



**Assessing the Needs of Further Education Colleges in the
Management of Intermediate and Higher Level Engineering and
Technology Programmes**

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GTEP

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¹ The New Engineering Foundation-NEF (<http://www.neweng.org.uk>) is an independent registered charity that supports engineering and technology education through:

- Offering professional development programmes and learning resources
- Commissioning and undertaking educational research studies
- Providing policy advice and advocacy

The Foundation currently operates a national Fellowship Scheme that supports the secondment of engineering lecturers to industry from over 60 further education colleges.

² The New Engineering Advisory Panel consists of representatives from the following organisations:

Association of Colleges
BBC (Engineering Training)
CBI
EEF
Foundation Degrees Forward
Gatsby Technical Education Projects
Higher Education Academy -Engineering Subject Centre
Institute of Directors
London Development Agency
North West Development Agency
OfSTED
Qualifications and Curriculum Authority
Royal Society of Chemistry
Continuing Education in Electronic Systems Integration - CEESI

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Executive Summary and Recommendations

Why is it that, over 30 years after Sir Kenneth Baker's famous description of the FE sector as the 'Cinderella Service' the epithet is regarded as appropriate now as when it was first uttered? In spite of the significant amounts of funding coming into education since the late 1990s, colleges have persistently failed to get an equal share of the funding cake. The ongoing problem for FE is that the funding has never been sufficient for the root and branch changes required to achieve the step changes demanded of it by successive governments. Colleges are a vital part of their local community, providing for a multiplicity of needs, and yet they have never been able to compete for resources as effectively as the schools or the universities. This research is looking at one part of the FE spectrum, namely engineering and technology, but a part that has always been at the heart of the college system since the end of WW2, when technical colleges for apprenticeship training were brought into being. The economy has transformed itself in the intervening period and the modern engineering department has to be responsive, commercial in its approach, and cost efficient and effective in its delivery. Latterly, colleges have been asked to participate in the expansion of higher education. So, the question the research seeks to answer is: 'exactly how efficient and effective?' In areas where FE is not efficient and effective, the research looks to identify the pressure points and critical success factors that would improve the colleges' overall capability.

The review of skills headed by Lord Leitch is due to be unveiled in the near future. This report is intended to provide a blueprint for lifting the skills level of the nation's workforce, and thus ensuring we remain competitive against our leading economic competitors in productivity, innovation and business success. The engineering and technology sector is at the centre of the skills agenda, at the core of our wealth creation. The performance of our training for intermediate or technician skills is both indicative of the larger canvas that describes the FE sector as a whole, and of itself, an important contributor to making industry more competitive. It is a well known and established fact in industry that appropriately qualified technicians have been in scarce supply in many areas of engineering and technology for a number of years, indicating that demand is not aligned to supply in the way it should be.

This research paper provides a comprehensive overview of current practice in FE college engineering departments, particularly in respect to their involvement with higher level training:

- Over 20% of all English colleges – 56 out of a total of 216 who offer engineering courses were sampled;
- the research sampled both management and teaching staff in each of the selected colleges using detailed questionnaires;
- the sampling criteria has ensured that the 56 college respondents represent the full spectrum of college types and environmental contexts;
- focus groups comprising a full range of key stakeholders, agencies and interest groups were established in five different regions of England.

The research findings were clustered around the following five main propositions, relating to the level of capability present within FE colleges, to deliver higher level training in engineering and technology:

- that college staff in the FE sector do not have the necessary updated knowledge and skills or industrial experience to effectively deliver the higher level programmes;
- that the funding of engineering in colleges – that is the weighted allocations of money from the LSC – is not sufficient to provide the materials and equipment for higher level work;
- that FE colleges have significant qualities in relation to the delivery of work based learning which are and will be essential for the effective delivery of work based Level 3 and 4 courses;
- that the capability of FE colleges in the delivery of higher education is variable, and relies heavily on local factors, such as the attitudes and commitment of local employers and the quality and scope of other potential partners;
- that the future success of the FE colleges in becoming established centres' of higher education provision, rests in part, with the regional and local strategies for economic development, and how provision is co-ordinated across a geographical area.

In the provision of higher levels of skills training, the spread of appropriately qualified staff is thin. The research found that while managers perceived that their staff were adequately trained, the amount of technical skills updating that had taken place, and length of time staff had been in college since their last exposure to industrial practice – as opposed to just visiting a student on work placement - belied this view. Staff training budgets are inadequate and most money goes to generic, college wide training. Also, the managers of engineering departments are having great difficulty in finding well qualified engineers to apply for jobs as they become available due, to the poor salaries that are offered compared to the earning potential in industry, schools or universities. With an average teaching age in the mid 50s, and the average time in the same department and in the same job being 15 years, the predisposition for innovation and development had become naturally limited. In many engineering and technology departments a conservative and risk-averse culture can be found which permeates through teaching practice and affects external relations with employers and other stakeholders.

In the battle for resources, it can be argued that engineering and technology departments have fared the worst of all. Firstly, engineering and technology departments are united in their view that the funding methodology has not reflected kindly on the cost of materials and equipment, and on technician support in a fast change technological environment. Secondly, the structure of the funding, based on whole qualifications, militates against the provision of training that is more suited to the employer who would prefer smaller units of training – including ‘on the job training’ - that can be built into a qualification over time and through various modes of flexible study. Thirdly, the perception of engineering as a declining area has moved management priorities for development to other areas of the curriculum. This is misguided because there are many areas of engineering that are buoyant and urgently need a supply of skilled labour.

These findings may paint a gloomy picture of the state of the sector and engineering and technology departments in particular, but there is cause for optimism. The research also found several positive indicators for the future:

- there were many examples of thriving college departments that had grown through either the COVE system of creating colleges for vocational excellence, or via employer collaboration, to provide innovative, leading edge training in their locality;

- many colleges have excellent examples of employer engagement and creatively use employers to add value to the curriculum offering e.g. utilisation of their equipment and other materials to supplement college resources;
- there is evidence from the research that demonstrates a good quality of work-based learning approaches;
- there are some good examples of Foundation Degrees where FE colleges are playing an integral part in the design and delivery;
- colleges have the capacity to offer a wide and varied range of provision to cover what might be called minority sector interests, and there were several examples of high quality activity in these niche areas;
- colleges who have COVE status are used to deliver staff training in their specialist field, and are also a focus for the latest training resources. The COVE initiative has generally been successful, and there is scope for this approach to be extended and developed further

The research also identified major issues with strategic and local planning of intermediate and higher level skills provision:

- the planning of provision at regional and local level is not normally based on any systematic evaluation of skills gaps against the supply of training. There is a recognition that this is an area for improvement between the government agencies , notably the RDAs and the LSCs through the mechanisms of the Regional Economic Strategy and the Skills Partnerships;
- the mobilisation of the employers at local level to engage with colleges in the delivery of training, needs much greater attention. The agencies representing companies – Business Links and the Chambers of Commerce and Industry – are failing to provide support to the colleges in their attempts to develop industry links, or in the promotion of their training;
- there are issues about the ability of the FE and HE sectors to work together as cultural and pedagogical approaches to training differ significantly.

On the basis of these key findings the following recommendations are made as to future action:

- 1.** The engineering and technology departments in colleges have been shown to struggle in the area of staff skills updating and development. **It is recommended that more emphasis in staff development budgets is given to staff professional development, including teaching and technical skills updating, as well as, enabling staff to return to industry for short periods on a regular basis. This could be achieved by ring fencing a proportion of the total allocation to support such activity. In addition, it is recommended that the government looks at ways of integrating the development needs of science, engineering and technology lecturers into a regional support mechanism. This could be through an enhanced COVE system that will incorporate K-TENS 'Knowledge and Technology Exchange Nodes', or through the provision offered by the Science Learning Centres. This would create a regionally responsive programme of in-service support where currently little exists.**
- 2.** There are problems with the funding of engineering and technology and enabling departments to shift their emphasis away from the declining areas of provision towards the new areas which are thriving. **It is recommended that the government reviews the weighting of engineering and technology subjects, as compared to other areas of provision to accurately reflect the costs associated with equipment and technician support. Alternatively, it is recommended that a direct funding stream is established for capital items. Funding could be used to encourage employers to lease some of their workshop space or equipment to the college, to create more opportunities for real time work experience for the students.**
- 3.** The desirability, even necessity, of regional or sub-regional centres of excellence has come through very strongly in this research. **It is recommended that the COVE system is reviewed and strengthened in the future. A greater degree of planned higher level work in Colleges can be achieved through using the vehicles of the Skills Partnerships at regional level, and Business Partnerships at local level. As part of this process, it is further suggested that more work is undertaken to develop a system of auditing employer links, and leveraging current business development practice specifically for work at intermediate and higher levels.**

4. Any drive to improve the capabilities in the engineering and technology sectors need to focus on the newer and more commercially viable areas of engineering and technology, to reflect where likely skill requirements will be. There should be a forum for encouraging higher level training that articulates local and regional needs, rather than have them springing up randomly, based on the enthusiasms and commitment of institution staff. **It is recommended that this task be given to the Skills Partnership groups within the RDA, to evaluate local provision and proposed courses. This approach should also take account of the Centres of Vocational Excellence and ensure that there is coherence between their courses and activities and those offerings of other neighbouring colleges.**

5. A related finding from the research has been around the difficulties colleges face in encouraging small or medium sized employers to engage in training or in any relationship with the colleges. **It is recommended that a separate employer engagement strategy is developed at regional level led by the RDAs, which puts more responsibility than is currently the case on the employer representative agencies, to support communication between colleges and employers.** The Train to Gain initiative is an excellent development to raise awareness of and commitment to training, and it is welcomed that companies can now get funding for intermediate skills levels. However, outside this initiative colleges are limited by the funding regime and therefore, **it is further recommended that the LSC urgently reviews its funding policy to introduce unit based funding rather than funding whole qualifications.**

6. The research has highlighted a lack of connectivity between colleges and universities in the delivery of higher level programmes. This has been brought into focus with the arrival of Foundation Degrees. **It is recommended that this issue is addressed initially, at national level by HEFCE and LSC in relation to the funding of provision and by QAA and OfSTED over the issues of quality assurance.**

The main conclusion that can be drawn from this research is that we are neglecting a key element in the government's skills strategy, by failing to adequately support the engine of intermediate skills supply, namely the FE Colleges and training providers sector. This research has focused on the state FE sector, and specifically on the engineering and technology sector. Here, colleges are struggling with the funds available to meet the demands placed upon them. Standards of delivery are, in general, too low, and with an ageing workforce and difficulties in recruitment, one can anticipate the situation deteriorating. However, there are many examples of good practice, even though the majority might be characterised as in survival mode. Intervention is required to introduce new blood, and new skills into the colleges, and to focus on those who have demonstrated the ability to leverage new opportunities and to become new centres of excellence.

There is an issue with the resources available to deliver leading edge training. However, this situation is not just about the lack of capability in colleges, but much more about poor regional planning and a failure to facilitate a process of targeting funding, to enable colleges to re-position their engineering and technology provision to meet the skills needs in their area. There also has to be a change in attitude for employers, and they need to be given incentives to engage with their local training providers. Any intervention will need to address these personnel, physical resource and employer engagement issues as a totally integrated whole and not piecemeal. This is the challenge the government faces if they are to achieve the aims of their skills strategy.

1.0 Introduction

- 1.1 The Further Education (FE) sector has always performed a diverse range of functions within the range of educational provision in the UK. This diversity has, over time, become a significant challenge for a number of reasons. Firstly, the diversity has developed both horizontally, across vocational and employment sector areas, and vertically from basic skills training to higher education. This has resulted in resources, particularly staffing, being stretched. Secondly, core funding to the FE sector for most of the last quarter of a century has been either static or in decline, and this, at a time when colleges have had to meet increasingly competitive demands for resources. Thirdly, there has been expansion into more commercial areas of activity, including non-prescribed higher education i.e. Higher National Diploma (HND), professional awards etc., borne out of the post-incorporation environment where colleges were driven to being market-led and in competition for resources.
- 1.2 The difficulties associated with meeting multiple and potentially conflicting expectations have been further exacerbated by a continuous stream of government policy initiatives, which have often created rapidly changing contexts for funding and curriculum priorities. These pressures have arguably been felt particularly keenly by departments of engineering and technology. Many areas of engineering have been contracting, and anecdotally the impression is formed that there are serious problems in staffing and resources, which are creating real difficulties in delivering a proactive and comprehensive service to employers and the local labour market.
- 1.3 This research has arisen out of concerns expressed by colleges and their representatives, that the drive to extend higher education, combined with the need to meet existing targets at Levels 1 to 3, is stretching the resources of college engineering departments beyond their capability to respond. Furthermore, the government and the range of stakeholders concerned with the success of higher education in FE – the Higher Education Funding Council for England (HEFCE), the Learning and Skills Council (LSC), the Sector Skills Councils (SSCs) and the Quality Assurance Agency (QAA) to name but a few - need assurance that the colleges can pick up the responsibilities presented by the creation of the new Foundation Degree structure.

