

The Impact of Knowledge and Technology Transfer on FE



Transferring knowledge, driving innovation

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The Impact of Knowledge and Technology Transfer on FE

INTRODUCTION



In recent years, knowledge and technology transfer (KTT) has increasingly become an area of activity for the further education sector. While there are no nationally available statistics on the nature and scale of KTT activity in FE, our experience to date indicates that the majority of the KTT activity is focused on 'skills' development for the businesses involved (i.e. colleges are supporting initial and continuing professional development). There are therefore relatively few examples of where colleges have adopted a broader interpretation of KTT and have started to engage in activities such as contract or collaborative research, consultancy, access to facilities and equipment, and supporting new enterprise development involving staff and/or students. There is, however, significant potential to increase the scale of the KTT activity, particularly where there is likely to be a demonstrable impact on SMEs. Furthermore, there is an appetite in the FE sector to expand their KTT activity building on their existing employer engagement activity. The challenge is how best to accelerate this movement.



The New Engineering Foundation, with support from the Gatsby Foundation, LSIS, LDA and TSB has been leading a number of programmes that aim to demonstrate the value of embracing Knowledge and Technology Transfer (KTT) by Further Education Colleges, in terms of impact on staff and curriculum development as well as local economic stimulation.

The KTT programmes that we have devised have primarily focused on creating awareness about the potential opportunities that could be gained from KTT and innovation activities, particularly in the applied science, engineering and technology (STEM) disciplines. The intention is to enable cultural change from within the colleges where KTT and innovation become standard practice embedded in curriculum development, teaching and learning and employer engagement.



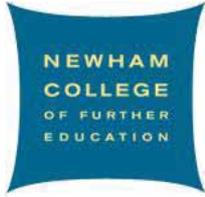
These KTT programmes have been effective in bringing together expertise from the often disparate STEM disciplines within an FE organisation, supported by business and industry expertise. They acted as catalysts for cross-curriculum initiatives to support demand from industry for new and emerging technologies such as bio technology and technologies for low carbon products and services.

The interventions included the development and delivery of the following programmes:

- Knowledge and Technology Exchange Nodes
- Knowledge and Technology Transfer Profile Builder
- Knowledge and Technology Transfer Champions (in STEM)
- Innovate to Educate workshops and Action Learning Sets across the UK
- Enterprise and Knowledge Transfer for London

Through industrial engagement and working with key clients, the FE lecturers / colleges focussed on and achieved the following objectives:

- Demonstrating the benefits of KTT and business innovation across the broad range of the STEM disciplines to fellow peers in teaching and learning;
 - Reviewing parts of the curriculum where involvement in KTT and innovation could improve and enrich the current provision and potentially develop the opportunities for Short KTPs.
 - Identifying and influencing areas for future college-business collaboration and development, particularly in areas of new and emerging technologies;
 - Providing a focus on future sector needs – taking into account new technologies and agendas and the impact that these may have on teaching and learning;
 - Developing and sharing good and innovative practice and resources;
- Enabling communications with strategic partners around key industrial and business issues.



Newham College of Further Education

Introduction of Emerging Technologies to Business and Industry

Category: Enterprise and Knowledge Transfer for London

AIM

To develop a level of capability to provide and support the provision of solutions to local business and industry based on novel applications of Radio Frequency Identification (RFID) and nanotechnology.

PROJECT

The project was focused on creating a solutions-driven knowledge base in RFID and nanotechnology. Throughout the project, a strong emphasis was placed on the practical application of emerging technology, and the involvement in nanotechnology (although an expansive subject) was narrowed down to nanotech coatings. The partnership with German company, Nanopool, armed Newham with the knowledge to develop a one-day workshop 'Nano SiO₂ coatings application' aimed at business and industry. This initial workshop helped to build an awareness of the capabilities and business benefits that nanotech coatings presented.

The engagement in RFID involved another partnering with an American company, RFID4U. Working with RFID4U provided the necessary knowledge to build capability, and enabled the college to provide solutions to organisations in the appropriate usage of radio frequency identification devices.

KNOWLEDGE TRANSFERRED

Before any workshops could be run or any solutions offered, Newham had to work closely with both Nanopool and RFID4U to capture and assimilate the new knowledge they needed to deliver their new offerings. The college had a specific focus, the development of a programme of awareness that would lead to the introduction of Nanotech coatings and RFID tags into local business and industry, and this clarity of focus guided their engagement and drove their commitment.

