

Emerging Practice in a Digital Age

A guide to technology-enhanced institutional innovation



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“In times of economic uncertainty, challenge and change, innovation is needed more than ever, but it can also seem harder than ever to actually sustain the process.”

Anne Miller, Director of The Creativity Partnership

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“The technology and the learning are developing together, and that co-evolution of learning and technology is really important for us to understand and to develop.”

Professor Mike Sharples, Professor of Learning Sciences and Director of the Learning Sciences Research Institute, University of Nottingham

“People have got to be given the space to experiment, try things out, to be innovative and also the space to fail and try again.”

Karl Royle, Curriculum Innovation and Knowledge Transfer, CeDARE – Centre for Development and Applied Research in Education, University of Wolverhampton



Introduction

Since the launch of the JISC guide **Innovative Practice with e-Learning** (JISC, 2005),¹ so much has changed. At that time, early adopters were exploring the potential of mobile and wireless learning. Since then, the increased availability of public and institutional wireless networks, the emergence of new and more powerful technologies and an increase in personal ownership of these technologies are changing the way we connect, communicate and collaborate.

Emerging Practice in a Digital Age draws on recent JISC reports and case studies and looks at how colleges and universities are continuing to embrace innovation and respond to changes in economic, social and technological circumstances in a fast-changing world.

The focus of this guide is on emerging practice rather than emerging technology. The examples and case studies in the section, **Exploring emerging practice**, show different perspectives and different approaches that reflect the naturally different stages institutions and departments will be at in using technology to enhance learning and teaching. They describe a series of exploratory journeys using a range of technologies to address particular needs or ambitions.

In some cases the technologies used are freely available, free to use or easy to implement; others are more complex involving combinations of technologies or bespoke solutions. Regardless of the complexity of the technologies featured, all have been deployed with strategic intent and with consideration for the skills, support mechanisms and systems necessary for successful implementation.

Emerging practice involves experimentation and openness – the ability to respond to changing circumstances and to embrace unforeseen benefits. By their nature, emerging technologies are those that are still evolving and not yet fully established – those that may require the consideration of new approaches, structures and roles. The challenge is perhaps

as much cultural as it is practical. The section, **Moving forward: from innovation to embedded practice**, looks at how institutions are responding to changes more profound than changes in technology. We are moving to changes of approach, and to more collaborative ways of working. Ways that harness the collective skills, knowledge and effort of all those involved in our learning communities, that transform practice to more accurately reflect the way we live and work.

Throughout the publication, you are encouraged to reflect on the pedagogical and other benefits that new and emerging technologies offer and how they might enhance the learning experience in your own institution.

Further information

Emerging Practice in a Digital Age is designed for those in further and higher education who are looking to develop and implement the effective use of innovative technologies in a pedagogically sound way.

This publication, which draws on work funded by JISC, JISC's partners, individual institutions and national funding agencies, complements other publications in the same series, in particular the companion guides, **Effective Practice in a Digital Age** (JISC, 2009)² and **Innovative Practice with e-Learning** (JISC, 2005).¹

Emerging Practice in a Digital Age is available in different formats, including ePub format for use with e-book readers. Supplementary resources, including video clips, podcasts and detailed versions of the case studies, are available online.

www.jisc.ac.uk/digiemerge

www.jisc.ac.uk/emergeresource

¹JISC (2005). *Innovative Practice with e-Learning*. www.jisc.ac.uk/eli_practice

²JISC (2009). *Effective Practice in a Digital Age*. www.jisc.ac.uk/practice



Changing landscape

The environment of further and higher education is changing in response to economic pressures, government policies and changing behaviours influenced by greater ownership of new technologies. In turn, this is encouraging institutions to review key aspects of their provision and to reassess what is delivered, to whom and in what ways.

The quality of the learning experience is still the prime consideration, but our understanding of what constitutes quality has grown to recognise the importance of aspects such as personalised learning and increasing emphasis on learner satisfaction and preparing students for future employment.

So what role does emerging practice in the use of technology to enhance learning play in responding to these key drivers for change, and why do institutions need to nurture emerging practice?

Drivers for change

■ Increased personalisation and choice

Quality mechanisms such as the Common Inspection Framework³ for further education institutions place great

importance on personalised learning. In Collaborate to Compete: Seizing the opportunity of online learning for UK higher education,⁴ the Higher Education Funding Council for England (HEFCE) Online Learning Task Force identifies that constraints on public funding are resulting in a more market-orientated approach, highlighting the need to acknowledge student demand and choice. It is anticipated that rising student fees will sharpen students' focus on the quality and consistency of their educational experience and raise expectations further.

Technology can support personalisation and choice in many ways, for example by increasing access to information, making content more accessible, and by creating new channels for delivery and support.

■ Developing new markets

The HEFCE strategic plan for 2006–2011⁵ advises that universities need to engage more fully with employers to prepare graduates to meet the evolving needs of industry and fulfil workforce development needs. Increasing the authenticity of learning better prepares learners for the workplace, builds learner confidence and develops skills valuable to employers.

“” **Emily-Ann Nash** Vice President, Academic Affairs, University of Brighton Students Union (2009–2011)

“I started university in 2005 and had a completely different expectation of technology to that which I have today. Many applications are now so user-friendly, and I use many technologies on a daily basis. I regularly use Google, e-books, YouTube and blogs. I have changed

from using technology for social use to using it for study too. I use EndNote, listen to lectures for my post-graduate studies, access journals and listen to podcasts, sometimes while travelling to university on the bus.”

Student voice

“We should see a university or college as a design organisation where they are designing and developing new forms of teaching and learning rather than just responding to innovations in technology or changes in policy.”

Professor Mike Sharples, Professor of Learning Sciences and Director of the Learning Sciences Research Institute, University of Nottingham

Technology offers flexible blended learning opportunities that work around employers’ needs and can simulate real-life situations when financial, logistical or ethical reasons make these real-life experiences difficult to provide.

■ Economic pressures

Economic pressures are leading institutions to explore new markets, new forms of curriculum delivery and associated support services. Innovations such as online delivery do not always save money, and it is important that colleges and universities explore the costs, benefits and likely impact if they are to secure the maximum return on investment. Collaboration between stakeholders (including students), public and commercial partners and others offers benefits such as economies of scale and helps to facilitate more rapid development and adoption of technologies.

The open source community is one example of where collaboration between those with common research and development interests has proved beneficial to the education community.

Changing behaviours and emerging benefits

The mass appropriation and rapid uptake of new technologies is changing behaviours. It is common for us to be able to communicate and to access, process and send information without being tied to any one location. Online learning is one option in a wider array of learning opportunities that we choose to blend with others to build models of learning that meet our personal circumstances. The Educause Learning Initiative/New Media Consortium 2011 publication, *The Horizon Report*⁶ identifies that our ability to communicate and work with others, free from geographical boundaries, is facilitating learning that is collaborative, open and social.

The rise in ownership of personal technologies combined with a growing awareness of their educational potential is encouraging more collaborative relationships with students: educators and students are jointly working through the implications of introducing new technologies and designing new approaches that better meet their needs. This more mature approach is a key recommendation from the HEFCE-funded National Union of Students (NUS) 2010 report *Student Perspectives on Technology: Demand, perceptions and training needs*.⁷

The low cost of ownership means that some students can afford newer-specification devices than colleges and universities can supply. Moving away from fixed equipment to open data systems and access to institutional platforms requires alterations to infrastructure, policies and estates to protect key systems and comply with legal safeguarding and personal safety requirements – safeguarding being a key priority for further education, which accommodates learners from age 14.

There has been significant investment in the further education and skills sector in research into the impact of emerging technologies on learning; see, for example MoLeNET⁸ and the Technology Exemplar Network.⁹

The opportunities perhaps are to reconfigure workspaces to create flexible and collaborative learning environments, and to invest in schemes that ensure less affluent students are not disadvantaged.

³ www.ofsted.gov.uk/resources/common-inspection-framework-for-further-education-and-skills-2009

⁴ www.hefce.ac.uk/learning/enhance/taskforce

⁵ www.hefce.ac.uk/pubs/hefce/2009/09_21

⁶ www.educause.edu/Resources/2011HorizonReport/223140

⁷ www.hefce.ac.uk/news/hefce/2010/nus.htm

⁸ www.molenet.org.uk

⁹ www.excellencegateway.org.uk/exemplarnetwork



Challenges

Reports such as The Horizon Report⁶ in 2011 cite the need to develop digital media literacy skills as a key challenge for institutions, with organisations such as the Universities and Colleges Information Systems Association (UCISA), in its 2010 survey of technology-enhanced learning for higher education in the UK,¹⁰ emphasising the need for investment to enable staff to develop the knowledge and new pedagogical understandings for effective use of technology.

