

Harnessing Technology: business practices which support risk-taking and innovation in schools and colleges

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This report explores the experiences of education practitioners in undertaking innovation and the critical role played by their management of risk. It also investigates the circumstances that nurture an advantageous environment for innovation, focusing primarily on the 'business processes' employed to deliver education.

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1 Summary

This report is part of a major research programme which aims to enable the Becta Harnessing Technology Outcomes to be achieved. This document focuses on one outcome in particular: improving confident system leadership and innovation. It explores the experiences of education practitioners in undertaking innovation and the critical role played by their management of risk. It also investigates the circumstances that nurture an advantageous environment for innovation, focusing primarily on the 'business processes' (those that assist educators in their jobs but do not define their performance) employed to deliver education.

Committed leadership and dissemination of good practice are underlying drivers of successful risk-taking and risk management, and yet many public sector institutions are risk-averse. Against this background, a series of interviews were conducted with schools, FE, HE, and other educational establishments. The research reveals that skilled leadership is the key to innovation. It can foster a culture that nurtures innovation primarily by creating a climate that encourages, enables, monitors and manages risk, and of course allows failure.

Analysis of this skilled leadership reveals that innovation is encouraged through appropriate practices on three levels: at those of the institution, the system, and as an aspect of the actual process of innovating. At the institutional level, we identified eight specific practices, driven by a strong leadership agenda, which support risk-taking and innovation:

- Managerial passion and support for innovation
- Sharing of responsibility for innovation
- Encouragement and management of risk-taking
- Capitalising on the teaching ethic
- commitment of resources for innovation
- Investment in relationships
- Promotion of cross-discipline working
- Creation of appropriate physical environments.

System-level practices were less readily forthcoming from our research, but two emerged:

- Availability of funding
- Facilitating the sharing of ideas.

Then, on a practical level, our findings point to practices in the innovation process that:

- identify the need and possibilities for change
- define the innovation and scope
- implement the change
- evaluate and disseminate the ideas.

These three levels of practices supporting risk-taking and innovation are then drawn together in this report into a framework which highlights the relationship between critical elements in the process. Although funding may be the most crucial of these elements, this research also suggests that fostering communications and developing leadership skills are fruitful areas for exploration.

The next report, on models of innovation for schools and due in spring 2009, will include further primary research, deepening our understanding of the innovation process and seeking practical models for encouraging and facilitating it. The report will explore in more depth some of the models for innovation within schools that are emerging from the research discussed in this report, such as the establishment of appreciative enquiry teams and the adoption of both an operational and an innovation organisational structure. It will also look at models for schools working together to make more efficient use of resources and provide a wider offer to students, for example in multi-school trusts and consortia.

2 Background

The range of ICT (information and communication technologies) available to the educational community in the UK is at an important stage of its evolution. The availability of education technology has expanded and matured, while interest in it has grown, so the task of matching resources to educational needs has never been more challenging.

Britain is a world leader in education technology. In comparison with Germany, France or even the United States, in terms of access to modern computers, whiteboards, access to broadband connections to the internet and many other measures, the UK holds a leading position.

However, being a leader also has its challenges. The UK educational community cannot conveniently follow the lead of someone else, and the technology it adopts is often at a development stage in terms of how it is best deployed and how optimum benefits are gained. Innovation is required to continue progress, and developing an environment that will encourage it is an important prerequisite.

The Harnessing Technology research programme¹, of which this report is a part, considers improving 'confident system leadership and innovation' in education as one of its five goals². This report explores the role of risk-taking in innovation and investigates how an advantageous environment can be nurtured.

¹ For more information, see <http://publications.becta.org.uk/display.cfm?resID=37346>

² The other four goals are: improved personalised learning experiences, technology-confident, effective providers, engaged and empowered learners and enabling infrastructure and processes.

3 How a culture can support innovation

The need to innovate in order to grow and prosper is a central tenet of modern management. Many of the insights from industry are applicable in seeking to understand how educational institutions can embrace a culture of innovation to deliver more effectively and with the needs of learners at their centre.

This section reviews some of the thinking on risk taking and innovation, as a guideline for examining the experience of educational practitioners, and generating themes to guide the research.

Innovation and risk

If innovation is to be a feature of an organisation, it requires a culture that is supportive and encouraging. Articulating new ideas, introducing technology, changing an approach or altering tried-and-true practices involves risk, and the willingness to take risks is a critical component of innovation. This is equally true in the public sector where, as the National Audit Office says, 'Well managed risk taking ...presents opportunities to innovate, experiment and develop new ideas where more traditional ways of working are not able to deliver real change.'³ It advocates active risk management, observing that 'the greatest risk of all may be not taking any risks, where services and the way they are delivered do not anticipate change or evolve to meet new demands from citizens'. If there is an cost to being risk-averse, the importance of creating an environment where risk-taking is encouraged is even greater.

Promoting a culture that supports innovation requires an understanding of members' attitudes to risk and structuring an environment that is open and positive. While a person may take risks in order to achieve desired benefits and maximise opportunities, they may also expose themselves to potential losses. Human behaviour is not entirely rational when it comes to risk taking. If a situation is described in a negative sense, emphasising the potential loss, a more risk-averse decision is likely to be made than if the situation had been presented in terms of possible gains (Kahneman and Tversky, 1981⁴).