Lecturing staff from the science, engineering and technology fields were identified and placed on knowledge transfer workshops in nanotech application and RFID. Following these workshops, the same staff were invited, with the support and expertise of

the industrial experts from Nanopool and RFID4U to develop a series of workshops for local companies. These workshops were delivered for the sectors of aviation, healthcare and leisure. In addition to these sector specific workshops, a number of general workshops for all businesses were also delivered, demonstrating the commercial opportunities offered by emerging technologies.

OUTCOME

35 businesses were introduced to RFID and 20 businesses were introduced to nanotechnology. One of the businesses, London City Airport agreed to engage in a mini pilot using nanotech coatings. A business case for the introduction of nanotech coatings was built, and a programme of technical development training was created for London City Airport staff focusing on surface preparation, application technique, maintenance procedure, and the safe storage of the nanotech coating products.

IMPACT

As a result of this project, 3 new nanocoating application businesses have been set-up: CleanTek1, PureNanotech and Velocity training.

London City Airport has realised the financial and sustainable benefits of using nanotech coatings on a range of its surfaces in the airport and requested further knowledge of other nano products for use at the airport, and Newham has already delivered workshops for their managers to demonstrate the use and benefits of intelligent paints and nanocoatings for combustion engines, gears, compressors and bearings.

The college have become a user of nanotech coatings and have gained efficiency savings as a result of this application. The college's STEM teaching and learning capability has improved greatly, as staff are now aware of new technologies, and have a practical understanding of their applications, and thus have the confidence and authority to introduce these subjects into the STEM curriculum.



GATESHEAD COLLEGE

Gateshead College

Low Carbon Electric Vehicle Improvement

Category: Knowledge and Technology Exchange Nodes

AIM

To enhance the product design of electric vehicles, and in the process develop a new technical capability in the assembly of electric commercial vehicles, and associated maintenance and support.

PROJECT

The project required Gateshead College to work in partnership with a commercial partner to gain technical capability in electric vehicle assembly and maintenance. The college has a recognised reputation for delivering training in motor vehicle engineering and in business improvement techniques. As the world's largest manufacturer of zero emission road-going commercial electric vehicles, Smith Electric Vehicles could see a natural fit with the college's experience in vehicle engineering. In partnership a project was developed that focused on whole organisation business improvement strategies such as Kaizen to enable Smith to support the development and maintenance of the Newton (120 Kw electric motor) product range of vehicles. The Smith Newton car is fuel-emissions-free, it runs without noise or vibration, and stores electric energy during stopping through a process called regenerative braking. It has a top speed of 50 mph, a range on one battery charge in excess of 100 miles and a payload of over 16,000 pounds. The college worked directly with Smith, providing their technical expertise to identify areas of product enhancement. To enable the product enhancement, Smith engaged in a substantial business transformation that included establishing new supply chains and new processes to underpin the company's strategic direction. The college provided key knowledge to assist this transformation.

KNOWLEDGE TRANSFERRED

Gateshead College used the knowledge and expertise they acquired as a result of their work with Nissan in Sunderland to support Smith to develop a capability in business improvement techniques. Smith supported Gateshead College to develop their knowledge base in the electric vehicle assembly and maintenance and in battery technologies, thereby providing a strong foundation to build new curriculum in electric vehicle and battery technology.

OUTCOME

Gateshead College identified the need to develop a programme for the Emergency Services on how to handle and rescue hybrid vehicles. This development was the first of its kind in the UK and attracted considerable interest and demand. The project enabled the development of a structured qualification in Hybrid Vehicles in partnership with Smith Electric Vehicles and Nissan.

Gateshead College is now working closely with an awarding body to gain accreditation of a specialist External Verifier qualification. The College is also developing Train the Trainer packages for Hybrid Vehicles for FE and industry providers to ensure consistent quality of delivery and assessment.

IMPACT

Improvements in the quality of production of the Newton fleet of Electric Vehicles. The college is working with Nissan to support the development and manufacture of their electric vehicle – "the Leaf". Gateshead College has developed new relationships with Smith's supply chain. They are also developing a new curriculum and lesson schemes on electric vehicle technologies.



Tower Hamlets College

Development of a 3D Hologram Viewer

Category: Enterprise and Knowledge Transfer for London

AIM

To develop a hologram viewer that does not rely on a specialised discrete light source for operation in the context of a full colour, moving 3D holographic poster.