JISC defines digital literacy as those capabilities which equip an individual for living, learning and working in a digital society (JISC LLiDA, 2009).¹¹ For example: the use of digital tools to undertake academic research, writing and critical thinking; digital professionalism; the use of specialist digital tools and data sets; communicating ideas effectively in a range of media; producing, sharing and critically evaluating information; collaborating in virtual networks; using digital technologies to support reflection and personal development planning; and managing digital reputation and showcasing achievements.

HEFCE⁴ sees the availability of specialist support as essential to effective curriculum design with greater emphasis on partnerships between technologists, learning support specialists and academics.

Technologies enable these groups to work together, share resources and files with ease, and connect to wider specialist interest groups where support is not locally available.

Leading the way

The complexities and interlinked nature of the challenges faced by institutions in embedding effective use of technologies require leadership at a senior level. This



leadership should be introduced as part of a holistic and strategic vision with due consideration to the support mechanisms necessary to engage staff and students and make the introduction of technologies successful.

Institutions need to review and, where necessary, re-engineer structures, strategies and policies to reflect changing circumstances. Forward-looking institutions are responding to the challenges posed by the ever-changing landscape by investigating new approaches to developing digital literacies for staff and students, collaborating with learners to learn more about their expectations, and with internal and external partners to build new alliances.

While the pace of technological change appears to be rapid, it can take time to develop appropriate and effective responses.

With rising student expectations and analysts such as the JISC Observatory predicting, in its 2011 Technology Forecasting Literature Review,¹² further technological changes of potential benefit to education, it has never been more important to nurture innovation and start to explore the benefits that new and emerging technologies, alongside more trusted and established practices, afford our learning communities.

The case studies within this guide show how much can be achieved by exploring the benefits of emerging technologies.

JISC has been at the forefront of research and innovation in technology-enhanced practice. The JISC e-Learning programme¹³ supports the key activity area of technology-enhanced learning environments and explores emerging practice in mobile learning, immersive worlds and social software.¹⁴ Ongoing and recently completed programmes of research include:

- **Developing Digital Literacies** – a new programme of JISC-funded projects in colleges and universities to support the development and implementation of institutional approaches to digital literacies across the entire workforce and including students
- **Institutional Approaches to Curriculum Design** (2008–2012) – reviewing how course design and validation can be informed by technology

- **Learning and Teaching Innovation Grants** – grants that support one-year projects on any innovative aspect of technology-enhanced learning, teaching and assessment
- **Lifelong Learning and Workforce Development** (completed in 2011) – developing and implementing the use of appropriate technologies and processes to enable higher-education-level learning services to meet the needs of learners in the workplace, and of their employers
- **Open Educational Resources** (2009–2012 in conjunction with the Higher Education Academy (HEA)) – supporting the open release of learning resources
- **Transforming Curriculum Delivery through Technology** – investigating more flexible and creative models of delivery (completed in 2011)



¹⁰ www.ucisa.ac.uk/groups/ssg/-/media/groups/ssg/surveys/TEL%20survey%202010_FINAL.ashx

¹¹ www.jisc.ac.uk/whatwedo/projects/elearningllida

¹² <http://blog.observatory.jisc.ac.uk>

¹³ www.jisc.ac.uk/elearningprogramme

¹⁴ www.jisc.ac.uk/whatwedo/programmes/elearning/tele

“I think we need to accept that the culture has changed, that institutions don’t need to own or control that culture but they need to take advantage of it and to equip their students to engage with it in new forms of literacy. We can’t just slide across traditional forms of literacy, and I think that is where the challenge is set.”

David White, Co-manager, Technology Assisted Lifelong Learning (TALL), Department for Continuing Education, University of Oxford



Exploring emerging practice

Case studies of how new technologies are used to respond to changes in learner behaviours and institutional contexts offer useful insights, creating an environment where new understandings and new approaches to learning and teaching can emerge, grow and mature. In exploring developmental journeys, case studies offer an opportunity to benefit from others' experiences and prompt reflection on how best to move forward in your own context.

The aims of the case study section of this guide are to:

- Demonstrate how considered and innovative use of technology can enhance learning, improve the student experience, and address wider cultural and contextual issues
- Support openness and collaboration among colleges and universities by sharing effective practice
- Highlight opportunities to transform practice, uncovering some of the benefits and challenges as well as signposting information that is useful to know
- Stimulate debate that may help to propagate new ideas pertinent to your own practice

The case studies bring to light aspects of change management, revealing some of the processes that act as agents for change or leverage change and help build the future. The case studies also reveal how students are being engaged in the change process, and the benefits this can bring, and how institutions are forging new collaborative alliances, fostering growth and developing new provision.

To reflect the changing emphases and the move towards a more collaborative culture, the case studies have been divided into three themes:

- **Working in partnership with students** – how students are being engaged as agents of change and collaborators in their own learning

- **Developing students' employability potential** – how institutions are using technology to provide relevant and authentic learning experiences to enhance student employability and develop professional practice
- **Preparing for the future** – how colleges and universities are looking ahead and developing the skills, knowledge and cultural environment that will help to build the future

Although individual case studies may illustrate only some of the above elements, in total the case studies provide a more comprehensive account of how use of technologies and emerging practice are supporting learning and teaching. It is therefore recommended that you read all the case studies.

The case studies naturally reflect the context in which the tools and technologies were adopted or developed and the practice initiated. As effective emerging practice is explored, it becomes ever more apparent that the relationships between pedagogy, institutional context and technology are complex and intertwined; however, the gain for learning or to ease administrative aspects of learning should remain the main focus.

The following table highlights the key features and themes of the case studies and outlines how emerging practice is enhancing learning and teaching. The tools, systems and technical terms used in the case studies are explained in the **Glossary**. To reflect the different cultures, the term 'student' is used when referring to higher education and 'learner' when referring to further education. The term 'practitioner' has been used to describe a teacher, lecturer or member of staff engaged in teaching or in supporting learning and teaching.

More detailed versions of the case studies are available online at www.jisc.ac.uk/digiemerge



Emerging practice

How emerging practice with technology is enhancing learning and teaching

Theme	Case study	Summary	Learners and learning context
Working in partnership with students	Case study 1 Supporting student transition through reflective video sharing University of Ulster	Improving practical laboratory skills through inclusive peer learning	Higher education undergraduate biomedical science students
	Case study 2 Engaging students as agents of change University of Exeter	Student-led research project to increase use of technology, increase engagement and help students in large cohorts in the School of Business get to know each other	Higher education undergraduate business studies students
	Case study 3 Students as partners in blending learning University of Wolverhampton	Redefining the traditional relationship between students and staff to develop student-led support mechanisms using social media	Higher education undergraduate students in health, computing and cultural studies
Developing students' employability potential	Case study 4 Developing professional practice using simulations Peninsula College of Medicine and Dentistry, Universities of Exeter and Plymouth	Extending learning opportunities by enabling students to practise hard-to-teach skills supported by detailed formative assessment feedback	Year 4 higher education undergraduate dental students
	Case study 5 Moving into virtual worlds University of Derby and Aston University	Development of collaborative distance and online learning provision	Year 1 higher education undergraduate psychology students

Emerging practice	Technologies
<ul style="list-style-type: none"> Improved preparation for practical laboratory work Enhanced relevance of module learning to overall course Increased student enjoyment, engagement and motivation Reflective practice through peer review mechanisms embedded in social media Range of student-developed materials to support revision 	<ul style="list-style-type: none"> Video cameras Laptop Web server Vidiscrypt open source software Video conversion software
<ul style="list-style-type: none"> Integration of technology across Business School, leading to higher student engagement Enhanced interactivity in lectures Improved lecture attendance Support for students, particularly international students, during transition period Collaborative development between students and staff, and between peers Development of desirable employability skills (research, business and personal) for students 	<ul style="list-style-type: none"> Echo 360[®] video lecture recording Turning Point[®] Optical mark recognition scanners Flip[™] video cameras Turnitin[®] YouTube[™] Facebook[™] Wikis Moodle[™] Student-owned mobile devices
<ul style="list-style-type: none"> Enhanced student engagement and motivation Increased levels of attainment Student advocacy leading to improved communication between staff and students Support for staff in use of social media Development of inclusive pedagogies 	<ul style="list-style-type: none"> Facebook Blog Twitter[®] PebblePad personal learning system
<ul style="list-style-type: none"> Developing professional practice Augmentation to real-life working Access to uncommon and complex clinical scenarios without incurring risk to patients Support for revision with detailed formative assessment feedback Collaboration between academic specialists and learning technologists 	<ul style="list-style-type: none"> Bespoke web-based system using standard technologies such as HTML, PHP, MySQL, XML, Flash[®], FMV Video, JavaScript[™] Video
<ul style="list-style-type: none"> Developing professional practice without incurring risk to patients Developing active and engaging problem-based learning experiences Enhancing access to multimedia resources External collaboration with other universities Internal collaboration between academic staff and learning technologists 	<ul style="list-style-type: none"> Second Life[®] Dedicated server to support Second Life