Evidence suggests that creativity is increased when individuals feel that they have the support of their manager⁵. Managers can influence this by including individuals in key decisions, sharing information, giving recognition to their endeavours and supporting them emotionally. Equally, a manager's lack of support is established by poor direction and inclusion, excessive monitoring of progress and delegating inappropriately. Open communication, participative leadership and teamwork combine to encourage employees to monitor and challenge each other's actions⁶. Error reporting is rewarded, even for those who have committed the error. This kind

³ NAO (2004), HC 1078-I Session 2003–2004, Managing Risks to Improve Public Services

⁴ Kahneman, A. and D. Tversky, 'The Framing of Decisions and the Psychology of Choice', *Science, New Series, Vol. 211, No. 4481. (Jan. 30, 1981), pp. 453–458*

⁵ Oldham, G.R., Cummings, A.,(1996), 'Employee Creativity: Personal and contextual factors at work', *Academy of Management Journal*, Vol. 39(3), pp.607–634.

⁶ Weick, K. E. and K. M. Sutcliffe (2001), *Managing the Unexpected*. Jossey-Bass, San Francisco, CA.

of culture is very supportive for innovation as it allows risk taking but can quickly identify negative reactions.

Innovation management

Theodore Levitt of Harvard Business School famously said that “Creativity is thinking up new things. Innovation is doing new things”. Creativity is the process of generating and expressing novel ideas that are likely to be useful. The ideas generated during this process are the seeds for innovation. However, many creative ideas do not become innovations. Why? Because innovations only occur when ideas have been well developed, packaged, positioned, promoted, and implemented⁷. Management, not imagination, is the key to an innovative organisation.

Jeffrey Immelt, chairman of General Electric, reckons that 'operational excellence' is the crucial driver of innovation and that 'passion and vision' might make up just 20 per cent of the process. GE's strength is based on a highly structured process that involves a mix of management training, increased exposure to outside ideas and continuous funding for the development of new ideas. He also emphasises that the acceptance of failure is an integral part of the effort, as long as it is 'fast failing'⁸.

In private sector companies, it is recognised that a large number of innovations will fail. According to Ron Adner, Associate Professor of Strategy and Management at Insead, “Innovation is a loser's game, as we know most initiatives fail. But the truly innovative companies know how to deal with losing.”⁹ The challenge is to weed those out as quickly as possible before too many resources are expended on them.

Although profit-driven firms will have their own objectives, significant areas of commonality can be identified across frameworks and processes for innovation developed both for industry and education. These shared elements typically include:

- idea generation/horizon scanning
- incubating and piloting
- tolerance of early failure
- transferring into widespread adoption
- analysing and learning.

⁷ Harvard ManageMentor: innovation implementation, provided by NCSL (Could we check this title, please?)

⁸ *Economist* Special Report on Innovation, 'A Dark Art No More', October 11, 2007.

⁹ <http://www.orjantappura.net/inno/Economist%20on%20Innovation%204.pdf>

Leadership

The right kind of manager can make the difference in fomenting a culture of innovation. One study¹⁰ comparing managers who achieved successful innovation and those who did not, suggested that those who were successful in promoting innovation were not extraordinary individuals but did exhibit certain characteristics that set them apart:

- They were comfortable with change, at ease with ambiguity and saw problems as opportunities.
- Clarity of direction: they chose projects carefully and looked to the future. Setbacks were short-term glitches: their focus was on the final objective.
- Thoroughness: they were effective in planning and organising, prepared well to make their case and had good insights in to organisational politics. They also knew the stakeholders and champions who would support them.
- Participative management style: they included direct reports as part of the team and involved them in the work, giving them rewards and recognition. They also delivered on their promises.
- Persuasiveness, persistence, and discretion: they were tolerant and patient in achieving their goals.

Innovation in education

Management style and competence may be major factors in creating an innovation culture, but there is no 'one size fits all' approach that will work. In education particularly, it may be that system-level, top-down innovation has limited applicability. But while many new and exciting ideas may arise from the grassroots, David Hargreaves, Professor of Education at Roehampton University's Centre for International Research on Creativity and Learning in Education (CIRCLE), asserts the need for 'disciplined innovation'¹¹, comprising three elements:

- Focus and prioritisation
- Recognising that rates and depth of innovation will vary between institutions, and supporting transferred innovation
- Encouraging collaboration and networking between schools.

There are particular challenges in public-sector innovation associated with scale, multi-agency working, achieving alignment and the need to involve external people. There is also a fundamental motivation in the public sector – to make a difference to the people it serves – which can drive successful change.

¹⁰ Rosabeth Moss Kanter, (2004), 'The Middle Manager as Innovator', *Harvard Business Review*, July. Quoted by Liz Carroll, Ashridge Business School in Ashridge Learning Guide on Innovation Management on the NCSL Learning Gateway.

¹¹ Hargreaves, D, 2003, Presentation at NCSL conference, [<http://forms.ncsl.org.uk/mediastore/image2/nlg-hargreaves-transcript.pdf>]

Michael Fullan, Professor Emeritus of the Ontario Institute for Studies in Education at the University of Toronto, has proposed that this is the key to innovation in education. In addition to the direct goal of making a difference in the lives of students, moral purpose plays a larger role in transforming and sustaining system change. Fullan argues that sustained improvement of schools is not possible unless the whole system is moving forward. Moral purpose means closing the gap between high performing schools and poorly performing schools, and between high and low achieving students, by raising the level of achievement of all.

Understanding risk-taking and encouraging innovation

The talent, training and experience that go into making a successful headteacher are not necessarily the same as would equip an individual for a role as a risk-taking entrepreneur. Yet while effective teachers and administrators already understand the need for progress and the validity of introducing change and new ideas to make their institutions more effective, they may not have the wherewithal to pursue such initiatives or feel confident in deviating from perceived accepted methods.

