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The Development of a Sustainable Approach to Learner-Employer Engagement

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The National **HE STEM** Programme

A Case Study Report:
**Succeeding in
Tomorrow's
Engineering
World of Work**
2011 ~ 2012



Author: Dr P. D. Denton

Employer Engagement, Workforce Development & Higher Level Skills

Foreword

The National HE STEM programme is dedicated to developing a closer relationship between schools, colleges, higher education (HE) institutions and industry.

After all, in today's competitive workplace, it's more important than ever that graduates have the skills to succeed in industry. Unfortunately, all too often, undergraduate learners are ill-equipped to make this transition smoothly and effectively.

This is an issue that was highlighted in the Lambert Review, which exposed the difficult interface between academia and industry. It's particularly relevant to Yorkshire & Humberside (Y&H) where only six per cent of employers have any contact with higher education.

Succeeding in Tomorrow's Engineering World of Work is an HE STEM strand focused on creating a pipeline for students in Science, Technology, Engineering and Mathematics (STEM) disciplines to progress successfully into the world of work. By enhancing the curriculum to include transferable skills, Succeeding in Tomorrow's Engineering World of Work is improving graduates' professional readiness. It's adding to the knowledge they require to play an active and valuable role in the workplace.

Involving collaborative partnership working, the Project has analysed, designed and evaluated a STEM-specific approach to learner/employer engagement. This has resulted in a robust, impact evaluation model from which other HE institutions can benefit.

This brochure outlines the general approach to this ambitious project and celebrates the successful outcomes for the students, graduates and employers involved.

Foreword by Dr Pam Murrell, ICME



For Your Reading

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Collaborative Partnerships



One of the desired long-term outcomes for the Succeeding in Tomorrow's Engineering World of Work project is to deliver regional economic growth.

By encouraging and delivering a steady flow of talent through STEM disciplines, the Project also aimed to provide a pool of knowledgeable and skilled individuals, which helps to safeguard the future of science, technology, engineering and manufacturing in the region.

The first step towards achieving this vision involved developing collaborations and networks. Based at the University of Huddersfield, the Project was partnered by The University of Bradford, Bradford College, private industrial organisations and professional bodies.



Using HE-STEM, Engineering Council and Royal Academy research and employer engagement expertise, the Project built on established industry networks developed through HEFCE's West Yorkshire Lifelong Learning Network (WYLLN) Advanced Engineering and Manufacturing (AEM), professional institutes, national Sector Skills Councils and industrial training organisations.

Delivered through a complementary mix of intervention activities, the Project has exceeded its primary objectives and is now committed to institutional sustainability. Integral to the Project delivery was successful employer engagement, employability skills training, a CPD industrial mentoring programme, student placements and signposting through collaborator websites. all facilitated by partnership working.

This collaborative approach established a pipeline for talented individuals, within STEM disciplines, to progress into the workplace and succeed in industry. By improving partnership working between partner organisations, the Project also improved communication with all parties and encouraged more employers to engage in academic knowledge transfer activity.



Project Scope and Purpose

The Project aimed to address learner, industry and academic partnership issues by delivering upon four integrated objectives intended to improve employability and build a greater understanding between learners and employers.

Overall: Succeeding in Tomorrow's Engineering World of Work

The overarching aim was to bring learners and employers together, through:

- Documenting a best practice learner/employer engagement model, aligned to Engineering Council's UK-SPEC professional standards.
- Liaison with Institution of Cast Metal Engineers (ICME) to deliver a collective project evaluation and case study for future learning.

Stem 1 - Engineering Your Future

Piloting enhanced employability and career planning:

- 75 industrial business engagements to determine the skills required by industry.
- Providing transparent, relevant information for at least 100 STEM learners.

Stem 2 - Engineering Your Skills

Introducing short courses, equipping students with key employability skills:

- Developing six, targeted short courses, attended by a minimum of five learners.
- Enhancing or developing three STEM-focused accredited curriculum elements in response to project findings.

Stem 3 - Engineering Workplace

Improving employer engagement and partnerships with academia:

- Designing and delivering a 15 to 20-credit Industrial Mentoring CPD Programme with at least 12 employers.
- Placing 15 learners within industry.