PROJECT

The project focused on resolving an issue which had held up development of the innovative full colour, moving 3D holographic image product called – MoviPoster. A key barrier in the field of holography was the development of a suitable viewer that works from its own integral light source, and thus enables holographic displays to be more widely used as a commercial communication tool. The project saw the college work with the company Colour Holographic to contribute to the redesign of the hologram viewer; provide material and aesthetic solutions to the 3D holographic modelling issues resulting from the new viewer, and provide new moulding techniques for reproduction of prototypes of the new viewer and production of master copies.

KNOWLEDGE TRANSFERRED

The lead lecturer involved in this project provided significant knowledge transfer to Colour Holographic, in the form of material and aesthetic solutions, due to his background in visual art, sculpture and 3 dimensional arts. In return, the lecturer gained knowledge and industrial experience, particularly in understanding the application that fine art plays in the development of new media technologies. He also gained essential knowledge pertaining to technologies of hologram design and manufacture.

OUTCOME

The project resulted in a new holographic viewer being developed that used an integral light source. As a result of the moulding techniques, the company employed rapid prototyping techniques, enabling them to customise 3D light boxes to suit the needs of their customers. Colour Holographic, an SME, would have found specialist input from a consultancy financially prohibitive, however their engagement with the college focused their research and development efforts and enabled them to solve a problem that had held back growth.

IMPACT

The impact of this technology transfer project has been one of growth and expansion, both from the small company side and that of the college. Colour Holographic have been able to grow and expand their product portfolio, and have maintained a strong relationship with the college to provide expertise for their future Research and Development activities. The college has gained significant knowledge through this engagement, and have realised that it is at the interface between different disciplines where real technology transfer and innovation happens. Armed with this information, the college has led a number of knowledge and technology transfer projects where subject experts have been used to find solutions to ‘out of field’ areas.



South Devon College

Advancing Marine Engineering in the South West

Category: Knowledge and Technology Transfer Champions

AIM

To develop a range of interventions to drive the advancement of marine engineering in local industry.

PROJECT

The project was focused on meeting the demands of industry and to driving the advancement in technology for business benefit. It was identified at the outset that both breadth of knowledge and numbers of learners needed to be increased to fulfil industry expectations.

The project identified partnership as a way forward, and a partnership for the joint delivery was developed with Centrax, a large gas turbine and turbine components manufacturer, to deliver to Young Apprentices on the Marine Engineering Programme. A range of engineering learning resources have also been developed jointly with Centrax to meet the needs of local industry.

KNOWLEDGE TRANSFERRED

College staff provided the pedagogical knowledge, whilst staff from Centrax provided up to date knowledge of gas turbine technology to develop the new engineering resources. The engineering staff gained a solid skills and knowledge base that fed into current curriculum enhancement. The college benefited from visits associated with the college staff placements. Centrax carried out teaching observations and commented on the relevance to the work place and current industry technology and practices.

OUTCOME

Working with Centrax led to a number of proposals for further recruitment, with 5 more apprenticeship placements being offered for September 2010. A specific need was identified from the outset that Centrax and their tier 1 and 2 supply chain partners require specific fabrication and welding programmes to improve capability and productivity. As a result of this need, a series of fabrication and welding courses were developed jointly and offered to reflect current techniques and technologies used in the workplace.

IMPACT

The project has identified a plan to increase learner numbers on programmes resulting in additional staff being required within engineering. A new role, Engineering Programme Coordinator, has been created and the job description contains a responsibility for knowledge transfer. The knowledge transfer has been invaluable, providing a vehicle to secure CPD and enhance a curriculum using industrial strength and knowledge.



Forth Valley College

Skills Development in Stem Cell Biology

Category: Knowledge and Technology Transfer Champion

AIM

To develop a complete suite of training and learning materials on stem cell biology available to all educational institutes teaching stem cell biology as part of a modern biology programme.

PROJECT

Stem cell biology is an emotive subject, often misunderstood by the general public. The challenge was to generate a suite of training and learning materials that could support young Scottish citizens to understand what stem cell biology is all about and make informed judgements. Working with Roslin Cells two FE lecturers, Dr Moira Wilson and Dr Patrick Lawlor observed, and then worked in the Roslin laboratories. As a result of their hands on high level experience they were able to develop in conjunction with Roslin laboratories (a world leader in stem cell technology) and the Scottish Stem Cell Network (SSCN) learning and teaching materials which supported the requirements of the Curriculum for Excellence.