Geoff Mulgan, head of the Young Foundation, a think-tank which supports new ventures in health and education, has identified the following factors as being important in hindering innovation in the public sector¹²:

- Efficiency: changes are resisted because, at least in the short term, they may reduce productivity and efficiency.
- Interests: change is likely to threaten the established balance of interests.
- The psychology of change: particular mental habits lock people into ways of working, and so a wider cultural shift is often needed to get them to embrace new methods.
- Social relationships: networks of those in authority may work against newcomers and new methods.

The National Audit Office has carried out research¹³ on the main barriers and incentives to risk-taking in public services, summarised in the table below. This presents a useful guide for understanding the experience of education professionals, and assessing how the institutions in which they operate can be made to embrace a culture of innovation and take the risks that will improve the effectiveness of teachers and the quality of learning.

¹² Mulgan, G. (2006), 'Public Sector Innovation', in *NAO Focus*, Innovation Special [http://www.nao.org.uk/guidance/focus/focus_innovation.pdf]

¹³ NAO (2004), HC 1078-I Session 2003–2004, *Managing Risks to Improve Public Services*

Barriers and incentives for risk-taking

Barriers	Incentives
Risk-averse organisation – "It is not in our culture"	Senior management support of risk taking and innovation even where it is not fully successful (shift away from blame culture)
Lack of expertise in risk management	Provision of training in risk management
Little information about risk faced by departments and what is appropriate risk taking	Improved communication about risks and the department's approach to risk taking (risks staff can take in practice)
Lack of formal systems, processes and procedures for managing business risks	Provision of guidance and advice on risk management
Unclear responsibilities for the management of risks	Clarification of individual responsibilities and accountabilities for key risks
The status and activities of public bodies limits the risk departments can take with public services	Dissemination of good practice on business risk management with examples where it has added value
Time, funding constraints and fear of project failure reduce scope for innovation	Greater use of pilot projects to test innovative solutions

Source: NAO/PwC risk survey and focus groups

In the next section, the findings from a study conducted on behalf of Becta are presented. Using the NAO's barriers and incentives as a starting point, we analyse how today's educationalists view their capability for innovating, taking risks and managing the implementation of changes in their organisations.

4 Findings: innovation unplugged

As part of a wider ongoing programme of research, this report focuses on identifying practices in the education sector which enable and support innovation. Interviews were conducted with representatives of a range of organisations, including primary and secondary schools, agencies, higher education and work-based learning providers, as well as official bodies.

In this section, we detail some of the findings concerning the ability of education institutions to innovate. While the research is still under way, analysis of the results so far shows a pattern emerging consistent with the expected barriers and incentives.

As an initial approach, the conditions for innovation and risk-taking identified from the interviews fall into three different categories, which are discussed in turn:

- Institution-level practices
- System-level practices
- Practices supporting the process of innovation.

These three categories link together at various junctures and a key finding which cuts across all these levels of practice is an awareness among our interview subjects that innovation is both necessary and desirable. However, in a sector where resources are typically limited, willingness to take risks is a challenging concept.

Institution-level enabling practices

The research has identified eight practices that successful leaders have implemented within their organisations to create a culture of innovation, or which are felt to be conducive to the development of such an environment. They are:

- committed leadership – passion and support for innovation
- a shared responsibility for innovation
- encouragement and management of risk-taking
- making the most of the teaching ethic
- commitment of resources for innovation
- investment in relationships
- promotion of cross-discipline working
- creation of appropriate physical environments.

Not all of them are present in every case. However, each element will have been recognised as important in more than one instance, and even where there is no concrete implementation, may be reflected as an attitude or aspiration among our respondents.

Committed leadership – passion and support for innovation

The research confirms the importance of committed leadership in enabling innovation. In schools, the visibility and determination of the headteacher, and their ability to communicate a shared vision and understanding throughout the organisation is critical. At the same time, it is seen as vital that passion and support for innovation is communicated across the organisation, with innovation rewarded and recognised, and that those who take risks are appreciated.

In some cases, this became evident following a change of headteacher where the new head was able to create a more innovative culture. It may be that schools are inherently conservative and risk-averse, and it is only when an initial change is introduced that the process demonstrates how change can be positive. A selection of quotes from our primary research follows.

You need a senior leadership team that sees innovation as a priority. Previously innovation happened within Departments but was not recognised and encouraged so it just stayed within the Department. Now as part of the bi-annual review of each faculty, the faculty will have to demonstrate an innovative project it has undertaken. (College)¹⁴

“Once there is a shared understanding of the vision, then middle leaders will be willing to suggest what their part might be in realising it.”
(Academy)

“You need to create a culture where doing new things is going to be rewarded and you need to move away from an “anti-keenie” culture where peer pressure prevents people from trying something new. Move away from a culture of “can’t do that”, thinking of problems rather than solutions.” (College)

A shared responsibility for innovation

Our findings show that innovation is a team affair; it cannot be carried out by an individual. It is therefore crucial to empower middle leaders – those heading departments or sections – to take it forward.

The research has highlighted the importance of enabling those with functional responsibilities to identify and embrace their role in generating and developing the new ideas that result in improvements in effectiveness or efficiency. The institution’s members need to understand why change is necessary to be motivated to embrace it. Ideally they also need to feel involved in developing the solution.

*Innovation happens when staff are inspired. For example, in Science they came up with a model for meetings whereby they video each other’s lessons and discuss the highlights. In addressing thinking skills, they spent half an hour collectively planning critical moments in lessons.
(School)*

¹⁴ Only the education level of the institution providing the quote is provided to maintain anonymity.

