THE INTELLIGENT COLLEGE®

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Prof Sa'ad Medhat
Dr Sarah Peers

The NEF Institute of INNOVATION & KNOWLEDGE EXCHANGE

A Think Tank Report by the New Engineering Foundation & NEF Institute of Innovation and Knowledge Exchange

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The NEF is an educational charity and Think Tank that focuses on developing vocational education through:

- Instigating Research
- Supporting Professional Development
- Enabling Knowledge Transfer and Innovation

Our mission is to achieve measurable and visible improvement in vocational education through partnerships by:

- Enriching teaching and learning professionalism
- Enhancing capability of providers and industry
- Empowering individuals to embrace contemporary practice

Thereby, creating a positive impact on society.

We look forward to your participation and support of our activities so that together we can achieve significant improvement in our vocational system.

The Institute of Innovation and Knowledge Exchange (IKE) is a not-for-profit organisation, established to promote the development of innovation including knowledge and technology exchange and transfer capabilities and resources.

The Institute will focus on Knowledge Exchange as a driver for innovative opportunities in education, business and industry, and to raise awareness with policy makers. IKE aims to provide a platform for knowledge exchange by bringing together entrepreneurs, academics and public representatives from business, charities, universities and public sector organisations and agencies. The network will look at ways to drive innovation on a sector-by-sector basis.

IKE will address innovation in leading sectors of growth including:

- High Tech Manufacturing
- Bioscience and Biotechnology
- Energy and Green Technologies
- Information and Communications Technology
- Digital and Creative Media

The NEF Institute of INNOVATION & KNOWLEDGE EXCHANGE

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ACKNOWLEDGEMENTS

"The Further Education sector does some amazing stuff, it's just how we, industry and stakeholders, can get colleges to do it more intelligently."

– Mike Pilbeam, Vice President, Cisco

We acknowledge with gratitude the contribution from Andrew Thomson in facilitating the Think Tank and compiling this report. We are also grateful for the on-going support received from the Gatsby Charitable Foundation.

We would like to thank the Think Tank's participating individuals and organisations for giving so generously of their time.

Finally, we would also like to thank the New Engineering Foundation Advisory Panel[1] for their continued enthusiasm and effective involvement.

1 The New Engineering Foundation Advisory Panel consists of representatives from the following organisations: Aseptika; Association Of Colleges; Aston University; Atkins Global; BASF; BBC; BT; Bournemouth University; Cogent Sector Skills Council Ltd; City University London; Department for Business, Innovation & Skills; Department of Energy and Climate Change; Department for Environment, Food and Rural Affairs; Engineering Employers Federation; E.ON UK; Flybe; Gatsby Charitable Foundation; Higher Education Academy - Physical Sciences Subject Centre; Higher Education Academy - Engineering Subject Centre; Hiremech Ltd; Institute of Directors; Learning and Skills Improvement Service; Marshall Aerospace; Microsoft; Middlesex University; National Apprenticeship Service; National Grid; National Physical Laboratory; National Skills Academy Manufacturing; National Skills Academy Process Industries; National Skills Academy Nuclear; OFSTED; Price Waterhouse Coopers; Prosonix; Rolls-Royce; Royal Academy of Engineering; Royal Society; SEMTA; Skills for Justice; Siemens UK; Technology Strategy Board; Transport for London; UK Commission for Employment & Skills; Unilever UK; Unionlearn with the TUC; Wellcome Trust and Westinghouse.

FOREWORD

Steve Holliday
Chief Executive of
National Grid Plc

Let me start by saying that this report is somewhat controversial and intended to prompt a dialogue towards rethinking how the UK needs to change the provision and resourcing of Further Education into the 21st century.

It's a 'big idea' which has merit in effecting change but it's not the only way! It should act as a stimulus to us all, to find new solutions and outcomes. There is some excellent FE provision today, which we need to build on, to make a more radical shift towards an outcomes based system.

The workplaces of the twenty-first century are unpredictable environments. Their technologies are more complex than ever before. Their business cycles are more erratic and markets more volatile. And their most important feature, their human capital, is more diverse and demanding.

It is extremely difficult to anticipate the requirements that will be sought from the workforce of tomorrow. Even today, the competencies, knowledge and approaches expected are varied and changing in ways that expose individual opportunity and national success to the ever-present threats of obsolescence and global competition.

Uncertainty is unavoidable and ineradicable. In the supply and demand of skills, it cannot be dealt with through the techniques, structures and cultures that were designed for – and served us well during – an era when our economy was differently balanced and far less globalised.

"The Intelligent College" is the response of the New Engineering Foundation's Institute of Innovation and Knowledge Exchange (IKE) to both the challenges and the opportunities that the future presents, by changing the conversation between stakeholders towards an innovative market-led education system.

Investigated and written in collaboration with policy-makers, business people, academics, educators, students and technologists, this report sets out a new paradigm for Further Education in the UK.

A college cannot prepare our young people and trainees for the fast and volatile world of work unless it is similarly rapid and flexible in its responses to the ambitions and capabilities of those who drive our economic growth. Indeed, we want these young people and trainees to be those very entrepreneurs and innovators who create wealth and improve lives.

The recognition of this is at the heart of the recommendations made here. An Intelligent College is an innovative college. But it is easy to describe an idea or an organisation as "innovative". The test comes in defining how that innovation is nurtured, harnessed, and then applied.

EXECUTIVE SUMMARY

Innovation has always been and remains a potent force for survival. Today, the ability to have an intelligent skills system that can proactively respond to dynamic societies is critical to success and durability.

This report brings together the assessments and views from many organisations and stakeholders in the education and industry sectors, and it advocates the need for a transformative approach to technical and scientific skills development. The proposed approach highlights innovation as the golden thread that guides those willing and able colleges to become Intelligent Colleges.

The emphasis on the mission of colleges for generating enterprise and social welfare should create fresh impetus for innovation and a concentration on the impact of colleges for the communities they serve. It is even possible that austerity itself will come to be seen as the mother of invention with the driving force to be 'teach less, learn more'.

Intelligent Colleges build on existing outstanding practice but also take a big step in a new direction – from colleges reacting to funding, inspection and national initiatives to colleges creating the future through the dynamism of horizon-scanning, enterprise, knowledge transfer and civic leadership. The paper outlines some of the key features and steps that colleges could embrace on their journey to becoming Intelligent Colleges. The report highlights the changing role of colleges to become a source of innovation and lecturers/teachers to become knowledge transfer professionals. The Intelligent College will also be a place where emphasis is placed on individual learning through the effective use of well supported e-learning and other advances in learning technologies. Above all, intelligent decision-making requires innovative leadership and strategic governance to create an ecosystem inspiring enterprise and growth while maintaining a customer focus.

The report also highlights the growing role that the Intelligent College will also play a role in knowledge exchange. Not only is the Intelligent College increasingly a source of innovation but also should be as a place to turn to for solutions. The college already provides a framework for the exchange of ideas and the Intelligent College should be utilized to their full Think Tank capabilities.

The New Engineering Foundation and the NEF Institute of Innovation and Knowledge Exchange will be working together to support colleges as they set out on this transformational approach in their quest to become Intelligent Colleges.

Professor Sa'ad Medhat
PhD MPhil CEng FIET FCIM FCMI FRSA FIKE
Chief Executive
New Engineering Foundation | NEF Institute of Innovation and Knowledge Exchange

WHY IT MATTERS – Views from Colleges and Industry

On the 16 June 2011, the New Engineering Foundation held a Think Tank at the Royal Society, London, to which senior representatives from education, particularly Further Education colleges, and from industry were invited. The following are extracts from the discussion by delegates on the day.

"What makes a college more attractive to a potential student than another provider is probably the college's connections with industry…"

"…The specialism of FE is using vocational learning to engage."

"The Intelligent College ought to create more people who think capably and creatively."

"If we know what we are trying to achieve then we can decide on the core capabilities required to deliver and on how to build those capabilities."

"We are all suffering from the result of a target-driven mentality that the education system as a whole is suffering; it gives us no information of quality."

"Funding is an issue with FE colleges, it is there one minute and gone the next… "

"The Intelligent College needs to change institutional self-interest, which is driven by the fear of failure."

"What the Intelligent College might be able to do is talk about what it is we want our learners to do, be and achieve."

"Colleges will need to influence learners from the age of six, seven, eight, if colleges want learners to look and act in a certain way at age seventeen…"

"…Learners suffer from lack of creativity, lack of problem-solving analysis, lack of ability to engage with other people …"

"…How do you get creativity? We seem to be moving towards a world in which we need a low-risk appetite where creativity is a problem, so we are not training for it."

"A non-linear approach is one of the keys to a personalised agenda for young people. It is possible to create a personalised approach, even within a set qualifications framework."

"Young people don't communicate today in the way that we expect them to. We need to understand this and adapt how we communicate with them and understand the new skills they have."

