

# Invigorating STEM Vocational Education

## THE TECHNICAL COLLEGE OF THE FUTURE



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**Thirty years ago Kenneth Baker famously described the Further Education sector as the 'Cinderella Service'. This view is still relevant, particularly in STEM: for example, rarely is vocational training and FE mentioned in the Science in Parliament magazine – reflecting the importance given to vocational training and education. This has to change and for a very good reason: the right STEM vocational skills are vital if innovative and new technologies are to be exploited and commercialised fully.**

It is five years since Sir Andrew Foster's report on the future of FE Colleges<sup>1</sup> held a mirror to them and invited colleges and stakeholders to respond. The main conclusion of his report was that the key purpose of FE colleges is *the acquisition of skills and employability*. The Leitch Review later the same year<sup>2</sup> placed greater emphasis on those whom colleges serve, and set targets on skills at the lower levels with an eye to progression beyond. The purpose of STEM vocational education and training was confirmed as supporting industry in the application of technology, and enabling individuals to develop

recognised and flexible skills in growth areas.

The period since, however, has been dominated by debate about providers with an emphasis on size: is larger better? There have been other significant developments: the economic downturn and its consequences for public spending cuts; the transfer of responsibility for funding 16-19 education to local authorities and the associated demise of the Learning and Skills Council; the 14-19 curriculum and raising the participation age; the capital crisis in funding college building; and questions about the accuracy of the reliance of data that suggests colleges have greatly improved. And yes, the Comprehensive Spending Review, and three parliamentary bills which undoubtedly will have an impact on further and vocational education: the Welfare Reform Bill, the Public Bodies Bill and the Education Bill.

### CHALLENGES AND FREE FE

There have been a number of ideas to address some of these post-Foster issues. The Learning and Skills Network and NEF have published papers arguing that FE should enjoy the freedoms of HE to raise cash (from students) and create qualifications<sup>3,4</sup>. A paper by Eversheds for the 157 Group argued for the possibility, if not necessarily the desirability, of new forms of legal structure and governance arrangements to enable more entrepreneurial colleges to emerge.<sup>5</sup> Part of this thinking is about the capacity of the colleges to meet the needs of their customers better.

But a lot of what is written seems still rooted in the

question of how to make colleges themselves better and stronger – rather than make services improve *for employers and employees*.

The UK Commission for Skills and Employment (UKCES) sets out, in 'Skills, Jobs, Growth',<sup>6</sup> a vision for the way the employment and skills sector should work in the UK. Clear principles define the way that the content of learning and qualifications should be shaped by the relevant sector; whilst informed customers – employers and learners – should drive supply, performance and quality.

When it comes to proposals to make this happen, the attention is focused on three areas:

- A 'balanced scorecard' to supplant current assessments of colleges and make them more responsive
- Simplifying funding through personal learning accounts and increased individual and employer 'co-investment' in skills
- A modular qualifications system driven by employer need

Each of these responds to the drive to make demand for skills shape what the employment and skills sector delivers. They are not new ideas but their endorsement by UKCES will carry significant weight. They are congruent with the direction of travel suggested by Foster and the aims for the system shaped by the Leitch Review of Skills.

The UKCES report adds a key message about investing in *strategic skills*. Much of the debate about what colleges should do blurs the distinction between meeting the immediate

needs of employers and investing in the future skills needs of the economy. The Leitch Review was of course concerned with both, but its focus was on up-skilling the entire workforce in distinct strategic areas.

'Strategic skills' require proper investment to stimulate increased provision and participation in those strategically important areas, including significant skills shortages and emerging sectors. This must depend on significant private investment, but, the UKCES argues, it should also be incentivised by price premiums to public funding to increase provider commitment and marketing.

Excellent technical education will depend on getting this right – alongside the challenges of raising the 'employability skills' of the workforce, particularly its young new entrants, and of continuing to respond to the immediate training needs of employers.

The three areas identified by UKCES have presented colleges with real challenges and some of the commentary about their success have been at best mixed. The challenges, however, are even more important as the world itself changes.

### INDUSTRY REQUIREMENTS AND NEW TECHNOLOGIES

At the broadest level, there are some obvious economic imperatives on the horizon: the need to develop carbon-neutrality at work and in life; the rapid pace of technological change; the continuing revolution in the application of IT; the decentralisation of semi-skilled labour away from the advanced economies; the consequent need for higher-

level skills to predominate in the advanced economies. All predictions point to the need for the UK to make itself a high-skills economy in which jobs will only really be available in work demanding either a high level of technical skill or a high level of interpersonal skill – or both.