- 1.4 The purpose of this research is therefore, to investigate the current health of engineering and technology departments in FE colleges, and to assess their capability to deliver higher level education and training programmes to a sufficient quality. At a time when the Government is determined to ramp up the levels of participation in higher education, and sees the FE college as having a key role in this, it is important that there is a realistic and current perspective on the state of the engineering and technology sector in Further Education.
- 1.5 The research has attempted to provide a comprehensive review of FE college engineering and technology departments and their activities, which has been conducted during the first part of 2006. The research starts with an examination of the national, regional and local policy contexts within which engineering and technology departments are operating. As part of this exercise, it has been possible to draw on previous relevant research which provides a historical context to the current position. Secondly, the research methodology is detailed. It has been necessary to define the research sample with precision given the diverse nature of the engineering profession. For example, there are seven separate SSCs which are either solely or partially concerned with what would be described as engineering disciplines. The sample frame has therefore, had to take account of a range of parameters which are outlined in Chapter 3. This section also provides a background to the methods of enquiry including the design of the questionnaires, interview schedules etc. The subsequent chapter summarises the results of the findings and the final chapter provides an analysis of the findings. An executive summary and recommendations can be found at the start of this paper.

2.0 The National Policy Context

- 2.1 Today, in 2006, the FE sector is in a state of flux and uncertainty. The Government's concerns with the performance of the sector prompted them to engage Sir Andrew Foster to undertake a comprehensive review, and to identify solutions to the perceived problems with the sector³. In March 2006 the Government published its White Paper *Further Education: Raising Skills, Improving Life Chances*⁴. The White Paper builds on the Foster FE review - accepting nearly all of his recommendations - and draws together and builds upon the existing legislation to set out a clear, long-term strategy for FE. The White Paper sets out a comprehensive programme of change that is intended to transform the FE system into what the government has called the 'powerhouse of economic prosperity and social mobility'.
- 2.2 The White Paper demonstrates very clearly that there continue to be high expectations from Government, employers and society at large for the sector to deliver on a whole range of targets from basic skills uplift, to growth in the numbers undertaking higher education courses in the FE sector. Furthermore, their target audience is seen as simultaneously being the community focus for adult learning and development through to being mainstream providers of skills and vocational training for the 14-19 age group. However, colleges are struggling to cope with this demanding agenda. In spite of recent improvements in the levels of funding, the historic base from which these improvements have been made has not changed. The direction of government policy has not been sufficiently clear in its approach to the FE sector, and there have been significant problems at local and regional level in providing a 'joined up' approach to the meeting of skills needs. Consequently, significant numbers of colleges are still having budgetary difficulties, being forced into mergers, or struggling to meet quality and performance targets. **Since post-incorporation in 1993, too many colleges are failing to make the improvements in performance that the Government requires of them, and there are persistent problems in the development of consistent local and regional strategies for the funding of provision, which makes difficult, the planning and delivery of courses in an effective and efficient manner.**

³ DfES (2005) Realising the potential: a Review of the Future Role of Further Education Colleges- Report of the review by Sir Andrew Foster

⁴ DfES (2006) White paper 'Further Education: Raising Skills, Improving Life Chances

- 2.3 The new White Paper states clearly that it has built on the previous initiatives that have been developed since the Labour government came into power in 1997. During that time they have invested significantly in Further Education, although it can be argued that the funding disparities between FE and its sister sectors, schools and higher education institutions (HEIs) remain intact. Notwithstanding this, there has been significant investment in a sector which had experienced two decades of relative neglect, where the physical infrastructure in departments such as engineering had declined to a point where they were no longer up to industry standard.
- 2.4 There have been four reports published during the last few years which have impacted on the sector, and which provide shape to the allocation of the additional funds:
- The DfES White Paper Success for All⁵ - the 14-19 Education and Skills White Paper and Skills Strategy which set out a series of reforms to raise skills and qualification levels for young people and adults to world standards. Subsequently, the 2006 FE White Paper has set out a comprehensive programme of change to transform the FE system into the 'powerhouse of economic prosperity and social mobility'. From April 2006, the Quality Improvement Agency (QIA) is leading the development of a national Quality Improvement Strategy (QIS), which will take over from Success for All and build on its key achievements.
 - Department for Education and Skills (DfES) White Paper 'Skills: Getting on in business, getting on at work' 2005 - this White Paper builds on the Government's earlier national Skills Strategy, published in July 2003⁶ and highlights the need for both basic intermediate skills development, while giving priority to the former rather than the latter.
 - The Skills 2020 Review led by Lord Leitch on behalf of HM Treasury, with the final report due in late 2006⁷ - illustrates out a set of far reaching recommendations to enable the UK's workforce to achieve competitive parity with comparable foreign economies in terms of skills and productivity.

⁵ Department for Education and Skills (2002) White Paper Success for All

⁶ Department for Education and Skills (2005) White Paper: Skills: Getting on in business, getting on at work

⁷ HM Treasury (2006) Skills 2020 a review by Lord Leitch

- DfES Raising the Potential - a review of the Future Role of Further Education Colleges being undertaken by Sir Andrew Foster 2006⁸ reaffirms the critical role that the sector plays in skills development and, recognising the broad scope of FE provision, suggests that colleges need to concentrate on this main purpose.
- 2.6 At local and regional level the government's policies were translated into the Learning and Skills Council (LSC) transformation **agenda for change**⁹. This document focuses on six key themes that aim to address some of the urgent issues facing further education. The LSC's six themes are:
- i. How to help colleges best meet the needs of **employers and their skills requirements**;
 - ii. How best to build a sector fully committed to **quality** and delivery to the highest standards throughout;
 - iii. An overhaul of the LSC's methodology to ensure the most is made of available **funding** to support the sector's priorities with the minimum of complexity and bureaucracy;
 - iv. **Business improvement** driving up the efficiency of the sector, individually and collectively, including investing in improvements;
 - v. Better systems to deliver the **data** and management information the sector needs;
 - vi. Highlighting the **reputation** of FE and the major contribution the sector makes to the delivery of education, training and skills fit for the 21st century.
- 2.7 These problems are more or less found in equal measure in all college departments. However, this paper will focus specifically on engineering, technology and manufacturing departments as defined by OfSTED¹⁰. The last OfSTED report on this sector was undertaken in 2003/4 and published in early 2005. It presents a picture of good to satisfactory provision in the English colleges with a few examples (2%) of outstanding curriculum performance. Conversely, 13% of colleges were designated as weak.

⁸ Further Education - Review of the future role of FE Colleges by Sir Andrew Foster Nov 2005

⁹ Learning and Skills - the Agenda for Change, LSC August 2005

¹⁰ OFSTED Report 2004-5, published 2006

The sector is presented as having poor levels of resourcing, and where there are weaknesses they are often attributable to negative staff attitudes to change. It is also evident that some areas of the sector have static or declining numbers. Overall, the impression is that the sector is struggling to maintain momentum in adapting to the fast change environment in which the FE sector finds itself.

Whether this condition has implications for the development of Foundation degrees and other higher intermediate level qualifications will emerge from this research.

- 2.8 In 2001, another government initiative was announced by David Blunkett¹¹. This took the form of the Skills White Paper (2001) and set out the specific contribution that Blunkett wanted the FE sector to play. He recognised the scale of the challenge and was probably more aware than most (due to his direct experience of the sector) of the difficulties that FE colleges faced. In this paper he introduced the concept of Centres of Vocational Excellence (CoVEs) and the notion of identifying Specialist College provision where funding could be effectively targeted and concentrated within a region.
- 2.9 The final policy initiative which bears on this research is the Foundation Degree (FD) initiative¹². These degrees are an intermediate, work-related higher education qualification. They are designed in conjunction with employers to meet skills shortages at the higher technician and associate professional levels. They are offered by universities in partnership with higher education colleges and further education colleges. Flexible study methods make them available to people already in work, unemployed people, or those wanting to embark on a career change. On successful completion foundation degree graduates can revisit their career options, and may choose to progress to further professional qualifications or to an honours degree.

The introduction of the FD extends the role of further education colleges in delivering higher level education and training. The Government wants to see 50% of the school leaving population achieving a degree by 2010. The FD is one of the planks in this strategy.

¹¹ DfEE (2000) Colleges for Competitiveness and Innovation David Blunkett

¹² Foundation Degrees Task Group Report Sir Leslie Wagner DfES 2004

The employer focus on these new qualifications and the need for them to be responsive to local and regional labour market contexts, places the FE college in a prime position as an integral part of the provision.

- 2.10 This is the policy background to the development of priorities for the FE sector over the last few years. The policies have been driven through a variety of agencies at national level – for example, the national LSC and HEFCE as the primary funding bodies, have adapted funding priorities to reflect the political priorities – at a regional level through the Regional Development Agencies (RDAs) and to local level through local LSCs, the precise character of these changes have been modified to reflect skills and labour market needs. There is general agreement that the planning of provision mapped against local and regional needs is improving, although it is still an inexact science.
- 2.11 What is apparent is that the decline in the traditional areas of engineering is having a direct impact on engineering provision in colleges and many departments are closing or being merged to create broader technology departments including disciplines such as computing or construction. It is also true to say that the large engineering employers, wherever they are located, have a significant influence on the training map, given that they are often critical partners with colleges in the provision of certain types of training, most often at Level 3 and 4 through the Edexcel National and Higher National route. It is therefore inevitable that the provision of engineering training across the country is a complex, patchwork quilt of provision. The concern must be as to whether the trend to contraction is creating holes in the regional map, where potential recruits and smaller employers may be deprived of ready access to training services.
- 2.12 One other matter of Government policy deserves mention. Going further back to 1993, when colleges in England and Wales were separated from local education authority control, the sector was encouraged to embrace a market driven approach to their delivery of services, but at a time when core funding was being systematically cut back. This resulted in expansion into new areas of activity, including the non-prescribed Higher Education (HE) market. Now, with government encouragement the sector has moved forward significantly in its provision of higher education work. A number of larger colleges with a presence in a key specialist vocational area have developed close relationships with local universities to provide franchised degrees.

Now that the FE sector is being given a wider remit to work with universities to deliver Foundation Degrees and Bachelor degrees, funding that would have otherwise gone to Higher Education Institutions is being redirected to colleges.

There is evidence that this change in the funding map has generated a rush by colleges to develop Foundation programmes either in partnership, or independent of, a partner university. Such funding is attractive to colleges for many reasons - it has indirect benefit to those curriculum areas where the HE programmes are located, it provides status to the college in respect of its local stakeholders and customer base, and it provides impetus to college's separate but overlapping agendas, such as the management of centres of vocational excellence, employer engagement and quality assurance measures.

- 2.12 There has not been an even development of 'new' engineering courses across the sector. Traditional areas, such as mechanical and manufacturing engineering, are generally in decline and therefore, there has been little movement in developing higher level programmes. Many colleges either have no engineering or have no advanced work and therefore are not involved. Many Foundation Degrees have been designed and are available to be offered but for various reasons are not running. However, the majority that are running are based on a relationship between a college, university and employer collective or association. The exact mix, and how well the degrees are faring, is extremely variable and has much to do with the quality of the relationships and the level of involvement by employers.
- 2.13 At the heart of this research is the concern from several quarters that FE colleges may not be able to respond to the government's drive to expand HE participation through the vehicle of FDs, and to a lesser extent, full Bachelor degrees. Historically, many engineering and technology departments have run Higher National Diplomas (HNDs), awarded by Edexcel, in a variety of engineering fields and have been universally popular with providers and employers alike. Many have been resistant to this new initiative although they are now resigned to the inevitable as HNDs will be phased out by 2007.

Another tension point has been around the ability or receptiveness of the FE sector to the QAA quality assurance process.

There is a different culture between that within the QAA approach and that of OfSTED. Consequently, the current position is that some colleges are failing to meet the expectations of either QAA or their university partners. The drive to introduce higher level work in colleges has been fractured and haphazard, subject to the local circumstances which may help or hinder the development. Success has arguably been based on coincidences of pre-existing partnerships to take such an initiative forward, or the commitment and talent of one or more key people within organisations who have influence. This scenario presents difficulties when trying to provide reliable and generic research data. **More importantly, the research needs to identify whether the concerns expressed over college's capability is well founded or not. Are colleges continually crying wolf about their budgets for resources and staff development, or are there real grounds for believing that they have a case? If they do, does the problem extend as far as limiting the ability to develop new provision?**

- 2.14 The consultation document¹³ sets out the rationale for the creation of FDs arguing for more employment-led locally designed provision which is both flexible, but also has the rigour of an academic degree. The FE college is seen as a key, though not essential partner in this triangular relationship with university and employer, and an important part of the process of implementation.

FE provides expertise in two critical areas – work based learning and curriculum, and experience in developing employer support and engagement. This latter aspect of the FD process is undoubtedly a weak link. The reason why so many FD proposals have stayed on the shelves of the universities is down to the failure to identify a range of employer partners and placements. Although it is still early days – FDs were only launched in 2002 - this problem is persistent and shows little sign of improvement. FE undoubtedly can bring its wealth of experience through apprenticeships and the implementation of National Vocational Qualifications (NVQs) to improve local employer engagement, but there are still underlying concerns that the staffing and physical infrastructure in colleges is not sufficient. This research will seek to clarify the situation.