"The type of skills base that Further Education really needs to be creating is one that actually leads to employability, not a five-minute career in a specific trade. Education, transferability and flexibility are key."

"Education is a much broader concept than just training – if we only train them in one trade then they will have lost future possibilities in other areas. We need to educate to support transferability."

"Problem solving has disappeared from many specifications. Exams are just testing little bits of information and the students expect to see that. The whole system has been corrupted. Students are not being encouraged to think."

"We currently have a very confusing landscape of qualifications. There is a need to create a much more simplistic qualifications framework."

"We are currently too qualification-centric, too assessment-methodology-centric; we're not progression-centric enough."

"We find that FE colleges are churning out people with 'biblical trades' such as carpentry, but that is not what employers want. Instead they want skills in new technologies, for example underfloor heating - and there aren't any courses around for that."

"The Intelligent College should offer different pathways and a number of routes leading to employment…"

"It's become very clear that the package of skills and knowledge that employers want their employees to have does not fit one level and does not necessarily fit in one faculty. Qualifications aren't set out like that."

"…We have an unintelligent system where people just fall off the end, where the qualification isn't enough. This is a time to review the system. We need to give learners, employers and the community what they need, which is above and beyond the qualification. Are these qualifications fit for purpose?"

"Industry can play a really big part in providing the know-how for assessment of application skills that is missing from FE. The big companies train their own technicians because FE does not have this expertise. Get those trainers from those big companies, meet with them and find out how they assess… That is part of an Intelligent College."

"…It is also about going to employers and asking them what skills they want and then creating the courses if they do not already exist."

"Teachers go into teaching to teach and generally their skills sets are around that. They are not there to sell and engage with employers, for which they would need a different set of skills. How can we support outstanding teachers to do all this other stuff?..."

"…The Intelligent College should look at how it brings in practitioners to teach. …But to what extent is it possible to be both a teacher and a practitioner? "

"Universities have the benefit of being funded for research and development so they have the capacity to think outside the day-to-day delivery of training and education. FE isn't funded in that way. Unless there is resource and a structure there to support it, there may always be attempts by college staff to be look beyond day-to-day teaching, but they will not be sustainable."

"One issue is lack of early engagement: colleges are being asked to approach industry, but no matter how hard colleges try there is little engagement with companies until the business need is here, and then it is too late…"

"A big problem is that colleges often talk at companies, and sometimes companies talk at colleges. What you need is a translator. The same things are being said by both parties, but neither quite realise it."

"...Conversations between colleges and employers have to happen at the right time, not too early or too late."

"There is a fundamental question of how to make engagement systemic rather than just periodic."

"An Intelligent College will have intelligent relationships with the vertical chain of schools, universities and so forth, and an effective lateral relationship with employers and the communities they serve. And it's intelligent not to wait for the other party to come up with the goods."

"One challenge we have in our college is that most of our companies are SMEs and have a different level of need to larger employers."

"A big failing of colleges is that they don't know who their biggest customers are and they don't look after their biggest customers."

"…Relationship management strategies are key. A stairway strategy with strategic partnerships at the top and those that are a bit more *ad hoc* and low level. There are opportunities to put this into place because colleges are not weighed down by research culture."

"There is at least one college that has built a community of employers who are working with each other, helping each other. So there's this other thing which is the college providing some infrastructure to do that. That needs a lot of trust and common understanding for that kind of thing to succeed – that's intelligence."

"…Is it about industry planning ahead and coming to us, or is it up to us to go out to them?"

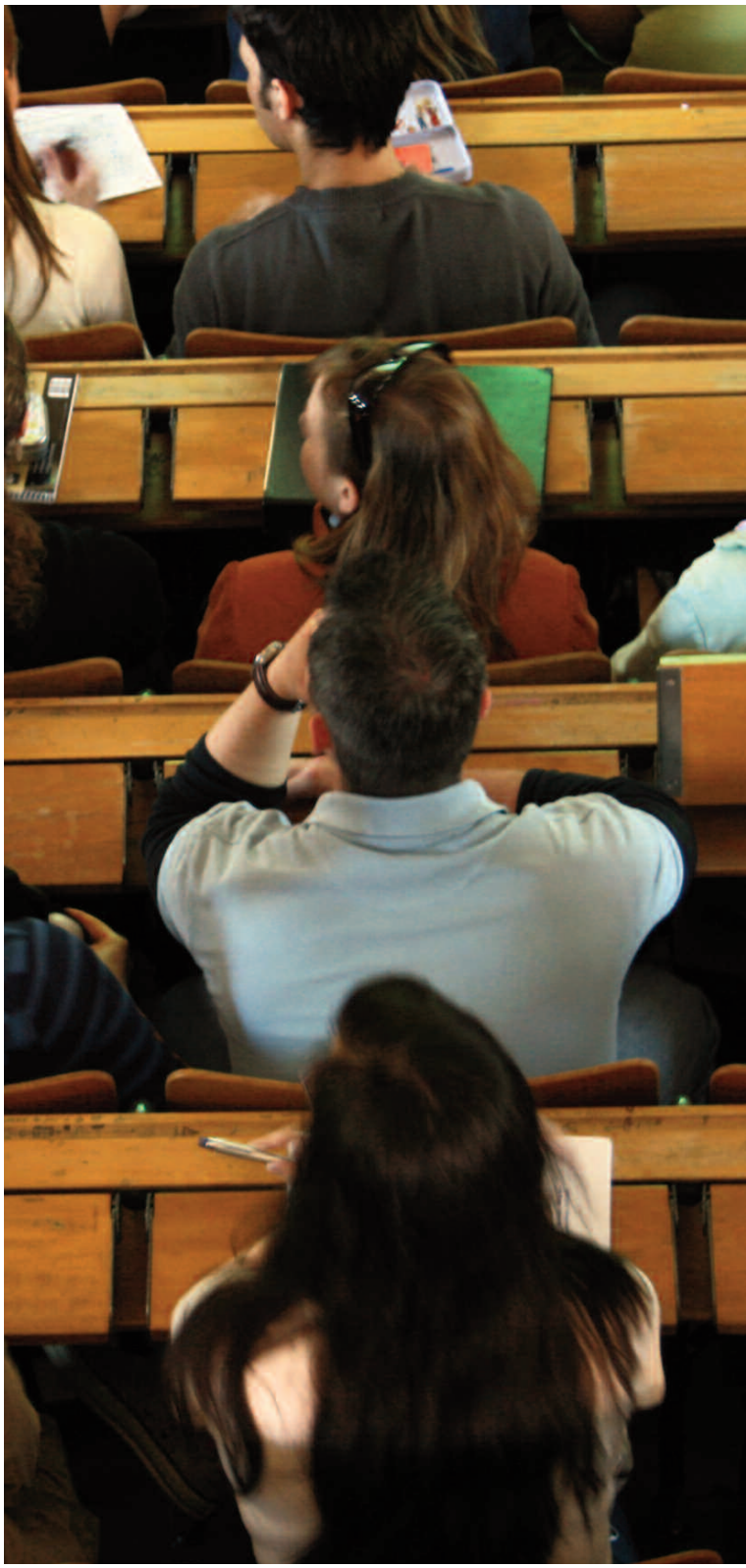
"One thing that needs to change is the way in which funding, accountability and the frameworks operate so as not to drive institutions' self interest as the natural by-product. That's a real challenge…"

"…The Intelligent College is one that takes away all the perverse incentives and funding system problems, and finds the key levers that get us to where we want to be."

"There are great examples everywhere, but what there isn't is a system for making it happen."

"All progress depends on the unreasonable man."

– George Bernard Shaw,
author and playwright



1. WHY IT MATTERS

1 There are currently 351 Colleges in England, including 227 further education (FE) colleges, 94 sixth-form colleges, 16 land-based colleges, 4 art and design colleges and 10 specialist colleges.

Colleges educate 831,000 young people compared with 423,000 in schools, academies and City Technology Colleges.

2 The achievements of colleges are mixed. By 2010, headline success rates (i.e. the proportion of students who successfully achieve their qualification aim) had risen to 81%, the highest they have been. 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 that is no better than satisfactory".

3 The Wolf Review of Vocational Skills identifies an underlying problem not picked up by measuring success rates: the value of the qualifications themselves:

"The staple offer for between a quarter and a third of the post-16 cohort is a diet of low-level vocational qualifications, most of which have little to no labour market value. Among 16 to 19 year olds, the Review estimates that at least 350,000 get little to no benefit from the post-16 education system."

4 This is not seen as a problem caused solely by colleges: the Review cites the 'deceit' and 'dishonesty' of a system where short-term institutional incentives cause colleges

(and schools) to direct young people into dead-end courses that provide little chance of progression. Amongst these incentives is the pressure to recruit target numbers of students and to get them through courses: the number of qualifications is the measure, not where they lead or what they enable a person to do. Such incentives Wolf calls 'perverse'.