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Theme	Case study	Summary	Learners and learning context
	Case study 6 Springboard TV: enhancing employability College of West Anglia	Enhancing learners' employability using an internet TV channel to provide a realistic working environment and showcase learners' work	Further education media studies students on further education level 2 and 3 courses
	Case study 7 Assessment and Learning in Practice Settings (ALPS) The Centre for Excellence in Teaching and Learning, comprising the Universities of Leeds, Bradford and Huddersfield, and Leeds Metropolitan and York St John Universities	Improving the learning and assessment experience for students on work placement, by providing access to resources, support and assessment tools via mobile devices	Higher education undergraduate students studying for one of 16 healthcare professions
Preparing for the future	Case study 8 Linking learning to location University Campus Suffolk	A strategic exploration into the potential pedagogical uses of a new mobile technology: 2D barcodes known as Quick Response (QR) codes	General applicability for further and higher education as well as the wider public
	Case study 9 Mobile Oxford: opening access to information University of Oxford	Development of intuitive mobile solution providing easy access to an array of public and university information services	All users: undergraduates, post graduates, staff and the general public
	Case study 10 Creating the culture: a holistic approach to technology-enhanced learning Gloucestershire College	A multi-faceted and supportive approach to combining pedagogical intent, learner expectations and institutional efficiencies	Learners and staff in further education (pre-entry to higher education)

Emerging practice	Technologies
<ul style="list-style-type: none"> Integrated theory and practical skills development Real-life working environment and development of professional skills Opportunities for learners to showcase their work to potential employers Enhanced reflective practice through peer review Rising retention and attainment statistics Increased engagement with local employers Staff-led curriculum transformation 	<ul style="list-style-type: none"> Internet TV channel and website Social media (blogs, Facebook, Flickr®, Twitter, wiki, YouTube) Independent server to support Apple® Mac® computers Internal video-hosting service Content management system Editing suite, including workflow software
<ul style="list-style-type: none"> Transformation of assessment practices with timely and responsive feedback Student led-assessment tools that support reflective practice Reliable access to e-portfolio and enhanced tutorial support while on work placement Extensive positive external collaboration with partner universities, health authorities and professional regulatory bodies Efficiency and cost benefits from collaborative partnerships 	<ul style="list-style-type: none"> Secure mobile services platform Virtual Learning Environments (VLEs) Data encryption service Smartphone devices (inc iPhone®) Student-owned devices Web-based e-portfolio systems Wi-Fi network Mobile-optimised assessment-generation tools Electronic resources
<ul style="list-style-type: none"> Providing interactive and context-sensitive learning experiences Enhanced access to multimedia content Strategic development of mobile provision Raising staff awareness through collaborative action research Developing community provision 	<ul style="list-style-type: none"> QR code generator and ELEVATE QR tour generator (both open source) Google Analytics™ Mobile phones with camera and QR code reader application
<ul style="list-style-type: none"> Supporting student transition with access to localised and contextually relevant information Enhanced support for learners with disabilities Collaborative development using open source community and providing open source solutions for others Building sustainable solutions 	<ul style="list-style-type: none"> Django® (Python) web framework and Wireless Uniform Resource FiLes (WURFLs) OpenStreetMap™ Gaboto open source geo-spatial data store
<ul style="list-style-type: none"> Engaging students and staff in the change processes Development of interactive and engaging pedagogical approaches Supporting a sustainable culture of innovation that is agile and responsive to learner and institutional needs 	<ul style="list-style-type: none"> Wide range, but specifically featured are: Bespoke retention and attainment monitoring system Sony® PSP™ games consoles Moodle Student Wi-Fi system Facebook

Working in partnership with students

The benefits of partnership working have long been acknowledged: organisations and individuals work together to enjoy benefits of scale, share the responsibility and share their expertise. Partnership working is a strategy that is frequently employed in many different contexts, so why not work with students to design, deliver and support their learning experiences?

Students as active partners

Colleges and universities have traditionally used surveys, focus groups and other feedback mechanisms to listen to their students and find out about their learning experiences, what they like and don't like and how things can be improved – a relatively passive process for students, with the institution retaining control. The challenge is to act on that feedback to deliver positive change. Involving students as “active partners in shaping their learning experiences” (QAA, 2010)¹⁵ enables institutions to go beyond listening and responding to learners, by creating opportunities for students to play an active and equal role in efforts to improve the quality of their learning experiences.

Harnessing existing skills

Efforts to widen participation in further and higher education have encouraged an increasingly diverse student intake, including more international students, students learning in the work-place, and students from communities where participation has traditionally been low. All of these students bring skills, knowledge, experience and insight that can be used to inform and improve the quality of learning and “to support a real step-change in the participation and

effectiveness of student engagement” (NUS–HEA Student Engagement project, 2009).¹⁶

In addition, student behaviours are being influenced by the emergence, increased availability and wide-scale adoption of new technologies, with access to information, resources and collaborative networks no longer confined to fixed locations but available almost anywhere and at any time.¹⁷ It makes sense to explore the potential of these technologies in partnership with learners, many of whom are highly proficient in the use of technology, to discover how learners choose to learn and to work together to enhance learning.

Creating collaborative cultures

Of course, such a change may present challenges in creating collaborative cultures, shifting the balance of control away from traditionally understood models, developing a shared understanding of responsibilities, and building structures that support and empower students. However, the emerging benefits indicate that students are more than willing and more than capable of rising to the challenge, enhancing not only their own learning experiences and achievements but those of their learning community, staff and the institution. Students gain research and personal development skills valuable to their future careers, while lecturers gain a greater insight into the issues that concern students, and greater understanding of the approaches that learners find effective.

There are social benefits too: a stronger sense of community can have a positive impact on retention, helping learners from diverse backgrounds to get to know each other, know their lecturers and benefit from less formal support mechanisms, making a difference to those who find the transition to further and higher education challenging.

The following three case studies explore emerging practice with technology when working in partnership with students

“I see education as being about transformation and empowerment, and part of that process is the ability of lecturers and students to work together. It is not just about us passing our knowledge on to them, it is also understanding how it is that they learn best.”

Professor Maggi Savin-Baden, Director, Learning Innovation, Coventry University



Working in partnership with students explores three innovative approaches to engaging learners:

- **Supporting student transition through reflective video sharing** describes how the University of Ulster is using social media to support first-year undergraduate biomedical science students to acclimatise to university life and develop their practical laboratory skills. In response to declining retention and national concern in relation to poor student perceptions of the relevance of practical laboratory work to their wider studies, the University of Ulster introduced video logs for students to record and discuss their practical work with peers. Tutors have observed a demonstrable increase in student confidence and enjoyment of the module and an improvement in retention statistics.

- The University of Exeter is **engaging students as agents of change** as a result of the JISC-funded INTEGRATE project. Students in the Business School are leading research into use of new technologies to enhance their learning experience in response to feedback from staff and student liaison committees. This approach has transformed practice from a comparatively low use of technology to enhance learning to the development of an investigative approach exploring use of a range of technologies that is active, collaborative and sustainable.
- At the University of Wolverhampton, **students as partners in blending learning** are collaborating with academic teams to develop blended learning opportunities for undergraduates across three subject disciplines. The student partners decided which technologies to use and how to interact with peers and engage with module staff. The pilot study proved beneficial for both students and staff in supporting the development of digital literacy skills. Early indications also reveal a positive correlation between increased engagement and student achievement.

¹⁵ <http://bit.ly/studentsaschangeagents>

¹⁶ www.nusconnect.org.uk/campaigns/highereducation/estudent-engagement-hub/nus-heaproject

¹⁷ www.jisc.ac.uk/media/documents/projects/effective-use-of-social-software-in-education-finalreport.pdf

Supporting student transition through reflective video sharing

University of Ulster

Vision

At the University of Ulster, the introductory chemistry module for the biomedical sciences degree has been redesigned using video sharing in a style similar to YouTube to ease the transition into university life for students and improve their practical laboratory skills. With support from the JISC TechDis HEAT scheme,¹⁸ the school created YouTestTube.com using Vidiscript open source software to add value to the laboratory experience, improve preparation, enhance the relevance of the practical sessions, and increase social interaction among peers.

The introductory module serves a range of degree courses including biology, dietetics, human nutrition, food and nutrition, and biomedical sciences itself. Cohort sizes often exceed 140 students. Students join these courses with varying levels of skill in and knowledge of practical laboratory work; not all have studied A level chemistry, and some are unprepared for and unfamiliar with safety protocols.



Transforming practice

UK bioscience students have rated their practical experiences as poor and lacking in relevance (Wilson, 2008).¹⁹ Staff at the University of Ulster observed low student engagement and poor preparation for practical sessions in some cases. To address these concerns and build upon previous work highlighted in the HEA-funded Student Transition and Retention project,²⁰ the academic team redesigned the introductory chemistry module to make the learning in practical sessions more engaging and help learners get to know each other.

