone and Vocational Education and Training (VET) is being seen increasingly as a valuable alternative. An EU Reform Agenda for the modernisation of HE has been established with the prime purpose of achieving 'massification' whilst maintaining high quality provision. The challenge will be to respond to the needs of society and the labour market while still attempting to 'shape the future'.

Kevin Van-Cauter, HE adviser at the British Council (BC), stressed how new economic power centres – notably China and India – were transforming our view of the world. While China remains the major sending country to the UK, it has far-reaching long term ambitions to develop world class research and teaching in its own domestic HE system. But new patterns of mobility are also developing elsewhere, with countries in Asia becoming net importers of international students.

The good news is that the UK remains second to the USA in terms of the number of international students attracted, with an increase of 51% since 2002/3, although India and China together currently make up about one third of the UK total. Increasing numbers of students are coming to the UK for relatively short courses, for example 55% of non-EU students in the UK are on postgraduate courses. But the global market is becoming ever more competitive and the effort and cost of recruitment is thus increasing significantly. Kevin provided a wealth of statistics including the fact that there are now 78 countries where at least as many students study a UK HE qualification *in that country* compared to the number of students travelling to the UK to study!

The BC uses a forecasting tool which predicts future demand, and this anticipates a growth in UK demand which is lower than the growth in global demand for study in the students' own countries. A new strategy for international education is thus clearly needed, and the BC has identified the way forward as a shift in focus from student recruitment to the UK to positioning the UK as a leader and innovator in global student mobility and experience.

Dominic Scott, Chief Executive of the UK Council for International Student Affairs (UKCISA), explained that the organisation 'benchmarked' student experience and had identified transition from one academic system to another as a major cause of failure. It was vital to smooth the transition and minimise distractions to 'clear the students' heads' to enable them to focus on their studies.

Government action post-election had not matched the pre-election rhetoric but there remained confusion over what action was contemplated. In particular, there was uncertainty over target student numbers and the application of local labour market rules post-graduation. But accreditation in the UK by both the Quality Assurance Agency (QAA) and the Professional and Statutory Bodies was 'highly trusted' internationally.

The total cost of studying anywhere needs to be clear – 'the price on the tin' – but students often under-estimate the costs of "extras", like TV and exercise gyms.

Dominic recommended use of the UKCISA 'Prepare for Success' website which presents the reality of studying in the UK for overseas students.

Olga Katsanova was born and lived in Estonia until coming to the UK in 2006 to study for an MEng degree at the University of Manchester. She has spent a year in Germany on an Erasmus Exchange scheme. Olga outlined her own experience, mentioning contrasts between methods of teaching, and how the examinations in Germany occupied a larger proportion of the course. She also drew attention to the high tuition fees and the very high cost of living in the UK. These challenges resulted in her working 20 hours per week throughout her course! However, Olga also stressed the positive aspects of her experience including excellent student support, particularly from teaching staff, many of whom operated an 'open door' policy, together with the Student Service Centre and the Careers Service. Olga found virtually all the facilities at Manchester to be 'excellent', as were the clubs and societies which made overseas students feel welcome. She identified field trips and group design projects as ideal opportunities to make lasting friendships which were particularly valuable for overseas students. Above all she said that she'd had 'fun' - an important element which should not be overlooked! All in all she had had a 'life-changing experience' which had certainly provided her with a wealth of transferable skills. Her only disappointment was her outstanding debt!

Session 3: Engineering Student Satisfaction and Employability

Professor Helen Atkinson
President, EPC

Will Archer is CEO of i-graduate (the International Graduate Insight Group) and as part of that runs the International Student Barometer™, which is highly regarded by universities in the UK for

gauging the views of international students. Headlines in Will's presentation included: the

impact of the UK Border Agency visa changes; the impact on the UK's image of the student unrest; the effect of fee levels and the fact that rivals worldwide are raising their game (including many overseas institutions now delivering degrees in English); issues surrounding the HEFCE work on Key Information Sets; private sector growth; and how to assure quality.

With international students, it is key to understand their decision-making. Personal recommendation is the single greatest influence on their choice of institution and country. What today's students say will determine future flows.