5 The principal drivers for college leaders are short-term: funding and accountability. These tend to prescribe rather than describe the job of colleges (causing much of the 'micromanagement' identified by the Wolf Review). This militates against innovation, particularly the use of ICT to reduce staff contact hours and improve learning.

6 Professor Wolf is not alone in recognising the current limitations of the FE system. In 2006, the Foster Report on Skills called for a simplification of the funding, accountability, quality assurance and qualifications systems. In 2010, the UK Commission for Employment and Skills called for FE colleges to be freed up to engage better with employers as a key part of a 'strategic, agile and labour-market-led FE system', so that the country could be better served by its colleges.

7 The focus of colleges tends to be on the short-term rather than the strategic: the current funding cuts provide the latest example. In two recent reports ("Preparing Colleges for the Future" and "Doing More for Less") the 157 group of larger colleges focus attention on structures, business models, efficiencies and partnerships to address market forces better. This is institutional thinking: the response to austerity being to think in terms of acquisitions, mergers, shared services, procurement systems and leaner management structures, rather than developing partners, markets, products and services to meet customer needs.

8 This is perhaps another illustration of the 'perverse incentive' at play. The paradox of the 'market' in FE is that the Government becomes the customer, the drive is to secure funding and pass Ofsted and the consequence is that things like the crisis in STEM persist: in the 2010 report, Ofsted identified science and mathematics as the 'least positively inspected area' and numbers are declining.

9 An equally important concern is the 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 imaginatively with employers on innovative projects concerned with skills and training. 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 which they work. This can take the form of work-experience placements, training contracts, business services and so on.

10 Many of these interactions are viewed very highly by employers and reflected in repeat business. However, there remains criticism from employers' groups that the FE system is too complex and too unresponsive to meet the needs of commerce.

11 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 labour market-led'.

12 This is partly at least due to the sort of 'perverse incentives' identified in the Wolf Report and the associated culture of short-term initiatives, short-term funding horizons and the short-term focus on skills needs. It is this culture that causes colleges to 'follow the (public) money' and to respond only to immediate employer needs. It is the changing pattern of expectation over who pays for what and how – which also varies in the short-term – which inhibits proper planning.

13 The result of this can be illustrated in the current arrangements with Job Centre Plus (JCP) and the challenge to support unemployed people back into jobs; and in the advent of new market enterprise in regional economic support in the shape of Local Enterprise Partnerships (LEPs).

14 In the case of JCP, there is a belief that colleges cannot respond to immediate needs of the unemployed with 'roll on, roll off' training; in the case of LEPs, there is a view that skills are important but colleges aren't really on their radar. This may have its roots in perceptions as much as in realities. The point is that colleges should be central to generating individual advance and economic prosperity, but key agencies do not recognise this role for colleges.

15 The need to make progress here is acute: the world is not waiting for the UK to catch up with the pace of change in economic order. The growth in Asian economic power and the demand for quality of life in the West drive the inevitable conclusion that it is only by manufacturing high value-added goods and services that the Western economies can have any hope of sustaining their place in the world. This is accentuated by the need to do so in a way that is good for the environment and in keeping with the freedoms and rights of democracy.

16 In almost any avenue of work, whether in exportable goods or in the supply of domestic services, from selling coffee to making aeroplane engines, from fixing plumbing to investment banking, there is a greater need than ever for higher level skills in the domestic workforce. The country needs to compete and win in its economic activities: it needs the right supply of skills, training and qualities in the workforce and it needs new entrepreneurs. Colleges are a make or break link in the chain of events that will generate the future we seek. Colleges need to compete with success. How can they do it?

"Every innovation has a black swan – the moment when traditional assumptions are redefined."

– Nassim Nicholas Taleb, author

Oxford University,
New York University Polytechnic Institute,
Principal, Universa Investments

2. TOWARDS THE INTELLIGENT COLLEGE

17 There is a recognition that colleges can change for the better if they are encouraged and enabled to change for the better.

This is expressed in policy and guidance through the influence of major reports such as the Foster Review, the Leitch Report, the Wolf Report and the determination of the current Government to 'free up' colleges so they can achieve more. It is also reflected in research papers from LSN, CfBT and position papers from the AoC and other college representative groups. Most recently, two publications have sharpened the focus: the RSA's "2020: The further education and skills sector in 2020: a social productivity approach"; and Fintan Donohue et al: "Entrepreneurial Colleges".

18 The RSA 2020 paper, sponsored by LSIS, draws out the need for colleges to operate as drivers for social-economic value and hubs for service integration; where further education serves the needs of learners through being a creative partner in local growth and service reform. Based on the idea of 'social productivity' that requires proactive colleges to:

- be hubs for entrepreneurs;
- collaborate;
- work with LEPs;
- meet needs;
- foster integration; and
- provide flexible learning.

In this way they can incubate social value, drive public service integration, create platforms for learning, network local growth and re-set citizen engagement.

19 The work on Entrepreneurial Colleges sketches a vision for colleges operating in a very much refreshed way, in some ways a radical departure from today, through colleges becoming places that encourage entrepreneurs and take an entrepreneurial approach to their own futures, requiring:

- enterprising staff and approaches to teaching and learning;
- permeating the curriculum with opportunities that encourage entrepreneurs; and
- new entities that align innovation, curriculum, technology and growth.

20 This all serves to encourage the view that the foremost experts and commentators on the future of further education colleges, the politicians who shape the destiny of the system and the key players in industry and communities who demand their goods are united in some powerful views, that:

- colleges matter tremendously to all our futures;
- colleges can provide far more enterprising responses to this need; and
- this requires a new approach to the leadership, purpose and culture of colleges.

..and that is where the Intelligent College comes in.

3. WHAT IS THE INTELLIGENT COLLEGE?

The Golden Thread: Innovation

21 Innovation is a process by which value is created for customers through public and private organisations that transform new knowledge and technologies into profitable products and services for national and global markets.

A high rate of innovation in turn contributes to more intellectual capital, market creation, economic growth, job creation, wealth, and higher standard of living. Innovation is best viewed as an ecosystem of relationships, connections and diverse patterns interacting amongst individuals, colleges and their stakeholders. It is a complex process in which new knowledge eventually becomes embedded into new programmes, products, services, processes and business models that create value.

22 The emphasis on the mission of colleges for generating enterprise and social welfare should create fresh impetus for innovation and a concentration on the impacts of colleges for the communities they serve. It is even possible that austerity itself will come to be seen as the mother of invention.

23 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 national initiatives to colleges creating the future through the dynamism of horizon-scanning, enterprise, knowledge exchange and civic leadership.

24 At the heart of the Intelligent College is the 'golden thread' of innovation, the capacity to:

- translate that into culture, planning, curriculum, teaching and learning;
- generate the market for new qualifications and skills;
- devise partnerships with employers and other civic leaders to promote this new way of working.

This means moving colleges towards the top right-hand part of the diagram below.

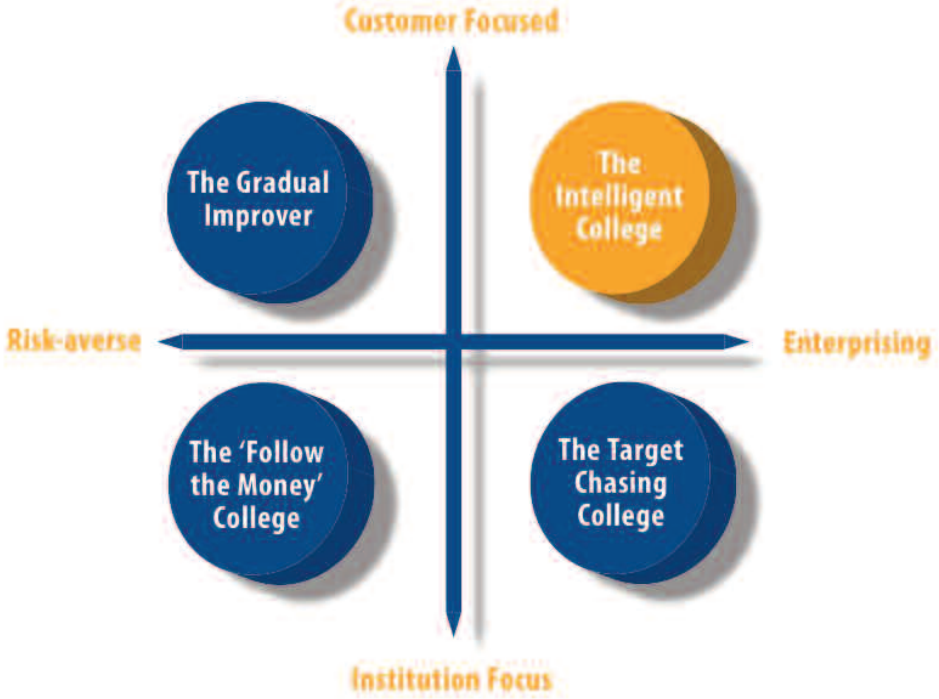


Diagram 1
The golden thread of innovation is the heart of the Intelligent College

4. HOW WILL THIS INNOVATIVE APPROACH WORK?

> *"The Intelligent College is doing exactly what is needed"*
>
> – Peter Roberts, Walsall College

25 Running a college to generate real prosperity requires six key features:

- Enterprising **staff** who are innovative knowledge-transfer professionals;
- Customer-focused **leaders** who foster a learning culture throughout the organisation and stimulate innovation;
- **Horizon-scanning** and knowledge exchange that aims to support planning and add value to the education offer;
- Enterprise in realising the **asset value** of colleges;
- Technologies that capitalise on **digital opportunities**; and
- **Civic leadership** to deliver a moral purpose.

