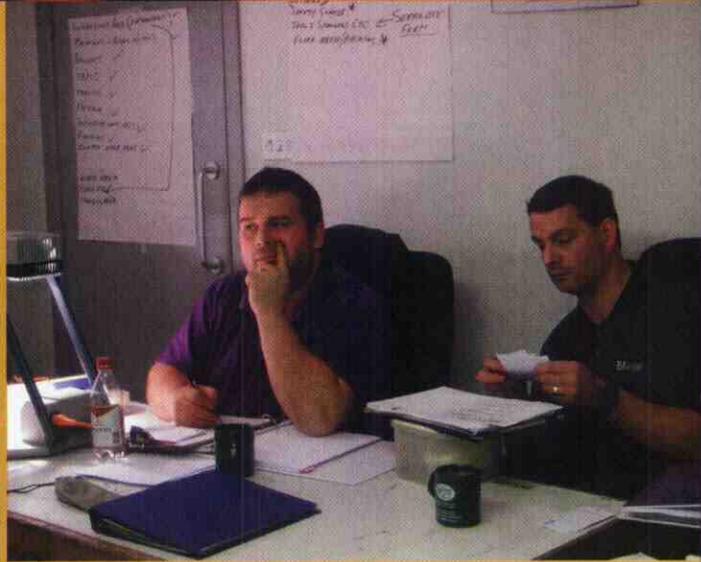


A.2 Conference papers and publications

A.2.1 “Learning at Work in the Automotive Industry”, IEE
Manufacturing Engineer, (2004)

Learning at



www.iee.org/manufacturingmagazine

Lecturer, students, notes, questions, discussion – a common scene in any university or college. Yes, but this is no real university or college. The virtual Automotive College takes the workplace for its classroom and enrolls staff from operator to director into its programmes. In an effort to address the skills shortages among manufacturers in the UK automotive supply chain, it has sought to make learning accessible, relevant and sustainable.

The Automotive College grew from the germ of an idea in 1995 after a DTI report that highlighted the lack of competitiveness in the UK automotive components sector. This had concluded that UK firms were being put at a competitive disadvantage by a shortage of suitably qualified engineers. That need has been reiterated time and again. The skills shortages and skill gaps at all levels within companies are a major factor in the UK's lack of competitiveness. Even the methods of tackling these shortages have come in for criticism. The Japanese component firms surveyed in 1998 criticised a lack of emphasis on practical skills, the use of old-fashioned equipment and teaching methods.

KEITH BEVIS DESCRIBES HOW THE AUTOMOTIVE COLLEGE IS MAKING A DIFFERENCE TO WORKER SKILLS AT SMALL BUSINESSES, ON THE PREMISES

work

Not only did the evidence show a need for training, it also showed a reluctance on the part of the small to medium sized enterprises (SMEs) within the supply chain to engage in training. While the main disincentive might be seen as finance, it was not the only one. For an SME, the burden of having to manage training or rather to manage and sustain the business while engaging in training can be too much. For these disincentives to be overcome the benefits to the business have to be very clear and measurable.

With support from the DTI and a heavy involvement from universities, colleges and industry in the form of the SMMT Industry Forum, together with an ICT specialist, the Automotive College was born. With no bricks and mortar, this virtual college has been able to concentrate its efforts on the learning activity. Experts from the various partners have been able to share ideas, design teaching materials and collect case studies using the college's online management information system.

This shared development has produced courses that can be delivered across the participating regions by local staff but with the backing of the relevant subject champions. Put simply this means that resources of the development team are available at the point of contact with an individual tutor. Of the programmes on offer, it is unsurprising that the most popular has been 'Lean Tools'.