Engineering Your Future

Approach

Through existing partnerships and research, a database of organisations and employers operating in STEM disciplines was identified. Interviews and paper-based surveys with 135 individuals within industry took place. This research determined transferable skill-sets that employers require from graduates and identified other issues, relating to graduates' readiness for work, currently faced by employers. Following analysis of the results a number of general issues and themes, concerning gaps in graduates' knowledge and skills, emerged.

Benefits

In partnership with South West Durham Training, 101 Information, Advice and Guidance (IAG) sessions were conducted for undergraduates. Students had the opportunity to take part in face-to-face and group IAG sessions to assess their existing skills in conjunction with their career plans. Benchmarking against national standards, and industry expectations arising from the research undertaken, gave students the opportunity to gauge their performance and identify any skills gaps that needed to be addressed.

Outcomes

Creating a dialogue with employers and organisations resulted in:

- A greater understanding between academia and industry
- More placement opportunities for students
- Recruitment opportunities

IAG sessions:

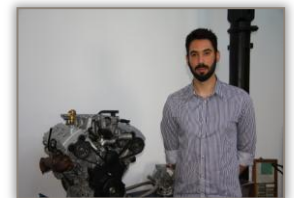
- Provided additional support for engineering competencies
- Signposted students to relevant, skill development courses
- Helped students prepare better for life in industry

Feedback was extremely positive, with students feeling empowered and more confident about their future prospects.

"The IAG sessions were invaluable. They gave me a better understanding of what it takes to become an engineer. I now know the skills I need to focus on and where to go for help.", Panagiotis Koutsompelis, Third-Year Student.

Results at a glance

Project Objectives	Target	Achievement
Industrial Business Engagements	75	135
Information, Advice and Guidance (IAG) Sessions	100	101



Engineering Your Skills

Approach

Engineering Your Future, identified the gap between students' existing competencies and the skills required by employers. These learnings were fed into the Engineering Your Skills element of the project. In partnership with the ICME, CPD short courses, including project management and communication skills, were piloted. The new courses equipped students with the transferable skills necessary to smooth the transition from academia to industry. Elements of the CPD courses fed into the existing (HE) degree and further education (FE) courses. Enhancing the existing curriculum, the new modules are intended to improve a graduate's readiness for work.

Benefits

The CPD courses and enhanced curriculum modules are providing students with the opportunity to gain transferable skills. It's helping to ensure that graduates are a more attractive proposition to future employers. It also gives employers greater confidence when employing graduates. Knowing that they have the skills and knowledge to contribute immediately to the company, saves employers time and money.

Outcomes

The CPD courses proved incredibly popular with students, with almost 150 students – five times more than anticipated – taking advantage of the training offered. Enhanced curriculums and CPD courses have led to a greater understanding between academia and industry:

- Improved placements for students
- Better job prospects
- Closer relationships with employers

Fourth-year student Gilbert Marangwanda, who took the Project Management and Quality Module, was offered a graduate job as a Design Project Engineer. He said:

"...what you have taught so far has really helped. I have found myself in a very strong position at the company after just one week in employment."

Results at a glance

Project Objectives	Target	Achievement
CPD Short Courses Developed	6	10
CPD Learners Benefiting	30	149
Curriculum Enhancements	3	4



Engineering Workplace



Approach

Engineering Workplace builds on the employer relationships generated in Engineering Your Future. The intention is to create long-term partnerships that will inform and shape future areas of study. This will help to ensure that academic programmes keep pace with the rate of change in industry, and provide graduates who can respond to the challenge of contemporary business needs. To improve employer engagement, and encourage employer investment, an Industrial Mentoring Module was designed and developed in collaboration with Semta, the Sector Skills Council for the Engineering sector. Run by Bradford College, the course adopted a blended learning approach. By offering both distance learning, through a VLE (Virtual Learning Environment) portal, and traditional face-to-face learning at regional centres throughout the UK, the project sought to maximise opportunities for participation.

Benefits

Strengthening the links between academia and industry through the mentoring programme has increased the number of placements available to students. Mentoring provides delegates with valuable industry experience, giving them a greater understanding of the demands and challenges of academic development. This mutually beneficial collaboration also empowers and encourages industry partners to play an active role in closing the gap between graduates' skills and industry demands.