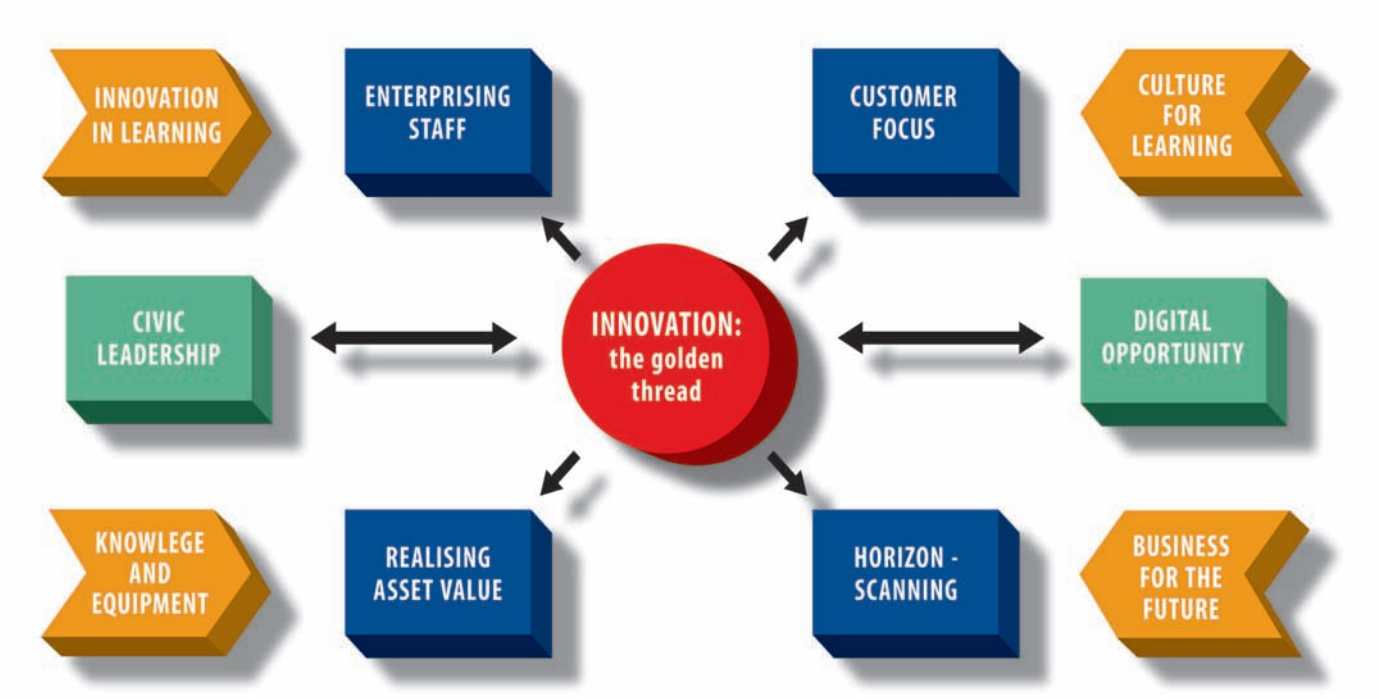


Diagram 2: Features of the Intelligent College
Creating new opportunities, inventing new futures

"We need to attract high quality staff … and the Intelligent College approach could help this happen."

– Finola Fitzgerald, Carshalton College

5. STAFF

Enterprising staff who are innovative knowledge-transfer professionals

26 The cornerstone of the Intelligent College is the quality of teaching and learning. High quality teaching and learning challenges people to think, experiment and create, inspires ambition and encourages people to learn for themselves.

Repeatedly, leaders in colleges and in their stakeholder organisations cite the key aim for colleges is to produce good thinkers, more able to apply their skills and intelligence. In Finland, they define the aim of education as being to 'inculcate ingenuity': it is a good definition of the aim for the Intelligent College.

27 One of the benefits of colleges as places for learning is that there is greater scope for people to choose a course appropriate to their needs, abilities and ambitions than is the case with schools. Indeed there is alarm amongst those with an interest in the value of colleges about the narrowing focus of school education to the detriment of vocational education: this looks more like something to sink into than to positively seek out.

28 However, the advantage of applying intelligence to choice of course is easily lost if the course leads nowhere, or the contents of the course – knowledge, experience, skills, learning – are of limited value, restricted by

an undue emphasis on the cohort, the pace of the course and the final assessment, as opposed to the individual learners, the excitement of learning and the inherent value of the learning.

29 The Intelligent College will succeed only with an intelligent approach to teaching and learning, following the logic of 'teach less, learn more'. This is the focus of enterprise and innovation in teaching and learning that asks how much, how fast and how well people are learning rather than how fast and how well the teacher is covering the syllabus. It is the key to making best use of the time people spend in classes, workshops, laboratories and so on. A session in which little is learned and enthusiasm for learning is diminished is a waste of time; a session that engages people in learning is great value for time and transfers the power for progress to the learner.

30 Of course, the approach to effective learning opens up new ways of using technology. This approach will start from what needs to be learned and tailor teaching and learning accordingly, blending instruction, demonstration and explanation with practical application, online learning and a variety of techniques that stimulate thought and develop skills. The Intelligent College will be a place where emphasis is placed on supporting individual learning through wise use of well-supported e-learning, inside and outside the college.

6. LEADERS

"The Intelligent College looks like what is needed: colleges need to engage with industry."

– Jessica Auton, Managing Director, Aseptika Ltd

Customer-focused leaders who foster a learning culture throughout the organisation and stimulate innovation

31 There are two big challenges in encouraging staff to become more enterprising and innovative:

- Is learning the key to our college culture?
- Where is the time to do it and what about the risks?

32 Innovative practice comes from learning – not least from customers and from colleagues. This requires a culture for learning in which ideas for improvement are constantly sought and applied, where the voice of the customer is routinely used at the end of each session to add to this learning, and where the key to success in the college is to be seen to be learning – including all from the least-paid employee to the CEO and Board. The Intelligent College will foster such a culture.

33 This is important because leaders set the tone in organisations. A tone that says, for example, 'watch your back', 'we are in crisis', 'it's all about the money', will not inspire the essential upward flow of good ideas that nourishes continuous improvement over the medium term. By contrast, a tone that says 'great leaders are great learners' will do a lot to encourage success.

34 This is the key to finding the time to generate enterprise and innovation. Setting the tone

that encourages flexible structures and new delivery modes supports provision that goes beyond the traditional view of teaching and learning happening only within a timetabled session, in a classroom, constrained by a qualification, and delivered by a lecturer. It also requires a good means of sharing knowledge about effective innovation across the organisation.

35 The main driver for the Intelligent College is to respond to the needs of customers: it must be a place where students, employers, individuals and communities feel centre stage. This is a basic part of a learning culture. It means that the Intelligent College will be constantly aware of individual, employer and community needs and will be creating opportunities and structures that meet these needs. Setting the tone that encourages flexible structures and new delivery modes supports provision that goes beyond the traditional view of teaching and learning happening only within a timetabled session, in a classroom, constrained by a qualification, and delivered by a lecturer. It will not be afraid to stop doing what is not needed, to let others do what the Intelligent College cannot do well, or to change its range of services to meet new needs.