¹³ Foundation Degrees - A Consultation Document DfEE 15th February 2000.

3.0 The Research Methodology

3.1 The research methodology can be divided into three areas:

- desk research
- the selection of the sample frame
- the selection of the interview instrument and format
- contextual analysis

3.2 The desk research has focused on recent Government legislation and policy documentation, and the work that has been undertaken to evaluate and respond to these policies. While there are some important pieces of research which have evaluated higher education in FE in general terms (notably Parry and Thompson¹⁴) there are no recent publications which focus down specifically on the engineering and technology sector. It was also necessary to do background research on the FE colleges that were to be selected. Having established that they fitted the template (described below), each college was contacted to ascertain that they were prepared to be involved.

3.3 The rationale underpinning the sample of colleges selected took into account the following considerations:

- The sample had to be statistically significant – there are over 200 colleges which are currently offering higher level engineering courses. 60 of these were selected to provide a 30% sample across the sector (in England only);
- The 60 had to be spread reasonably equitably across the English regions. The regional spread was made on the basis of the RDA regions. In addition, the sample was selected with consideration of the socio-economic environment that the college was located – rural, urban, traditional and service industry, and a sample of colleges with a large employer within their purview;

¹⁴ Parry G and Thompson A., *Closer by degrees-the past, present and future of higher education in further education colleges*. London: Learning and Skills Development Agency (2002).

- The sample needed to take account of the range of engineering sub-sets – in general the majority of colleges needed to be delivering higher level education and training in at least two of the engineering disciplines - mechanical, manufacturing, electrical and automotive. Some colleges were also selected because they had a more specialist field such as computer engineering, digital, micro- electronics, process engineering etc; and,
 - Finally, the sample needed to be cross-referenced. As a result the research team carried out a series of six regional focus groups comprising representatives from all key stakeholder agencies and employers. They were invited to comment on a summary of the issues that arose from the interviews, and the outcomes were recorded and fed into the interview data summaries.
- 3.4 The interview instrument comprised two structured questionnaires which were sent to the participant colleges, and then were followed up by phone. There were two separate questionnaires, the first of which was aimed at the senior manager in charge of the broader engineering and technology department. In some cases this task fell to an assistant principal or someone who is not an engineer. However, their management knowledge and experience was the prime concern. The other questionnaire was directed at a lecturer or course tutor or curriculum leader in one of the specific engineering disciplines. Care was taken that the specialisms involved were spread across the range identified above.
- 3.5 The design of the questionnaire was carefully considered in consultation with specialists from the FE sector, and from the engineering community. The initial questions had to establish the baseline data for each college in terms of size, complexity, range of provision, OfSTED ranking etc. The next set of questions needed to address the critical success factors that make engineering departments fit for purpose, in the delivery of higher level education and training. These factors have been identified as:
- **Staffing** – what is the staffing composition? How well qualified? What strength in depth? Age profile? How is staff development geared to the implementation of new programmes and industrial updating?

- **Employer engagement** – what are the mechanisms to involve employers? What assistance do local employers provide in supporting teaching and learning? What arrangements are in place for industrial secondment of staff and students?
- **Resources** – what is the state of the materials and equipment support? How does general fund allocation treat the engineering area? How close are the resources to industry standard in all courses and particularly in the higher level courses?
- **Methodology** – how innovative are the learning approaches used in the delivery of new higher level programmes? What materials are available as e-learning or distance learning options? How is the work-based learning managed in higher level programmes?
- **Relations with local stakeholders** – how well does the department work with agencies such as LSC, Business Link, or the RDA office?

These key factors were all assimilated into the questionnaire design for both managers and lecturers. Copies of the research questionnaires can be found in Sections (ii) of the Annexes.

- 3.6 The final element is that of the situational context within which the research study is located. The colleges are bound by a complex set of influences and pressures – political, socio-economic and geographical – which continuously change and alter the shape of both college planning and provision. Therefore, it was regarded as important to identify the key stakeholders in this circle of influence and then bring representatives together in a focus group to review the findings from the colleges and provide their own perspective on what those findings might reveal. These stakeholders can be sampled on several axes - local, regional and national perspectives, sectoral perspectives, and employer, government agency and provider perspectives. In order to provide as broad coverage of views as possible it was decided to congregate a mix of the various representatives' voices on a regional basis. Six regions were selected and the membership of the focus groups in each region covered the broadest range of views possible, including the Regional Development Agencies, the Learning and Skills Councils, the employers, the providers, and national association representation. The full list of membership of each focus group meeting and the guidance notes are provided in section (iv) of the Annexes.

4. The research findings

4.1 The interviews were undertaken over a four month period from February to May 2006; the focus group meetings took place in May and June. In the event 56 colleges were covered by the research, spread across six regions of England – London and the South East, the South West, the east of England, the West Midlands, the North East and the North West. Originally, 75 had been selected and approached but several either were unwilling to participate or failed to respond to the telephone enquiry.

4.2 General College Data

4.2.1 Colleges Profile

The profile of the colleges sampled was as follows. The average number of students in the sample was 13342, the average number of FTE staff 620. The upper and lower sized colleges varied in size by a factor of +/- 40%. With regard to the size of the engineering departments sampled the average number of courses, full time and part time, was 27, the average number of students was 510, and the average number of FTE staff in the department was 20. It is difficult to generalise here as there were wide variations in the sample. The range parameters which taken into were:

- rural / urban split;
- the level of industrialisation;
- the extent of a single or multiple larger engineering/technology employers within the catchment area;
- local LSC and RDA policy which might be impacted on college developments.

4.2.2 In particular, the research pointed to the significant environmental factors which determined the profile of rural and industrialised urban communities. There is a critical mass of operation and there are several examples of colleges who have shut down their engineering departments and merged them with other areas. In the process, some specific areas in particular mechanical and manufacturing engineering have disappeared.

The numbers of Engineering and Technology courses offered across survey were as follows:

Automotive Engineering	13
Civil Engineering	10
Electrical Engineering	12
Electronics	13
Environmental Engineering	2
Industrial Engineering & Instrumentation	2
Manufacturing	8
Mechanical Engineering	10
Precision, Process & Control Engineering	1
Systems (including Mechatronics)	1
Sound (All Audio and Visual Engineering)	2
Structural Engineering	1
Transport Engineering	4

Fig 1 The range of engineering subjects represented in the survey group

4.3 Staffing

4.3.1 Age of Lecturers and Qualifications

The profile of staffing from the sample indicated that colleges have a problem over the ageing and relatively static workforce. The average age of respondents was 48 and the average length of time at College was 10.7 years. However, when asked about the staff group in general, the respondents confirmed that the average age across the whole department was in the mid 50s. The average length of FE experience was 13.8 years, which suggests that the workforce is entrenched with little movement in or out from the college.

One Head of Department said, *'It is very difficult to get these (older) staff to change their ways of operating – they don't like new initiatives and they don't see the need to go back into industry....as long as we have this problem it will continue to be difficult to introduce anything new.'*

Another said, *'We have had the same working group for over five years and they are all in their 50s. But when one of them retired last year I couldn't find a replacement with the right skills and experience'.*

4.3.2 Generally, there is a good spread of qualified staff, as is demonstrated in Fig 2, although in small and medium size colleges where they do run higher level courses, these staff are more thinly spread and are vulnerable to losing one or two key staff without having any replacements. Certainly, this is an area of vulnerability for colleges, and an aspect of FE capability that frequently creates difficulty with university partners who may perceive FE as not having the academic rigour. One Head of Department commented that their local university *'seemed to be making life as difficult as they could in approving our (Foundation Degree), and we felt as though they were looking down their nose at us'*.

Master or Higher	5
First Degree	7
HNC/D	8
ONC/D	2
Cert Ed	12
Professional Qualification	4

Fig 2 Types and number of qualification held in the 20 largest colleges

On the other hand, one of the great advantages of FE is its experience in work based learning, and its close and established links with employers. These are qualities that universities do not possess in such measure, and the employment-led nature of the FD lends itself to the work-based models of delivery found in FE rather than the more typically academic approach to learning found in universities. Elsewhere in the survey, the research bore this out.

The research produced some statistics on gender balance which indicated that there has probably been a marginal increase in the proportion of female lecturers and tutors. However, females are still only around 6% of the cohort that this research investigated.

4.3.3 Upskilling and CPD

The research was concerned to establish how effectively staff were being trained to adapt and where necessary up-skill themselves to take on the new FD programmes, as well as generally keeping abreast of the latest developments in their field.

Virtually all the colleges (97%) operate an appraisal system, primarily based on annual review, and this appraisal was clearly tied into staff development needs whether individual needs or those driven by corporate objectives.

The survey showed that staff were generally satisfied with the staff development they received, with over 87% expressing the view that their needs had been met. **However, when one looked at the actual staff development that took place, the amount of time allocated to all staff development activity was approximately two days a year (Fig 3).**

The majority of the staff development time was devoted to quality improvement issues around teaching and learning, rather than in skills and knowledge updating. **The amount of time given over to specific technical skills updating, whether through internal training or industry experience, was very limited.**

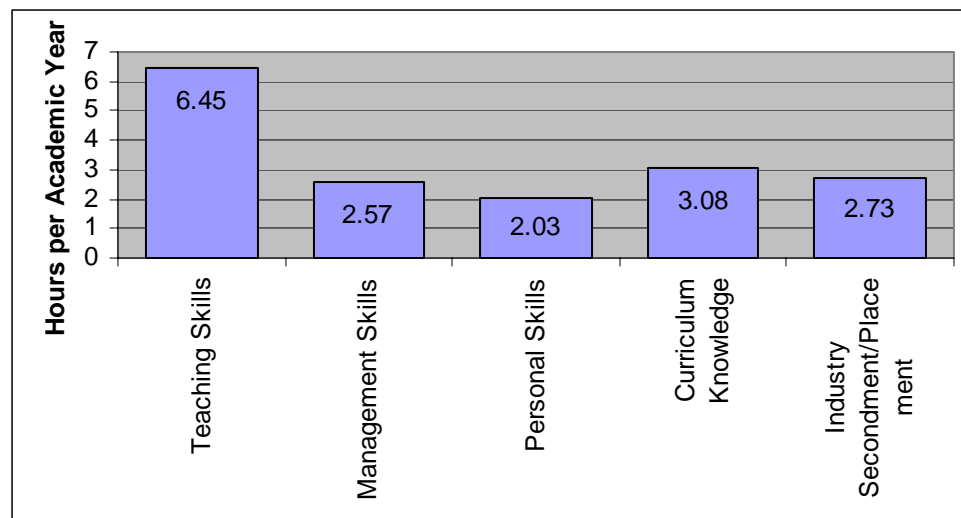


Fig 3 Average hours allocated to staff development issues over an academic year period

4.3.4 The funding of staff development

Part of the explanation for this small amount of staff development is that the majority of departmental heads in the sample - 85% - had little or no budget earmarked for staff development, and if they wanted to undertake any in-house training they had to bid to the central college pot. The view of most heads was that this money was rapidly taken up with cross college curriculum issues and ensuring that the college had improved on its latest OfSTED grading.

Few had any commitment to taking money out of what they perceived as an inadequate capital or resource allocation for the year to give over to staff training. The exceptions were in those colleges where there had been a strategic commitment to developing technology or applied engineering subjects and additional funding had been found.

It should be stressed that there was no evidence that the managers did not recognise the importance of training, but rather felt unable to respond in an environment of squeezed resourcing.

Another possible explanation for the high correlation between lecturers and managers satisfaction with staff development, may be found in the age and work longevity factors. Older staff who have seen it all before become cynical about training geared to the latest policy initiative or management priority, which they may feel distanced from. One Head of department complained:

'...trying to get the old guard to co-operate with any new developments is like pulling teeth. There are three all in their late fifties and waiting for retirement. Where is the incentive?'

In these circumstances being left alone to get on with the job (as they define it) and not being engaged in new initiatives which they have no interest in, might be perceived as a positive rather than negative attribute of the line manager.

However, there is one important caveat in that this appears to be a particular issue with what has been termed 'traditional' engineering. The same Head quoted above, contrasted this attitude from his staff teaching Mechanical and Production Engineering to National Diploma level, with that of his Automotive Engineering team who were proactive, enthusiastic and were developing an FD. This differentiation between traditional areas and applied areas was found to be consistent throughout the sample.

4.3.5 Issues surrounding CPD in colleges

The survey did identify some issues around the flexibility of staff to respond to new initiatives. When asked if they would be prepared to attend paid for, external professional development courses, 48% said they would not, the main reasons being given as pressure of work and the problems of replacement. Across the sample of managers, about a third of the respondents who presented a picture of pressure, policy fatigue and a major motivational challenge to maintain staff morale.

On the other hand, there were at least another third who were more upbeat about the situation in their colleges. Again, there was a correlation between these views and the type of engineering training being undertaken, with automotive, electronics and electrical engineering departments being more buoyant.