Working in small groups, students are invited to make short video logs of their practical work. The video sessions are staged throughout the module, with each student taking part in one video. Guidance on what to include in the video is provided along with a series of reflective prompts asking students to consider what the practical is about, the skills they are developing, how the practical ties in with lectures, and how it may be important for other parts of their course. Students are encouraged to reflect on which parts of the practical were the most and least beneficial, any difficulties, and what advice they might give to others conducting the same experiment.

The module leader publishes the unedited videos on the YouTestTube.com website. Students are invited to join the closed site where they can review, rate and comment on the work of their peers. The site includes a social networking element that encourages interaction. Taking part is not compulsory, but students who do are recognised and awarded a small number of extra marks for their coursework. Prizes are offered for the most popular and highly rated videos.

The feedback has been positive, with good practice acknowledged by staff and students. Although some students

Working in partnership with students

“Being able to watch the practicals shows you what you need to improve on and reminds you exactly what happened in the course of the experiment. (It) makes you want to participate and increases enthusiasm towards practicals.”

Student, University of Ulster



were initially apprehensive, most found the process easy and enjoyable. They acknowledge improvements in their laboratory work and knowledge, enhanced understanding of the relevance of practical laboratory work to their broader studies, as well as benefits to their study skills and team work.

The videos are valued revision tools and extend laboratory practice by encouraging repeat viewing. Students appreciate being able to see videos of the practicals before they perform them, so that they can understand what they have to do and familiarise themselves with the apparatus. Making use of peer-generated learning objects in this way helps those less confident feel better supported. Tutors observe that students seem to interact better with one another and demonstrate enhanced reflection and analysis in their practical work.

Social interaction is highlighted by students generally as one of the better features of laboratory classes.

“www.YouTestTube.com is a great way to interact with the class as well as learn from the practicals completed throughout the semester.”

Student, University of Ulster

Useful to know

- Some students were reluctant to participate. Making participation optional maintained the fun element and removed pressure. Many overcame their anxieties when the benefits became obvious. Closed online groups helped to reassure anxious students.
- The system is easy to administer, but staff need time to manage administrative tasks and upload videos. Providing a centralised service across the institution may aid wide-scale adoption.
- An institution may need to consider its approach to the use of open source software to ensure that adequate support for both students and staff is available.

Moving forward

Reflective video sharing is helping to establish a collaborative and inclusive peer-learning environment in a subject often perceived to be difficult. The practice is now used in two other modules. Future work includes enabling students to edit and upload their own videos, and developing mobile access.

For detailed case studies, visit www.jisc.ac.uk/digiemerge

¹⁸ www.jiscstechdis.ac.uk/getheatscheme

¹⁹ www.bioscience.heacademy.ac.uk/ftp/reports/pracworkshopreport.pdf

²⁰ www.ulster.ac.uk/star

Engaging students as agents of change

University of Exeter

Vision

At the University of Exeter, first-year undergraduate students in the Business School are acting as 'agents of change' and working with academic staff to enhance learning and support engagement. Students are transforming traditional approaches to lectures by researching and co-developing innovative solutions in response to feedback from staff and student liaison committees.

Although the Business School has outstanding National Student Survey results, its use of technology was limited. The university has seen a sharp rise in its undergraduate intake, 33% of which are international students. Working together, students and staff have embedded technology to reflect commercial practice, sustain active participation in learning, and manage assessment and feedback processes, despite a large and culturally diverse student population.

Transforming practice

The JISC-funded INTEGRATE project is one of ten projects undertaken by the university to engage students as agents of change.

Students were invited to put forward proposals for improving learning and teaching to the university's Education Enhancement team. Each proposal was endorsed by a named member of staff within the school to ensure staff input and support. The application process was open and encouraging, outlining the support that would be offered and the skills that students would develop. Students were supported throughout the application process, and a graduate project coordinator was recruited to support the data collection and analysis and reporting aspects, and to develop collaboration between students, staff, the Students' Guild and the Educational Enhancement team.



Working in partnership with students

“I think the most exciting part of this project has been to see that it is possible to make a change even at such a large institution.”

Year 1 student, University of Exeter

Finding out students' aspirations for how technology could support their learning was part of the research process. The students explored how technology might support student engagement in lectures, how students felt about the use of technology in lectures, and whether technology enhanced their learning experience.

Activities included: recording and streaming lectures; responding to questions in lectures using mobile phones and SMS messaging; using an electronic voting system to facilitate greater interaction during lectures and group sessions; creating video evidence that students uploaded to the VLE; podcasting lectures; using optical mark recognition scanners and multiple choice questionnaire software for formative and summative assessment; and using wikis for collaborative group work and blogs to record and communicate project progress. In addition, lecturers used Turnitin, an internet-based plagiarism-detection service, to minimise potential plagiarism in student-submitted assignments and improve turnaround time.

Fears that students being able to watch recorded lectures without being present would have an adverse effect on attendance proved unfounded, with 98% attendance and particular benefits for learners for whom English is not the first language. The electronic voting system and use of SMS messaging promoted greater student engagement, offered diagnostic benefits and enabled lecturers to respond to learners. Camcorders supported the development of presentation skills and together with wikis helped to develop peer relationships and a collaborative online community.

Students are integral to the development process. This represents a significant culture change where the emphasis is on student action rather than just listening to the student voice. Students are benefitting from engaging in practical

research and developing valuable business skills and confidence that will better equip them to cope and respond to change in an evolving world. In taking charge of their own learning environment they are benefitting the academic community, ensuring their learning needs and preferences are met, and sharing with staff the responsibility of keeping pace with new technologies.

Useful to know

- **Engaging students as agents of change is fundamentally about people. Developing trust, confidence and a cultural mind-set that is positive, open, enquiring and supportive can take time.**
- **The support of a team focusing on learning improvement, such as the Educational Enhancement team, can facilitate conversations with key people and broker support between academic and technical staff. It can also provide both support and challenge at appropriate times.**
- **Make use of internal stakeholder groups with complementary agendas, such as the Students' Guild and staff and student liaison committees, to utilise established structures for moving forward.**

Moving forward

Engaging students as agents of change has enabled the Business School to move further and faster in integrating technology appropriately within the curriculum. The momentum and enthusiasm generated has empowered students and generated a commitment to action in the quest to build educational futures that best serve students' needs.

For detailed case studies, visit www.jisc.ac.uk/digiemerge

Students as partners in blending learning

University of Wolverhampton

Vision

At the University of Wolverhampton, students are working in partnership with practitioners to develop and deliver blended learning. Redefining the traditional relationship between student and practitioner, this innovative approach offers challenges and risks but also provides increased opportunities to empower students and create an exciting and inclusive approach to learning.

Staff and 350 undergraduate students across three modules in health, computing and cultural studies have been participating in a pilot study to investigate new solutions to persistent issues in the blending of learning (Melville, 2009):²¹ inconsistent integration of technology in higher education courses (Sharpe et al, 2006),²² how to exploit the potential of ever-changing technologies, and the need to develop an inclusive pedagogical strategy to benefit from the skills of students (Hocking, 2010).²³

Transforming practice

Students from the three modules were invited to apply for the role of student partner to lead an exploration into how learning may be enhanced using freely available software. Seven students were appointed; each was given an honorarium at the end of the module. The student partners chose the technology and how it was used: all used Facebook groups as hubs to support peer learning, with each group establishing its own hub. Facebook groups permit individual privacy and support information sharing via the Facebook Wall, discussions, sharing of links and videos, and synchronous (real-time, text-based) chat.

Two groups invited staff to join the site, one excluded them. Over the three modules, staff and students encouraged class



members to join the Facebook groups at face-to-face sessions; around 50% of the students signed up.

Activities led by student partners, with which peers engaged, included posting additional subject information, outlining their interactions with module leaders, seeking feedback from peers to share with lecturers, making notes available, and one instance of providing formative assessment materials. Analysis of the groups' Walls also showed very rich exchanges and debate on topics from modules, relating the discussions to information from other sources and contemporary events.

A blog was used to distribute learning materials, some written and researched by the student partners. Use of technologies such as Twitter, e-portfolios and other social media were explored.

Working in partnership with students

“The student partners were most successful in eliciting for the class a list of troublesome points they wished me to clear up.”

Module Leader, University of Wolverhampton

The extent of use of Facebook and interaction varied across the disciplines, with cultural studies showing the highest engagement. The approaches and energies of the student partners also varied according to the context of the modules, with one subject creating formative assessment questions and feedback with the module leader, and another providing feedback to staff about student-voiced learning issues.

The students on each of the three modules partnered with staff in different ways, using email, the telephone, and meetings at different frequencies (from weekly to ad hoc). Two-way communication between students and staff was seen as valuable by all.

Although the sample is comparatively small, an analysis of the findings so far indicates increased engagement and student achievement, with pass rates for two modules being 10% higher than the previous year. Another outcome is improved attendance. Students are largely appreciative of the role and efforts of the student partners, and have identified specific benefits such as:

“Being able to ask any questions I had and learning from other questions that other students asked.”