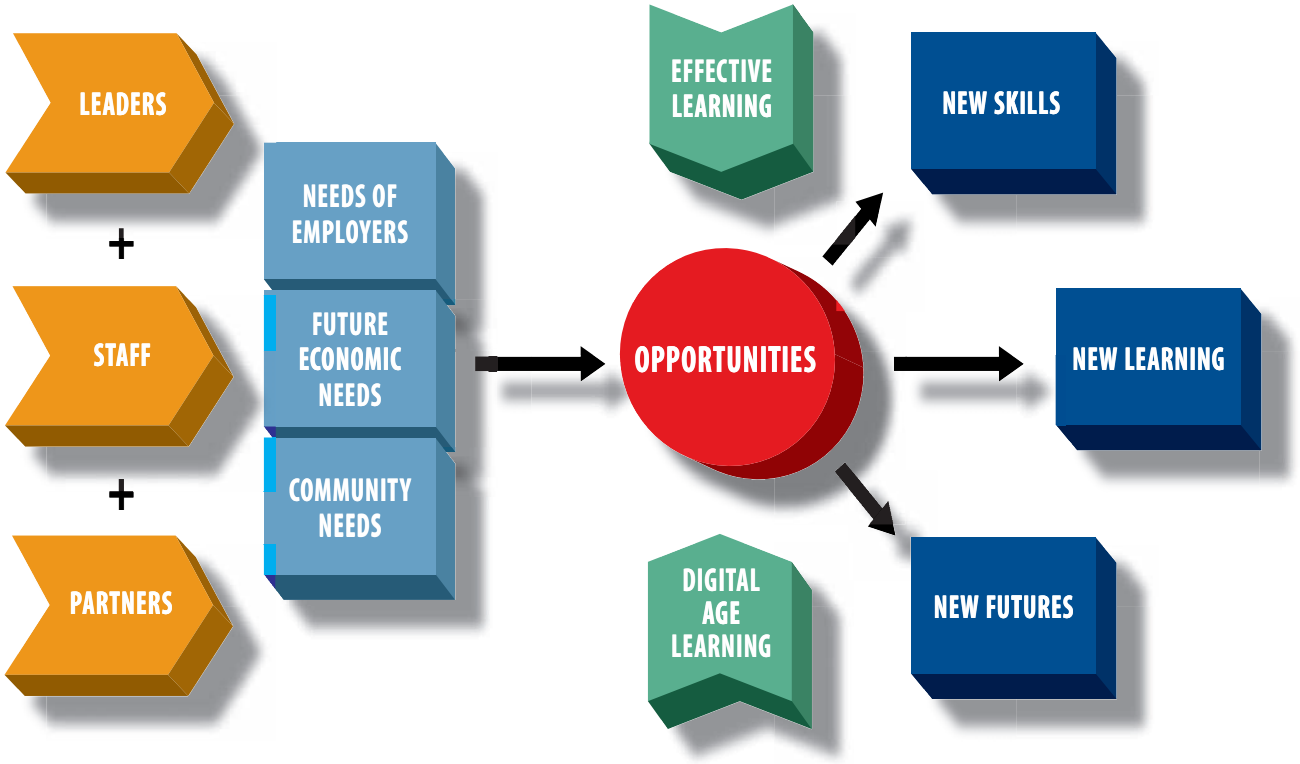


Diagram 3
Driving the Intelligent College through identification of opportunities

7 HORIZON-SCANNING AND KNOWLEDGE EXCHANGE

Horizon-scanning and knowledge exchange that aims to support planning and add value to the education offer

36 What customers can tell companies is how well they are doing, what to do, what not to do. This also applies to colleges. However, as with the most ground-breaking of companies, there is also a role for the Intelligent College to help shape demand for future prosperity.

37 Inherently, colleges have been required to respond to large quantities of labour market data that was typically hard to digest at source level, not a great deal of use at aggregate level and in any case subject to the prime deficiency that it told a lot about the past and little about the future.

38 The future is a hard place to be, planning-wise, but it is nevertheless very important to have an idea of its characteristics. There are some obvious global drivers – climate change, population growth, food supply pressures, the shift of economic power to Asia, declining oil and gas supplies, the mobility of demand for labour and the digital revolution.

39 The inevitable consequences for the UK include the need to generate economic growth through a 'knowledge economy', to rely less on finance and retail sectors for employment, to generate more sustainable energy, to nourish high-value manufacturing

and service industries and to cope with a rising, ageing population with limited land and the demand for higher-value services from plumbing to healthcare.

40 The Intelligent College needs to operate with these broad factors and to do two things:

- understand the employer base they serve and the industries these represent and the way these industries are changing;
- understand the demand for future industries and the possibilities for their location.

41 The first of these leads the Intelligent College to provide a 'horizon-scanning' service for its local employer base, particularly though not exclusively, SMEs: what is happening in these industries that will require change for tomorrow?

42 The second element means the Intelligent College will be working with major employers, research establishments, including universities, and local authorities to generate new enterprise. The value both these activities add is to do more than simply respond to existing employer demand for training: it is to see the future coming and to plan for new enterprise.

8 ENTERPRISE IN REALISING THE ASSET POTENTIAL OF THE COLLEGE

"The Intelligent College is something new that has got a future – engaging, proactive not reactive."

– John Devine,
City of Westminster College

Enterprise in realising the asset value of colleges

43 Innovation must also mean re-inventing the college, going beyond the institutional concern with size, structure, acquisition, efficiency, to realise the true value of the college in terms of its asset base: knowledge, space, equipment and Unique Selling Propositions (USPs).

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

45 And then there are the physical assets – learning space, equipment, access to internet resources. Colleges can turn these assets to 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 indispensible first-choice partner to employers and entrepreneurs.

46 A major part of this way of working is for The Intelligent College to work with local SMEs on product and service design, to provide access to knowledge about the key trends in the sectors of these SMEs and to

build partnerships between local and national employers. For example, an Intelligent College may be helping supplier companies in low carbon industries to design and develop new products and they will measure success in terms of Net Present Value per product to the SME. At the same time, the Intelligent College will know what major national employers need. Currently, this is project managers to install new wind farms. The Intelligent College will then work with national employers to meet this need which may well have advantages for local SMEs and for local people.

47 If we take the advent of Local Enterprise Partnerships (LEPs), the role of colleges, according to recent research, is seen by the LEPs as simply delivery agents, not strategic partners. There is a risk that the debate about LEPs and colleges becomes a simple one about membership of LEP boards and / or a rush to access any cash that may be available for new projects. However, the Intelligent College will:

- realise the potential of its resources and equipment to assist entrepreneurs to develop new products and to assist SMEs with product research and design;
- provide business development services for entrepreneurs and SMEs;
- be partners in economic planning: contributing to strategy and identifying new opportunities for economic growth.

48 The Intelligent College will innovate in this way and will work with employers to generate prosperity and provide the skills needed for the emerging economy. This is critical to STEM industries. These are the industries of Britain's future: high-value engineering, pharmaceuticals, low carbon technologies. They need a good supply of skills of the right kind in the right place at the right time. Intelligent Colleges will have the horizon-scanning facilities to know what this means and to meet the need, using their assets to work with industry partners to research, design and develop training and related business services.

9 CAPITALISING ON OPPORTUNITIES OF THE DIGITAL AGE

Technologies that capitalise on digital opportunities

49 Technological progress transforms the way we work, socialise, live and learn. The rapid advance of information and communications technologies (ICT) is a major and increasingly important part of this pattern.

Across the world, education seeks to adapt ICT to make improvements. This is particularly important in colleges – with their vital mission for social welfare, economic prosperity and skilled individuals.

50 The rapid pace of change is faster than the capacity of education systems to respond. It is becoming increasingly important to focus on new ways of working with customers – individuals and employers – in meeting their needs. This means not just working on how to use ICT to make improved learning – but also to develop the potential of ICT to open up new services and modes of delivery.

51 The future will be an increasingly collaborative one – in economic terms as between sectors and actors; in social terms as with networks and knowledge flows; and in individual terms. The advance in ICT that brings us the social network, cloud computing, mobility and access creates the 'me-centred' world and this is perhaps the key relationship: the individual with information, people, places, opportunities.

52 This paints a picture of a world in which we will need to transform the teaching and learning environment, enabling workforce development and creating flexible workspace and place to use / exploit new technologies to their maximum advantage for both individuals and employers.

53 Across most business functions – R and D, design, production, marketing, sales, growth, corporate services – there is a productive relationship to be had for an employer with the Intelligent College – a college prepared to act entrepreneurially, responding to customer needs and helping to create demand. Business faces the same challenges as colleges in keeping up with new technologies and the possibilities these create. The Intelligent College will realise the potential of ICT for creating new ways of learning and working with employers.

54 To do this well and to be of real value to generating enterprise, the Intelligent College will need staff who:

- understand how ICT resources are developing;
- can see how this means they can change the way they do things;
- employ practices that work for customers;
- invent the future for their customers, capitalising on their assets (HR and physical);
- trust each other and have the resources to encourage and implement change.

55 The Intelligent College will act on some key propositions in capitalising on the opportunities of the digital age:

- tomorrow's world starts now – the key industries for the UK are emerging in creative digital technology, low-carbon economics and systems, advanced manufacturing and high value-added services: these demand a major shift in the focus of teaching and learning and in the business orientation of colleges;
- the purpose and value of colleges need to align with the role of colleges as engines for socio-economic advance, moving on from an era of the dominance of output measures for colleges as businesses in themselves;
- college leaders need to focus more on the needs of their communities for prosperity and wellbeing and work on how the college can help create this;
- the 'time-lag' between socio-economic innovation and education should be reduced and requires new ventures, new partnership and new perspectives about colleges in their relationship with the economy and the community.