4.4 Current Industry Knowledge and Experience

4.4.1 Familiarity with current industry practice

The research also highlighted a fairly mixed pattern of attitudes and behaviour in respect of relevant industry experience. Most manager respondents said they were committed to ensuring that the staff had up-to-date skills, but at the same time often admitted that they were a long way from the aspiration. Fig 4 below shows the spread of involvement with industrial practice. **However, many managers chose to interpret visiting students out on work placement as a legitimate source of getting updated, and a figure of under 4% who were felt to have current industry expertise, is surely too low.**

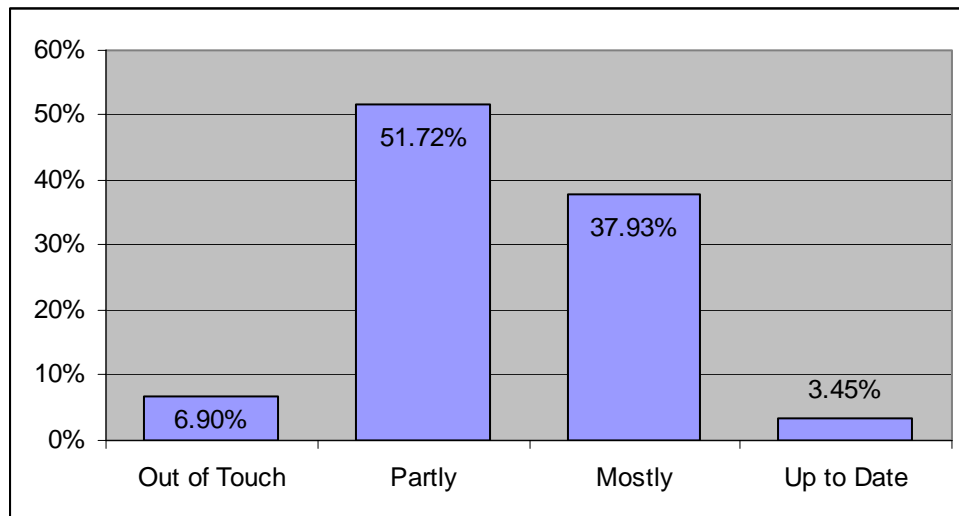


Fig 4 Managers' perceptions of current industry knowledge within their staff

This assessment by managers is closely correlated with the lecturers' response (fig 5).

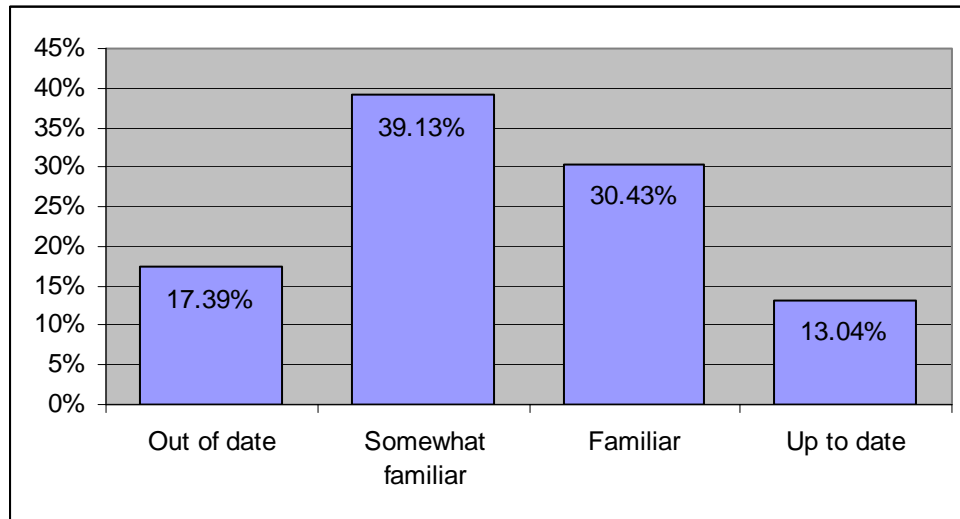


Fig 5 Lecturers' perceptions of their current industry practice

However, if the question is presented another way, as in Fig 6, some inconsistencies emerge. According to the lecturers 43% are at least familiar with current industry practice, but over 38% have not been to a company in over 12 months.

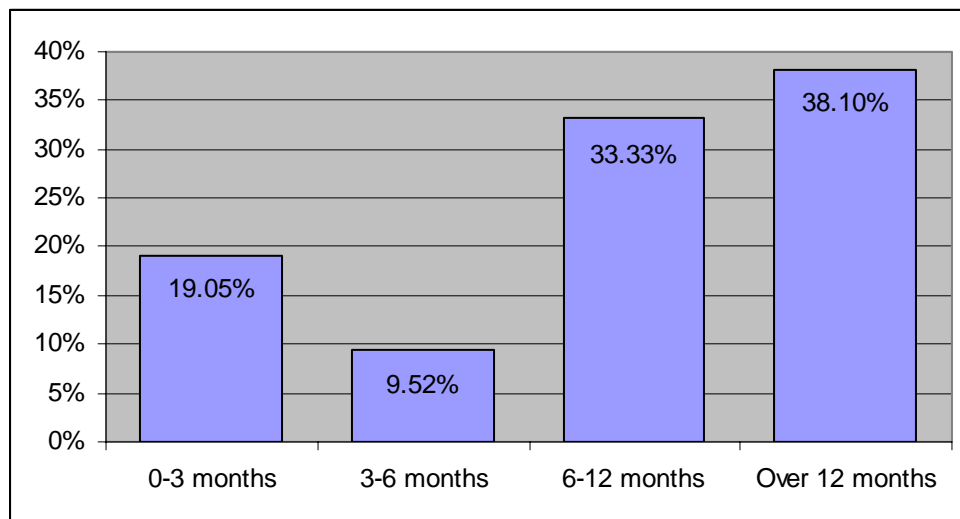


Fig 6 Last time the lecturer visited an employer to get experience

Where staff are not up to date, the situation is largely blamed on a lack of time and opportunity, as in the case of the responses to accessing staff training. This bears out the earlier observation that teaching staff in key positions have no back up to replace them if they are away from the job. Such stretched staffing resources will create difficulties if one of these staff falls ill or has to leave the job for any period of time.

4.4.2 Involvement of employers in college provision

Most colleges claimed to have good relations with their employer contacts (see Fig 7). However, there were significant variations. In rural areas where the population of employers are micro or small in size, the colleges generally found engagement very difficult. In these colleges, manufacturing engineering tended to be in decline while automotive and electrical engineering were stable or, in some cases, growing. Furthermore, these colleges (approximately 20% of the sample) demonstrated only limited evidence of local employer associations or other models of employer co-operation. Similarly, the college's approach to this was reactive, citing the time problem in trying to bring the employers together. In the larger colleges and those in more urban areas, closer to administrative centres of local government, the situation was very different, and there were some excellent examples of college/employer collaboration in the form of:- monitoring existing programmes; resource sharing; project oversight of new programmes (i.e. FD design). **Overall however, the impression given is that the departments need to do more to raise their profile in their business community through their own contacts and develop events and activities that employers can be invited to, as a part of a wider customer relations and marketing communications strategy.**

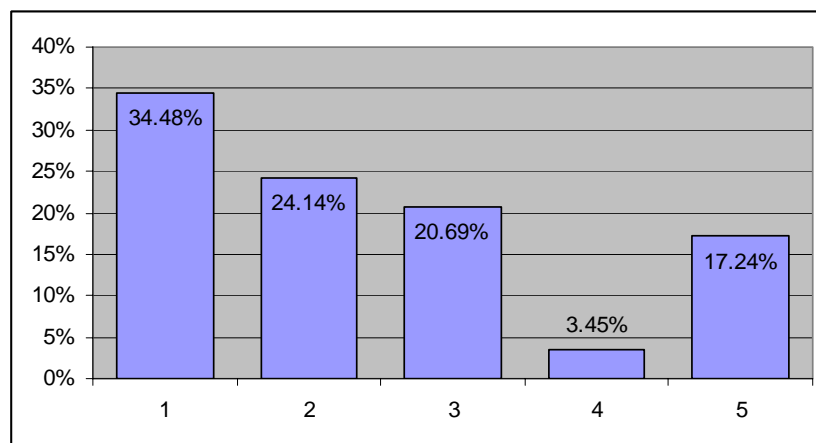


Fig 7 (a) Relationships with Employers – Senior Manager response

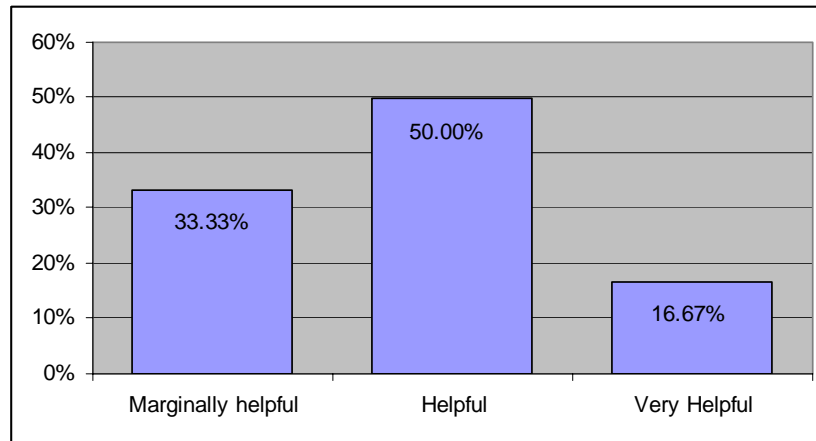


Fig 7 (b) Relationships with Employers – lecturer response

There was little evidence that departments were trying to use marketing resources available to them – the College Marketing departments or outside agencies such as the Chambers of Commerce or Business Links. **It should be noted that not one respondent mentioned a link with Business Link, and there is a real question mark over the role of the Business Links in their role as an information source for local businesses to connect them to training and development opportunities in their area.** The conclusions drawn from this research are that they are not playing any constructive role in raising awareness of training opportunities.

4.5 Resources

4.5.1 Physical resourcing of Higher Level work

The research next looked at the physical resourcing of higher level work. Where the range and capability of staffing in FE engineering departments to deliver higher level work was patchy, and in some cases inadequate, the situation in respect of physical resources was even more serious.

There is a particular problem within the FE sector in that the capitation allocations for students are supposedly weighted to allow for materials and resource spend, as well as covering teaching costs. However, the weighting is seen by the departments as inadequate and is absorbed by the day to day costs of teaching and teaching support, particularly in higher level courses, without any capital funding. This has created an environment in colleges, where there is a serious disincentive to invest, especially in areas such as engineering which is in decline, and may be used as a justification for closing or merging facilities. The research found support for this point of view.

Over half the sample of departments had received less than £10,000 per year over the previous three years and there were just 8 colleges who had received more than £250,000 over the same period. A few had significant investment which had been associated with college mergers, or in two cases, strategic decisions to invest in new engineering fields. In spite of these exceptions, there was very little evidence that colleges were being given anywhere near the necessary funding to provide industry standard training environments.

4.5.2 Capitation Allowances

Managers were asked their view on the weighting of LSC funding for engineering and technology courses and there was universal dissatisfaction with the current methodology. Most engineering courses are weighted at 1.4 that is 40% uplift for extra resourcing. However, this is seen as inadequate.

One Head represented the majority view when he said:

'The LSC are quite unrealistic in their assessment of the costs associated with engineering. When you look at what the performing arts and even some of the design areas get it does make me very annoyed. I find all my allocation gets mopped up with the materials budget and a small amount left over. But when we want to buy a large piece of equipment, the request has to go into the college bidding process, rather than be recognised as an element of our weighted allocation.'

It was interesting to note that the responses from senior managers and lecturers to the question about the overall quality of resource provision with respect to delivering levels 3 and 4 programmes were also correlated. Fig 8 shows that at level 4 only 10% have the resource capability to deliver to the expected standard. Such colleges tended to be mainly those who a CoVE status. 65.6% of respondents said that they partially have the resource capability to meet level 3 standards.

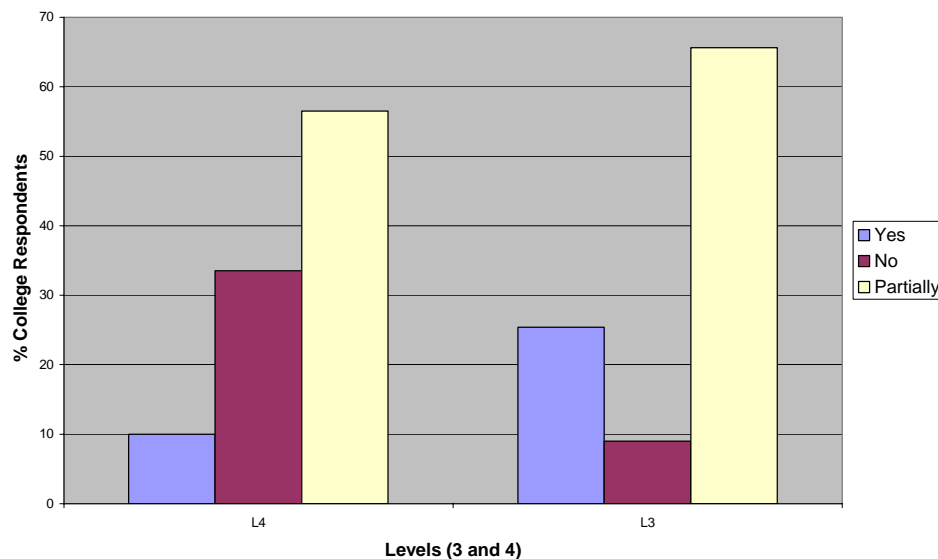


Fig 8 Are the materials and equipment up to the standard to deliver levels 3 and 4?