Outcomes

The mentoring programme:

- Is accessible to students and employers throughout the country, through four regional learning centres and virtual learning
- Gives students a valuable opportunity to put their learning into practice
- Creates a vital link between academia and industry

As a direct result of the programme, four students, including two individuals on the Foundation Degree, received awards sponsored by participating organisations, at the Bradford College Awards.

"I found my placement a thoroughly rewarding experience, contributing to the fulfilment of my career expectations. It gave me an insight into the strategy and workings of a global OEM", Sarah-Jane Tonks, Nissan Placement Student.

Results at a glance

Project Objectives	Target	Achievement
Industrial Mentors Benefiting	12	8 (*28)
Students Attending Placements	15	17

* 8 Delegates currently enrolled from 28 registrations





Project Results

Succeeding in Tomorrow's Engineering World of Work has more than delivered its objectives. The project exceeded all targets, engaging a total of 381 individuals.

Through sustained collaborative working, the project has made significant progress in bridging the gap between graduates' skills and employers' expectations in STEM disciplines.

1. Engineering Your Future has resulted in students having a clearer understanding of employers' expectations.
2. Engineering Your Skills has equipped students with transferable skills, improving their readiness for work.
3. Engineering Workplace has brought learners and employers closer together, building a pipeline whereby talented graduates can progress successfully into industry.

Importantly, the Project has resulted in the development of a Learner / Employer Engagement Model. While the model illustrates a best practice approach within STEM disciplines, the principles can easily be adopted by, and adapted to, other sectors.



Delegates from Bentley Motors

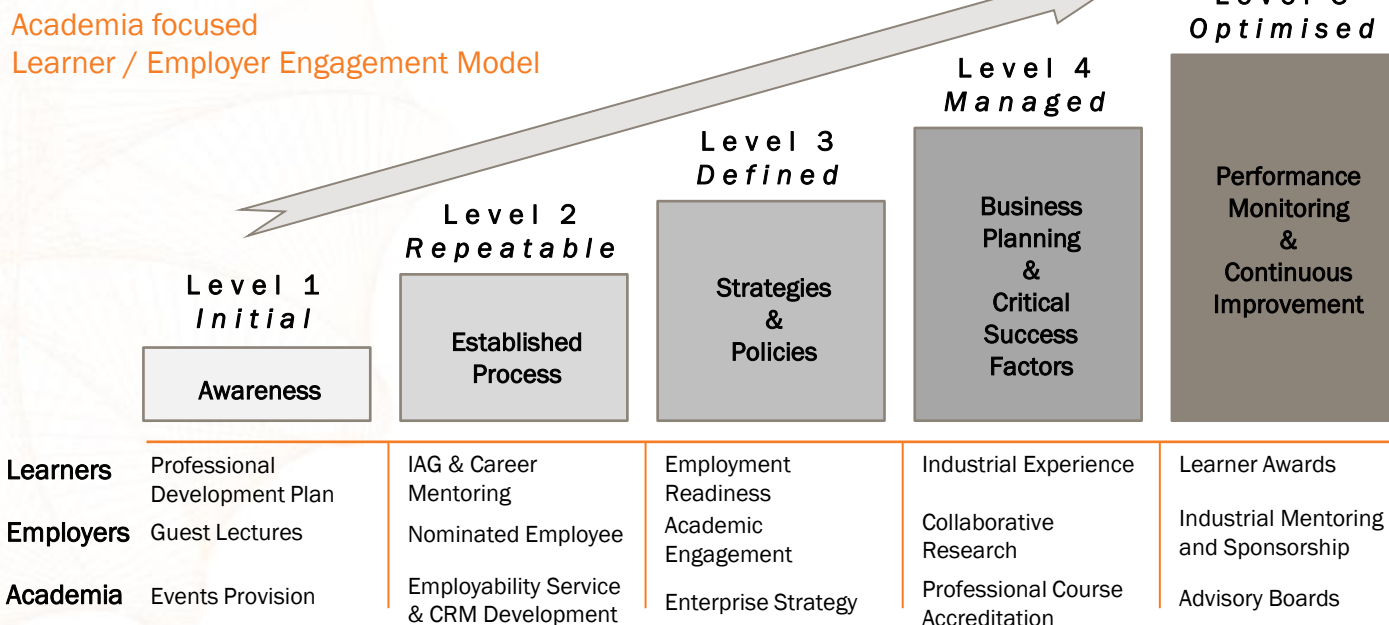
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Practitioner Recommendations

Through the achievements of the integrated delivery strands of this Project, it is recognised that there is no coherent interface between academia, learners and employers. As graduate employer schemes have dwindled, the demand from employers for professional, work-ready graduates has increased. This has resulted in research findings which continue to highlight employer concern at the ability of new graduates to make an effective contribution in the workplace with any immediacy.