10 CIVIC LEADERSHIP

Civic leadership to deliver a moral purpose

56 The challenge for leaders of the Intelligent College is to become major players in civic leadership. Professor John Benington at Warwick University, in a study of the way public services have been run by Governments since World War II, sets out the comparison thus:

	TRADITIONAL Post-war UK	NEW PUBLIC MANAGEMENT 1970s - Present	NETWORKED COMMUNITY GOVERNANCE Future Outlook
CONTEXT	Stable	Competitive	Changing
POPULATION	Homogeneous	Atomised	Diverse
NEEDS	Authorities	Markets	Complex
STRATEGY	State	Market	Civil society
GOVERNANCE	Hierarchies	Markets	Networks
REGULATION	Voice	Exit	Loyalty
ACTORS	Public servants	Provider - user	Civic leaders
THEORY	Public goods	Public choice	Public value

Table 1
Looking to the future – the new leadership paradigm. (John Bennington, 2009)

"The impact of this thinking is to suggest that, though it in some respects seems very much the dominant process still, 'new public management', through which the market is intended to make services improve, either hasn't really done what it was intended to do, or hasn't really been given the chance – depending where you stand. It is time for a new way of doing things and that is 'Networked Community Governance'."

57 The idea chimes with at least some of the gathering momentum for localism, the removal of regional government and the concept of 'Big Society'. The model is based in what is beginning to happen across western democracies – the devolution of power back to more local levels; the importance of partnerships combining to deliver better services; the response to 'targets culture'. What it says about the future is that, for any better system to work, there have to be capable 'civic leaders' operating at the local level.

58 Such leaders face the challenges posed by resource-allocation by being very clear about purpose and being determined to serve the public as well as possible. The public wants safer cities, stronger communities, better jobs, brighter futures – and they expect their taxes to pay for this to happen. Leaders of organisations providing services to the public place the highest priority on quality of service and meeting these needs. Institutional advancement is the consequence of acting in this way – not the primary cause. This is to deal with the pressure for institutional self-interest by placing the customer for services first.

59 This is demanding. But it is necessary for better quality colleges, and the Intelligent College will rise to the challenge. The main character of this challenge is to determine direction, provide structure for decisions and encourage professional expertise in other organisations to help achieve the aims of better services.

60 A principle of leadership is directing to a greater purpose – a moral purpose. In the case of the Intelligent College, this moral purpose is connecting success with engaging people and their skills and capabilities with work, enterprise and new business opportunities.

61 In particular with the case of STEM, the Intelligent College can promote social enterprise, linking sustainability and green technologies. The links are all the more powerful in view of the high priority placed on these technologies for our economic future and our environmental needs. It is not surprising to learn that most LEPs identify these technologies and the associated industries as one of the keys to creating new jobs.

11 AN INNOVATION ECOSYSTEM FOR SKILLS DEVELOPMENT

"Technological innovation is about combining many technologies, not incremental enhancements on each."

– Brian Arthur, Santa Fe Institute

62 Bringing together these elements of the Intelligent College creates the basis for an 'ecosystem for skills development'.

This means that each element is capable of reinforcing the impacts of each other element in the system. It also means that no one element is too dominant and that each element is necessary.

63 People drive the ecosystem: staff and leaders of colleges. By taking the Intelligent College approach these people will be constantly in search of better ways to innovate, connect with local and regional immediate and future skills demand and generate new partnerships with employers based on a variety of activities beyond training.

64 In this way the Intelligent College becomes the hub of the system, driving forward enterprise with well-informed horizon-scanning that draws key partners into the work and creates a sense of responsive joint ownership of skills development, 'skills' in the broad and specific meanings. This will include being a catalyst for putting together ideas from different sources; for uniting trends in different technologies; and bringing people together to define the skills needed to make new developments work.

65 Ecosystems develop over time: proper civic leadership will keep them well-managed and responsive to all needs, avoiding the dominance of the needs of one player or another. They also thrive in making these responses to local conditions, free to do so in the most beneficial way.

"Today's unimaginable is tomorrow's conventional wisdom."

– Vinod Khosla, entrepreneur

12 DOES THE EXISTING SYSTEM HAVE TO CHANGE?

66 One of the most obvious encouragements for developing the Intelligent College is that examples of each aspect of the essential features form the basis for the proposition. Ergo, it can be done under the current system. The operative word being, 'can'.

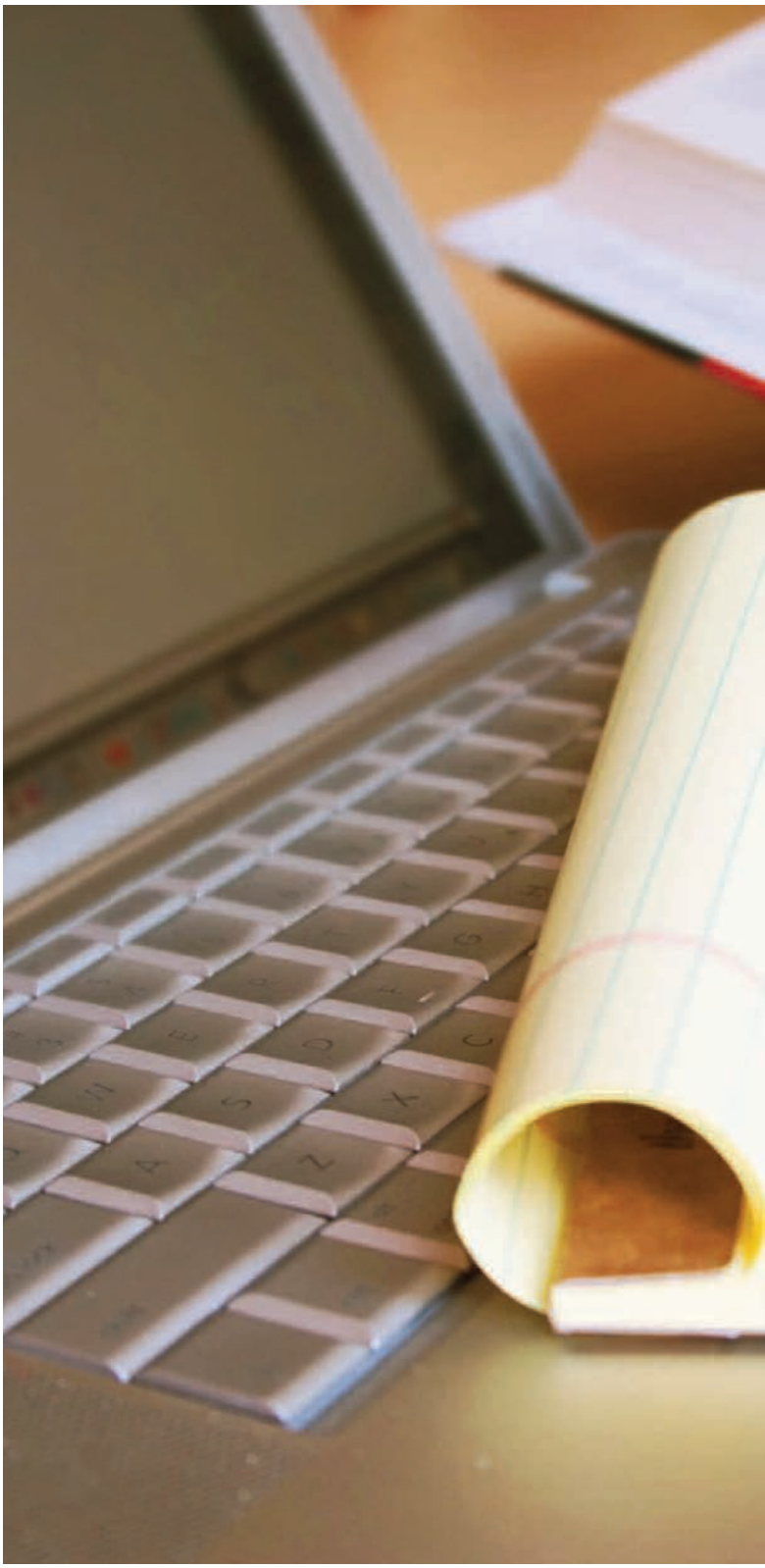
67 This paper is primarily about defining the Intelligent College so that we can be clear both what it is and how people can create it. But there are some important features of the systems in which colleges operate that could be changed to make the Intelligent College less of a struggle with external forces and more of an encouraged quest for excellence.

68 The key areas for attention are:

- Rules governing public funding – and the constraints on innovation
- The adverse consequences of inspection – risk aversion and compliance
- Curriculum and qualifications – quality over quantity

"We need to 'lean out' the processes under which we operate, freeing up curriculum staff to do their basic job, rather than see creativity stifled by bureaucracy."

– Jenny Bubb,
University of Chester



13 RULES GOVERNING PUBLIC FUNDING

And the constraints on innovation

69 The big change that will drive Government reforms for the coming years is the advent of a real market in the supply of skills. No longer is the Government expected to pay, via initiatives like Train to Gain.