“Demonstrate the need. Show what gains will result. Create a sense of urgency – we need to do this and this is why. Get people to see the reasons for themselves. Get people to come up with the solutions themselves. With the Federation, the Heads got together and said we know that there are going to be schools that are going to have to be closed. Do we want it to happen to us in this way? It was initially about alerting people. This created a sense of urgency; people had ownership and accepted that the changes are for the better.” (School federation)

“I give them the space, give them that freedom, let them loose, don’t restrict them, they know what the boundaries are, and they’re very simple – is it good for the child, is it legal? Then I am there to support and encourage, share ideas with them... You’ve got to let them lead it and get the other people involved, so they get to know how to do it, and then it just becomes embedded.” (College)

Encouragement and management of risk-taking

The interviews conducted with practitioners pointed to the importance of creating a management culture that enables innovation. This comprises such elements as demonstrating the need for and desirability of new ideas and practices, ensuring risk-taking happens and emphasising the benefits of innovation rather than the negative consequences of failure, but also learning from mistakes.

Creating a no-blame culture and eliminating, or at least reducing, the fear of failure are important and need to be accompanied by openness to the improvement of ideas through discussion and professional debate. This functions as a clear incentive.

“You’ve got to have an atmosphere of honesty, openness, trust, and innovation... You need to coach staff that confrontation isn’t conflict, that you need a grain of sand to get a pearl.” (Junior school)

“If you want staff to embrace innovative thinking you need to build a professional debate about teaching, get senior staff to model whatever it is that you want to achieve first, give staff release time so they can go and look at practice either in other classrooms or in other schools, and make sure staff know they will be supported.” (Junior school)

“You’ve got to make people feel as though they can make mistakes. Making mistakes is key. For example, we spent £18k on a behaviour monitoring and registration system. We learned the hard way that technology companies will say what they need to in order to make a sale and the system won’t necessarily do what we need. It puts you in a position to know what you need, how to manage these companies and what it is likely to cost.” (Academy)

“Staff need to be confident in the school’s culture to take risks and so have to have heard from the SMT “Give it a go, if it doesn’t work, failure’s OK as long as it’s being innovative”.” (College)

“We want to move from good to excellent. Staff have to undertake that they will try something new and the fact that someone is watching them will make them go through with it. I don't mind if it doesn't work but they have to try.” (Grammar school)

One finding from the interviews that may be worth noting is the suggestion that creating an innovation-enabling culture may be easier within higher education (HE) than in other sectors. As representative of the JISC noted, 'the concept of research doesn't work if some projects don't fail'. Conversely, it appears that an innovative culture could be most difficult to engender in work-based learning organisations, where financial constraints and the risk of failing makes providers more risk averse.

Monitoring risks

The main lever schools have for ensuring that risk taking happens is through their monitoring processes, performance management and target setting. While trust and giving people opportunities are very important in change management and innovation, they need to be balanced by good monitoring to ensure that the headteacher can intervene if necessary and change track or provide more support as required.

"People are encouraged to take calculated risks and make decisions. It is this trust that has enabled accelerated improvement. Here, people are very empowered as senior leaders. [The head] is creating capacity for the future and giving people opportunities. This means that the school moves quickly and with purpose because senior leaders feel that they are part of the journey, not functionaries. He resists being a 'super head' and involved in everything. But of course he does his own checks and monitoring.” (School)

Very few innovations turn out exactly as they were conceived. Most are adapted as they develop, learning from mistakes on the way.

"If someone wants to take part in a project or try something new, they know they can and no one will condemn them if it doesn't work. Gradually more people have become willing to take a risk. Even if they don't end up doing it that way, I am always careful to find a success in it. For example, with the two tier day project, we learned a lot from it and often refer back to it.” (School federation)

Capitalising on the teaching ethic

The concept of the 'moral purpose' of education also emerged from the research as one which can inspire innovative behaviour. Pursuing this ideal of making a difference to benefit learners means having the learners at the centre of all decisions. Further, creating a structure where those learners are empowered to influence change can prompt new and creative ways of thinking. Interviewees noted that students are also empowered to talk about the process of learning and to raise their issues directly with staff.

“The student review panel is the toughest panel the heads of departments can face, because it’s a panel of kids who tell that head of department what’s wrong with their department, and that head of department has to tell them how they’re going to make it better.” (College)

“In the end the students are the biggest lever. They are taught by multiple different lecturers. A student will see good practice in one lecture and then expect to see it in all their other lectures. The culture is that it is seen as a good thing for students to suggest different approaches to their lecturers. The key to innovation is the students themselves. What we can invent is nothing in comparison with what the students will invent. They are not frightened by technology or a particular way of looking at it.” (College)

While this concept may be peculiar to the education sector, it is likely that other public sectors or service professions – health or charitable work, for example – would have a similar moral purpose that would function as a principle in driving forward an ethic of innovation.

Commitment of resources for innovation

The status quo can appear the cheaper option, since it is assumed that established processes have somehow been optimised for their context, or at the very least are complex, integrated and difficult to unravel. Similarly, piloting a new approach while still running the old one may well incur additional costs. Obtaining funding to cover a new approach can be key to innovation happening. Our research indicates that recognition of the funding implications for pursuing innovation is essential. It is not surprising that our findings confirm that NAO’s assessment that lack of resources, financial and otherwise, acts as a barrier to innovation.

However, in the interviews with schools, at the level of the institution, the emphasis was found to be more about funding as a lever and catalyst. A far bigger barrier to innovation was the availability of time for reflection and planning – the most helpful use of funding was for supply cover to enable this.