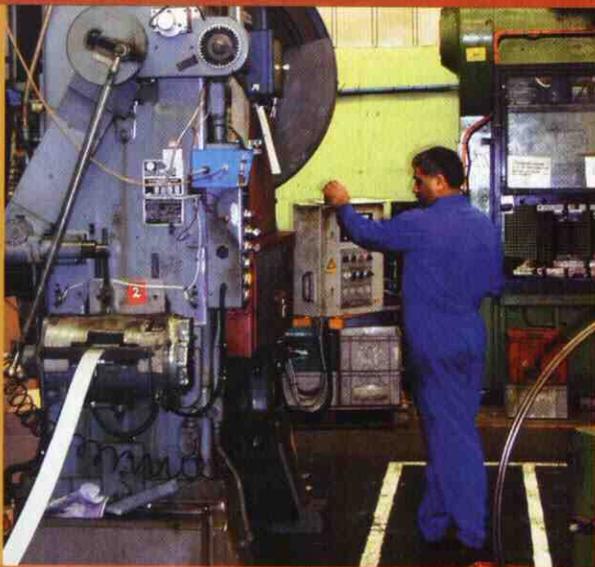
There are four key phases in the delivery process: diagnose, customise, deliver, support. The diagnostic visit will define the company needs, goals and benefits, as well as identifying individual employee needs. Programmes of learning are then customised to suit the specific needs of the company and individuals – and high quality learning materials are selected to support the customised learning programme. The learning programmes are delivered in-house – where there is focus on company case studies and real company problem solving. The staff for these programmes will be selected from the universities and FE Colleges in the partnership. Ongoing support is provided to aid implementation of improvements including the recording of achievements and access to the network of companies and an online network. At each step in that process, we can see both how the college itself has been developed and how the participating companies have benefited.

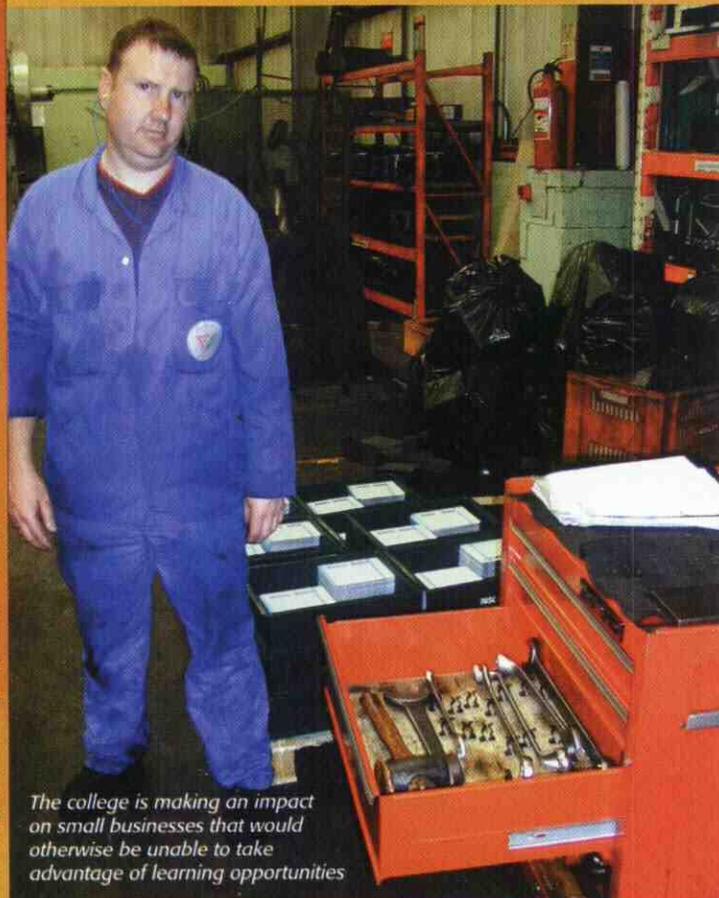
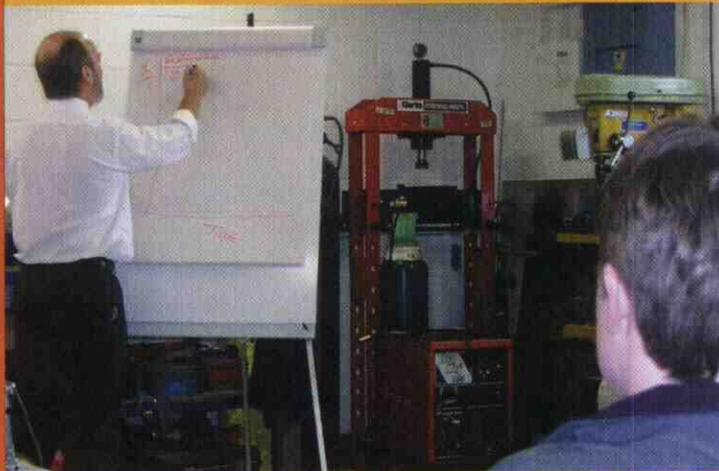
DIAGNOSIS