Instead, what is anticipated is real people spending real money and demanding real quality – not just the *route one,* least-cost route for suppliers. Colleges are in a new and different market. The Intelligent College will embrace this and advance in a new partnership with employers.

70 What must support this is a new approach to national management of the FE system. Colleges need to enjoy the freedoms, identified by the Wolf Report, to use their resources far more flexibly to meet employer needs and to be held to account for the impacts they have. This requires a major shift from measuring volumes and auditing processes to championing (and only buying) quality and assessing outcomes.

71 It is a big demand, moving away from micro-managed targets and funding / audit systems that subtly but decisively drive institutions to think of their own short-term needs ahead of their real customers' needs and priorities. It is not certain it can or will happen. But it really is essential: the Intelligent College will thrive in an intelligent

system; without one, we will go on seeing glimpses of what could be, but never the real thing.

72 The necessary change is as much about the details as about the big picture. It is no good proclaiming new freedoms from micromanagement for colleges when we still have auditors demanding evidence of threshold hours of learning to qualify for funding. So long as we have to have students in class for prescribed hours we will have limited flexibly to extract full value from new technology to support better learning.

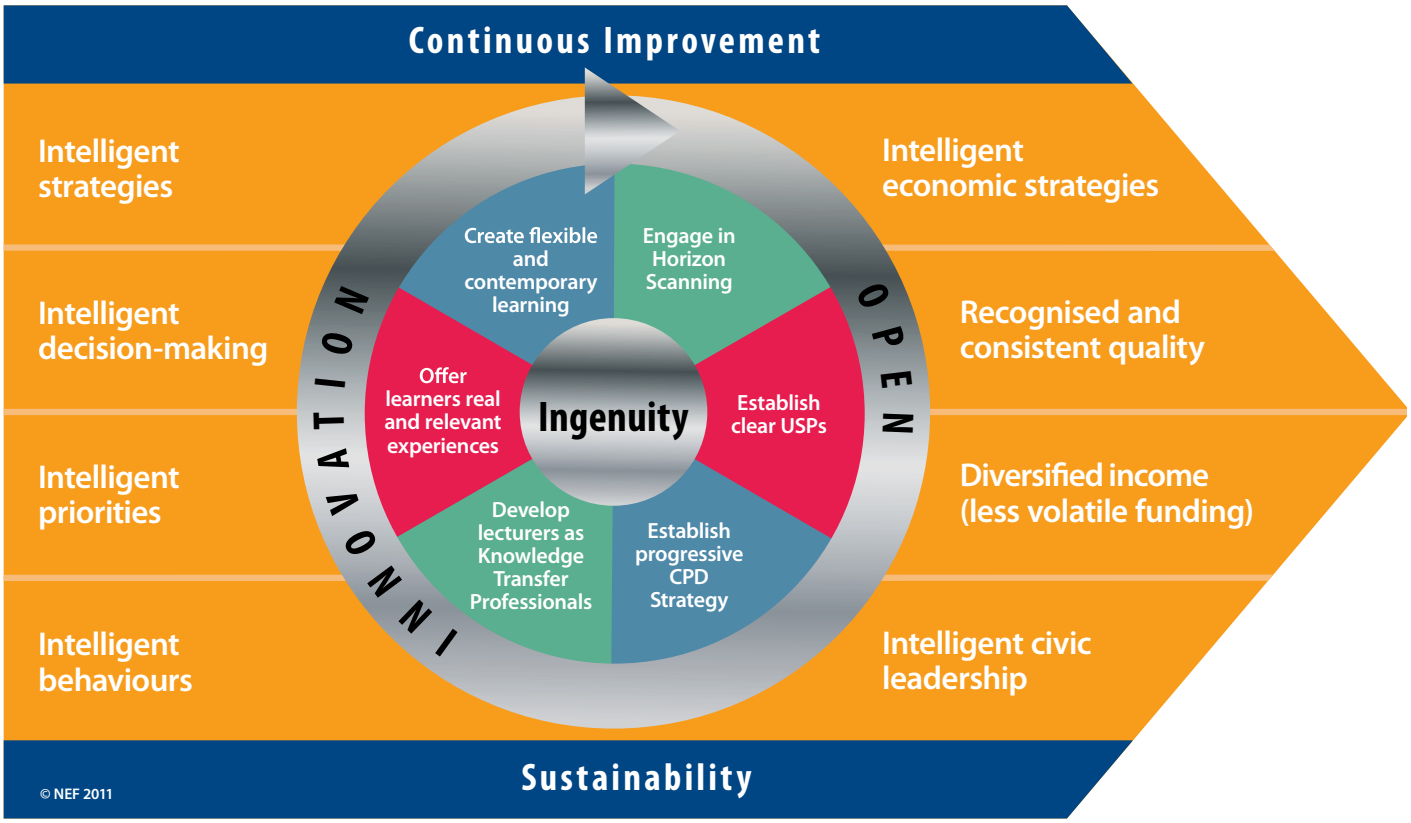
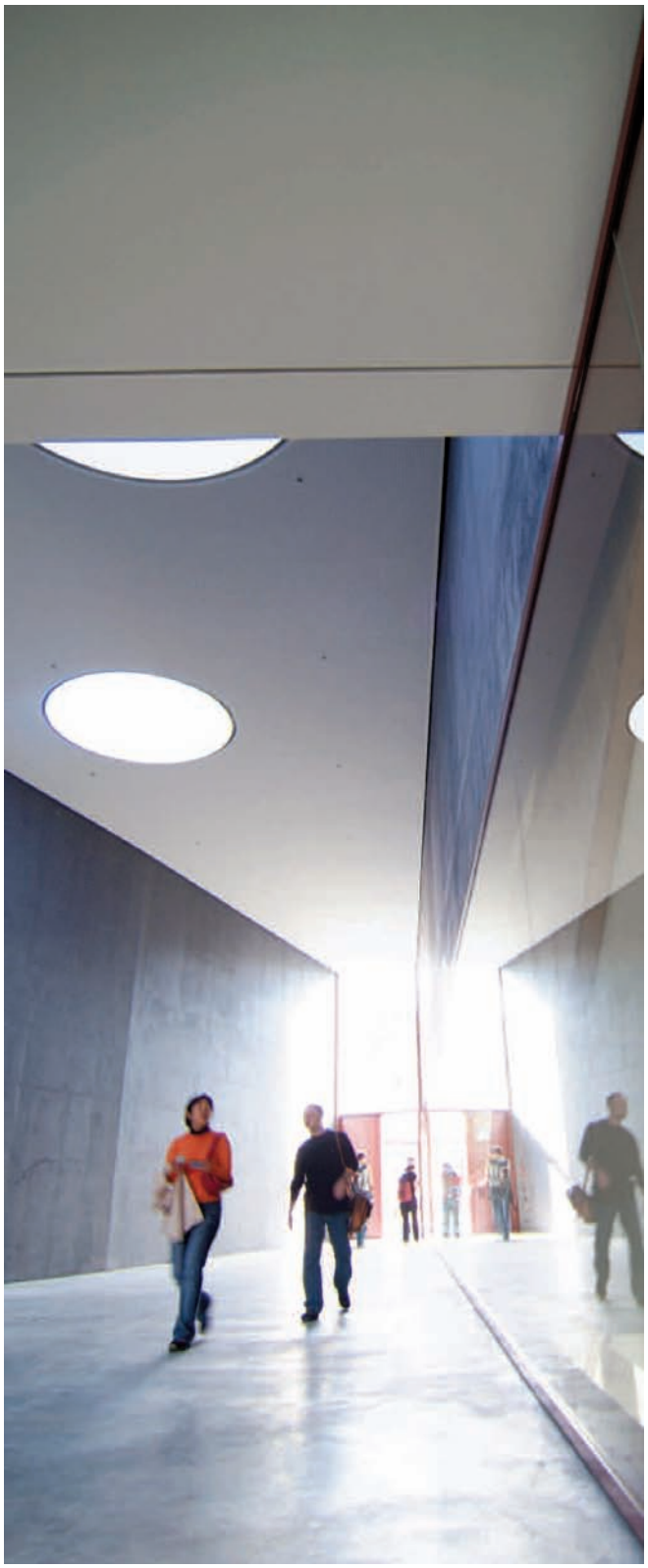


Diagram 4
The Intelligent College Paradigm

14 THE ADVERSE CONSEQUENCES OF INSPECTION



Risk-aversion and compliance

73 One of the main legacies of the incorporation era has been the culture of compliance built upon the collection of data.

The origins of this are in the seventeen year quest for a funding methodology that is fair and therefore reflects the diverse costs of providing the full range of courses available in FE; and, in the equally long-lasting creation of inspection and quality assurance systems that have generated huge quantities of data to prove quality – diverting the same effort from improving quality.