While this was a wonderful opportunity to address the needs of specific qualifications: for example Higher Biotechnology, it also supported associated topics such as Higher Biology and Higher Human Biology. Furthermore by maintaining a focus on breadth of knowledge transfer, some aspects of the lessons learned during Drs Wilson and Lawlor's time at Roslin Cells were used to inform teaching of more generic scientific courses.

KNOWLEDGE TRANSFERRED

First and foremost it was essential that Drs Wilson and Lawlor understood the discipline of the research bench. They are after all preparing young people for the world of work, where both technical and employability skills are vital. Roslin Cells operates in an environment where the highest possible standards of:

- data management, tracking and tracing;
- cleanliness;
- ethical conduct;
- quality control

must be met. Moreover, Roslin Cells have to anticipate future regulatory requirements and the consequent changing demands that may be made of them in conducting their work. Beyond these more generic learning points there was a host of technical teaching and learning materials to develop on the history, science and future uses of stem cell technology.

Knowledge gained from the structured placement has been exchanged with lecturing staff on an initially informal briefing and is now being distilled into learning materials to be used in the first instance at Forth Valley College, but by means of the Scottish Stem Cell Network, and other partners promoted to and distributed across other schools and colleges engaged in delivering aspects of the Scotland-based Higher National framework. The materials that have been produced are being currently mapped to the Curriculum for Excellence, Experience and Outcomes so as to further increase the availability of the information at other levels of school education.

OUTCOMES

- Individual lecturers have a clear understanding of the levels of demand in this emerging high level industry;
- Staff across the college are aware and advised of the unique requirements of a major local employer;
- Learning materials are being generated in a variety of media;
- e-Learning materials will be used to refresh current National Qualifications.

IMPACT

As a result of this project, aspects of the Scottish Curriculum's delivery system will be altered to better inform and train many thousands of young people in a high- level, high-skill emerging technology. Teaching and learning has benefitted from an exchange with best practice employers. The relationship between Roslin Cells, the Scottish Stem Cell Network and Forth Valley College have been further developed and strengthened. It should be noted that the knowledge transfer in this case study is in the early stages and its benefits will continue to develop over the next months.



Lowestoft College

Wind and Wave Energy Development

Category: Knowledge and Technology Transfer Champion

AIM

To extend the existing focus of provision on offshore and photovoltaics to include wind and wave energy.

PROJECT

The background to the project indicated that 100 learners had engaged in training linked to energy sectors or tier 1 supply chain companies, for example, mechanical engineering courses that will feed into the offshore wind sector. The college worked in partnership with 3 Sun (a wind turbine engineering manufacturer) and other renewable energy companies, to develop innovative curriculum in wind energy.

KNOWLEDGE TRANSFERRED

The project required staff from Lowestoft to spend time in 3 Sun, and staff in 3 Sun undertook guest lecturing in the college. Using the relationship with 3 Sun, the project acted as a test bed to develop a programme of facilitated engagement with key renewable energy companies in the region.

OUTCOME

A series of new learning units in renewable energy were created. The college also developed a framework for a three day commercial course on renewable technology. The framework was also used to enhance the delivery of existing courses such as the Foundation Degree in Low Carbon Energy Skills. Equally, 3 Sun have now formed a bridge to close their skills gap and established a clear line of communication based on shared understanding that will allow them to confidently articulate their skills needs to the college.

IMPACT

As a result of this project, motivation and focus of teaching staff improved. Job satisfaction levels increased, as staff felt confident to deliver innovative curriculum that was in demand by industry. Using knowledge and technology transfer as a catalyst, the college has been able to create new revenue streams and a programme of guest industrial speakers to ensure teaching and learning reflect current industry technologies and practices.



Duchy College and Hartpury College

Developing and Innovating Small Business Food Producers

Category: Knowledge and Technology Exchange Nodes

AIM

To develop a capability amongst small food producers to innovate and improve their food production.

PROJECT

The project was focused on providing a range of practical solutions responding to issues and problems identified by small businesses operating in agri-food sector. The premise behind the project was that small businesses rarely have people employed whose job it is to interpret the science behind a product's development, what potential manufacturing problems there are interpretation of information in a non-scientific way to make it applicable to product development.