The International Student Barometer has plotted changes in satisfaction levels between 2006 and 2010 under a number of headings (learning, good teachers, language support, multicultural, library, learning support, development of friendships, Students' Union, accommodation, worship facilities, internet access, living costs, counselling and visa application support amongst others).

Overall satisfaction levels have been rising (partly helped by the weaker pound!). There were some very interesting findings under employment/careers related questions, including the fact that 1 in 4 international students 'expect the university to get me a job' and a significant proportion expect the university to contact employers on their behalf.

Engineering fares well in such surveys, gaining very high satisfaction levels.

Chris Dowlen then talked about the potential for mismatch between what employers are expecting of new employees and the actual attributes of graduating engineering students. Chris is a Reader in Engineering Design at London South Bank and a Vice-Chairman of the Institution of Engineering Designers and so his presentation was set against the context of design and how we identify the skills needed by the community of practice. He asked the question 'If we can't ourselves become part of that community of practice how do we become respected by it?'

Designing The Future – Engineering Education Colloquia Series and EPC Conference Workshop

Professor Denise Bower

***Chair of the EPC
Designing The Future
Project***



The project funded by the Royal Academy of Engineering, Engineering Professors Council and the University of Leeds aims to enhance Engineering capability in the UK through the proposal of a clear and realistic agenda for future Engineering Education. By

bringing together representatives from relevant professional bodies and institutions, employers and engineering disciplines to address the key themes, the project is fostering the collaborative generation of meaningful dialogue and support for action.

A series of four colloquia focusing on subject, staffing, student-employer perspective and learning space are being held in 2011. Through

the colloquia series relevant issues will be transformed into outputs including: a 'road-map' to inform the future review of the engineering benchmark statement; a competency framework for professional development of academic staff; a guidance note for transitioning engineering graduates into the workplace; and recommendations for efficient and effective use of engineering spaces.

The project partners include: The Royal Academy of Engineering, Engineering Council, the Engineering Professor's Council, HEA Engineering Subject Centre and Engineering CETL, ICE, IMechE, IET, Sector Skills Councils – Cogent and ConstructionSkills, the University of Leeds, Loughborough University and London South Bank University.

Colloquium 1 – March 16th 2011 Royal Academy of Engineering The Subject of Engineering – Interpreting future engineering education requirements

Outcomes from the first colloquium, reported in the last issue of this newsletter, included the initial development of a 'road map' to identify priority action areas for engineering education in the short-term (prior to the engineering

benchmark statement review in 2013), mid-term and long-term.

The outcomes were discussed further at the EPC Conference .

EPC Conference: Designing the Future – Preparing Engineers for the Grand Challenges

For presentations given at the Conference, see <http://www.epc.ac.uk/meetings/presentations.php?id=69>. The event built on the Designing the Future project, focusing on, amongst other things, the learning outcomes expected of an engineering education. The output from the first colloquium informed the event, covering:

1. The relationship between learning outcomes, competency and National Occupational Standards;
2. The relevance of graduate knowledge to their career; and
3. The roles of employers, professional institutions, SSCs and other education influencers in building capability and capacity.

Next Steps

Outputs from the workshop are being used to translate the priority action areas generated from the first Colloquium into a clear set of initiatives from now to 2020.

For example:

Area: Improved engagement with SMEs and local employers

Actions:

1. *Formation of regional partnering clusters*
2. *SSC/HE mapping of industry needs for increase degree cooperation*
3. *Industry involvement case studies*
4. *SWOT analysis of funding changes*
5. *Development of a modern sandwich course toolkit*

Action consultation between project partners is ongoing. For more information about this project, or if you would like to be involved in leading an action area, please contact me at:

d.a.bower@leeds.ac.uk

Colloquium 2 – June 8th 2011 HEA Engineering Subject Centre, Loughborough Staffing for Improving Engineering Education

The second colloquium will form the basis for development of a competency framework for the professional development of academic staff within engineering education. The framework will support and ensure the presence of the underpinning knowledge and behaviours needed to work across boundaries, attract and engage with industry and successfully guide the development of a sustainable engineering workforce.