4.5.3 In spite of this fairly pessimistic scenario, both sets of respondents, the managers and the lecturers, appeared to feel confident about their department's capacity (see Fig.9 for the management view) which at first seems something of a contradiction. However, there are in fact some important qualifying observations which demonstrate that the picture is not as bad as might first appear.

Firstly, the majority of staff respondents were clear that the training needed to be rooted in basic engineering skills and that the equipment available was adequate to cover these elements. In rural areas for instance, the demand for these basic engineering skills was buoyant. However, of itself this did not address the problems of funding the more specialised equipment for the higher level courses.

Secondly, there are significant differences in the costs of developing the various strands of engineering, and some could thrive with less resource support, or support provided other than through capital investment in the colleges.

Thirdly, colleges had developed a number of innovative responses to addressing the problem, which removed the burden of investing in expensive equipment themselves (e.g. collaboration with a local university or employer that possesses some of the specialised equipment available).

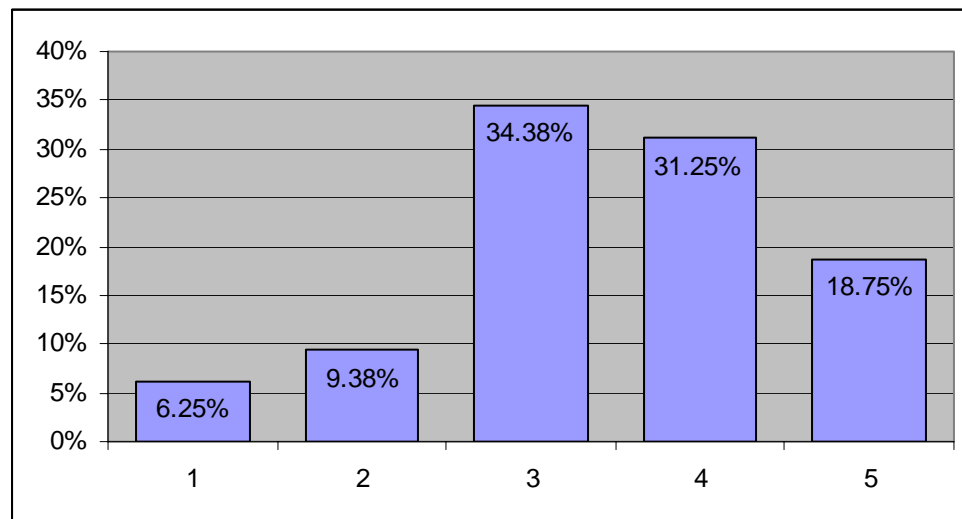


Fig 9 Rating of how close to industry standard the equipment is (1 = not at all to 5 completely)

4.6 Strategies for developing Foundation Degree provision

4.6.1 Curriculum innovation and development

The research was concerned to find out how college engineering and technology departments managed to overcome what is a well known problem of under funding. The evidence from our sample suggests that there are two main strategies.

The first has been to use links with local employers and source training opportunities using their equipment. The FE sector, and particularly engineering departments steeped in the apprenticeship system, have well developed and tested mechanisms for working with employers, and this experience is proving valuable in building employer links as part of the Foundation Degree programme. The second area of innovation has been in the development of flexible approaches to delivery as a means of reducing costs.

- 4.6.2 With regard to the development of employer links there were numerous examples of such activity. Most respondents had some form of employer advisory or liaison group for each of the course areas. The performance of these groups was highly variable from those which were active and enthusiastic to those who existed on paper alone. The sample indicated that about 75% of colleges have formal arrangements with their employers either through a local engineering association or internally through an advisory group of some shape and function.

The average number of employers who are closely involved with a college engineering department is around 15. However, the numbers of participants who are active rather than passive is small. Some manager respondents, when referring to the work of their College Business Development Unit in raising the profile of the college and created possible opportunities for income generation, on both a full-cost and collaborative basis.

A number of colleges gave examples of their internships or work placement opportunities. These include:

- Student/staff visits to a company producing commercial and military flight simulators
- Motorcycle manufacturing – company visits
- Mechanical Engineering plant visits for a BMW Level 3 diploma.
- Kingston University link using their equipment for specific training opportunities
- Local (military) company providing destruction testing equipment
- GEC Alstom, Caterpillar, JCB as partners in a consortium delivering Level 3 and 4 Programmes

However, while this activity is an essential part of successful work based training programmes, this is a small base from which to develop robust strategies for the running of successful vocational courses at Level 4 and above, where there have to be guaranteed college-based resources present.

Several smaller colleges in both rural and urban areas, where the resources were stretched, were experiencing a second difficulty of a shrinking employer base from which they could draw work experience or on-site training opportunities.

One Head of Department said, *'In a catchment area such as ours where there are no large employers, it is increasingly difficult to find companies who have the time or inclination to get involved in training beyond their needs to train one or two of their own people in very specific areas'*.

4.6.3 Development of learning materials

The research showed that, in the leading colleges, there has been a lot of work undertaken around the development of learning materials which simulate or otherwise attempt to replicate real-time practical skills performance. There has been a steady shift over the last few years to more classroom based mechanisms for training in specialist and higher level areas through the use of the web based information and interactive computer based simulations.

In Fig 10 there is a clear trend towards the inclusion of a large amount of the curriculum on the intranet, and manager respondents were unanimous that e-learning will play an important part in the future delivery of the curriculum in higher level courses. The average proportion allocated to e-learning was deemed to be 25%, with three quarters of the e-learning being subject-specific.

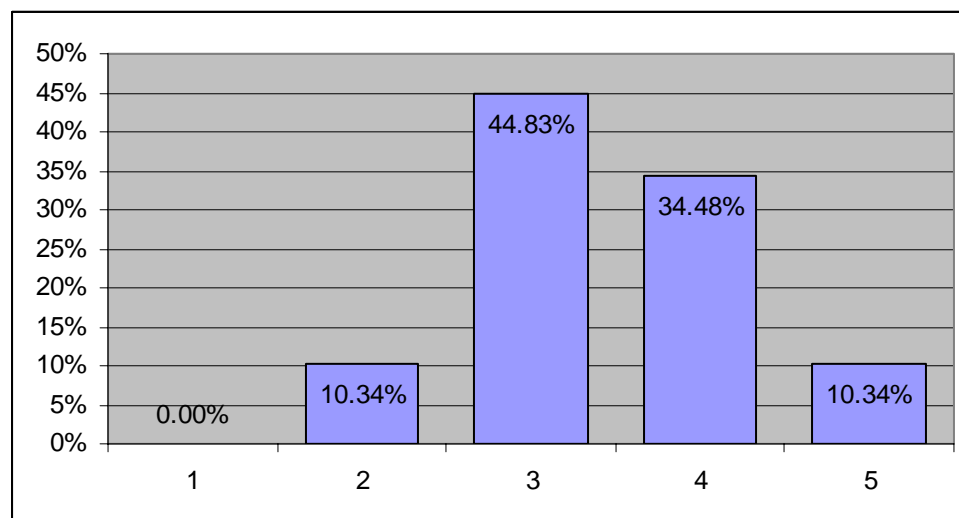


Fig 10 The amount of engineering & technology material, which is on the college intranet, produced by the college staff (1 – None from college, 5 – All from college)

4.7 Relations with local stakeholders

- 4.7.1 Managers were invited to comment on the relationships with the local agencies, which have most immediate impact on them in terms of curriculum and funding. The key agencies identified were the LSC, the local council, the Chamber of Commerce and Business Link. They were also asked if they were aware of the Regional development Agency and any inputs they may have had. Finally, they were asked to comment on the impact of central government driven initiatives in the area of skills.
- 4.7.2 Most respondents commented favourably about their relations with their local LSC, and about 20% were very positive about the support they had received around developing opportunities or programmes that LSC were promoting. In these cases LSC had offered additional funding against very specific objectives within engineering and technology. The views on other organisations were less conclusive, and the responses could be characterised as indifference. Although there existed an understanding of the underpinning philosophy and policies around the skills strategy, there was a fairly cynical view of how effective these national and regional activities were. For example, there was little recognition of the role and involvement of the RDAs. The most negative responses came when discussing employer representative groups.

5.0 Analysis of the Research

- 5.1 This research paper provides a comprehensive overview of current practice in FE college engineering departments, particularly in respect to their involvement with what has been defined as intermediate level training, that is at NVQ Levels 3 and 4 equivalent (being mindful that these classifications no longer chime with the new levels in the National Qualifications Framework). Over 30% of all English colleges who offer engineering courses were sampled, and the research has provided both management and teaching staff perspectives on the work that is going on. The sampling criteria have ensured that the 56 college respondents represent the full spectrum of college types and the environments they operate in. In addition the focus groups have provided excellent contextual information against which to evaluate and interpret the college responses.
- 5.2 Historically, the FE sector has had little or no involvement in higher level work. Naturally, there has been part time professional training for those in employment, and some colleges were allowed to develop provision in Higher National Certificates and Diplomas from what was then the Business and Technician Council (BTEC), now Edexcel. HNDs were attractive to the FE sector as they provided opportunities to raise the profile of the college, to further develop their relations with local employers and present new challenges to the teaching team.
- 5.3 Since Incorporation in 1993, there has been a much stronger push to diversify into higher level work and many colleges were able to start franchising degrees or Higher Nationals from their local university. Of course, this required the university to part with some of its HEFCE funding allocation which was never easy to do, so the pace of development was quite slow. It was only in 2002 with the advent of the Foundation Degrees that the expansion programme was set up and we are now in the grip of a genuine force for change. Given this recent surge in activity, it is appropriate that an analysis of the capabilities of the sector takes place at this time.
- 5.4 The research findings were clustered around five main propositions relating to the purpose of the research, to establish the level of capability present within FE colleges to take on the new Foundation Degrees and other higher level training in engineering and technology.

These propositions are:

- (i) **Knowledge base:** that college staff in the FE sector do not have the necessary updated knowledge and skills, or industrial experience to effectively deliver the higher level programmes;
- (ii) **Funding and Weighting:** that the funding of engineering in colleges – that is the weighted allocations of money from the LSC – is not sufficient to provide the materials and equipment for higher level work;
- (iii) **Work Based Learning:** that FE colleges do have significant qualities in relation to the delivery of higher level work based learning, which are and will be essential for the effective delivery of Level 3 and 4 courses;
- (iv) **HE in FE:** that the capability of FE colleges in the delivery of higher education is variable and relies heavily on local factors, such as the attitudes and commitment of local employers and the quality and scope of other potential partners;
- (v) **Regional and Local Strategies:** that the future success of the FE colleges in becoming established centres of higher education provision rests, in part, with the regional and local strategies for economic development and how provision is co-ordinated across a geographical area.

In this section, we will analyse these propositions to determine the extent to which they are applicable.

- 5.5 The research showed consistently that there were disparities in the performance and in the experience of engineering training, dependent on the strand of engineering one was looking at. As has been said engineering is a broad field encompassing quite diverse subject areas. In most cases the information fed back was that manufacturing and production engineering were struggling, that automotive and electrical engineering were stable and that other more specialist areas, such as digital and computer engineering, were doing well. This reflects the general economic context and has a double effect on the colleges in that, on the one hand, the perception of decline results in poor recruitment and on the other the lack of employers translates to lack of work experience or partnership opportunities. The dichotomy between traditional and newer areas of engineering repeated itself throughout the research.

- 5.6 In relation to the spread of engineering provision, the research also pointed to potential gaps in the provision at a regional level. The lack of strategic planning at regional level together with the funding and curriculum limitations within the colleges, translate into a failure to respond to the technological shifts in the economy. An example of this would be in the area of environmental science and applied engineering. This problem of how adaptive colleges can be is not one that can be solved by the opportunism or innovativeness of individual colleges, or the local interests generated through a company, but needs to be part of a coordinated and planned regional approach.
- 5.7 The first proposition was around staff competence and experience. Here the research was looking for evidence of suitable academic profile of some staff, as well strength in depth and relevant industry experience. The research supports the view that the engineering departments will have the staff to deliver FDs and related courses. However, it is important to stress that many colleges in the sample were not involved in FDs and had no intentions of being involved and, co-incidentally, were the colleges where the staff group didn't have the academic background to deliver higher education courses.
- 5.8 What the research did find was that there were many examples where the staff were thinly spread, and managers accepted that if key staff were away for an extended period this would create problems. There was a correlation between the staff profile and the existence of higher level work, which suggests that this is the main causal factor in the development of higher level work within a given institution. Staff who have the academic background, have the enthusiasm to provide the push for the college to apply to do HNDs or latterly to be a FD provider. It seemed rarely the case that the college decided to develop a higher level course and then go looking for the appropriately qualified staff. While this is reasonable it is also provides the explanation why the well qualified members of staff who are already stretched, become over tasked. It is also the case that colleges are having huge problems in recruiting the appropriately qualified people, due to the poor levels of remuneration in comparison with what can be earned in industry. In the light of the Foster report, there is also a question about the wisdom of stretching scarce resources by taking on higher level courses as well as focussing on basic and intermediate skills level requirements, within their catchment area.