There is already so much pressure on academics. You need to make space for being more creative in knowledge transfer. It’s not going to happen if people are overloaded with their teaching and research agendas. People need to be paid for this, to have professorships for knowledge transfer activities. JISC

The structure of funding available for innovation is not always suitable. Interviews with work-based learning providers indicated that funding such as the Learning Innovation Grants from the LSC were critical in enabling innovation. However, funding is on a fixed-term basis with little certainty of renewal. This means that the sector is volatile and long-term planning and investment is difficult.

“It is not that there isn’t the potential for innovation – it’s more something that learning providers can’t afford.... Providers need to develop the skills to write the bids, be able to pick themselves up when you don’t get the funding and be able to go again.” (Training organisation)

Paradoxically, a lack of funding can itself prompt innovation. For example, a school federation interviewed noted that an amalgamation of several schools into two resulted in a review of the timings of the school day and flexible building design. Cost concerns also were behind one development of distance learning and assessment for work-based learning:

“Isolation was the motivating factor, the problem is not about the learners accessing us; it’s about the assessors accessing the learners. They used to be driving around seeing just one or two a day. That cannot be effective. Even for many of the learners, they cannot just jump on a bus and come into a training centre.” (Training organisation)

Carving out time for innovation

To be innovative, people need time to focus on issues and think creatively. Innovative institutions develop different ways of freeing up time. Our interviewees emphasised how, when undertaking major changes, staff need to be given time and space to develop the concept and really understand it.

“The word that I use a lot... is ‘abandonment’. What is it we stop doing if we’re going to do something else? And quite often, when I get challenged about what, people say “Why are we not doing that any more because it was actually very good?”. The issue about abandonment is it’s easy to abandon the things that don’t work. What I try to do is abandon things that I think are okay but what we’re going to do instead would be better. In my mind I don’t think a school can probably cope with more than three or four key development initiatives at any one point, if it’s really going to happen.” (Secondary)

“This is not tweaking, this is re-engineering, or what industry calls ‘disruptive innovation’. In other words, we’re undertaking massive change. So we need to take staff off site, to have the mental space, the emotional space, to say, “I don’t understand what you mean, can you talk me through this again?” ... Staff need to be given the time to discuss it to the point of them truly understanding it.” (Junior school)

“As a senior team, we go away and have what we call our 48-hour blue sky... And then we just brain storm. We have an agenda – kind of, it might

only be three words, and then we take it from there. And from that, we decide how we're going to develop it, if we're going to develop it."
(College)

Similarly with ICT training, it is important to give staff the opportunity to learn how to use something and then support while they are using it.

"They need time to explore after the training – this needs to be straight away. They then tend to get quite inspired themselves. Most teachers will make it work if they can, if they have it." (School federation)

Promotion of innovation projects

Where resources are available, institutions may stimulate innovation through initiatives such as Innovation Funds. These can focus and stimulate members to contemplate solutions to existing problems or devise new approaches to deliver results.

One example is an FE institution which made £50k funding available for a technical solution not yet used in the college and of relevance to the new building. Projects included a video-training installation in the indoor dressage arena. This enables students to view their performance on screens while riding, and also review the recordings later. Another initiative was a 'Big Brother' -style kiosk for student feedback to camera as part of the quality process.

Similarly, an HE institution interviewed has an innovation fund and runs an annual competition for teaching innovation ideas involving computers. Participants can win development time working with the developers and the chance to get their idea turned into a reality. One project involved a peer-to-peer learning programme for the study of Shakespeare. The software requires the learner to click on a word and enter their view on its meaning – which then accesses other students' interpretations and allows contribution to discussion spaces. Another project centred on 3D molecular visualisation, developing software that allows multiple students to view the representation and manipulate it.

Investment in relationships

Management theorists consistently point to the importance of relationships in innovation, and this is borne out by the experiences elicited in our research. Our findings show that investing in developing successful relationships and a team approach encourages both creativity and a culture of innovation. Management structures need to be supportive of collaboration, rather than stifling.

"We completely shuffled the staff from the four schools and as a result there isn't any "we used to do it this way...". The teams are really determined to make it work. The preparation work of getting to know each other has really helped. People are really flexible and motivated and willing to change or try different approaches to make things work." (School federation)

“The re-structuring has made a clear differentiation between e-learning which is part of the curriculum and IT support. E-learning personnel are now seen as “allies rather than enemies.” Richard has a saying “Don’t ask what you should be doing for the technology but what the technology should be doing for you”.” (College)

Promotion of cross-disciplinary working

Our findings show appreciation for the notion that much can be learned from those outside one’s usual sphere. This was identified as a particular issue in the HE interviews, though there is also an issue in schools of ensuring that an innovation in one department is made available to others. Universities are engines of innovation in the sense of fostering ground-breaking research within a discipline. But they also increasingly foster innovation working with the business community and this requires more of a cross-discipline approach.

“Many large research universities have silo structures based on research disciplines; getting cross-discipline working is very difficult. Rewards and incentives historically have been counter-productive to innovative demand-led application of knowledge.” (JISC)

“There’s a need to develop cross-discipline offers that are research and expertise based then have meaningful marketing to external partners in a language that makes sense to them”. (JISC)

Creation of appropriate physical environments

Designing appropriate physical environments has emerged as an enabling practice in interviews in HE, FE and in schools. Considering the ways in which collaboration, interaction and creativity can be enhanced and encouraged changes what buildings look like and how they operate.

