

# THE INTELLIGENT COLLEGE – STIMULATING THE STEM SKILLS SYSTEM



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**There are currently 351 Colleges in England, including 227 further education (FE) colleges. Colleges educate 831,000 young people compared with 423,000 in schools, academies and city technology colleges.**

The achievements of colleges are mixed. By 2010 the proportion of students who successfully achieved their qualification aim had risen to 81%, the highest ever rate. But in the same year Ofsted commented: "Of the 79 colleges inspected 44 are good or better. However, too many colleges remain satisfactory with capacity to improve"<sup>1</sup>.

The Wolf Review of Vocational Skills<sup>2</sup> picked up the underlying problem that by measuring success rates the value of the qualifications themselves was not recognised. This is not seen as caused solely by colleges: the Review cited the "deceit" and "dishonesty" of a system where short-term institutional incentives (such as funding and accountability) caused colleges and schools to direct young

people into dead-end courses that provided little chance of progression. Amongst these incentives was the pressure to recruit target numbers of students and to get them through courses. The number of qualifications taken was the measure, not where they led to, or what they enabled a person to do or achieve. Such incentives Wolf called "perverse".

The paradox of the "market" in FE is that when the Government becomes the customer, the drive is to secure funding and pass Ofsted. The consequence is that the crisis in Science, Technology, Engineering and Mathematics (STEM) areas persists: in the 2010 report, Ofsted identified science and mathematics as the "least positively inspected area". An equally important concern is strategy or agility in working with employers. There is a mixed track record here too. Across the country there are some marvellous examples of colleges working with employers on innovative projects. Most general FE colleges came into being to meet the need of industries and most today will be able to identify hundreds of employers with whom they work. Many of these interactions are viewed very highly by employers and reflected by on-going relations. However, there remains criticism from employers' groups that the FE system is too complex and too unresponsive to meet the needs of business.

For all their achievements – improved inspections, greater

success rates, engaging with industry, responding to short-term changes – there remains a problem. The prime aim of colleges is to help generate prosperity through developing people's skills. They struggle to do this in a way that is "strategic, agile and market-led". So what can be done?

## THE INTELLIGENT COLLEGE

There is a broad political consensus about what colleges should be doing. It is encapsulated by the Coalition Government's vision of "a customer-focused locally accountable system whose strength is that it consists of competitive public and private businesses with a social mission"<sup>3</sup>.

There are some encouraging signs in the new policies that will govern the way colleges operate. The Government intends to strip out micromanagement and to "free up" colleges. It is even possible that austerity itself will become the mother of invention.

The current situation prompted the New Engineering Foundation, which is leading the transformation of the UK STEM performance, to develop its idea of the Intelligent College.

The Intelligent College builds on existing outstanding practice but also takes a big step in a new direction – from colleges reacting to funding, inspection and initiatives to that of colleges inventing the future through the dynamism of horizon-scanning,

enterprise, innovation and civic leadership. At the heart of the Intelligent College concept is the "golden thread" of innovation. Innovation in colleges primarily means the capacity to understand the needs of the future; translate that into curriculum planning and generate the market for new qualifications and skills in partnership with employers and other civic leaders.

Innovation must also mean re-inventing the college. This is not the "institutional" obsession with size, structure, acquisition or efficiency. Rather, it is to see the role of the college in terms of its asset base. Colleges enjoy the benefits of charitable status: their beneficiaries are individuals, employers and communities. The assets at their disposal in providing for these groups are of two main kinds: intellectual and physical.

On the intellectual side, the prominent currency is training through courses that lead (mainly) to qualifications. But there is more to it. Colleges also have the potential for horizon-scanning and knowledge transfer; research, design and development of products and services as well as for "incubation services" for entrepreneurs.

And then there are the physical assets – learning space, equipment and access to internet resources. Colleges can turn these assets into generating new products with and for SMEs and entrepreneurs. Together with the intelligent use of intellectual

assets, colleges can build on their strengths, and their experience, to become an indispensable first-choice partner to employers and entrepreneurs.