- 5.9 It may be that too many colleges have felt obliged to initiate the partnership that the FD requires for approval, or at least to join with the local university where the capability is not really there, or where the management is taking a calculated risk that the funding following the implementation of a FD, will enable the department to make the case for the necessary support that is not fully in place at the time of the bid proposal. However, the research found managers to be realistic about the capabilities of their departments, but often caught up in wider issues of merger, expansion or contraction over which they have little or no influence. The opportunities to be innovative or to take calculated risks are limited.
- 5.10 Another aspect of the findings on staffing which deserves mention here is that of the training within the college. Higher level courses will demand that some staff will need to upgrade their knowledge to be able to deliver the higher level content of the programmes. However, the research generally found that the level of staff in house training was inadequate beyond the instrumental needs to improve teaching and learning, in preparation for inspection. Subject specific staff development was patchy and largely based on the attitude for the managers as to whether he was prepared to find money from within his own equipment and materials budget, something that is hard to achieve. However, there was a healthy minority of colleges who allowed staff time off, although infrequently allocated funding, to study for external qualifications, such as degrees. It was evident that many colleges tolerated fairly low levels of exposure of their staff to current industry practice, or what they defined as industry practice comprised visiting trainees on work placement. Even where funding is available as in the case of the New Engineering Foundation grants¹⁵ some colleges claim to be unable to take up the offer which is based on finding an employer partner and seconding a member of staff out for a period of three weeks. The main reason given was that the department is unable to find people to cover the absent colleague which indicates that there that is a shortage of staff of the right calibre and attitude in a number of colleges. Certainly, the research showed that the engineering departments surveyed have a very high age profile – somewhere in the mid 50s – and a static workforce with many lecturers having been in the same institution for over 20 years. This applied to many of the Heads of Department as well. The research recognises the proposals made by the Government White Paper - *FE Reform: Raising Skills, Improving Life Chances*¹⁶ for the need to strengthen the continuous professional development (CPD) provision.

¹⁵ Information can be found at www.neweng.org.uk

¹⁶ DfES White Paper - *FE Reform: Raising Skills, Improving Life Chances*, March 2006.

- 5.11 Several manager respondents commented on the difficulties in motivating their staff. The consequences of an ageing staff population who are change-averse and reluctant to engage in new developments, or in industrial updating will be serious for the sector over the coming years. **There is little evidence that managers are really addressing the issue of succession planning while at the same time they are very aware that they are having difficulty in recruiting replacements for those who are retiring or leaving for other reasons.** The OfSTED¹⁷ report also gave some clues as to the impact of these staff factors on teaching and learning, in that the sector is only performing at a satisfactory level and too many colleges are unsatisfactory. Although performance is not deteriorating, the OfSTED report is concerned with how few colleges are outstanding or good. Of course, this becomes an issue at all levels of engineering training, but perversely is less likely to affect those who are engaged in higher level courses, as they will tend to be the colleges who have the resources and the committed staff. Recognising that there is an issue here, the London Focus Group raised the idea of using the new Science Learning Centres as a vehicle to develop a co-ordinated approach to delivering training programmes specifically for the staff in the engineering and technology departments of colleges. This would be an extension to their current role but could be a viable way to develop a regional and accessible approach to in-service training and updating. Another proposition is to develop regional staff development, as part of a broader strategy to develop Knowledge and Technology Exchange Nodes, which would stimulate education business links and provide stimulus to enhance the curriculum and the skills of participating staff. This concept has been put forward in a paper by Professor Sa'ad Medhat¹⁸ which suggests that significant benefit can be derived from the development of these centres to stimulate best practice across a range of education, training and business activities. Whatever the solution, the general point here is that some attention needs to be given to the provision of regional centres for staff development, beyond what is provided now, and that colleges need to be given incentives to release staff for such development.
- 5.12 The issues around resources are rooted in the funding regime and the 'weighting' given to engineering i.e. the additional requirements to deliver training over and beyond the actual teaching resource needs to be reviewed. The Campaign for Science and Engineering in the UK

¹⁷ OFSTED Curriculum Area Report on Engineering and Technology 2004/2005.

¹⁸ New Engineering Foundation: Knowledge and Technology Exchange in Further Education Colleges 2005

(CASE) has provided a strong case to support the view that the sector is disadvantaged, both in comparison to other sectors but also in the actual calculation of what resource support is needed to deliver engineering subjects¹⁹. The differentials in funding derive from a variety of sources such as the problems with running a range of qualification provision which can compromise staff student ratios; the need for technician support; and the need for capital equipment and additional materials. **CASE argue for the creation of a direct funding stream to be introduced to cover the capital costs of up to date laboratories and workshops. The research certainly supported these views presenting a picture of ageing workshops and most equipment suited only to delivering the basic skills of engineering.** The acquisition of modern or specialist capital equipment derives from the ability of a given department having the drive and skill to bid against internal competition from other departments, or to construct co-operation agreements with external company sponsors.

There is plenty of evidence that various strands of engineering are well supported by their local LSCs and colleges, although **most manager respondents felt that engineering was year-on-year losing ground in the competition for resources against the more popular, but resource intensive areas such as design, media studies and performing arts.** What is undoubtedly the case is that management within the colleges need to be looking more proactively at shifting resources to new areas of engineering where there is both demand for training and for skills within industry. Unfortunately, there appears to be a perceived view within the college executive that the engineering sector is in decline, and that major resource investment needs to go in other directions. There is an onus on the engineering managers to convince their executives otherwise. Very often this has been achieved by getting buy in from local employers which has given the impetus needed. However, individual sponsorship such as this is a lottery, based first on the local availability of a suitable partner. There were several examples from the sample of excellent local arrangements which had resulted in major investment in the college infrastructure. For the majority of colleges who are not in this position the options are limited. Some will develop opportunities to send their trainees out to local companies for short internships or visits of observation, for limited periods of time to give them exposure to state of the art equipment, and many are turning to the use of computer simulations.

¹⁹ Campaign for Engineering and Science in the UK Opinion Forum No 1 2005

- 5.13 What is apparent, based on the perceptions of the manager respondents, is that, in general, **there does not appear to be a co-ordinated approach to the development of training which is responding to the changes in the sector, and this appears to be true at both local and regional level.** Colleges, being in a competitive environment, do find it difficult to collaborate where that collaboration may require giving up courses.

The onus needs to be on the LSCs to manage this process and rationalise provision in a logical way. The focus groups did highlight work going on through the RDAs and the LSCs in this respect, to cluster provision for distinct strands of engineering and technology around specific colleges. Normally, these colleges were already Centres of Vocational Excellence and were therefore, in a position to provide a focus for the concentration of high value resources that other colleges in the hub could access. This approach was articulated most clearly by Advantage West Midlands in the Black Cat COVE which covered colleges in the area of the Black Country and centred on Wolverhampton and Dudley Colleges. Unfortunately, for many colleges particularly in rural areas, this concept of clusters is more difficult to develop due to issues of geography and local SME needs for training available locally. However, the SWRDA Focus group, which represents a highly geographically dispersed catchment area, also provided some indications that this issue was being looked at more closely.

The research also recognises the Government's intention for encouraging and strengthening specialisms in FE colleges through the development of National Skills Academies NSA, which will be aligned to major economic sectors.

- 5.14 The next proposition concerns the positive aspects that FE colleges can bring to bear on the delivery of vocational higher education. The Foundation Degree is now becoming established and will completely take over from the Edexcel Higher National programme over the next two years, and the government has placed the FE sector in a central position to develop these FD courses, as a locally responsive provision. The sector will bring with it the experience of running Higher Nationals and while this is not exclusively the domain of the sector, as many new universities also offered them, they have developed a range of methods which can be applied or transferred across, such as the integrated assignments, cross-discipline thematics and the whole process of continuous and applied assessment. Also, the underpinning philosophy of the FE sector is more pre-disposed to the delivery of many aspects of the Foundation Degree than the university sector, in that it is rooted in work based

learning on the one hand and community based provision on the other.

If the intention is for the FD to base itself around local employer engagement and be a provider for local and regional recruitment then colleges are a logical home for the degree under the watchful eye of the 'parent' universities. Specifically, the college expertise will focus on the ability to develop and maintain employer links as part of a continuum of provision that they offer; secondly, they have the experience of developing teaching and learning methodologies to incorporate a work-based or employment led approach.

The research showed that colleges were contributing to the design and development of the FDs primarily through their experience with HNDs and HNCs, which are themselves rooted in an integrative approach to theory and practice. However, they were also drawing on more generic experiences of working with employers. The findings demonstrated a range of examples where colleges have built excellent relationships with local employers, and have similarly developed learning approaches which are both innovative and inclusive in their design. There is, however, a question mark over the extent to which colleges have been able to inculcate these ideas into the design of the FDs.

- 5.15 Universities will take the lead, quite reasonably, in the design of the content and will be concerned with the academic rigour of the programme, which will take precedence over other considerations such as teaching methodology and methods of employer engagement. **Some of the respondents did refer to the difficulties they had with their university partners, who were presented as inflexible and high handed in their desire to retain what they saw as 'the academic integrity of the programme'. There are undoubtedly issues of cultural clash, and although it will not be these factors which might call into question the validity of the college's involvement in the FD programme, they will potentially damage the effectiveness of the partnership and ultimately the fabric of the programme itself.** The change from working with Edexcel in the Higher Nationals environment to working with the universities, has clearly posed some difficulties and both sides need to work on developing better understanding of each other's approach, to what is clearly a common challenge.

- 5.16 The problem is however more about the proportion and number of colleges who are capable of delivering higher level work in engineering and technology, than about working with the universities themselves. **The research did bear out the latest OfSTED²⁰ report that engineering provision is patchy in its coverage and variable in quality.** This report identified almost one sixth of the provision as having significant weaknesses, with engineering departments lagging behind other curriculum areas in the development of new and innovative solutions to delivery, or in the commitment to quality assurance measures.

It is therefore the case that this issue of capability should be looked at from a more regional perspective, and some co-ordination introduced into the development of FDs in given areas.

There are now well over 500 different FDs in various types of engineering and technology with approval to run, yet only 10% of that number that are actually operational. This is an extremely worrying state of affairs.

- 5.17 There is little evidence-based information as to why these other FDs have not started, but **feedback from the focus groups suggested that lack of employer commitment is the main stumbling block.** In the context of the wholesale dismantling of the Higher Nationals, so beloved by the sector, in favour of this new creature begs many questions about the immediate future, and indeed security, of intermediate and higher intermediate skills provision, and how effectively it is going to meet demand. Given the democratic, and 'bottom-up' approach to the development of FDs, there does seem to be a very strong argument that the development of the FD programme across a given region, and in given sectors, is co-ordinated in a more formal and strategic way.

A strong candidate to provide oversight of both the provision of FDs and the wider co-ordination of skills training provision at all levels is the Skills Strategy groups that have been set up in every RDA region. These groups have a remit to look at the regional economy, and make recommendations as to the priorities for training, set against economic performance patterns and the availability of provision. At the RDA level, universities, colleges, employers and all the other stakeholder interests can be convened to ensure that the partnerships established to develop and deliver FD programmes are viable, and also provide support to mobilise employer involvement.

²⁰ OFSTED Reports 2004/2005

The funding of such training, particularly where this may involve new investment, will need to be managed through the two main funding agencies. **Since the inception of the FDs one of the weaknesses that has been identified in the implementation has been a lack of dialogue between the LSC and HEFCE about the funding priorities and criteria.** It is important to stress that these funding issues are not restricted to FDs, but need to address the full range of professional and intermediate skills programmes that are on offer within engineering and technology.

6.0 Concluding remarks - the current state of engineering in further education colleges

- 6.1 This research into the health of engineering colleges has provided some useful, if unsurprising, insights as to how well the sector is fairing in what is an extremely challenging change environment. Whether the evidence has been gleaned from the surveys undertaken of the 56 colleges sampled, or from the six focus groups who added some valuable views and insights of their own, there has been a fair degree of consensus on where the main problems lie, but not necessarily on the means of solving these problems. It should be said at the outset that the benchmark for judging success in the UK today is set high, and it is important to hold on to the fact that we are a world leader in the delivery of vocational education and training systems²¹. Nevertheless, this research has demonstrated that there are significant causes for concern, at least within the confines of the engineering and technology sectors, as to how well colleges are coping with higher level work, and with the competing demands of simultaneously addressing basic skills issues and meeting intermediate and higher level skills targets. This section makes an attempt to arrive at some conclusions as to the sources of the problems identified, and to offer some solutions in a way that is measurable and has practical application.
- 6.2 Many of the difficulties facing the FE sector, as well as the most common strengths and weaknesses within colleges, are well known and reported upon. What is less understood is how these strengths and weaknesses impact at departmental level in the specific field of engineering. There is something of a blame culture in the sector, and although it is less in evidence over the last few years, as more funding has flowed into the sector, there was plenty of evidence from our feedback that long standing divergence of views still persist. Colleges still bemoan the funding methodology and, overall, the lack of resources. They criticise the amount of change and pressure the government has placed on colleges, and the lack of central planning regarding the funding of certain types of provision each year. They also complain about employers for their negativity about supporting the training of their staff, and in their inability to articulate their needs.