The project was focused on not only looking at short term real solutions to problems threatening business survival, but also looked at easily transferable processes to innovate and drive growth in the small businesses. The partnership of Duchy College and Hartpury College (part of the University of West of England) brought together a blend of FE/HE expertise enabling a knowledge base of scientific and technological processes, as well as business and marketing skills to be transferred to local small agri-food businesses.

A number of workshops were developed and delivered to a range of small agri-food businesses, and a follow on process of business review that covered:

- Evaluation of each product being manufactured
- Identification of the manufacturing process
- Identification of where critical controls could be applied

After the responses to these areas had been received, the College team could identify where the problems were, provide a practical solution and assist the small business in implementing the solution.

KNOWLEDGE TRANSFERRED

Duchy and Hartpury lecturing staff used their expertise to engage with local agri-food businesses in a variety of ways, including face to face workshops and formal presentations. Many of the businesses also delivered their own presentations to college staff, thereby providing a level of specific food sector knowledge that assisted in closing the gap between scientific and commercial business language.

OUTCOMES

The project resulted in the development of the Hartpury Business Network. Initially, 30 small agri-food businesses were supported directly, and by the end of the knowledge transfer project some 75 small businesses had been engaged either directly with college lecturing staff going to the businesses to problem-solve, or through attendance at the food and drink innovation events developed by the colleges.

One of the businesses was the Spice House, a start up business that needed support in the commercialisation of a range of 'cook in sauce' type products. Specifically, the Spice House needed assistance in validating a suitable, safe and cost effective manufacturing process. They also needed supply chain support in identifying suitable packaging designs, formats and possible suppliers.

With both Colleges' expertise and the use of the manufacturing unit at the college, trial products were developed, and were used to get product into local retailers. The colleges also used their marketing expertise to assist in developing a marketing strategy for the Spice House to enter the market.

Another business supported in this knowledge transfer project was Boccadon Farm, who needed to optimise (getting a consistent pH level) the current range of unripened lactic cheese products, together with targeted up-skilling of their workforce in new processing techniques that would improve the quality of the cheeses. The colleges also provided expertise to enable the farm to develop a new variety of blue cheeses.

Commercialisation advice and support was provided by the college, with a specific focus on packaging materials and other consumables that would have a critical impact on the success or failure of the finished product.

IMPACT

Spice House has continued to use the college's food processing unit as an incubator, and has successfully launched a comprehensive range of sauces and marketed them to food retailers and distributors. Boccadon Farm developed a second round of trials that led to a new blue cheese variety being added to their product portfolio. Through a structured programme of engagement, staff at the Farm were up-skilled in new dairy processes, leading to quality improvements, particularly around the optimisation of taste and texture. Boccadon continue to work with the Hartpury Business Network to ensure best practice and latest knowledge is transferred and business benefit is gained.



Leeds City College

Innovation in Colour Management

Category: Knowledge and Technology Exchange Nodes

AIM

To develop an integrated and consistent programme of support for print businesses to improve their colour management processes.

PROJECT

The project was focused on building capability in print businesses to address the launch of the new ISO that was based wholly on the control of colour. Working in partnership with Leeds University's department of chemistry (focusing on the colour of science), a consultancy service and a series of custom short courses were developed to provide local print businesses with a practical understanding of colour management, as well as providing them with necessary expertise to prepare them for the new ISO audit.

The control of colour is critically important in the print process. Accurate and consistent control has a significant effect on any print business, as it reduces waste in terms of materials (paper stock and ink) and man hours, creates a benchmark standard moving away from the 'dark arts' ethos, and provides a more consistent product. Ensuring print business optimise this process was critical to achieving the project's aim.

KNOWLEDGE TRANSFERRED

College lecturers from print and production, provided their expertise to develop a programme of practical engagement including workshops, and one to one technical support in new print production processes, as well as more specialised areas concerning the: fundamentals of colour and the science of colour management, and with the University's support: the physics of light, biology of the eye and the psychology of colour, were also addressed.

In addition, the lecturers transferred a body of knowledge in colour management to prospective ISO auditors.

OUTCOME

The project resulted in the development of five in-company learning centres. College staff used the centres to deliver their expertise and support in a structured, practical format.

Across the five centres - each one established in a print businesses - the engagement of some 500 print practitioners took place in the project.