“Time is key. You need to change the way that schools are structured to build time in – flexible working, different day starts, changes with spaces in buildings. For example, we can’t have flexibility if we continue to teach in groups of six in small rooms – we need more flexible learning spaces.” (Academy)

At Sutherland School in Telford, they opted to create a large learning space with no walls, which is completely networked. There were strong teaching and learning reasons for this – teachers were brought more into the open, and others could see what they were doing. They have found that behaviour has improved, and it enables greater flexibility in staffing.

Similarly, the New Line Learning Academy has created a Learning Plaza in a disused school hall. This is a pilot to investigate how children would behave in a new environment. The initial ideas centred on the space and furniture, but the project prompted a learning focus and exploration of different teaching styles. As there are several classes using the space, it isn’t just 1 teacher with 30 students – rather several teachers with large numbers of children. As a space to work and socialise,

the school has found that the approaches adopted in this new environment have increased engagement and this has resulted in improved attendance.

In HE, much work is being undertaken in terms of building design in response to the changing needs and expectations of students who use laptops and want to pull in resources in a more companionable way. For example, at Cambridge, Sir David Wallace has established the Newton Institute for Innovation in Mathematics. It has been purpose-built to encourage innovative research.

Changes in pedagogical approach at the Department of Mechanical Engineering at the University of Strathclyde resulted in new requirements for their teaching spaces. Low achievement and attendance amongst first-year students prompted them to replace the standard combination of tutorials, lectures and workshops with a series of two-hour active learning sessions, involving mini-lectures, videos, demonstrations and problem solving. This approach prompted the creation of an 'InterActive Classroom' and the introduction of an electronic voting system. In 2000, the first teaching cluster was established. It comprises an interactive classroom, seminar rooms and a teaching studio, which are centrally managed and bookable.

System-level practices enabling risk-taking and innovation

While the loci for much of the impetus and structure enabling innovation are within the individual institution, our findings also indicate a role for wider system-level practices and initiatives to facilitate and encourage a culture of innovation. Not only does policy and investment in the educational sector determine the day-to-day operation of an institution, it also generates an energy or ambience which could either foster or impede an enthusiasm for new ways of working.

That system-level practices generated little discussion or perceived relevance should not be taken as an indication that they are of little importance. Certainly, it is likely that other system-level influences than those identified here could be found. It does suggest, however, that many practitioners on the ground do not feel they are engaged with a wider system which supports their initiatives and, if this does exist, it needs to be communicated more effectively.

Availability of funding

Across the education sectors, interviewees cited the availability of funding for projects as a catalyst that stimulated innovation. It was also a mechanism for the 'centre' to find out about innovative practices that otherwise might be known only to the particular institution or even a single department within that institution.

“Funding is key in surfacing innovative ideas. Funding is extremely limited in FE and there are fewer opportunities for FE to engage in this work.”
(JISC)

“Money is really important. It is a big carrot and will attract schools to try something out. They will then make time and effort. It encourages people to experiment. For example, with Pathways to Success, the school is given £3k so it can afford to take three teachers out of class to work

together. In this project they are also working with another school. It allows you to be creative. You wouldn't otherwise do this because you wouldn't be able to afford the time." (School federation)

"It is surprising how small sums can make a difference. With current pressures in the system, if you want to encourage innovation you need to grease the wheels." (HE institution)

"For more exploratory projects we wait for a grant in that area. We only use university money when the need has been proven, for example for the VLE. This is how we manage the risk around innovation." (HE institution)

Facilitating sharing of ideas

Our research has also identified a general sense that the potential for sharing ideas and transmitting innovations between similar organisations and across education sectors is not being realised. Interviewees identified this as an area where the 'system' could be facilitative: supporting conferences, awards, open days, case studies, communities of practice and networks, and the opportunity as well for accessing expertise and consultancy services where necessary.

Without specific funding, organisation and ongoing support from central bodies, these activities are unlikely to occur to any significant extent. However, the need to increase accessibility and awareness of existing opportunities was also cited. This is an area where further research is required, particularly with regard to the potential for using ICT as the basis for a knowledge community.

"There is a competitive element in Higher Education research so there isn't a good incentive for collaboration. Research groups are like independent small businesses. There is competition for institutional and national resources." (JISC)

Practices supporting the process of innovation

If innovation can be regarded as a process, it is possible to identify certain practices and activities comprising this. Examining aspects of successful innovation with our interviewees has suggested that four distinct stages are involved. For each of these, we have highlighted the practices emerging from the interviews that were described as being particularly helpful.

Identifying the need and possibilities for change

Although some innovations might arise spontaneously, the process can be kick-started by defining the reason why a change is necessary, and thereby awakening the possibilities among those involved. Focusing on the need for change concentrates thinking. A couple of institutions interviewed had set up dedicated enquiry teams to explore an issue and develop possibilities. Our interviewees noted the importance of having the right individuals to articulate a need.

"It is people that are important and inspiring." (Academy)

“You need to get original thinkers around the Head. Strength of character is the biggest thing. You have to have that when you come to a school that is failing or you will go down too.” (School)

Having recognised the possibility of change, a further activity may involve actively seeking new ideas outside the institution, through research, visits, conferences and involvement in networks of schools. Many of the institutions interviewed encourage visits to other institutions to gather ideas and gain exposure to alternative ways of doing things, and then provide opportunities for discussing and disseminating these ideas with colleagues.