²¹ OECD Report on education and training provision 2006

- 6.3 They will talk about the invisibility of regional skills strategies by government, and the almost non-existent role of the Business Links in supporting local provision and delivery. On the other hand, LSCs, and other areas of government, as well as the employers themselves, will criticise colleges for their lack of innovation and change management skills. They are also unhappy with the low levels of innovation and responsiveness colleges show towards employers in making clear what is on offer at the college, and in what ways it can benefit their bottom line. They will tend to see colleges as monolithic and inflexible compared to their private sector training counterparts. This latter perception is costing the sector both financially and politically, as the roll out of *Train-to-Gain*, the largest single funded employee training initiative ever provided by government, has shown. The majority of the business on offer has been allocated to the private sector, as colleges have failed to deliver rapid responses.
- 6.4 Both sets of views have some truth of course, but they undoubtedly provide a refracted view of the reality of what state engineering provision is in, at the present time. Colleges are being presented a challenge on several fronts by the current government, and the expectation of increasing higher level work is perhaps the most demanding. This research has produced data regarding provision of engineering and technology programmes at levels 3, 4 and 5 centred on the staffing and resource capability of colleges, the quality of their current links with employers, universities and other stakeholders and the methods employed to deliver education and training, with the emphasis on higher level work.
- 6.5 This research has shown a wide range of responses to the introduction of Foundation Degrees, with a significant number of colleges taking the view that they are not equipped to develop this provision, but have instead offered other exciting and innovative programmes. However, the large numbers of FDs that are on the shelf waiting to start suggest that there are issues around the capacity of colleges to deliver these programmes. Generally, the colleges in this survey showed evidence of both staffing and resource shortcomings, such that many will be unlikely to fulfil the requirements of this level of study. How this translates in practical terms will unfold in due course, but the results of this survey point to a number of remedial actions to ensure that the momentum that has been generated in the past few years to strengthen the FE sector, is maintained.

- 6.6 Currently, there is a debate over the future role of the FE college. Sir Andrew Foster has stimulated a debate about the extent to which the FE college remit should be more focussed, and expecting that 'every FE provider to develop one or more areas of specialist excellence'. This notion of specialism is already evident in the engineering sectors in colleges, and provides a useful model for developing a coherent national approach for the delivery of HE in FE. However, Foster and the White Paper arising from his findings, go on to suggest a narrowing of the polymorphic character of colleges, for instance, to shed any responsibility for 14-19 'academic' pathway, or separate out adult provision from that for 'under 19s'. However these ideas strike at the heart of the community role of colleges. Colleges in the UK are varied in size and complexion precisely because they have been moulded by community need over decades, and there is nothing in this research to suggest that the drive for a college to become a centre of excellence in one sector, and their mission to provide a full range of provision for their communities are mutually exclusive propositions. Indeed, it can be argued that this omnipresence in the community will feed genuine education business partnership, similar to that found in community colleges in the USA.
- 6.7 What was evident from the research was that some areas of engineering are much healthier than others. There was a sense that manufacturing engineering is in a steady and inexorable decline. If training provision is to follow market demands then this will be the case for the future, as traditional engineering industry declines. The malaise in manufacturing was clearly reflected in other measures – colleges with ageing workshops and equipment which could only be used for very basic training, an ageing workforce and problems in recruitment, and a general sense that there was no energy or pro-activity in training on new initiatives. This was in contrast to most other areas of engineering provision. **Yet there seemed little evidence that colleges were looking proactively at shifting their focus from traditional to other more commercial forms of engineering, but were rather moving the funding out of engineering altogether to fund other areas of provision which were perceived to be more popular.** This may be a failure at management level where heads of engineering departments have been unable to make the case, or demonstrate the potential for developing new strands of engineering training. However, it is more often the case that funding priorities from the LSC have been directed into other areas such as the service and business sectors.

- 6.8 One cannot blame colleges for this bias against the engineering sector, even though the research has shown many examples of highly successful and innovative developments in new engineering fields. In this case, the emphasis has to fall to those agencies, the LSCs and the RDAs to intervene at strategic level in influencing the direction of college planning and spending. For example, the research showed very clearly that there is a need to look at the development of higher level provision on a regional basis. Most FDs are based on university/college partnerships (rather than universities offering them on their own) and have arisen out of particular and internal motivations which might have no bearing on the local labour market or skills requirements. Regional development, led by the RDAs, need to identify where labour market requirements suggest for the creation and support for higher level vocational provision that is responsive to local training needs. Further, there needs to be more communication between the LSCs and the universities within given regions to make sense of the plethora of FD courses which have been validated. It would seem sensible to review the function of skills partnerships at both regional level – the Skills Partnerships groups and at local level - the Business Development Partnerships - and give them far more authority to influence the planning and funding of provision.
- 6.9 The regional approach has much more to recommend it. The creation of CoVEs has been a successful development in focussing resources for both provision that may be more specialist, as well as in supporting staff development. Such arrangements could also be enhanced through embracing the concept of the Knowledge and Technology Exchange Nodes (KTENs) that have been proposed (section 5.11). The notion of multi-functional, sub-regionally based centres providing the full gamut of services to business and the community, in the support of skills, productivity and innovation in the science engineering and technology sectors is an attractive one. Certainly nothing similar exists at the present time.
- 6.10 One consistent finding was that engineering and technology departments have funding difficulties to support the level and types of training they wish to undertake. There are notable exceptions where an LSC has invested in the development of a new facility linked to a local employer or training strategy, but generally colleges do not have the facilities to attract employers to buy into local college training. They are locked into a downward spiral of inadequate resources and staff who cannot deliver cutting edge training, resulting in companies who will not pay for training with that college.

It has to be said that this was not the picture drawn by most of the college managers who were interviewed, but the fact that very few had any full cost training business with local employers, was more telling.

- 6.11 The relationships with employers are critical to the success of the colleges in delivering higher level work. It is one area where they genuinely add value to a partnership with a university in delivering foundation degrees. However, many colleges still need to improve both the quality of their links and the flexibility of their provision. **Another limitation on college's ability to be responsive is that the funding methodology restricts college's ability to use LSC funded provision in a flexible way. Employers do not want whole qualifications and the funding of provision outside the mainstream of full time and part time day release needs to reflect this.** Secondly, it has been demonstrated that colleges with strong business development units and proactive management make the critical difference in the quality of employer engagement.
- 6.12 The issue of staffing may be a problem for some colleges both in having the numbers of staff who have the necessary academic background to deliver higher level work, but also who have the necessary industrial experience. This applies not only to those colleges who choose to take on foundation degrees or other higher level courses. For all colleges there is an issue of skills updating, to ensure that staff can enrich the curriculum through current understanding and experience of their specialism. Current levels of staff development targeted at engineering training were found to be very low, subverted to the demands of generic cross college training for teaching and learning, quality, inspection etc. In most colleges, departmental budgets were almost non-existent. The difficulties encountered have been exposed by the New Engineering Foundation in its management of the Engineering Fellowship Scheme, which provides grants to support staff being seconded to have a three week industrial placement. A number of colleges were unable to take advantage of the grant because they could not identify a member of staff with adequate expertise to cover for the absent colleague.

6.13 Overall, the research findings have created the impression of a sector that, while under pressure, is still growing and developing new methods and new provision, in response to the changing economic and industrial context that it finds itself in. The picture is inevitably a complex one, and it is hard to make generalisations because the circumstances in different regions of the country and in engineering fields vary so much. However, there are many FE colleges who are working extremely effectively with their local universities and employers and delivering high quality education and training to their students and customers. The challenge is to capture this best practice and to ensure it is promulgated effectively and as widely as possible.

It is therefore worth concluding that the DfES needs to look at ways of ensuring that best practice is communicated as effectively as possible for this particular challenge.

The evidence is clear, that this country ignores the effective training of its young technicians and engineers at its peril, for they continue to be the engine of wealth creation for the foreseeable future.

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Annexes

- i. Sample of colleges**
- ii. Research questionnaires**
- iii. Focus groups**
- iv. Sample of companies**
- v. NEF Panel**

Annex i: Sample of Colleges

Alton College
Barking College
Barnsley College
Basingstoke College of Technology
Bath College
Bromley College
Blackburn College
Bolton Community College
Boston College
Bradford College
Bridgewater College
Broxtowe College
Cambridge Regional College
Carshalton College
Central Sussex College
Chichester College of Arts Science and Technology
City College, Brighton and Hove
City College, Coventry
City of Bristol College
City of Wolverhampton College
Darlington College of Technology
Dudley College
Eastleigh College
Exeter College
Great Yarmouth College
Herefordshire College of Technology
Huntingdonshire College of Technology
Keighley College
Kendal College
Leeds College of Technology
Liverpool Community College
Macclesfield College
Merton College
Nelson & Colne College
New College Nottingham
Newcastle College
North Trafford College
Northampton College

Oldham College
Peterborough Regional College
Plymouth College of Further Education
Preston College
Sandwell College
Sheffield College
Shrewsbury College of Arts and Technology
Solihull College of Technology
Somerset College of Arts and Technology
St Helens College
Stafford College
Tameside College of Technology
Wigan & Leigh College
Wigan & Leigh College
Wiltshire College
Wirral Metropolitan College
Yeovil College

Annex - ii Research questionnaires



**INTERVIEW SCHEDULE FOR SENIOR MANAGERS
(At least Director Level with line management responsibility for E&T)**

Name:

Position:

Years at the College:

Areas of responsibility:

Staff Development

1. Do you have an appraisal system? Yes/No
2. How often are lecturers appraised?
6 months or less / 12 months / More than 12 months
3. Is your appraisal system linked to College objectives? Yes/No
4. Does the appraisal link to the individual staff member's INSET? Yes/No

If 'yes', how is this managed? How is it tied into budgets for training?
How are priorities determined?

5. Does the budget extend to supporting lecturers on external professional qualification courses? Yes/No
6. In general do you think staff development needs are met? Yes/No
7. How familiar do you think your lecturing staff are with current industry practice in engineering and technology?
Out of touch / Partly / Mostly / Up to date
8. How many staff have visited or have had longer placements in local industry to update their knowledge and experience in the last year?
1 / 2 / 3 / more than 3

College Resources

9. As part of the College's resources acquisition policy, how has the engineering and technology area fared over the last three years in getting new equipment and materials as part of the LSC's direct funding to support teaching and learning?

Please specify the annual amounts spent on equipment over the previous three years as against the amounts bid for.

	Amount Received (£)	Amount Bid For (£)
2004/5		
2003/4		
2002/3		

10. Are the materials and equipment up to the necessary standard to deliver the curriculum at Levels 3 and 4?
Not all / very limited / partially / completely
11. Please give an overall rating how close to industry standard the equipment is:
Not at all 1 2 3 4 5 Completely

Industrial Links

12. Do you have any links with local companies to access specialist or high specifications equipment?
Yes/No
- If 'yes' please specify.

13. Do you have a standing employer liaison group or groups for your level 3 / 4 provision?

Yes/No

If 'yes' please identify the number of companies who are involved.

No of companies: _____

14. In terms of providing support to the college how would you rate the contribution of the employers?

Very helpful 1 2 3 4 5 Marginal help

15. Do you have a modern apprenticeship scheme?

Yes/No

If 'yes', please name.

16. How do you rate your relationship with:

a) LSC Poor 1 2 3 4 5 Excellent

b) Employer association Poor 1 2 3 4 5 Excellent

c) Business Links Poor 1 2 3 4 5 Excellent

E-Learning / Training Materials

17. Is the engineering & technology material, which is on the College intranet, produced by the College staff or is it off the shelf proprietary products?

None from college 1 2 3 4 5 All from college

18. Please provide any subject specific e-Learning items that have been bought in the last two years (no more than ten):

19. Do you see your staff using e-Learning materials with the Level 3 and 4 courses over the next year?

Yes/No

If 'yes', what proportion (as a percentage) of the total quantity of study time will be allocated to e learning? _____%

How much of this percentage will involve subject specific materials?

20. Will the use of e-Learning vary between FT and PT groups? Yes/No

If 'yes', please explain why.

21. Do you offer any customised upskilling training to local companies? Yes/No

If 'yes', what mode(s) of delivery are used?

Day release into college/part time on company premises
flexible distance learning/blended training (including e-Learning)

Other Comments

This research is intended to identify the needs of the modern lecturer in an engineering/ technology department of a further education college. If you have any further comments you would like to make about the management of the staffing and resources in the department please make them here.

Interviewer to complete

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End



Understanding the Needs of Lecturers of Engineering & Technology in Further Education

Questionnaire

Respondent Criteria

Respondents should be FT lecturers, **senior lecturers or team leaders** in Engineering and Technology areas (not IT). Questions are geared towards Level 3 and 4 provisions, and therefore, the staff cohort must have a strong background in these levels. NVQ trainers are not acceptable.

