



Excellence in Postgraduate Education:

Postgraduate Apprenticeships,
Future Challenges

29 March 2017



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Excellence in Postgraduate Education: Manufacturing, Materials and Design

Supporting organisations

- BAE Systems
- Unipart Logistics
- The Institute for Apprenticeships

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Postgraduate Apprenticeships, Future Challenges

Postgraduate Apprenticeships are a new opportunity to develop the next generation of manufacturing, materials and design technical specialists and leaders with a mix of academic and vocational qualifications and learning.

This higher apprenticeship programme is gaining significant industry engagement as new standards are developed. The quality of the learning and skills development is even more important at postgraduate level.

Identifying suitable provision, assessments and metrics for excellence and quality for postgraduate (level 7) apprenticeships will be challenging. This report outlines the discussions and findings from a National Symposium, comprising experts across the fields of manufacturing, materials and design, to clarify and explore excellence in postgraduate level apprenticeships. Presentations and focused debate considered the current developments, from the UK government and perspective of employers, within and outside of the UK.

This symposium, the fourth in the series, initiated from an independent forum in May 2014 at time when the cost of undergraduate courses transferred from the state to students. UK students would also require significant investment in their postgraduate education. The ambition of this symposium was to raise the profile of postgraduates, to identify key attributes of excellent learning and teaching in postgraduate education and share best practice to develop a postgraduate provision fit for the future.

Successive annual symposia brought together communities of experts across the fields of manufacturing, materials and design postgraduate education to define essential attributes and propose routes to achieving excellence in postgraduate education. Participants also shared insight regarding the current and future higher education policy. Sessions last

year (2016) included insight from the HEFCE funded postgraduate experience project in postgraduate taught study in the UK and the launch of the best practice guide. Partnerships and collaboration activities were developed and ideas shared.

The current political and economic landscape in the UK reflects further change. From April 2017, the Institute for Apprenticeships will be available to support education and a tax levy has been introduced. Apprenticeships are being designed to develop the next generation of manufacturing, materials and design professionals. The education provision has developed from 'working with industry' to being 'entirely industry led'.

At the symposium in March 2017, the basis of this report, the focus was the future challenge of postgraduate (level 7) apprenticeships. Over 60 participants from the postgraduate student community, universities, business and industry employers shared ideas of excellence in postgraduate apprenticeships. Speakers outlined the expectations from the perspective of employers, universities as knowledge providers, and from personal experience as former apprentices. Participants shared ideas of excellence in postgraduate apprenticeships, to explore what is meant by excellence in this type of learning and development. New and innovative delivery models to enhance the learning, and ways to encourage excellence in apprenticeships were proposed.

The discussions, findings and outcomes from the event have been captured in this report and will be of value to a range of professionals, across higher education institutions, who plan, and facilitate training programmes and postgraduate education.



Speakers



Susan Impey
Organiser
Programme Director
for masters courses
in Manufacturing
Technology
and Materials



Rajkumar Roy
Chair
Director of the
Manufacturing,
Cranfield University



Richard Hamer
Education and Skills Director,
BAE Systems

Richard is responsible for BAE Systems UK Education and Skills strategy. He co-ordinates BAE Systems education programme and its schools roadshow, which will this year, in partnership with the Royal Air Force and the Royal Navy, engage over 90,000 young people. He has a responsibility too for apprenticeships and skills policy. BAE Systems is one of the largest employers of apprentices and has a record 2000 apprentices in training. Richard chaired the cross sector Aerospace and Airworthiness Trailblazer groups that have produced the new Apprenticeship Standards for the sector.



Bernard Morgan
Global Industrial Logistics
Director, Unipart Logistics

Bernard has over 40-years' experience of managing and strategically advising companies in the warehousing, logistics and materials handling industries. A Fellow of the Chartered Institute of Logistics and Transport and a strategic advisor to leading blue chip companies in supply chain and logistics, he has been responsible for numerous developments of national distribution centres and resolving supply chain issues particularly in manufacturing. In January 2011 he became Global Director of Unipart Industrial Logistics. In September 2012 he was appointed to the Board of Liverpool Super Port and recently became Chairman.



Mark Aberdein
Apprenticeship Relationship
Manager, Standards
Development Team,
Institute for Apprenticeships

Since graduating with a BA Honours Degree in Business studies Mark has spent over 20 years working in the training and skills sector. Previous roles have included working as an Investors in People Adviser/Assessor with East Lancashire TEC, Sector Skills Adviser and Train to Gain Broker Manager with the Learning and Skills Council, and most recently, Provider Manager with the Skills Funding Agency as Relationship Manager with the National Apprenticeship Service. Mark transferred to the Institute for Apprenticeships in April.



Lynette Ryals
Pro-Vice-Chancellor Education,
Cranfield University

Lynette's professional background is in financial services. Prior to joining Cranfield she worked for a major management consultancy, selling profit improvement programmes to both public sector and a wide range of large private corporations. Before taking on her current role at Cranfield she was Professor of Strategic Sales and Account Management in the University's School of Management. Lynette was appointed Pro-Vice-Chancellor Education of Cranfield University in August 2014 to drive enhancement of the university's education provision.