“You need to know what is at the forefront of current thinking. You need to get out of school to be able to think where the bigger picture is and develop the vision.” (School)

“We are participating in two projects that are Local Authority led. We then work out how to implement things in our own way in school.” (School federation)

“Ideas usually come from conversations. A lot comes from visiting other schools, coming away with an idea and how they could adapt it. Sometimes they can come completely by chance, for example on a planned visit or learning walk, when feeding back to the headteacher, realised what a good use of space that school made. The ideas grow when you take them back to your own team and discuss them.” (School federation)

Defining the innovation and scope

Defining and articulating the innovation also functions as a way of building a culture of creativity and risk-taking, by empowering the members of an organisation to take charge of the future. The organisation is challenged to achieve beyond what it thinks can be achieved. The challenge is finding the right level: enough to stretch people but not overwhelm them. Leadership is important but one person alone cannot deliver major change.

"Leadership is clearly key but it's not just one person. It's how they empower the rest of the team. A lot of the training they had undertaken with the National Remodelling Team (NRT) helped. They shared the vision forming with a group of people. They started with a core group of six and then opened up to a larger change team with representatives from the community, staff, children, governors, parents. This brought the four communities together (around 20 people)." (School federation)

“You give them the canvas and tell them "This is what I'm thinking". Get everyone's shoulder to the wheel so we develop a shared vision and they all have ownership.” (Training)

Young people are frequently very innovative in their approach and can be a great source of ideas, drive and feedback. Many of the most innovative institutions are involving students in institutional development.

“Children were involved in the change teams and took part in the school-based discussions. Now they are being involved a lot more in school improvement projects. For example, the school is using a change management book by John Kotter called *Our iceberg is melting*. They have given this to all the Year 6 children and they are going to be involved in visioning. Two of the four schools were judged satisfactory by Ofsted and this is part of the work to change them to be outstanding.” (School federation)

Implementing the change

Change management might not usually be seen as a core skill in a headteacher. However, innovation implies change and this is an area where successful initiatives reflect an understanding of the interlocking mechanisms which must be taken into account.

Maintaining a focus came up repeatedly in the interviews as being essential.

“It’s the headteacher’s role to provide focus. The headteacher should be able to say no. Doing too much can have a detrimental effect”. (Academy)

“What I think frustrates teachers is when change is not managed well; it’s not an appropriate timescale. There’s not a sense of prioritisation.” (Academy)

“It was the wrong time to be doing that project and we couldn’t really show the need for it although we thought that it would be important for the building design. It was too much in addition to all the other changes that were important to people. You need to make sure projects are relevant and make others see the need. People don’t want to change for the sake of it.” (School federation)

One strategy – which may be particularly applicable where change is viewed with suspicion – is to undertake limited pilot projects prior to full-scale implementation. These allow initiatives not only to be tested, but to garner support.

“Piloting is very important but it has to be significant and really have an impact on the whole organisation. Then you can build it into the school. With Opening Minds, we have trialled across a whole year group. If we had only done it with small groups you wouldn’t have seen the potential impact.” (Academy)

Interviewees observed that changes in working practices only happen if there is a certain amount of obligation. People are naturally resistant to change, and need to be convinced of the value of any change or new technology. They emphasised the

need to keep communicating with stakeholders – but also warned against holding too many meetings.

“The core team had the job of instigating the change. The change team formed a communications layer that they would inform and then listen to their responses. They would meet at regular intervals, every 6–8 weeks, more frequently when there were big decisions. However, it’s important not to have too many meetings as people won’t be able to attend them all.” (School federation)

Evaluating and disseminating the ideas

Having implemented a new process or initiative, how can an institution develop its success into an ongoing culture of innovation? This is an area which most interviewees acknowledged is difficult, across all sectors. While experiences are highly variable, in terms of the kinds of projects or developments being considered, our research participants demonstrated considerable awareness of the importance of expanding and building on achievements and sharing this with other interested practitioners.

One recommendation is to establish a means of baselining and more formal evaluation. In general evaluation tends to be informal and anecdotal; the institution is aware of the impact of the innovation from teacher and student feedback. But in order to disseminate innovative practices more widely there is a need for more formal evaluation to build an evidence base.

Many initiatives are focused around disseminating good practice with the aim of avoiding ‘reinventing the wheel’. However, interviewees comment that this is difficult.

“There is no forum for discussions on innovation because people don’t feel that it goes anywhere. People who have been working on new ideas are not acknowledged. Energy is wasted – for example, anytime anywhere access is being recreated from the bottom up. No one is looking at the lessons learned from the Academy Online experience. Lessons learned from conversations are just not happening. These need to be supported with funding for supply cover to enable headteachers to let people out of school.” (Academy)

“In putting together the e-framework that creates the knowledge base that will enable people to look at what has been done elsewhere, the problem has been that it is remarkably difficult to locate quality-assured information from the institutions themselves.” (JISC)

In HE, the need for a bottom-up approach presents its own challenges. For example, even though a variety of innovations may be happening within a faculty, they may not be disseminated widely and it is difficult for others to find out about them. Connected to this, one respondent commented on a “fundamental issue with attitude – if you are not expecting to find innovative practice in another department that could be replicable, then you are not going to go looking for it”.

5 Future research – developing models of innovation

Perhaps because the need to 'innovate or die' is not as obvious as it might be for the private sector, the impetus for risk-taking is not ingrained among education professionals. This study was intended to discover how innovations can be implemented and what barriers and incentives to the willingness to 'have a go' are perceived at different levels in the education sector.

In looking at how the process of innovation can be supported, Michael Fullan offers two particularly telling insights¹⁵: One is that information (of which we have a glut) only becomes knowledge through a social process, which is why relationships and professional learning communities are essential. The second is that organisations must foster knowledge-*giving* as well as knowledge-*seeking*.