An Intelligent College approach would be to shape the way a college can:

- Realise the potential of their resources and equipment and provide business development services for entrepreneurs and SMEs
- Horizon-scan industrial sectors in partnership with key employers to develop relevant training
- Help to address the difficulties in providing apprenticeships with SMEs
- Contribute to effective information, advice and guidance about vocational and occupational education so that more young people, in particular, can make intelligent choices about careers
- Work with employers to develop a curriculum that promotes enterprise, entrepreneurship and the attributes needed for success at work

The Intelligent College will innovate in this way and work with employers to generate prosperity and provide the skills needed for the economy. This is critical to STEM industries which are among the industries of Britain's future: high-value engineering and manufacturing, biotechnologies and low-carbon technologies. They need a good supply of skills of the right kind in the right place at the right time.

Running a college for the point of view of generating these benefits means the college needs to be:

- Enterprising: in the way it is run, in its people, its action and its impact

- Pioneering: on skills, as a horizon-scanner and transferor of knowledge
- Designing: courses, training and partnerships that deliver new skills and experiences
- Innovating: making the connections that make change happen
- Leading: on ideas and initiatives with partners

Putting all this together would place Intelligent Colleges centre-stage as partners for prosperity. Intelligent Colleges would not come about by chance or by small changes – a shift to customer focus, enterprising “knowledge transfer” professionals and lean, integrated business systems is challenging.

### ASSURING A STRATEGIC APPROACH TO STEM SKILLS PROVISION

Ensuring that FE colleges can respond to the STEM challenges posed by market dynamics and technology advancement, particularly where technologies are converging and require knowledge, understanding and competence in multi-disciplined areas (eg technologies for low



Professor Sa'ad Medhat explains the benefits of enhanced STEM education to HM The Queen Elizabeth II at City and Islington College that was presented with the STEM Assured award, London 30 March 2011

carbon and sustainability), requires a strategic approach to STEM. The New Engineering Foundation has developed STEM Assured, a unique standard that assures the quality of STEM education and training to validate colleges' ability to meet the needs of business and industry. It encourages a cross-curricular approach to course design and delivery in STEM.

The elusive gain of colleges as major catalysts for innovation and socio-economic health is the prize that can be attained. The New Engineering Foundation, with its rich experience of

productive partnerships with colleges, is geared to help colleges define and achieve their true value as Intelligent Colleges.

#### References:

1. Ofsted, The Annual Report 2009/2010 (<http://www.ofsted.gov.uk/Ofsted-home/Annual-Report-2009-10/Learning-and-skills>)
2. Wolf, A., Review of Vocational Education – The Wolf Report, March 2011 (<http://www.education.gov.uk/publications/eOrderingDownload/The%20Wolf%20Report.pdf>)
3. Russell, G., Keynote Speech at the LSIS Annual Governance Conference (<https://www.lsis.org.uk/AboutLSIS/MediaCentre/NewsArticles/Pages/Greater-freedom-means-greater-responsibility-says-agency-CEO.aspx>)

### STEM ASSURED – A CASE STUDY FROM CITY AND ISLINGTON COLLEGE, LONDON

City and Islington undertook STEM Assured with a focus on their Centre for Applied Sciences. They were aware of some pockets of best practice in their STEM provision, particularly in forensics, optics, and health- and medical-related provision. The college wanted to highlight those areas that were developed with very close engagement with industry. These courses, not surprisingly, also have a high impact in terms of progression to Higher Education and employment.

The Validation Panel, which draws senior industry representatives, agreed that some of City and Islington courses set a benchmark for the sector in those subjects. Other highlights of the submission include: the innovative work in developing a flexible and work-based apprenticeship programme with local employers; the approaches by Science and Optics to improve learning opportunities and development of online seminars to drive scholarly activity. Although use of Alumni is not common practice in FE, the Alumni from the forensics courses have been encouraged to stay in contact, thereby enabling measurement of impact. Dr Steve Jones, who heads the Centre for Applied Sciences, said during the formal presentation of the award by HM The Queen: “STEM Assured helped us to focus our efforts and build an integrated STEM strategy to enable a long term growth for the centre and the college.”