74 The current regime for quality assurance and inspection is one based on processes rather than outcomes. For example, quality assurance systems in colleges generate huge amounts of data about every aspect of the learner journey from enrolment to completion and progression. They use a significant amount of resource and generate huge self-assessment reports. They tend to address the question 'how are we performing' rather than 'what are we achieving'? Because they are so reliant on quantified data, they are open to manipulation and leave colleges susceptible to 'hitting the target and missing the point'.

75 College leaders would welcome significant change here to an approach based on outcomes that reduces the burden of proving that processes are in good order and uses far fewer, and different, KPIs (key performance indicators) to measure outcomes. There is a

clear distinction to be made between what managers need to know to improve business performance and what the external audience needs to know.

76 The mistake of the Further Education Funding Council for England (FEFC) and Learning Skills Council (LSC) years has been to assume that making the internal management information the basis for externally required information would make things simpler – colleges would just provide what they had anyway. This is a profound error. The greater value appears to be placed on the information the more the data industry grows, multiplying the resource used to gather, provide, check, (at times amend) and publish data.

77 So what data is needed if we were to shift from a process model based on management information to an outcomes model based on impacts? It would mean an overhaul of the remit and focus of Ofsted – losing the straight jacket of outstanding, good, satisfactory and inadequate with respect to planning would be a start. The need is for inspection to be capable of understanding and assessing impacts of colleges and the extent to which they are meeting socio-economic needs.

15 CURRICULUM AND QUALIFICATIONS

"Too often we talk about these things but nothing changes. For the Intelligent College to work we need to show staff what to do and enable them to do it."

– Mark Dawe, Chief Executive, OCR

Quality over quantity

78 The Intelligent College must operate an intelligent curriculum that seeks to provide excellence in experience, in generating expertise, in inculcating ingenuity and in making sure that qualifications are to be taken as real indicators of achievement and ability by employers and others.

79 One of the main 'perverse incentives' of 'new public management' in colleges has been the restless pursuit of increased success rates and the associated tail of assessment wagging the curriculum dog. The curriculum itself has seen some curtailing; qualifications are taught 'to the test'. The practice of 'assess-assess-assess' has inhibited progress, particularly around work-based learning which is reliant on assessing skills in the workplace. The idea is to make it much more 'assess-train-assess'.

80 These problems may be a consequence of limited resources, but it is also a consequence of limited ambition and the need for greater enterprise in teaching and learning. The Intelligent College needs to grasp the challenges of making the intentions of well-thought out qualifications transfer into the experiences of those who take them.

81 Operating in this way, and with a new and

better set of impact measures for colleges, there is much to be achieved. However, the curriculum could also be greatly improved by expecting colleges to play a stronger part in devising and awarding qualifications to suit the needs of employers and of the employee – who will need to use the qualification in a variety of contexts.

16 THE NEW PARADIGM FOR FE

82 The new paradigm for Further Education is for institutions to operate in a market with a reduced array of constraints on the way they can do this. The objective is to provide enhanced value for money in creating better services for people, employers and communities.

83 The Intelligent College embodies the spirit of these intentions in a series of steps that can be taken by any college from its own starting point. These steps, (taken in the context of the features set out in Annex A) are:

- decide to become an Intelligent College;
- understand the current position of the college in the context of the requirements for the Intelligent College: this can be done in many ways; the STEM Assured and NEF Diamond processes are geared to achieving this;
- work with governors, leadership team, staff and stakeholders to design plans to deliver:
  - the college definition of customer focus and the college plans to deliver it in full;
  - staff who are enterprising, innovative knowledge-transfer professionals;
  - structures that support flexible delivery modes and a culture for learning and innovation.
- work with stakeholders and partners to design the college's horizon-scanning and asset-realising processes;
- design the plan to capitalise on opportunities of the digital age.

ANNEX A: STEPS TOWARDS THE INTELLIGENT COLLEGE

INNOVATION

Establish a customer focus and identify clear USPs	• Expertise and disciplines • Capability to deliver (people, processes, and infrastructure) • Markets & trends
Engage in horizon scanning	• Products & services • Emerging technologies • Competition
Establish a progressive CPD strategy	• Secondments to industry • Reflect business context in teaching & learning • New learning technologies (learning space)
Develop lecturers as knowledge transfer professionals	• Source of solutions • Engage in applied research • Respond to employers • Embrace innovation (design, delivery, engagements etc)
Offer real & relevant experience	• Inventive and exciting • Inquiry based & progressive • Learner centric & personalised
Enable flexible & contemporary learning	• Delivery modes • Clever use of technology • Collaborative & cross-curricular
Ensure recognised quality	• Not just inspection scoring! • Consistency in practice • Impact – increased employer, learner and community confidence
Become not reliant on state funding	• Diversified sources of income • Smarter use of assets • Vision beyond the local catchment

Embracing sustainability and low carbon ethos and practice

ANNEX B: Think Tank Delegates

Name	Organisation
Ms Jessica Auton	Aseptika
Ms Denise Brown-Sackey	Newham College of Further Education
Ms Jenny Bubb	University of Chester
Mr Jim Clifford	Baker Tilly
Ms Lorraine Collins	Uxbridge College
Ms Judith Compton	UK Commission for Employment and Skills
Mr Stephen Criddle	South Devon College
Ms Dympna Cunnane	London Business School
Mr Mark Dawe	OCR
Mr John Devine	City of Westminster College
Mr Lambert Dopping-Hepenstal	BAE Systems
Mr Terry Dowsett	BAM Nuttall
Mr Philip Ellaway	City & Guilds
Ms Finola Fitzgerald	Carshalton College
Ms Carol Harris	Edwards
Mr David Hughes	E.ON UK
Mr Tim Hulme	Ealing, Hammersmith & West London College
Mr Gareth Humphreys MBE	MBDA Missile Systems
Mr Richard Jarrald	City College Norwich
Mr Alex Kinder	Laing O'Rourke
Mr Andrew Kinsey	Bovis Lend Lease
Ms Jean Llewellyn OBE	National Skills Academy – Nuclear
Ms Jacqui Mace	Stanmore College
Mr David Martin	Arriva Plc
Dr Elaine McMahon	Hull College
Prof. Sa'ad Medhat	NEF
Mr Alan Mitchelson	The Weir Group
Mr Tony Moloney	National Grid
Mr Jamie Moss	NEF
Mr Jim Mutton	Loughborough College
Dr Sarah Peers	NEF
Mr Mike Pilbeam	Cisco
Mr Noorzaman Rashid	Harvey Nash
Mr Peter Roberts	Walsall College
Ms Melanie Saunders	Hampshire County Council
Mr Steve Smith	EDF Energy
Ms Wendy Stevens	Birmingham Metropolitan College
Mr Andy Thomas	Oxford and Cherwell Valley College
Mr Andrew Thomson	NEF
Mr Richard Thorold	Gateshead College
Mr Markos Tiris	LSIS
Mr George Trow	Doncaster College
Mr Nick Tyson	Deeside College
Mr Daniel Wainwright	NEF
Mr Peter Webb	MidKent College
Mr Simon Whittemore	JISC
Dr Ann Williams OBE	West Suffolk College

ANNEX C: NEF Advisory Panel Members

Name	Organisation
Ms Jessica Auton	Aseptika
Mr David Bonser	Formerly of Westinghouse
Ms Angela Borman	Siemens UK
Dr Rosie Bryson	BASF Plc
Mr Bob Busby	OFSTED
Dr Terry Butland	Middlesex University
Mr Robert Butler	Marshall Aerospace
Ms Lindsay Chapman	National Physical Laboratory
Dr John Chudley	National Apprenticeship Service
Ms Judith Compton	UK Commission for Employment & Skills
Ms Hazel Elderkin	Unilever UK
Mr Neil Fowkes	Rolls-Royce Plc
Prof. Ken Grattan	City University London
Prof. Alison Halstead	Aston University
Mr David Hughes	E.ON UK
Mr Tony Iles	Atkins Global
Mr Andrew Jones	BBC Eng & Tech Operations
Mr Richard Marsh	National Apprenticeship Service
Mr Tony Moloney	National Grid
Ms Rachel Muckle	Department for Environment, Food and Rural Affairs
Mr Andy Palmer	BT
Ms Maggie Philbin	BBC
Dr Allyson Reed	Technology Strategy Board
Mr Phil Romain	OFSTED
Dr Graham Ruecroft	Prosonix Ltd
Mr Graham Schuhmacher	Rolls-Royce Plc
Mr Iain Smith	London Underground Ltd
Mr Nigel Thomas	Gatsby Charitable Foundation
Ms Jo Tipa	National Skills Academy – Nuclear
Mr Stephen Uden	Microsoft
Mr Methilan Vivekanandarajah	Department of Energy and Climate Change
Dr John Williams	Gatsby Charitable Foundation
Mr Tom Wilson	UnionLearn with the TUC
Mr Simon Witts	Formerly of Flybe

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