Student, University of Wolverhampton



Useful to know

- There are ethical issues to consider, such as that selected student partners tend to achieve some of the highest grades, possibly because they engage deeply with the learning.
- The pilot study involved staff who were supportive and open to the project's aims. Securing the buy-in of all stakeholder groups is important if you are considering wide-scale adoption of this approach.
- Institutions need to consider how they will support students, some of whom may have less well-developed digital literacy skills, to acquire appropriate skills.
- An introductory workshop for students and staff can facilitate effective working and raise pedagogical awareness.
- Guidelines may help to address potential issues such as accuracy in student-generated content.

Moving forward

By harnessing the knowledge, skills and abilities of students in their use of social software, staff have begun to address some of the challenges in integrating technology and overcoming barriers of time and understanding to develop inclusive pedagogical approaches.

For detailed case studies, visit www.jisc.ac.uk/digiemerge

²¹ www.jisc.ac.uk/media/documents/publications/heweb20rptv1.pdf

²² www.heacademy.ac.uk/assets/York/documents/ourwork/research/literature_reviews/blended_elearning_full_review.pdf

²³ Hocking, C (2010). Inclusive Learning and Teaching Research Synthesis. HEA: York

Developing students' employability potential

Providing relevant and authentic learning experiences that offer opportunities to develop and evidence professional practice not only enhances student employability but makes good business sense for colleges and universities, for employers and for the economy as a whole.

Benefits of authenticity

For students, the opportunity to engage in authentic learning activities better prepares them for their chosen careers, instils professional working practices and builds both confidence and competence. Engaging in real-world learning can be motivating for students, introducing a level of challenge that can inspire students to higher levels of attainment than may otherwise be expected, as well as showing the breadth of opportunities available and introducing students to potential employers.

The benefits for employers are clear: in developing employer-responsive provision, colleges and universities are servicing business by providing better-prepared employees, reducing initial training costs and enabling new recruits to contribute more fully, in less time, towards business objectives. Colleges and universities are responding by engaging more directly with businesses and students to better understand and meet their needs. In a fast-changing world the need to maintain this engagement is vital for all parties.

Technology offers flexible opportunities

Successive governments continue to emphasise the importance to the economy in raising skills levels to increase our ability to compete in global markets and to innovate. The drive to improve skills relates not just to first-time students but also to those already employed who may require professional updating, to learn new skills to meet emerging

business needs or to train for a change in career. This signifies a potential need for greater flexibility in modes of study and an increase in part-time, distance and/or online learning.

Technology is now so much more than a medium to deliver content, receive assignments or exchange information. Although these features are important, it is the potential of technology to enable collaborative and immersive learning that is particularly exciting, along with opportunities to practise skills that may otherwise be difficult to practise for logistical or ethical reasons. To provide responsive and personalised opportunities for learning with access to information and support whenever and wherever it is needed is now a realistic ambition, further enabled by the rapid uptake of mobile technologies.

With technology featuring in most workplaces in some form or other, the ability to learn using industry-standard technologies in authentic situations is invaluable.



The following four case studies explore how emerging practice with technology is supporting student employability

“We need to give people a new set of skills in an explicit way that will make them more marketable for the job market.”

Cristina Costa, Research Technologies Development Officer, Research and Graduate College, University of Salford



Developing students' employability potential explores four ways in which colleges and universities are equipping students with the skills and experiences they need to succeed:

- Undergraduate dental students at the Universities of Exeter and Plymouth's Peninsula College of Medicine and Dentistry are **developing professional practice using simulations** of complex clinical situations without incurring risks to patients. Students are able to revisit the interactive online scenarios as often as they like, extending their learning experience, and they receive detailed feedback when they complete each scenario. The university is now exploring the possibility of extending the practice to support continuous professional development for qualified dentists.
- In response to increased demand, the University of Derby is **moving into virtual worlds** to develop distance and flexible learning opportunities to provide parity of learning experience for undergraduate psychology students studying online. Working in collaboration with Aston University, the university has developed a series of interactive, problem-based learning scenarios that explore a range common mental health disorders in a safe and ethical environment. The result is an immersive and engaging experience that brings learning to life.
- **Springboard TV: enhancing employability** reveals how learners on media studies courses at the College of West Anglia are gaining valuable industry experience and enhancing their employment prospects by working through the college's internet TV channel. Learners work on real projects commissioned by local businesses and community organisations. The learner experience has been transformed with improved contextual relevance, theory integrated into practical sessions in a more meaningful way, and opportunities for the students to showcase their work to employers and higher education.
- The **Assessment and Learning in Practice Settings (ALPS)** project shows how mobile technology is being used to improve the experience of health and social care undergraduates while training on work placements. The ALPS Centre of Excellence in Teaching and Learning adopted a collaborative approach spanning five universities and 16 professional regulatory bodies to transform practice by assessing students much closer to the patients and point of delivery, enabling responsive capture of 360-degree feedback and evidence of competency from healthcare professionals and patients that can be securely transmitted to students' e-portfolios.

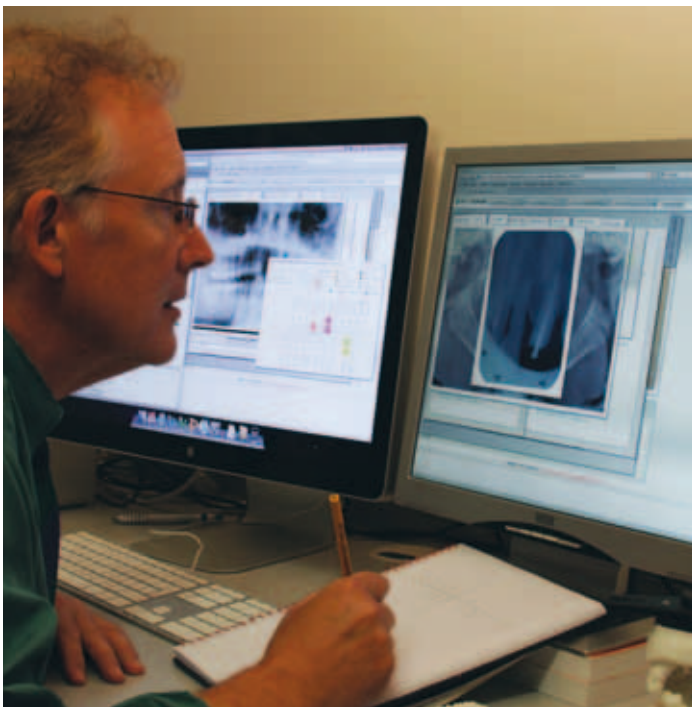
Developing professional practice using simulations

Peninsula College of Medicine and Dentistry, Universities of Exeter and Plymouth

Vision

Undergraduate dental students at the Peninsula College of Medicine and Dentistry (a collaboration between the Universities of Exeter and Plymouth and the NHS) are developing their professional practice using interactive online simulations of real scenarios to help them master specialised skills that are hard to learn.

The Bachelor of Dental Surgery degree at the college has a focus on learning in a clinical context. Students are involved in community-based projects and undertake supervised work for the public. The introduction of the Dental Virtual Patient (DVP) suite was designed to augment and extend learning, not to replace real-life practice. It is used to support formative rather than summative assessment.



Transforming practice

A bespoke web-based system, the DVP suite, was built using standard browser-based technologies to present a series of scenarios to students in their fourth (final) year. The suite exposes students to complex clinical situations that they would not normally see until much later in their careers, in a safe environment, without incurring risk to patients – a particularly acute need in medical and healthcare professions.

Treatment planning is an important part of the final year dental curriculum and is difficult to master. It is a competency that develops over time, requiring exposure to a range of different case studies. Students need to be aware of uncommon clinical scenarios, but may not always have an opportunity to engage with these at more than a theoretical level during training.

The development of the DVP suite was a collaborative project involving academic staff and learning technologists in the college's e-Learning Support Group. After conducting a review of available systems (including commercial), the project team decided that a bespoke system was necessary to address the complexities of providing high-quality feedback in cases where multiple approaches to treatment are possible.

Five interactive scenarios were developed that include real patient information presented using video, photographs, patient notes and diagnostic aids. Students 'examine' each patient by drawing on the information available before completing charts, making a diagnosis and developing treatment plans. The system is designed to encourage students to engage, by only releasing information in response to student interaction. Additional resources such as CT scans, X-rays, bite moulds and examination results can be requested, introducing further realism in terms of cost and timescales.

Developing students' employability potential

"I find the virtual patients a very useful learning tool and a good opportunity to treat patients I wouldn't otherwise meet."

Student, Peninsula College of Medicine and Dentistry

The DVP tracks students' use of the tool and enables tutors to monitor progress. The automated feedback is detailed and includes prompts to facilitate reflection on learning. Students review their results and discuss these individually with their tutors. A group plenary session is held to discuss any issues arising and manage gaps in understanding. Students can revisit the case studies to practise further.