Demand for flexible, work-based approaches to training is increasing. This is aligned with qualifications that recognise skills and abilities – often acquired through experience but substantiated through further study. In some economic sectors, real emphasis is placed on updating these skills and linking them more clearly with career progression. There is growing demand for professional recognition at technician level, allied to achieving and sustaining the status of a leading-edge performer through first-class CPD. For example, developing a 'portfolio based learning' that embraces employability, innovation and professional skills could be one of the proposed approaches.

The demand for changes in the way we train people is reflected in the deliberate attempt to define career paths and associated training requirements in a variety of sectors of the economy. For example, in health care, 'Modernising Scientific Careers: the UK Way Forward',<sup>7</sup> proposals are set out to introduce a new simplified healthcare science pathway and to develop new training and education programmes to ensure that tomorrow's health care provision is as good as it can be and takes full advantage of perpetual scientific discovery.

## DEVELOPING A FORWARD THINKING STRATEGY

Our vocational education and training strategies tend to focus on the 'here and now' and in many cases are backward looking to what has appeared to work in the past, for instance

apprenticeships. In addition, some of the new proposals such as the University Technical College are also confusing and lack contemporary thinking. Unfortunately, such initiatives force artificial relationships and structures that are not necessarily effective nor do they serve business and industry needs. Moreover, these initiatives tend to be unsustainable: it is not training for the sake of training that is required; it is training for a purpose. Policy and strategy has to address needs first: training requirements will naturally follow.

Colleges will need to be encouraged and supported (and even rewarded) to think smartly about their future economic needs in such areas as low carbon technologies and advanced manufacturing and to break away from the existing mould of embracing more and more beauty and therapy salons and catering restaurants!

Today, there are a number of contemporary approaches that re-position workplace learning and occupational competence in an effective way to be delivered in a just-in-time fashion at the point of need. Further education colleges can do much to help themselves and become more agile and responsive, by adopting a strategic approach to improve performance in planning and funding.<sup>8</sup> NEF suggests a four-step approach to change management (NEF Diamond)<sup>9</sup>:

- Carry out an appraisal of internal capabilities, identifying weaknesses, and more importantly strengths
- Map market trends, involving horizon scanning, to identify immediate and future requirements for skills
- Formulate a strategy to re-focus, re-shape and re-position the college, making clear the purpose and focus of the new organisation
- Implement the strategy and evaluate impact, so supporting

efficient delivery of training truly appropriate to industry needs whilst driving technical innovation and exploiting capabilities.

In parallel, colleges can reassure employers that their STEM training provision is of the appropriate quality and led by industry needs. Quality assurance schemes, such as NEF's STEM Assured,<sup>10</sup> that assure the use of **integrated cross-curricular STEM strategies** in education and training, enable stronger collaboration between providers and employers and the delivery of innovative and multi-disciplinary teaching and learning.

Furthermore, there is potentially a new role for advanced vocational education and technical education centres. In the last *Science in Parliament* magazine, Dr David Dent commented on the gap in the innovation market.<sup>11</sup> Here is an opportunity for forward thinking colleges to transform into power-houses of market-led innovation, driving new prosperity and shaping new technologies. This could take the form of new *polytechnic colleges* that embrace applied and near market research.

## TECHNICAL COLLEGES OF THE FUTURE

Developing a Technical College of the Future will be different from what we have been used to: it will encompass different access points to learning and training, new learning spaces with a variety of delivery channels and mechanisms, and take on technical innovation and knowledge transfer capabilities. In all this, the learning and training organisation will need to adapt and adopt new thinking to sensitise learners, employers and higher education to engage and develop new economically viable areas.

Technical colleges can add real value to technical developments and innovation –

through up-skilling and re-skilling based on best practice and a clear idea of emerging needs. The technical college of the future needs to grasp these fundamental changes: to see itself as the engine for horizon-scanning, partnerships with employers, the incubator for business innovation that is able to deliver skills for tomorrow's world on time and in the right sectors. The wealth of the future depends on getting our vocational STEM education and training right so that a high-skilled, high value-added economy can develop.

## References

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