The Speakers provided perspectives of Postgraduate Apprenticeships from the government, industry and academia.

The Government Perspective

As responsibility for the Apprenticeship programme moves from the SFA (Skills Funding Agency) to the IfA (Institute for Apprenticeships) Mark Aberdein, making that same transition himself, introduced participants to the new (April '17) Institute for Apprenticeships, their make-up, aims and responsibilities.

For many years industry has claimed that the quality and level of education does not meet industry needs and government accepts that industry is best placed to better understand their own requirements and how they can fulfil their skills and business needs. The prime purpose of the IfA is to establish and drive the quality of apprenticeships in England.

The core functions of the IfA:

- Developing and maintaining quality criteria for the approval of apprenticeship standards and assessment plans.
- Supporting the development of standards and assessment plans by employer groups, reviewing and approving the standards and plans.
- Publishing approved standards and assessment plans.
- Advising on the maximum amount of Government funding drawn down by employers for individual apprenticeship standards, determining funding bands.
- Quality assuring the delivery of apprenticeship end-point assessments, where employer groups have been unable to propose other arrangements.

The development of Apprenticeship Standards are employer led through trailblazer groups, similarly the IfA are also employer led. The IfA board comprises representatives from a wide range of industry. Reporting into this Board are 15 Route Panels each one led by an industry representative, providing genuine employer decision making. The Route Panels are aligned to occupational groupings and comprise industry experts to review and approve proposals, standards and assessment plans taking on this responsibility from the SFA. Of the 15 Routes outlined, an important occupational strand is 'creative and design', and another 'engineering and manufacturing'.

The IfA will be working hard to rectify problems: common complaints have been; (a) the length of time taken to approve standards (b) time to generate a new standard and (c) standards and guidelines which change often. The IfA are working hard to streamline the process, making it easy to follow and use.

Industry Expectations

Bernard Molloy has a wealth of experience both professionally and personally. He was an apprentice himself, has set up training academies and worked with the German model of work based training. Linking apprenticeships to postgraduate study brings a sudden change in status, and has the potential to bring the UK more in line with Germany, which has benefited from its greater appreciation of the value of high-level and specialist vocational education. In Germany, the technical / vocational route is at least as prestigious as the traditional route through university to employment. Bernard urged participants to embrace a model that delivers high quality engineers and a system where the status of Engineer is a respected profession. Participants were reminded that it is industry who must identify the skills gaps, the organisational needs and couple these with the development needs of the individual.

Industry Perspective

Richard Hamer outlined the skills problems facing UK Engineering Industry. With 'baby boomer' engineers now at or approaching retirement, estimates say that some 182,000 engineers will be needed each year to 2022 and industry needs to double the numbers currently trained. Additionally more engineers from the Black Asian and Minorities community and more women engineers are sought.

BAE Systems acknowledge that graduate development goes beyond the knowledge content and have developed a number of in-house programmes. These are targeted at delivering engineers who, in addition to their academic achievement, have developed competencies in skills and behaviours.

"Working with the sector in a way we never have before" Richard Hamer

The Trailblazer group under Richard's leadership has developed a Post Graduate Engineer Standard and assessment criteria to allow companies to use their Apprenticeship Levy to fund their next generation of Engineers. BAE Systems are working with smaller and medium sized companies to identify the needs required now and in the future. The skills developed within large companies in any role will benefit UK economy as these professionals move within and outside of the sector.

The Post Graduate Engineer Standard leads towards Chartered recognition through registration with the Engineering Council.

"Can't do this without support from the university sector, helping us to raise our game, be more competent and more productive." Richard Hamer

Perspective from Academia

Postgraduate Apprenticeships are designed around three pillars (knowledge, skills and behaviours): direct application of knowledge, enhancing practical skills and developing leaders in technology and management. Knowledge is the key to the success of the scheme, from an individual perspective. Gaining knowledge has many benefits, the apprentice will learn alongside students from different companies, countries, cultures and industries providing a variety and depth of learning that they would not otherwise experience.



Lynette Ryals pointed out that graduates will also access an Alumni community of some 60,000 leaders. Although a demanding and difficult route to a postgraduate qualification, encompassing both academic studies and also workplace learning, it is a desirable education pathway for any learner to have.

Lynette was pleased to say that a second cohort is now following the Systems Engineering Masters Apprenticeship. Cranfield University was part of the Trailblazer team that developed this first Masters Level Standard led by Atkins.

The pace of change in technology requires individuals to be able to develop and enhance their skills throughout their working lives. Lynette remarked that a related challenge for technology-based industries is leadership. Understandably, high-performing individuals often get promoted on their technical ability in roles without the management skills to operate effectively or to lead periods of change and innovation. Effective managers are in demand in general. Government data has shown that a further one million will be needed by 2020. The advanced and post-experience learning for senior-level staff provided by level 7 apprenticeships will be an opportunity to fill gaps in management capabilities, linking up technical advances with the practical implications of delivery and commercialisation within specific organisational and market context. Cranfield use the award of 'Masterships™', appropriate for upskilling senior managers and technical specialists.