The user interface has been tested and refined in response to feedback from practitioners, students, learning technologists and assessment experts. The students' reactions are encouraging and indicate they value opportunities to rehearse future interactions with patients.

"A good way to quickly see many different cases and practise diagnosis and treatment planning."

Student, Peninsula College of Medicine and Dentistry

"I liked the immediate feedback after completion and good feedback on what was right or wrong."

Student, Peninsula College of Medicine and Dentistry



Useful to know

- The college has its own in-house e-Learning Support Group, which has provided the advisory and development role, working with core dental academic staff as the content experts. The collaborative process has been critical to the success of the DVP, particularly in terms of technical support and in developing multiple routes through the material and robust feedback.
- All the patients are known to the year 4 lead academic tutor and have given their full consent to the information, images and sound recordings being used. Further care may be necessary if resources are to be publicly available.
- Ease of use was a key consideration. Students needed little or no support beyond the initial induction, although a help manual is provided. The system is designed to work on low-specification machines.

Moving forward

The introduction of the DVP is enabling the college to extend the learning experience and develop skills essential to professional practice.

The complex decision-tree approach, in which there is more than one right answer, has enabled the college to develop a sophisticated formative assessment tool applicable (with appropriate adaptations) to other subjects.

The college plans to expand the portfolio using student-generated exit case studies compiled during their final year, and less complex case studies in year 2.

The potential to use the system to support professional updating for qualified dentists is also being explored.

For detailed case studies, visit www.jisc.ac.uk/digiemerge

Moving into virtual worlds

University of Derby and Aston University

Vision

Like many universities, Derby is facing increased demand for distance and flexible learning, and aims to increase the number of courses providing alternative modes of study. The university has collaborated with Aston University to develop resources in Second Life to support tutorials and problem-based learning for undergraduate psychology students studying through the university's flexible online programme (accredited by the British Psychological Society).

Transforming practice

Second Life is a 3D multi-user virtual environment (MUVE) in which participants can move around, collaborate and socialise using voice and text chat as avatars (forms they have chosen to represent themselves). While MUVEs can have cost implications, there are some important advantages: resources can be repurposed for use in other disciplines; MUVEs offer flexible access for part-time, distance and work-based students; and they provide an immersive learning experience that replicates authentic learning and, in some circumstances, overcomes logistical and ethical barriers associated with learning in real-world settings.

Building on the JISC-funded PREVIEW project (Coventry University),²⁴ with support from the HEA Psychology Network and JISC funding, the PREVIEW-Psych²⁵ course team developed four avatar-driven clinical scenarios designed around common mental health disorders, closely linked to content from the University of Derby and Aston University's first year psychology teaching modules. The aim was to emulate campus-based learning using interactive lectures, seminars and group work.

Careful consideration was given to what was necessary to provide an effective online learning space and to develop

strategies that would engage the students in active learning. Problem-based learning was identified as an appropriate strategy because it requires students to seek out information and can be collaborative. Second Life was selected as a suitable platform because students can read, listen to audio resources, see 3D avatars acting out symptomatic behaviours, and interact with avatars and peers to gain further information, very much as would occur in campus-based group work. Students can also take on the role of a social worker, work in teams with a tutor (member of staff) to find out more about the virtual family they are visiting, and construct a report without leaving the virtual world environment.

The project team was familiar with Second Life, had a server and island available to host the scenarios, and had the developmental skills to build the environment. The island hosts an orientation and information area, a lecture theatre and a house where the scenarios are based. The house is populated with programmed avatars called chatbots that provide additional information and bring the case studies to life.



Developing students' employability potential

“I was thinking more about the real life psychology because the avatars represented real people with real psychological problems.”

Student, University of Derby

Students enjoy the collaborative aspects but also view avatar-driven simulations as valuable for individual work. Their feedback has been positive:

“We worked as a team ... this seemed much more valuable than just writing an essay or having a discussion.”

Student, University of Derby

Useful to know

- **Group induction and orientation sessions are an essential precursor for effective problem-based learning sessions in Second Life. Students found sessions more rewarding when facilitation was kept to a minimum once the initial introductions were made.**
- **MUVEs may not be accessible to all, and adaptations or alternative approaches may be necessary to provide an equivalent experience for some users. The University of Derby provides alternative access by posting all materials and resources used in Second Life sessions on a companion website.**
- **Combining academic and technical expertise is vital – both skill sets are necessary for effective and innovative use of MUVEs – as well as careful curriculum design and training for all. The University of Derby's Technology Enhanced Learning Group contributes to strategic thinking and ensures that pedagogical aims drive and inform technological solutions.**
- **If distance learners must use Second Life, it is vital that this is stated clearly in the student handbook. Technical help and support to develop ICT and digital literacy skills should be provided for online learners to ensure equity of experience with on-campus students.**
- **There are several different MUVEs, some of which are open source; those interested in working with virtual worlds will need to explore the different costs, functions and licence agreements to find the solution most appropriate to their needs.**

Moving forward

MUVEs allow you to think outside existing paradigms and offer simulations that are more than just a digital equivalent to the real world.

In exploring the use of Second Life to provide parity for online learning students, the university is not only opening up new markets but also using the lessons learned to enrich campus-based provision.

The approach taken by the University of Derby and Aston University is highly replicable: the virtual house is also being used for an environmental project to explore people's attitudes towards green issues and motivation to embrace, for example, recycling and energy efficiency.

For detailed case studies, visit www.jisc.ac.uk/digiemerge



See also the video clip: Moving into virtual worlds
www.jisc.ac.uk/emergeresource

²⁴ www.jisc.ac.uk/whatwedo/programmes/usersandinnovation/preview

²⁵ www.previewpsych.org

Springboard TV: enhancing employability

College of West Anglia

Vision

The College of West Anglia set out to enhance the employability of learners on media studies courses by setting up Springboard TV, a media production company and online television channel that showcases learners' work to employers and higher education. First and second-year BTEC and Diploma learners work collaboratively on real projects commissioned by local businesses and community organisations.

Most of the curriculum is now delivered through the production company, a radical change that involved taking a fresh look at the requirements of the media industry and mapping these against vocational qualification specifications. The result is an innovative and engaging delivery model that motivates learners and replicates the professional working environment.



Transforming practice

Interest from a community organisation in developing an internet TV station, combined with an awareness of declining recruitment and low satisfaction ratings, prompted the college to re-evaluate the delivery model for media studies. Learners struggled with project timescales and failed to comprehend the urgency of commercial deadlines.

A holistic project, funded by Becta and JISC, addressing curriculum, cultural and resource implications, enabled the college to launch Springboard TV just eight months after inception, providing benefits for learners, staff and the wider community.

The production company emulates the commercial world with real clients, real projects and real deadlines. The contextual relevance of theory is improved by embedding it in practical sessions. Working in mixed-level teams facilitates a spiral curriculum where learners consolidate and extend their skills by undertaking different roles for each project, moving from basic to advanced roles over time.

The college regards technology as a tool and an enabler. Springboard TV provided the catalyst to update practice and fully embed appropriate technologies in the new delivery model. Industry-standard equipment is essential to the success of the initiative, and social media such as Facebook and Twitter are used for communication and promotion purposes. Learners are encouraged to blog about their experiences and to reflectively critique their own and each other's work. The curricular and IT teams work together to remove obstacles to the introduction of non-standard equipment, to update policies and address training needs.

Successfully implementing this significant culture change necessitated the involvement of all stakeholders and an

Developing students' employability potential

“All the equipment that we have here is of a professional standard, and all of the practices that we are taught are of a professional standard, so I feel as though I am prepared to go on into the media world and know what I am doing.”

Toby Foulkes, Learner, College of West Anglia

effective communication strategy. It was important that staff 'owned' the challenge and worked in partnership with learners, senior managers and support teams to develop the new approaches. Lecturers were given remission from teaching schedules to plan and up-skill. Learner focus groups were held and surveys conducted; learners designed the logo and brand for the channel and named the production company.

The result is a highly learner-centred approach with a professional work ethos. Learners are focused and motivated. They proudly wear their Springboard TV t-shirts and have a strong affiliation with the company. Recruitment, retention and achievement have significantly improved, with the percentage of learners progressing to university increasing from 37% in 2009 to 77% in 2010. The channel has been adopted as a cross-college communication tool and is central to the college's marketing strategy.

Springboard TV produces training resources and films conferences, awards ceremonies and portfolio evidence for other curriculum areas across the college. The pedagogical approaches are transferable. For example, a theoretical or philosophical topic can be explored through a filmed debate, providing a resource for further reflection, analysis or revision.

There is a strong demand for the services of Springboard TV among local employers and community organisations. Clients include the Tourist Board, local authority, rescue services, a commercial production company and many smaller businesses. The learning experience is authentic, and learners accrue high-quality portfolio evidence to support their future careers and study ambitions.