Section A	General Information
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Name (optional):

Position:

Institution name:

Address:

Email:

Website:

Number of College students:

Number of College staff (Estimate of FTEs):

Department:

Main subject areas:

Number of courses:

Number of students:

Number of staff in department (estimated FTE):

College Special Status (e.g. CoVEs, Beacon Awards):

Does the College have a CoVE in engineering, construction or technology? Yes/No

When was the last College OFSTED inspection:

Overall College grade:

Grade received for Engineering and Technology:

Section B Personal Data

Age:

Gender:

How long have you been in FE?

How long have you been at your current College?

Please briefly describe your role in your department including roles of responsibility:

Please list your current qualifications – include all achievements after ‘O’ or ‘A’ levels.

If your answer is ‘none’, please say why?

Achievement	Date
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

Section C Staff Development

1. Does your college operate a formal appraisal system? Yes/No

2. If yes, how often do you receive a formal appraisal?

6 months or less/12 months/More than 12 months/Never

3. Is your appraisal linked to College objectives? Yes/No

4. Does your appraisal link to your staff development? Yes/No

5. If yes, how many staff development 'events' in the last 12 months can be attributed to your appraisal?
1 / 2 / 3 / more than 3

6. Have you been on an **external** academic or professional qualification course e.g. Cert Ed., B Sc., Masters? Yes/No

If 'yes', please specify in the box below:

Area of qualification	Year
Teaching	
Management	
Job related e.g. Basic Skills, <i>(please specify)</i> _____ _____	
First Degree	
Masters	
Other <i>(please specify)</i> _____ _____	

7. Would your employer support you if you wanted to go on an external professional development course, such as those listed above?
Unlikely/Possibly/Probably/Don't know

8. What internal staff development have you had in the last two years?

Type of staff development	No. of days
Teaching Skills	
Management Skills	
Personal Skills	
Curriculum knowledge	
Industry secondment/placement	
Other (please specify)	

9. If given the opportunity (say, financial support but no remission) would you take up the chance to for a further/higher qualification?

Yes/No

If no, why not?

10. Are there general factors limiting your participation in continuing professional development? Please tick as appropriate:

- Lack of personal financial resources
- Lack of college financial support
- Lack of suitable course content
- Lack of appropriate mode of delivery to suit
- Lack of interest
- Other personal commitments
- Other (please specify)

11. In general do you think your staff development needs are met? Yes/No

If 'not', why not?

12. How familiar do you think you are with current industry issues and practice in your area of discipline?

Out of touch/Partly/Mostly/Up to date

13. When was the last time you visited a local employer in your skills area?

0-3 months; 3-6 months; 6-12 months; over 12 months

Section D College Resources

14. Are the teaching materials (e.g. virtual classrooms, intranet and e-Learning software, print materials and other teaching aids) up to the necessary standard to deliver the curriculum at Level 3 and 4?

Not all/very limited/partially/completely

15. Please rate how close to industry standard the equipment is (*related to your course responsibilities*):

Not at all 1 2 3 4 5 completely

16. Do you have a modern apprenticeship scheme? Yes/No

If 'yes', how do you rate relationships with:

a) Local employers Poor 1 2 3 4 5 Excellent

b) LSC Poor 1 2 3 4 5 Excellent

17. Do you have any links with local companies to access specialist or high specification equipment?

Yes/No

If 'yes', please specify.

18. Do you have a standing employer liaison group or groups for your Level 3 /4 courses you are responsible for? Yes/No

If 'yes', please identify the number of companies who are involved.

No of companies: _____

19. In terms of providing support to the college how would rate the contribution of the employers i.e. via the liaison groups?

Marginally helpful 1 2 3 4 5 Very helpful

If you have ringed 4 or 5 please give examples of the nature of the contribution.

20. Do staff within the department pool learning materials? Yes/No

21. How often do you use e-Learning materials as part of the teaching delivery?

Never / once a term/once a fortnight / once a week / continually

22. How useful is the college intranet in providing (online) learning materials?

No intranet 1 2 3 4 5 Very helpful

If you have NO intranet and do not use e-Learning materials please move to Section E.

23. Is the material on the intranet produced by the college staff or off the shelf proprietary products?

None from college 1 2 3 4 5 All from college

24. Is any of the teaching material that you use derived from external collaborative projects or local network arrangements with other providers, the universities, employers etc.

Yes/No

If 'yes', please specify

25. Do you have access to any equipment or laboratory/specialist workshop space provided by local universities or regional centres of excellence?

Yes/No

If 'yes', please specify

26. Please list any subject specific e-Learning items you have bought in the last two years (no more than ten):

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27. Do you see yourself using e-Learning materials with your courses over the next year?

Yes/No

If 'yes', what proportion (as a percentage) of the total quantity of study time will be allocated to e-Learning?

_____ %

How much of this percentage will involve subject specific materials?

29. Please list any e-Learning materials that you would like to have during the next year.

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30. Will the use of e learning vary between FT and PT groups? Yes/No

If 'yes', please explain why.

Section E Other comments

This research is intended to identify the needs of the modern lecturer in an engineering / technology department of a further education college. If you have any further comments you would like to make about the support you receive or the ways you update your knowledge and experience please make them below:

End

NEF- Interview Lecturers v1.0 Feb 2006

Annex iii- Regional Focus Groups

Focus Group Guidance Notes

Research Project: Assessing the needs of Further Education colleges in the management of intermediate and higher level engineering programmes

The focus group membership draws together knowledge experience and perspectives from the widest possible range of sources. The stakeholder groups represented are listed in the accompanying letter to these notes.

Expected Outcomes

1. To provide a broader understanding of the range of stakeholder views about the performance of FE colleges in relation to the delivery of National Diploma, Higher National Diploma and Foundation degree programmes in Engineering;
2. To identify short and medium term policy issues, both nationally and regionally, which will impact on FE Engineering departments and their delivery of programmes;
3. To identify any consensus around the critical success factors for the delivery of good quality HND and FD programmes within the FE sector;
4. To provide an evaluation of the quality of work based learning and employer/college links within the FE engineering sector.

Meeting Structure

The meeting will last approximately 90 minutes. Please allow 2 hours.

The facilitators will be Prof Sa'ad Medhat and Mr Ashley Rowlands from the NEF.

The meeting will start with a brief introduction about the project and then participants will be asked to give a brief (approx 5 minute) resume of their personal and organisational roles in relation to the topic of discussion.

Following this, the meeting will be structured around the following questions:

1. What impact is current and (near) future government policy going to have on the capacity of FE colleges to deliver higher level work (i.e. impact of Foster, Leitch, Skills in the 21st Century etc.)?
2. What are the major strengths and weaknesses of the Foundation Degree as against the HND? In terms of FE delivery which poses the greater problems and why?
3. What are the major difficulties for colleges in resourcing higher level programmes? Please consider this in relations to both staffing and physical resources.
4. What are the strengths and weaknesses of the FE system in relation to employer involvement?
5. What are the strengths and weaknesses of the FE system in working with HE institutions to deliver higher level qualifications?
6. Please identify five to ten critical success factors for the FE sector to achieve in order to meet the governments targets for NQF (National Qualifications Framework) Levels 4 to 6 in engineering subjects.

It is understood that engineering covers a broad area of subjects and for the purpose of this discussion we will concentrate on electrical and Electronics, mechanical, automotive, manufacturing and production engineering.

Memberships

London, and, South East Regions 23 May 2006

Ray Jenkins	Carshalton College
Errol Ince	Bromley College
Barbara Mesa	LSC (London East)
Chris Simpson	Wates Group Limited
Rob Mills	Manufacturing, Engineering Marine Sector Partnership
Brian Dorey	Smith and Byford
Penny Routledge	Association of Colleges (South East)
Ajay Sharman	SETNET (South East)
Judith Rosser-Davies*	London Development Agency
Adrian Lawson	Automotive Skills
Dr John Williams*	Gatsby Charitable Foundation.
Prof Sa'ad Medhat	New Engineering Foundation
Ashley Rowlands	New Engineering Foundation

North West Focus Group

North West Regional Development Agency, 25 May 2006

Neil Wilton	NWRDA
Dave Blacklidge	Blackburn College
Peter Nangle	Blackburn College
Andy Fawcett	LSC Lancashire
Steven Gray	Training 2000
Mike Niblett	Manufacturing Institute
William Devine*	NFEC
Cliff Dickinson	AoC North West / North Trafford College
Prof Sa'ad Medhat	New Engineering Foundation
Ashley Rowlands	New Engineering Foundation

* Separate Discussions

South West Focus Group

South West Regional Development Agency, 31 May 2006

Paul May	LSC
Keith Cleeve	Exeter College
Steve Smith	Claron Limited
Jill Sheen	SWRDA
Liz Georgeson	SWRDA
Joseanne Stewart,	SWRDA Advanced Engineering Project
Ian Munro	Association of Colleges for the South West
Prof Sa'ad Medhat	New Engineering Foundation
Ashley Rowlands	New Engineering Foundation

Midlands Focus Group

Advantage West Midlands, 8 June 2006

David Lampitt	Advantage West Midlands RDA
Val Tomlinson	Association of Colleges
Bill Nicholls	Engineering Employers Federation (EEF)
Ian Mountford	Automotive Academy (Skills4Auto)
David Fisher	LSC National Centres of Vocational Excellence
Roger Wilson	Dudley College
Sirius Fardagie	Solihull College
David Vaughan	City of Wolverhampton College
Allyson Reed	QinetiQ [^]
Adrian Birch	Land Rover /Jaguar
Julie Mulryan	LSC
Ian Lindsay	HE Academy - Engineering Subject Centre
Prof Sa'ad Medhat	New Engineering Foundation
Ashley Rowlands	New Engineering Foundation

[^] Separate Communication

North East Focus Group

South Yorkshire Learning and Skills Council, 29 June 2006

Charles Pickford	Foundation Degree Forward
Gary Drabble	Sheffield City Council
Lindsay Middleton	SEMTA
Bob Johnson	LSC South Yorkshire
Liz Wright	AoC Yorkshire
Colin Evans	OFSTED
Alan Bainbridge	Newcastle College
Andy Howe Corus Group	Engineering Manager
Jackie Green Corus Group	Training Manager
David Ellis	Sheffield College
	Yorkshire Forward
Prof Sa'ad Medhat	New Engineering Foundation
Mrs Michelle Medhat	New Engineering Foundation

Annex iv: Sample of Companies

Participating Companies

Accuracy International
Airbus UK
Alstom Power
AMP Rose
Augusta Westland Ltd
BAE Systems
Bentley
BMW
BOC Edwards
Boots
Caterpillar
CCRLC Daresbury Laboratory
Cenit Desktop
Claas UK Ltd
Coors Brewery
Delphi Systems
Developer Solutions
Em Power Training
Epson
Eurostar
Fairline Boats Plc
Ford Motor Company
FW Developments/Dynojet UK
GCD Security Ltd
General Dynamics UK Ltd
Getrag Ford Transmission
GKN Aerospace
Goodrich Actuation Systems Ltd
Hanson Building Products
Heliwest Ltd
Heysham Nuclear Power Station
Imperial Tobacco
Independent Forgings and Alloys Ltd
Indesit
Industrial Automation Ltd
Innovative Technology Ltd
Intechweb
J&E Halls

Jaguar
Jaguar Cars
Johnson Control
Kennametal UK Ltd
Labman
Lagan Construction Group
Lance Owen
Lawday Engineering
Lely UK
Lever Faberge Limited
Leyland Trucks Ltd
LJ Group
Mahle Filter Systems
Marshall Aerospace Limited
McLaren Racing
McVities
MFI UK Ltd
Micrometric Techniques Ltd
MKW Engineering Ltd
Moore Racing
MyTravel Engineering
News International plc
Nissan Motor Manufacturing (UK) Ltd
Parker Hannifin (UK) Ltd - Polyflex Division
Patronics International
Pipex Limited
RAF Henlow
Rolls-Royce Power Engineering Plc
Scania Training
Schott Industrial Glass
Schulter Solutions Ltd
Scothall BMW
Siemens Industrial Turbo machinery Ltd
Solent Composite Systems
Terminal 5/AMEC
TNT Aircraft Maintenance Services
Torr Scientific Ltd
Total Communications Ltd
Transco Plc
Tritec Developments Ltd
Tubelines
Utile Engineering
Vauxhall Motors
Ward Hi Tech Ltd
WBB Materials
Westland Helicopters

Annex v: The New Engineering Advisory Panel

Ms Carol Arlett, Higher Education Academy -Engineering Subject Centre

Clair Donovan, Engineering Employers Federation-EEF

Mr Colin Evans, OfSTED

Mr Andrew Jones, BBC

Ms Jenny Lo, Association of Colleges (London)

Prof Sa'ad Medhat, New Engineering Foundation (Chair)

Mr Charles Pickford, Foundation Degrees Forward

Professor Ted Pritchard, Continuing Education in Electronic Systems
Integration – CEESI

Mr Richard Wainer, CBI

Dr John Williams, Gatsby Technical Education Projects

Dr Richard Wilson, Institute of Directors

Mr Neil Wilton, North West Development Agency

Dr David A Whan, Royal Society of Chemistry

Mr Stirling Wood, QCA