Thus the benefits to the employer with an apprenticeship programme at postgraduate level are attracting new talent, developing a motivated and skilled workforce, boosting productivity, filling skills gaps and massively increasing employee retention.

"This is a three way relationship between training provider, employee and employer; not just about upskilling individual but very much about the developing the performance of the organisation".

Lynette Ryals

Discussion



Peter Harrison Centre Manager - Centre for Andragogy and Academic Skills
Matthew Caffrey The Cranfield Manufacturing Innovations Consultancy, Apprenticeship Lead



Lorraine Bell Head of Technology Enhanced Learning Education Support
Christina Goodman Apprenticeship Co-ordinator, Education Support

Following insights provided by the speakers, participants were invited to share in activities, linked to setting up new postgraduate apprenticeships through:

- early discussions (Trailblazer groups),
- design of learning and content (delivery modes)
- exploring key elements, experience and effect of postgraduate apprenticeships

Design of learning and content (delivery modes)

Participants at this interactive session highlighted a number of key themes which are listed below:

- **Learning modes**
Providing materials in multiple formats to ensure variety to meet learning styles and accessibility requirements
- **Enhance the learning experience**
Enhance the learning by generating learning communities
Ensuring accessibility of learning delivery and materials
- **Flexibility of delivery and learning**
Case studies regarding the on the job learning, bringing the academic learning to benefit the employer
- **Exploring the employer benefits**
Flexible apprentice, that can fit around work/ learning around work commitments
- **Innovative programme design**
Development of 'digital twin labs' to simulate the real labs to be used outside of face-to-face delivery



Key elements, experience and effect of postgraduate apprenticeships

This activity took the form of a pyramid discussion in which three areas were considered. The issues participants discussed are outlined below:

1. Elements within the best quality postgraduate apprenticeship
 - a. A flexible approach for employers
 - b. Bespoke learning tailored to the individual.
A portfolio with includes guided pathways (pathway linked with context).
 - c. Business competence and interpersonal skills with a better understanding of how companies work.
 - d. Technology enhanced learning (TEL) to be engaging, while accessible to the learner, attractive, and stimulating, providing instant results and immediate feedback. Considerations are the resources required to produce successful TEL, support and training.
2. Participants or employers experience of a postgraduate apprenticeship.
 - a. Coherence and context between workplace and study to provide a meaningful experience.
 - b. Diversity in universities provides a vibrant environment in which alternative views are shared, explored, permitting further development of ideas.
 - c. Employers very engaged and aware of employees development.
 - d. Lifelong learning, study skills, research skills, are personal and professional skills supporting continuing professional development.
3. The effect of the apprenticeship on current postgraduate education.
 - a. Permits alignment between professional qualifications and apprenticeship programme
 - b. Accrediting bodies will need to talk to each other so employers can take modules accredited by different bodies. This may be challenging as accreditation is often by programme not by individual modules or elements.
 - c. There is a clear expectation around commitment: real clarity around requirements before collaborative documents are signed and a good definition about the 20% employee training.
 - d. Flexibility and complementary study.

Postgraduate Apprenticeships, Future Challenges

Summary

Postgraduate Apprenticeships are part of the biggest change to industry training in a generation and could be a 'game changer' for the industry, employers and academia alike. The tax levy for approved training is the government's approach to enabling industry to respond to the industry skills gap, as it is now the employers responsibility to identify and fill the gaps.

The UK needs skilled engineers in multiple disciplines and it is up to employers to work with other stakeholders to develop the range of standards we need to attract, train and retain the engineers of our future.

There is a lack of metrics around the quality of the apprenticeships, specifically the quality of the learning output from the perspective of the individual, the employer and the end point assessment. Success of quality of the postgraduate apprenticeships is now largely in the hands of the employers, training providers, but specifically IfA and the professional institutes.

Next Steps

The framework is in place for industry, employers, government and academia to work collaboratively to make this a success. The postgraduate awards are a route to Chartered status and the Engineering Council will play a pivotal role in ensuring quality with the Professional Institutes working closely with the IfA. It is crucial that the best quality postgraduate education is embedded within the apprenticeships.

There is now a huge opportunity for all the community to shape the future of UK Industry by advancing the skills and knowledge of our engineers, enabling and empowering them making the UK's engineering and design capability the envy of the world.

Call to Action:

- Employers need to identify their skills needs and gaps, now and for the future. If there is not a current standard that fills the skills needs and skills gap, get involved in a Trailblazer group.
- For high quality postgraduate apprenticeships, collaborate with employers, through the IFA and Professional bodies, to establish industry wide metrics on quality.

Cranfield University

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Next '**Excellence in Postgraduate Education - Manufacturing, Materials and Design**' event Thursday 22 March 2018