Useful to know

- **Senior managers empowered staff to make such a radical transformation to the curriculum by creating a culture in which innovation was encouraged through off-site training events and individual support.**
- **Learner involvement from the outset is essential; the prototype Springboard TV website was not well received by learners and had to be redeveloped to meet their expectations.**
- **A project-based approach supported by a steering committee and 'critical friends' helped to maintain focus and momentum, and give access to specialist knowledge and objective thinking.**
- **Although developing the new delivery model was challenging at times, staff now feel reinvigorated and better supported by colleagues. The team approach draws on the broader skill set of staff and encourages the sharing of expertise.**
- **The engagement of local employers is critical and can take time to develop.**

Moving forward

For the Media Studies team, it is unthinkable to go back to the previous delivery model; the benefits to learners, the college and wider community are wholeheartedly positive. Springboard TV is now so embedded in the way the college does things that the college is funding the positions of channel manager and media technician while exploring cost-recovery options to develop the service further.

For detailed case studies, visit www.jisc.ac.uk/digiemerge



See also the video clip: Springboard TV: enhancing employability www.jisc.ac.uk/emergeresource

Assessment and Learning in Practice Settings (ALPS)

The Centre for Excellence in Teaching and Learning, comprising the Universities of Leeds, Bradford and Huddersfield, and Leeds Metropolitan and York St John Universities

Vision

The Centre for Excellence in Teaching and Learning's ALPS programme investigated the use of mobile technology to improve the assessment and learning experience of students while on placement, training for one of 16 health and social care professions.

Hands-on experience can greatly enhance students' learning but can have drawbacks. Varying levels of access to tutorial support and computers may cause students to feel isolated or miss learning opportunities. Mobile devices provide students with reliable, consistent and secure access to a range of services, tools and resources to develop the competencies and confidence essential to their professional practice.

Initially, the University of Leeds loaned mobile devices to students, but more recently it has issued iPhones to medical students in years 4 and 5, while the University of Bradford is developing access to a wide range of resources and services via student-owned devices.

Transforming practice

The ALPS programme is multi-faceted involving a radical review of assessment practices across 16 healthcare professions, compliance with the requirements of stakeholder groups such as the National Health Service and professional regulatory bodies, attention to ethical and legal aspects of professional practice, and building trust and collaboration across five higher education institutions.

Designing and building a large-scale mobile solution was not only a major procurement exercise but also an exercise in working across institutional cultures and systems to reach a best fit. Accommodating multiple platforms (VLEs, student record systems and e-portfolios) across multiple partners



was acknowledged as a complex task. ALPS developed a mobile learning platform and assessment suite shared across the partners that linked in to the universities' systems, providing authenticated access when users logged on.

While mobile technology became the solution, the underlying vision continued to be to improve confidence and competence in practice. This led to:

- The development of three competency maps common to all 16 professions. The maps make it possible for students from one profession to be assessed by staff from another health or social care profession, simplifying evidence collection for students and facilitating inter-professional working.

Developing students' employability potential

“I think that the idea of assessment has changed. The idea that you can assess immediately something that has happened in practice, the idea that you can assess a student and give them immediate feedback and that it will be recorded as evidence for them [is new].”

Gareth Frith, Technology Enhanced Learning Manager, University of Leeds

- Student-led assessment tools that support reflective practice. The ease of uploading evidence to the e-portfolio means that students assemble everything in one place and can reflect on work before submitting it for assessment. Tutors are notified when work is ready for assessment and can feed back in a timely manner. Tutors are also able to monitor progress and prioritise workplace visits for those most in need of support.
- A number of additional research projects. One, the Mobile Enabled Disabled Student (MEDS) project, explored the use of technology by disabled students; students found that devices helped them with organisation and spelling, and provided the ability to record audio notes. Recommendations from the MEDS project for changes that would make a positive impact on disabled students were made to the software developers.

Students now benefit from access to key medical texts to support their practice, more responsive tutorial support, reflective tools, and the ability to capture and submit evidence with ease wherever they work or study. The authenticity of the assessment twinned with the ability to capture immediate feedback is proving beneficial to students, service users and tutors:

“I think I am a better student for it. It is going to enhance us becoming better doctors in the future and overall provide better patient care.”

Adam Grice, Medical Student, University of Leeds

Useful to know

- **Complex programmes require commitment and vision at the highest level, supported by detailed research and consideration of the resources and structures most likely to service the project aims.**
- **Collaborative projects, including those with commercial partners, offer great potential in terms of pooled resources and expertise, creative growth, increased bargaining power, marketable products, new business opportunities, and momentum for change, but need time for relationships and trust to develop.**
- **The rapid pace of technological change makes future-proofing difficult. Enabling access via user-owned rather than university-owned devices may present a more sustainable option but will require student access to appropriate technology and a mobile platform flexible enough to deliver to a wide range of devices.**

Moving forward

Although challenging at times, the partnership between the individual universities and stakeholder groups involved has enabled the centre to achieve significant efficiency gains and transform assessment practice, providing authentic experiences that more closely reflect what future healthcare professionals will face in practice.

The ALPS mobile learning work has had an influence across the partnership. The University of Leeds School of Medicine is taking the work forward through its Mobile Learning project. At the University of Bradford, a broader focus on providing mobile access to university systems is now part of its e-strategy.

For detailed case studies, visit www.jisc.ac.uk/digiemerge



See also the video clip: Assessment and Learning in Practice Settings www.jisc.ac.uk/emergeresource

Preparing for the future

In a world of continuous change, few are confident enough to predict the future, yet the need to look ahead and prepare is vital. While the speed and scale of a change may be unpredictable, when you look back there are often indicators that signalled how things may develop – perhaps the germ of an idea or recognition of a future possibility that is often visible long before it is publicly acknowledged.

Embracing change

Accepting the inevitability of change need not prevent engagement in the challenge to remain agile and well positioned to respond to those changes – to engage in future building not future-proofing (Facer, 2011).²⁶

Technology is perhaps the most obvious example of an area experiencing rapid change that necessitates enquiry into how new opportunities can be used to positively influence learning and pedagogical practice. By observing behaviours such as the rise in collaborative and online social networking and the advent of new learning patterns that see users logging in from varied locations, including while on the move, by

reflecting on changing circumstances such as an increase in students combining work, caring and social responsibilities with their studies, and by monitoring new technologies, it is possible to see new possibilities start to emerge and to begin to prepare for these.

Engaging strategies

Finite resources mean it may not be feasible to devote significant resources to unproven, exploratory initiatives, but it is possible to prepare the way with modest means. Starting small and proving the concept is an established strategy, but it can sometimes be difficult to move beyond this and scale up to achieve wider adoption. Identifying and working with key stakeholders by engaging them in the design and development, collaborating with others working towards similar goals, and making use of open source communities can be powerful change mechanisms. In the longer term, efforts to create the right culture and to engage others in the process of change may prove to be more valuable and lead to more sustainable practice.



The following three case studies explore how emerging practice with technology is supporting institutions to prepare for the future

“Future-proofing is being on the back foot, protecting individuals and institutions against change. Future-building is exploring possible futures in development and asking how can we work together to tip the balance in favour of futures that offer real wellbeing for our students.”

Professor Keri Facer, Professor of Education, Education and Social Research Institute, Manchester Metropolitan University



Preparing for the future shows three different approaches being employed by institutions to develop creative use of technology to engage their learning communities and begin to prepare for the future:

- **Linking learning to location** outlines how University Campus Suffolk is using 2D barcodes known as Quick Response (QR) codes to develop its knowledge and provision of mobile technology. Choosing a technology that is comparatively new and untested in education encourages a more open and exploratory approach; involving curriculum teams in the investigation from the start and pairing this with the support of learning technologists means the resulting models of potential use are pedagogically informed and make best use of the creative talents of both teams. In addition, some of the traditional barriers to adopting new technologies, such as staff awareness and training, are addressed organically from within the project.
- In developing Mobile Oxford, the University of Oxford is **opening access to information** to benefit students, staff

and the wider community. The rapid uptake in use of mobile technologies, and observations on changing student behaviours, signpost growing expectations from students for mobile access to the university's services. Anticipating these expectations, the university is exploring how mobile technology can best support pedagogy, and is beginning to make its services available using intuitive mobile applications with support from the open source community. The university has benefitted by combining a far-sighted vision with an agile and responsive development cycle, and is supporting others to establish similar provision.

- Gloucestershire College is taking a holistic and strategic approach and investing in the future by **creating the culture** in which innovation can thrive. Believing strongly that the innovation is not in the technology but in embedding practice, the college has developed a multi-faceted approach designed to encourage and engage all members of the learning community to participate, explore, contribute and share. By making technology highly visible, supporting innovative ideas, tackling logistical barriers to use and participating in collaborative projects, the college is building momentum through a positive, forward-looking and solutions-focused ethos that is enabling it to remain responsive and sustain progress.