To improve this worrying situation, this Project has developed, piloted and evaluated a best practice learner / employer engagement model to provide advice, ideas, hints and tips for academic practitioners, learners and employers on how to secure the maximum benefit from such interactions. This model has been adapted from the well known Capability Maturity Model (CMM) developed by Carnegie Mellon University and represents a formalisation of continuous improvement practices; from ad-hoc approaches, to formally defined steps, to managed result metrics, to active optimisation of institutional processes.



Though the generic model comes from the field of software, it is used here as a specific practitioner model to support learner and employer engagement. Furthermore, it has been used extensively worldwide in government, commerce and industrial organisations.

Sustainable Practice

As well as achieving its objectives, Succeeding in Tomorrow's Engineering World of Work has developed a sustainable engagement model, outlining a best practice approach for developing closer relationships between academia and industry.

Through the work carried out in this Project, a platform has been established which facilitates dialogue between academic organisations, professional institutions, private training organisations and employers.

Initial feedback from both students and industry partners has been very positive. These early findings are encouraging, and offer optimism for future longitudinal studies that focus on the key beneficiaries.

Spreading the word

To overcome the challenge of disseminating the study's findings and approach, several opportunities have been identified:

- **Conferences** – in addition to the national HE STEM conference, the Project was the subject of a keynote speech at the Foundry World Conference in Mexico.
- **Publications** – findings from the Project have been published in reports, academic publications and on the HE STEM website.
- **Project partners** – relationships with partner organisations has resulted in a number of advocates willing to promote and endorse the employer engagement model.



Looking to the future

Continuing the work undertaken so far, the Project team has been asked to form a committee to look at an industrial development model, specifically for the Casting Industry. In addition, the Innovative Manufacturing Research Centre in Metrology at the University of Huddersfield has expressed an interest in the CPD courses.

Opportunities for student placements continue to grow as employers realise the benefits of this collaborative approach to education. This has already delivered wider and deeper for participating institutions through schemes such as Knowledge Transfer Partnerships (KTPs), collaborative research projects and industrial consultancy.

How to Find Out More...



The National HE STEM Programme was an initiative funded by the Higher Education Funding Councils for England and Wales. Although focused around Science, Technology, Engineering and Mathematics, it primarily supported the disciplines of Chemistry, Engineering, Mathematics and Physics. These subjects were deemed to be strategically important and vulnerable, and were the subject of Pilot Project activities initiated by the Higher Education Funding Council for England in 2005 and 2006.

Programme activities were successfully delivered across three related strands:

- Widening participation within STEM disciplines at university level, by working with schools and FE sectors
- Higher Education curriculum developments, focusing on course delivery, design and student support, to enhance student knowledge, progression and skills
- Encouraging those currently within the workforce and society without a prior university-level qualification to engage with further study to develop enhanced knowledge and skills

This Project addressed issues identified within the Employer Engagement category, ensuring that graduates from higher education STEM programmes have the skills and competencies to contribute fully in the workplace. At the core of Programme activities to widen participation, was the transfer and embedding of proven practice from four discipline-based projects developed independently by the Royal Society of Chemistry (Chemistry for our Future), the Institute of Physics (Stimulating Physics), the Royal Academy of Engineering (London Engineering Project), and a consortium of mathematical bodies (More Maths Grads).

How to find out more about the success of the Programme

If you are interested in finding more about new approaches to recruiting students and delivering programmes of study within STEM or understanding how the Programme has delivered success, please visit the Programme website. Within the website a wide range of useful project information and resources related to enabling the sector to engage with schools, enhance curricula, support graduates and develop the workforce is presented. From each delivery strand activity it is then possible to identify contact details for the relevant Programme Partners.

www.hestem.ac.uk