There are three distinct diagnostic objectives. The starting point has to be the state of the company, its background, its needs and its own understanding of its situation. The decision to propose an Automotive College programme has to be taken within this contextual framework.

In one company the new directors were finding their feet and were unsure of how to drive the company forward. BusinessLink was asked to support them as they developed their new business plan. Only when the company had a clearer vision of where it wanted to go was it appropriate for Automotive College to re-engage.

The next step of the diagnostic is to jointly identify →





The college is making an impact on small businesses that would otherwise be unable to take advantage of learning opportunities

the specific training goals. With agreed goals it is possible to choose the most appropriate elements of the training programme and the level at which it should be aimed. For the learning to be sustainable, the goals are more than individual targets for achievement. The company must see benefit in terms of quality, cost and delivery for its operations. So part of the diagnostic is not just about future goals but also about measuring the current status so that levels of improvement can be measured.

Where possible, measurements are made using the automotive industry's seven benchmark performance measures. These target quality, cost and delivery but focusing on: Non right first time, people productivity, stock turns, delivery schedule achievement, overall equipment effectiveness, value added per person, and floor space utilisation.

The fine-tuning will complete the diagnostic with an action plan. Here the specific learners are identified. The Automotive College selects the university or college staff that will deliver the programme, negotiates their availability and defines the level of customisation of the teaching material.

CUSTOMISATION

The college has developed a number of programmes ranging from Project Management, through SPC to lean manufacturing and the use of ICT. Each programme consists of a number of self-contained units each of which can be delivered as a workshop. Based on the data gathered during the diagnostic phase, it is possible to adapt the material to suit the situation of the particular group of learners.

The lean manufacturing programme introduces the learners to a number of tools including 5Cs, 7wastes, visual management, kanban and standard operations. The programme is designed to start with an interactive activity that brings alive the issues. In companies requiring a freshening of an existing but tired lean culture, the interactive activity has been deleted.

Delivery and implementation take place side by side. Yes, the delivery places a lecturer with the learners with teaching materials, but here the similarity with a traditional college ends. It is vitally important for these programmes that delivery takes place in the workplace. When a point needs to be illustrated in the workshop, the learners can identify the words and the ideas with the physical examples in their own workplace setting. There is an immediacy with which they can bring those examples into the group and take the new concepts back into the workplace setting.

When delivering the project management programme to the design team of a niche market sports car, at the time the most pressing problem facing the team was the delivery of the new curved window mechanism. The activity had been kept under control with spreadsheets, to-do lists and much angst. Using this as the main example the learning could be focused on managing projects within an SME's design environment.

The corollary is that the lecturer, too, is faced with direct contact with the manufacturing environment. The lecturer has the benefit of working with the practitioners with a range of real work experience. The bonus is the ability to take back current real world examples for use within the conventional teaching environment. Students at university or college can be confronted with today's real world examples. The updating is a two way process that adds value to all participants. One experienced tutor has said that working with the participant companies had been the most rewarding experience of their career so far.

IMPLEMENTATION

During the implementation phase there is continued contact with the lecturers as the learners implement their new tools. Perhaps the simplest way to describe this phase is by illustration from the experience of participant companies.