The businesses supported ranged from small family print businesses to behemoths of the print industry Du Pont and Polestar, together with large scale printed material producers Ordnance Survey and Thomas Cook.

The company responsible for ISO auditing on the control of colour received specialist knowledge transfer sessions from college lecturers on state of the art printing press systems (a facility provided by the college as a key component of this knowledge transfer process). This practical engagement was essential for the ISO auditors to garner a strong understanding of colour process control and colour management, an area that was central to the audit criteria.

A local print company, DS Smith Multigraphics had experienced issues regarding profiling procedures and colour consistency. The project enabled college lecturers to review these areas of concern and develop a number of technical workshops supported by targeted consultancy covering colour science, control and management.

IMPACT

Implementing colour management and control in the print process delivers a number of cost, quality and productivity gains, including 70% reduction of waste and 50% reduction of print press set up times.

Continuous process improvement approach has been embedded in the print companies, with Polestar housing 2 out of the 5 in-house learning centres, with another 4 centres planned in other Polestar factories around the UK.

Du Pont in collaboration with both the Leeds City College and Leeds University now deliver a form of the Colour Management and Control programme to their supply chain directly to ensure accuracy and consistency.

DS Smith Multigraphics invested in new colour management and control techniques and practices, together with specialised equipment, such as a high-tech proofer. These initial changes improved their service, and enabled them to supply better product in the ever-more competitive print industry. Their productivity increased as a result of a better understanding of colour and achieving the correct results first time, and thus their profit line was impacted on positively.





North Devon College

Skills Development in Stem Cell Biology

Category: Knowledge and Technology Exchange Nodes

AIM

To create a hub to build and disseminate innovative practice in rural advanced manufacturing companies.

PROJECT

The North Devon Manufacturing Alliance data showed that one fifth of the region's workforce was in manufacturing and it generated 26% of GDP for North Devon. However, the major challenges needing to be surmounted were those presented by the remoteness of North Devon, as well as finding an effective way to integrate into a network of innovation and knowledge transfer that provided expertise from both an HE and FE perspective. With the nearest Universities (Exeter and Plymouth) an hour and a half to two hours drive away respectively, the College sought to create itself as the hub of innovation and knowledge transfer, providing not only an effective conduit for the transfer of higher level research oriented knowledge transfer, but also a major source of practical consultancy covering new product design and new manufacturing techniques.

KNOWLEDGE TRANSFERRED

The college had strong links with industry, however their connection with Higher Education was not as strong, and therefore, both lecturing and knowledge transfer professional staff spent time with the various universities in the region to develop a knowledge and understanding of each university's research activities at undergraduate and postgraduate, and in addition, an appreciation of the research being conducted by university staff.

Having established a good knowledge base of research information, the college disseminated this availability of expertise to local businesses through a programme of events. Advanced manufacturing business were the main target, and during these knowledge events, a portfolio of expertise ranging from practical technical consultancy through to higher level research was made available to local manufacturing employers

OUTCOMES

The project resulted in a hub being formed, providing a clear channel of communication, dissemination and innovation between the College, Plymouth and Exeter

Universities and the local manufacturing businesses. A key element that supported the developed of the hub was the development of a long term communications plan, promoting links between industry and academia, and encouraging communication and sharing of ideas and expertise for the benefit of the local economy.

IMPACT

A number of businesses were supported with innovative engagement at college and university level. TDK – Lambda, an electronics power supply manufacturer used the hub's service to resolve their product development issues, and Norbord, manufacturers of particle board and laminates, reduced their downtime on production equipment by using the hub to bring together expertise to develop a system to automatically gather information relating to key operating conditions, attributes and variables, from production equipment. Following analysis possible triggers were identified thus preventing machine downtime and increased productivity.

Eaton Aerospace who employed the blended expertise of a university researcher together with a number of college lecturers to focus on the development of new materials. The research focused on developing a better understanding of the materials properties and characteristics of sustainable reinforcement materials for composites, using experimental and statistical analysis. This work enabled the production of reliable data about the material, and was a cornerstone in creating new designs using sustainable reinforcement substitutes for composite materials.

It was found that many of the materials tested were biodegradable, easily grown and could potentially be by-products from farming activities or other similar processes, and thus could impact on a number of current applications where replacing either glass fibre or even carbon fibre where sustainability was a key component in design.

This example was only one impact of the knowledge hub, but it is reflective of the value produced as a result of an effective innovation network of HE, FE and employers working together.