If you would like to book a place at Colloquium 2 please contact Vicky Elston at:

v.elston@epc.ac.uk

Engineering Professors' Council Annual General Meeting

The 2011 Annual General Meeting of the Engineering Professors' Council was held immediately after the Congress, at London South Bank University on 12th April.

Professor Helen Atkinson, elected at last year's AGM as President-elect, took over as President from Professor Barry Clarke, who remains on the Committee as Vice-President (Immediate Past President); a biography of Helen, who is Head of the Mechanics of Materials Group in the Department of Engineering at the University of Leicester, appeared last in June's EPC newsletter.

Professor David Harrison was re-elected as Honorary Secretary, and Professor Jim Yip was elected in place of Mr Ian Whyte as Honorary Treasurer, to take over at the end of July.

Four elected members of the Committee - Professor Denise Bower, Professor Robin Clarke, Ms Angela Dean and Professor John Turner – reached the end of their terms, though Denise stays on the Committee as Chair of the Designing the Future Working Group. In their places, Professor John Davies (Glasgow University), Professor Simon Hodgson (Teesside University), Dr Geoff Parks (Cambridge University) and Professor Peter White (Coventry University) were elected.

The AGM also approved the creation of Patrons of the EPC, and decided that recipients of the biennial President's Prize, and others at the Committee's discretion, should be invited to become Patrons.

New Sectoral Group

A proposal to create a new sectoral group for bio-medical engineering was welcomed by the AGM. An exploratory meeting is planned for 4th October in central London - more details will be available nearer to the time. If you would like to register your interest, please email V.Elston@epc.ac.uk.

The University of Portsmouth has agreed to host the EPC Congress in 2013, and Professor Djamel Ait-Boudaoud joins the Committee as Congress Convenor.

Biographical notes on the new Committee members follow, and the overall composition of the Committee for 2011-12 is on the last page.

Professor Djamel Ait-Boudaoud

is the Dean of Faculty of Technology at the University of Portsmouth. With an academic career spanning over 20 years, he has held several senior academic appointments in the UK and Overseas. Prior to joining the University of Portsmouth, he was the head of School of Computing, Engineering and Physical Sciences at the University of Central Lancashire.



He is a Chartered Engineer (CEng) and a Fellow of the Institution of Engineering and Technology (FIET). He holds a PhD (1991) from the University of Nottingham where he conducted research in system and circuit integration for Digital Signal Processing (DSP) applications. He has authored and co-authored several research papers and his research interests include VLSI architectures, image Processing and Computer vision, and Evolutionary algorithms.

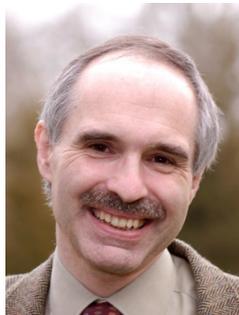
Professor John Davies is Convenor of Learning and Teaching for the School of Engineering in the University of Glasgow, having overall responsibility for taught programmes in all branches of engineering, both undergraduate and postgraduate. He has previously been Director of Undergraduate Studies for the Department of Electronics and Electrical Engineering.

His research is centred on the theory of semiconductors for electronic and optoelectronic devices. His recent work has been concerned with elasticity; over the years he has also worked on topics ranging from magnetic fields in permanent-magnet motors to quantum transport theory. His teaching has spanned all levels from PhD to first year; the first-year teaching led to an interest in student retention.

He is an academic accreditor for the IET and an external examiner to Sheffield University. In the past I have served on various editorial boards, committees of the IET and Institute of Physics, and the coordination board of an EU Network.

Professor Simon Hodgson is a Materials Engineer by background. He is currently Dean of the School of Science and Engineering at Teesside University, with overall responsibility for programmes delivered to almost 2500 students, encompassing Electrical, Mechanical, Chemical and Civil Engineering, as well as courses in the physical and life sciences. Outside his management role, he leads a research group focusing on Advanced Processing, working in areas such as catalytic materials and functional coatings for industrial application, and also maintains an active interest in teaching and learning development, for example as lead for a current RAE/HEA project on new approaches to enhance industrial engagement in the design and delivery of relevant and engaging engineering programmes. He has worked in both the pre- and post-92 parts of the sector, at Sheffield Hallam, Humberside (now Lincoln) and Loughborough Universities.