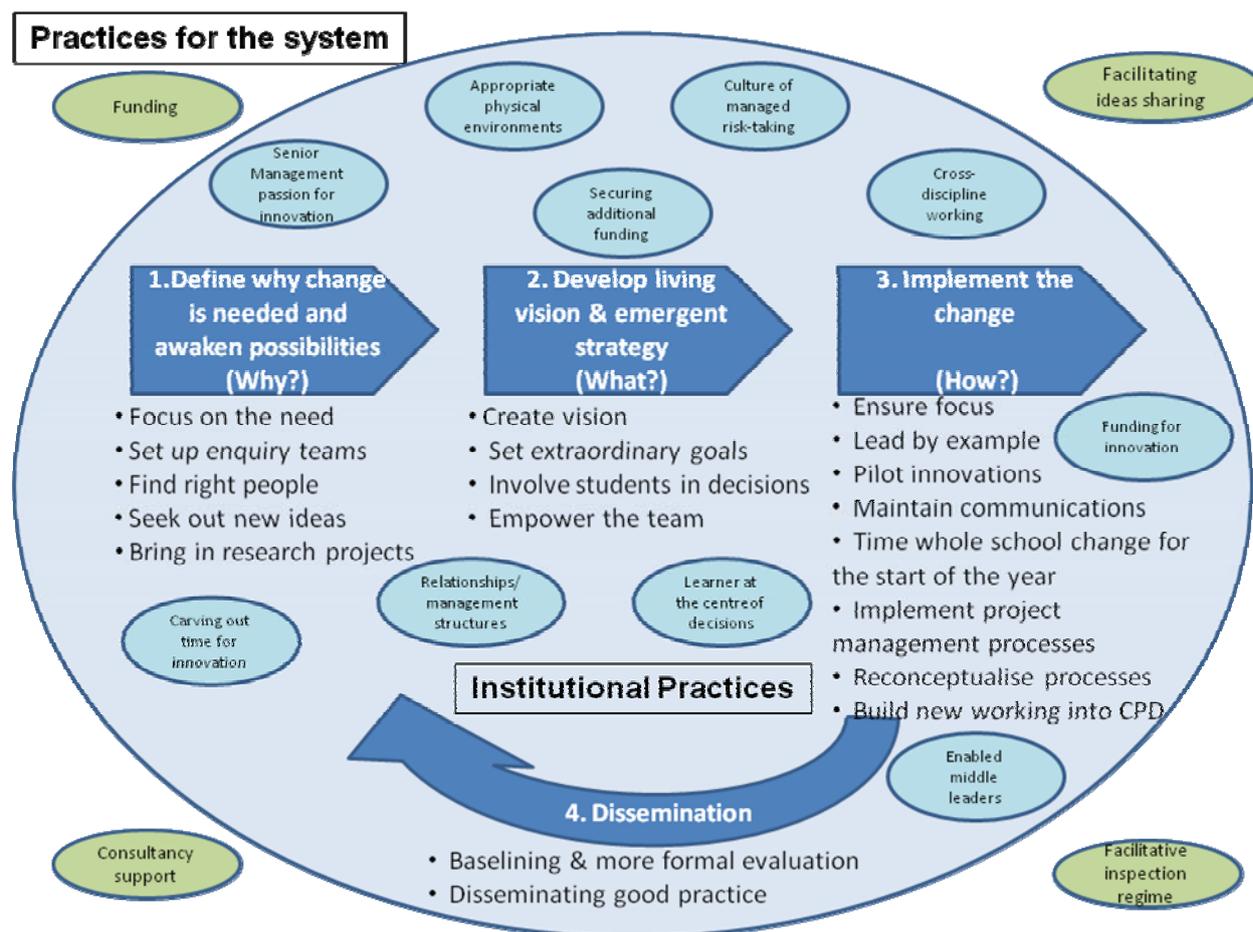
At the same time, it is evident from the research presented here that practitioners in schools, colleges, FE and HE institutions, as well as the boards and agencies representing them, demonstrate a willingness to embrace the need for innovation. Educators and administrators are not concerned only with efficiency and productivity, but with the needs of the learners for whom they are responsible. Indeed, innovation may occasionally be stifled specifically because these two objectives do not always move hand –in hand. They also share an awareness that the means and mechanisms for pursuing and implementing useful and exciting new ideas are not currently well defined or easily available.

A suggested framework summarising the findings to date is shown in the diagram below. This illustrates a process diagram for innovation, encompassing four stages, set against a background of enabling practices both in the educational institutions themselves and in the wider system.

Future research is planned to develop and refine this framework with the aim of constructing models for successful innovation in education.

¹⁵ Fullan, M. (2002), 'Principals as Leaders in a Culture of Change', Paper prepared for *Educational Leadership*, Special Issue

Framework of practices supporting risk-taking and innovation



Taking into account the institution-level practices and system-level requirements, as well as the operational issues involved in generating a culture of innovation, the framework highlights the relationship between critical elements in the process. Although key amongst these may be funding, our research also suggests that fostering communications and developing leadership skills are fruitful areas for exploration.

Our analysis indicates that there is substantial knowledge of the benefits and challenges for innovating in our educational institutions. It is important for policy-makers and funding bodies to understand the needs of their stakeholders, and to target their initiatives so that they address those key requirements. The research indicates a strong desire for greater support for those looking to improve the way they deliver learning, though perhaps dampened by the recognition that resources will always be scarce. The data suggests, however, that much progress could be made by harnessing the skill and enthusiasm of those who have already established their innovation credentials.