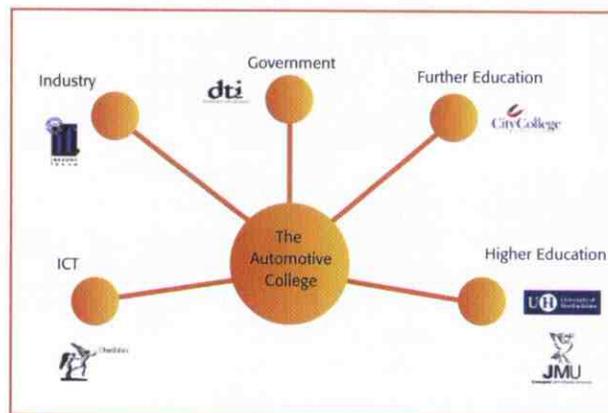
Polynorm (UK) supplies the automotive Sector with GRP compression moulded components including bumper beams, seat bases and acoustic undertrays. Polynorm aims to introduce and sustain a culture of continuous improvement and empowerment because it has realised the potential for increasing customer satisfaction. Andy Hobbs, the Operations Manager acknowledges "standing still is going backwards".

When Polynorm worked with the Automotive College the agreed goals were to increase the knowledge of Lean Manufacturing tools and techniques throughout the organisation. The results speak for themselves. The company has implemented a 5S system as a foundation for its lean manufacturing approach. Product changeover times have been reduced from five hours to two hours, output targets exceeded by 13% and scrap targets reduced by 2%.

Breed Manufacturing design and manufacture automotive accessories based on tubular fabrications. Faced with customer pressure to reduce costs and increase efficiency in an uncertain market, the company took a radical look at its manufacturing operation. Key staff were encouraged to work towards the NVQ in Business Improvement Techniques. Training in the principles of lean manufacture has been provided by the Automotive College.

On site learning with its clear relevance to the shop floor has enabled the supervisors to feel empowered to implement changes. Already there are better visual management systems in place and a more efficient maintenance regime based on tagging priority issues. Improved jig design is increasing the company's flexibility.

Factory layout can be a dry subject to teach. When I visited Breed, near the end of their programme, I found the delegates and the Operations Manager crowded around plans of their factory with the Automotive College tutor. They were not engaged in some academic exercise of hypothetical possibilities. Here the manager and his staff were discussing the re-organisation of the factory floor as part of a drive to improve efficiency. All the staff present could participate actively and knowledgeably in the discussion.



Above: The Automotive College has a number of partners

Pace Products is a much smaller, younger company, specialising in intercoolers and dry sump pumping systems for motorsport enthusiasts. The company had only recently moved into its new premises. During the company's early growth, the emphasis had been on the technical excellence of its products and its ability to service its customers. Here the goals agreed with the Automotive College related to materials handling and organisation.

With the smaller companies, one of the first results of any programme is the better understanding of what the company is doing and where it could go. A major improvement has been the reduction of stock outs of castings from a "regular feature causing delays in production" to none. Once the actual numbers of suppliers were discovered, the staff worked to bring these down by 29%. Amongst the commodity lines average cost savings of 20% have been achieved.

Beyond the statistics of these improvements, there is the management confidence in staff ability. Aside from any qualification or attendance certificate, the delegates are demonstrating their competence through immediate application of new skills. It has been this opportunity for the individual to transfer their new learning directly into the workplace that has been a significant factor in the ability of the programme to make a difference to companies.

With the current pressures on the industry, the levels of investment in training in the sector are low, especially in the SME community. The birth of the Automotive College was supported by the DTI. The delivery of programmes into companies has for the most part been supported by local funding initiatives working with sector groups or the Manufacturing Advisory Service.

The real challenge continues to be to facilitate that connection between the classroom, the boardroom and the shop floor. Learning is sustainable when learners are empowered, lecturers connected and industry improves. ■

Eur. Ing. Keith Bevis is the Automotive College's regional manager in the East of England, based within the University of Hertfordshire's Automotive Engineering Centre. He can be contacted on k.bevis@herts.ac.uk. For more information on the Automotive College see www.automotivecollege.co.uk

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