Dr Geoff Parks received his BA in Engineering in 1984 and his PhD in Nuclear Engineering in 1989, both from the University of Cambridge. He is now a Senior Lecturer in Nuclear Engineering at Cambridge. He is also Director of Studies in Engineering at Jesus College. He served as the College's Sciences Admissions Tutor from 1997 to 2007 and in 2003 he became Director of Admissions for the Cambridge Colleges.



Geoff heads the Computational Design Group in the Cambridge Engineering Design Centre, which researches into the effective exploitation and integration of computational analysis and optimisation methods within the Engineering Design process. He has long-standing interests in nuclear reactor operation and control with particular expertise in in-core fuel management, and has more recently developed interests in the use of accelerator-driven systems for waste transmutation and power generation.

Dr Parks is a trustee of the Engineering Development Trust and of the Social Mobility Foundation.

Professor Peter White is an Associate Dean in the Faculty of Engineering and Computing at Coventry University, a post he has held since May 2006. His responsibilities cover postgraduate taught and research students, research within the Faculty, and a watching brief on the engineering departments. Prior to that he was the Head of the Mechanical Engineering and Design Department for a period of eight years.

He has strong interests in the educational formation of engineers, and was involved in the introduction of Problem Based Learning within an Automotive Engineering Design degree in 1989. He was also a member of the EPC working Group which produced the Exemplar Benchmarks for IEng as part of the EPC Engineering Graduate Output Standard project.

His research interests cover renewable energy sources, heat transfer and heat exchangers, and he is the Chairman of the Automobile Division of the IMechE until May 2012.

Contact Us

The EPC Office moved from the University of Surrey at the end of April.

As a result, EPC staff will work mostly from home. We are grateful to the Institute of Measurement and Control for making available to us office and meeting room space for occasional use in central London. We have a new postal address, and new email addresses.

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EPC Committee Members, 2011/12

President	Professor Helen Atkinson	University of Leicester
Vice-President	Professor Barry Clarke	University of Leeds
/Immediate past President		
Honorary Secretary	Professor David Harrison	Glasgow Caledonian University
Honorary Treasurer		
<i>until 31st July</i>	Mr Ian Whyte	University of Manchester
<i>from 1st August</i>	Professor Jim Yip	University of Huddersfield
Elected Members	Professor Jonathan Cooper	Liverpool University
	Professor John Davies	University of Glasgow
	Professor Kamel Hawwash	Birmingham University
	Professor Simon Hodgson	University of Teesside
	Professor Rob Krams	Imperial College London
	Dr Geoff Parks	University of Cambridge
	Professor Peter R S White	University of Coventry
Co-opted Members	Professor Ray Allen	University of Sheffield
	Professor Bill Banks	Strathclyde University
	Professor Tony Brown	Manchester University
	Professor Fred Maillardet	University of Brighton
	Professor Dik Morling	University of Westminster
	Professor Tony Unsworth	Durham University
Annual Congress	Dr Rob Best	London South Bank University 2011
Convenors	Professor Helen Atkinson	University of Leicester 2012
	Professor Djamel Ait-Boudaoud	University of Portsmouth 2013
Sectoral Group Representatives		
Civil	Professor Bob Lark	Cardiff University
Computing	Professor Jim Yip	University of Huddersfield
Manufacturing	Dr Linda Newnes	University of Bath
Mechanical	Professor Clive Neal-Sturgess	University of Birmingham
PHEE	Professor Stephanie Haywood	Hull University
Working Group Chairs		
Admissions	Professor Dik Morling	University of Westminster
“Designing the Future”	Professor Denise Bower	University of Leeds
International	Professor Clive Neal-Sturgess	University of Birmingham
Mathematics	Professor Fred Maillardet	University of Brighton
Observer	Professor John Dickens	Loughborough University