Kingston College

Making Resource Planning Systems Effective

Category: Enterprise and Knowledge Transfer for London

AIM

To develop a more consistent and integrated approach to internal systems in a manufacturing company to improve organisational efficiency.

PROJECT

The project was focused on building an effective set of processes in the company Sash Window Workshop that could be integrated within the new ERP (enterprise resource planning) and MRP (manufacturing resource profiling) systems that the company were introducing. The key challenge for the company was to ensure that the processes drove the technology and not vice versa, as was the case with many implementations. The college provided their expertise in both ICT and business process analysis, to enable a full analysis of the company's business processes. This led them to define an optimal over-riding architecture for implementation of these systems, and ensure that all stakeholders from all parts of the business (not just the shop floor or purchasing) were sufficiently involved enough to become owners of the system.

KNOWLEDGE TRANSFERRED

A strong bi-directional transfer of knowledge took place, with lecturing staff working with the company and IT manufacturers to build a body of knowledge to meet the requirements of the project. Through this interaction, the company learned more about their own internal processes, the manufacturer learned how parts of their proprietary product could be re-developed to meet different customer needs and thus deliver better organisational benefit, and the college gained a strong understanding on how to better optimise their own ERP system.

OUTCOME

Lecturing staff from the college provided expertise to review and analyse a number of key processes that impacted across the company's value chain. These processes were deconstructed and their logic paths (inputs and outputs) reviewed for efficiency, effectiveness and most importantly to a small business, productivity and cost benefit. Where necessary, these processes were refined and improved upon, and then tested for robustness and operational integrity.

At the same time, the staff reviewed the functional processes represented in the IT systems. Correlation with the actual processes was made, and areas of mismatch identified. With the assistance of the system manufacturers, the functional processes in the systems were augmented to reflect more accurately the operational business processes.

IMPACT

The optimisation of processes enabled the Sash Window Workshop to redevelop their customer interface product and communicate requirements directly to the workshop floor. The company improved their key performance indicators including reducing manufacturing days and wastage, and implemented just in time to reduce stock levels. The company was able to implement feedback and control for the integrated ERP and MRP system and placed a greater emphasis on quality management systems and continuous process improvement.

As a result, the company improved their organisational capability and developed into new products and markets; something that they would not have been able to have done had they not had the systems in place and clarity around the reason why particular processes were being employed.

Concluding Remarks

The programmes outlined here enabled FE colleges to develop and grow their knowledge and technology exchange activities with employers as a means by which to strengthen their contribution to economic development at local, regional and sectoral levels.

Key highlights of these programmes' impact include:

- Strategic alignment of complementary priorities with knowledge exchange embedded in college strategy and plans;
- Relatively small amounts of ('seed corn') funding have been instrumental in bringing about a wide range of knowledge exchange activity with regionally significant employers;
- Significant levels of additional funding have been leveraged ;
- New employer-led provision particularly in areas of new and near market technologies has been developed, improving progression pathways aligned to sectors of strategic importance, regionally and nationally;
- Capacity and capability have been strengthened and embedded to support a wider portfolio of knowledge exchange activity;
- New, better and more collaborative ways of working have been established particularly engaging supply chain companies with innovation and new skills development;
- Stronger, more strategic partnerships have emerged with employers and employer representative bodies, higher education and local and regional agencies.



Summary and Recommendations

FE colleges have a key role to play in supporting innovation through the process of knowledge (and technology) exchange. The emerging concept of 'value innovation' should therefore be exploited by the sector through the development of innovative multi-lateral knowledge exchanges that add value to society and the economy. The programmes outlined in this paper have proved to offer very effective mechanisms to facilitate this process.

Three key recommendations are:

Recommendation 1

The strategic implications and effective practice which have emerged from these KTT programmes should be widely promoted to enable FE colleges to develop mixed economy funding regimes whilst generating a real economic value at local, regional and national levels;

Recommendation 2

FE colleges should consider how through 'active leadership' they can harness the proven potential of knowledge exchange activities to create new business, better supporting the mission and strategy of the college;

Recommendation 3

Local government and economic agencies should consider where the development of these types of programmes would add value and accelerate their response to economic regeneration priorities.

The overall business case for knowledge exchange activity should be clearly presented and widely promoted to Government, regional economic agencies, local authorities, employer representative bodies and the FE sector.