²⁶ Facer, K (2011) *Learning Futures Education: Technology and social change*. Routledge: London and New York

Linking learning to location

University Campus Suffolk

Vision

A strategic priority for University Campus Suffolk (UCS) is to exploit the growth in use of mobile technologies and their potential to support learning wherever the student chooses to learn. The university has set up an innovative research project to explore the potential of 2D Quick Response (QR) barcodes to develop enhanced-reality learning experiences, accessed via mobile phones. The project serves multiple aims: creating interactive learning experiences, identifying opportunities and challenges to inform future developments, generating interest among students and staff, and paving the way for future initiatives.

QR codes are graphical two-dimensional barcodes which easily connect a physical object to an online resource when the physical object is scanned using a smartphone camera. Barcodes can be created and read using free software.

UCS selected QR codes as the focus for research because they have the potential to engage students by linking them to context-sensitive multimedia resources from almost any location; they are also inexpensive and easy to deploy.

In partnership with academic staff, the ELEVATE team (established to enhance learning through innovative technologies) at UCS has piloted the use of QR codes through two different learning experiences and created an easy-to-use QR-code tour-generator tool that enables users to create and edit tours involving multiple codes.

Transforming practice

Previous JISC-funded research²⁷ established efficiency benefits in using QR codes for administrative routines such as assignment submission. The ELEVATE team wanted to explore use of QR codes to deliver meaningful learning



experiences enhanced by adding a location-specific context. An awareness-raising session for staff introduced the technology and concept. Proposals to design and develop learning activities and test the further potential of QR codes were invited, two of which were selected for full implementation, funding and support.

The team developed easy-to-use open source web-based tools, the QR code generator²⁸ and QR tour generator,²⁹ designed to remove potential barriers for non-technical staff. The tour generator tool enables staff to create codes that, when fixed to objects, guide users to additional information and resources relevant to that object or its location. The tool simplifies the technical processes by automatically generating short URLs, facilitating future editing and creating a PDF document of the points of interest. It also uses Google Analytics to provide statistical information to track use once the tour is being used.

Preparing for the future

“Teachers are good at innovating if they are given the space and their innovations are legitimised.”

Karl Royle, Curriculum Innovation and Knowledge Transfer, CeDARE – Centre for Development and Applied Research in Education, University of Wolverhampton

The School of Arts and Humanities used the tool to add a more interactive element to exhibitions. Staff placed QR codes next to art exhibits and in catalogues to direct visitors to websites providing additional information on the artists, their influences, materials and methods, and other multimedia resources. QR codes offer the potential to extend the exhibition space beyond the physical boundaries and showcase a broader selection of students' work.

The Division of History and the Ipswich Maritime Trust are developing a virtual tour that charts the social and economic changes of Ipswich wet dock through time, making previously archived resources easily accessible to a wider audience. At key points on the tour, users can access an interactive trail with audio commentary from past skippers of vessels, and photographs and film footage.

The ELEVATE team is taking this work forward with curriculum teams through its structured 'hub and spoke' approach. Each of the five heads of school works with the e-learning development manager to plan how technology will be used to enhance learning. A technologist is then allocated to work with the school for two or three days a week, managed by the e-learning development manager. This strategic approach facilitates cross-fertilisation of ideas between schools and ensures equitable access to support.

Collaboration between academics and technologists has overcome some of the hurdles in using QR codes, and identified future support and staff development needs. The project provides valuable home-grown examples to inspire others, both in UCS and externally. Being able to draw on local examples establishes a culture and community in which further innovation can thrive.

Useful to know

- **Not all students have top-end phones. Testing on a variety of devices enables differences in functionality between phones to be addressed and adequate support to be put in place; for example, in small-group work, at least one member of the group should have a phone that can read QR codes.**
- **Good, reliable connectivity is a precursor when using QR codes. The possible cost of using mobile networks where free wireless access is not available may diminish students' willingness to participate.**
- **Consider security precautions to prevent QR codes being misused (for example, someone placing an alternative code over the top of your own to direct users to other sites).**

Moving forward

A structured but 'light-touch' approach using technology that is readily available, easy to use and inexpensive has enabled rapid development and visible results. UCS has developed a supportive model that is building capacity to exploit new technologies.

A project is now underway working with induction, library and estates teams to create an interactive treasure hunt to support new students to acclimatise to the campus, by 'giving buildings a voice'.

For detailed case studies, visit www.jisc.ac.uk/digiemerge

²⁷ www.jisc.ac.uk/whatwedo/programmes/elearning/ltig/qr

²⁸ <http://wolseyweb.ucs.ac.uk/elttcode>

²⁹ <http://wolseyweb.ucs.ac.uk/QRTour/index.aspx>

Mobile Oxford: opening access to information

University of Oxford

Vision

Taking information sharing to a new level, the university developed the Mobile Oxford project for students and the wider community. Mobile Oxford also has clear advantages for those with disabilities. Intuitive access is provided, via mobile phones and other devices, to maps, contact details, news and items such as travel information, podcasts and information on library books.

Transforming practice

Mobile Oxford provides a wealth of information and services using public information and, for students, authenticated access to university systems and data. Data from different services is presented quickly in a simple and consistent format designed, rather than optimised, for mobile use.

Examples of Mobile Oxford's powerful features include:

- A 'Places' application that enables users to find their way around the city. The application combines details of the user's location with data from the Department for Transport, Open Street Map and the university's own geo-spatial database. Users can access detailed information on university buildings and services, local amenities, leisure facilities and transport.
- The 'Library Search' application, which searches Oxford University's extensive library collections by title, author or ISBN number; in addition to showing the user a map and the distance from the user's current location, the library search will advise on the availability of the book and any limitations to lending.
- Full access to the University of Oxford's public podcasts library through an interface that is easy to browse on mobile devices.

- A universal search facility on all the key pages that allows users to enter postcodes, bus stop numbers and free text; content-specific searches are available within individual features.

A project board and the open source community support the team responsible for the technical architecture and development of Mobile Oxford. The project board includes technical and academic staff and representatives from the disability advisory service and external organisations.

Key aims for the JISC-funded project were for Mobile Oxford's services to be accessible to those with disabilities, and from any type of mobile device. The continuing involvement of the



Preparing for the future

“We survey students when they come up to university and have found that most don't carry laptops as they are too heavy. We felt that it is important to make our services available to mobile devices and explore how mobile technology can support the pedagogy.”

Professor Paul Jeffreys, Professorial Fellow and Director of IT for the University of Oxford

university's disability services has resulted in excellent customer service and a strong user focus. Specific features that benefit disabled users (1,300 students declared a range of disabilities in 2010–2011) include: the consistent format to aid navigation for users with impaired sight; photographs of entrances to buildings and information on disabled access; and information about facilities and services near to a user's location, of benefit to those with fatigue conditions. By making information available at the point of need, the university is enhancing access to information for all students.

Users can provide anonymous feedback from a link on every screen. Contextual information – about the page that was being viewed and the type of device being used – is included automatically. Anonymity increases the likelihood of people providing feedback. Specific, detailed and timely information expedites responsive and agile development cycles.

Useful to know

- **The benefits of highly conceptual and technical projects are not always easy to visualise. Demonstrating the benefits with early prototypes can ignite interest, attract new ideas and build momentum.**
- **Working with the open source community offers the potential to replicate the higher resource levels available to corporate development teams at a lower cost but building the community can take time to establish and to reach a critical mass.**
- **The impact of continuous industry growth and change can be managed using web applications rather than addressing individual operating systems or devices.**
- **Services such as JISC OSS Watch³⁰ and technology blogs are good sources of up-to-date development information.**

Moving forward

Mobile devices are changing the way users engage with information. With over 1,700 discrete users per day Mobile Oxford demonstrates how an institution can include the larger community when providing open access to data for students.

Future work includes collaboration to develop a new student record and information system, embedding the use of Mobile Oxford in a new biomedical sciences course, and potential use by the Admissions team to provide an interactive experience for visiting students, combining places and routes with podcasts relevant to each location.

Mobile Oxford has also led to the development of the Molly project,³¹ an open source community project that provides a flexible framework to enable others to develop similar services quickly and efficiently.

For detailed case studies, visit www.jisc.ac.uk/digiemerge



See also the video clip: Mobile Oxford: opening access to information www.jisc.ac.uk/emergeresource

³⁰ www.oss-watch.ac.uk

³¹ <http://mollyproject.org>

Creating the culture: a holistic approach to technology-enhanced learning

Gloucestershire College

Vision

Gloucestershire College wants to develop a forward-looking and creative organisational culture with a positive approach to innovation and change that is shared by learners, staff and management. The college wants all staff to feel comfortable and safe in using technology to solve problems relating to both learning experiences and administration. Through a broad range of initiatives it has ensured practitioners have access to the expertise, equipment and support they need to trial new ideas, and that the systems and processes reward innovation, rather than discourage it.

Transforming practice

The strategy adopted by Gloucestershire College is multi-dimensional, encompassing a number of initiatives that are illustrated in the following examples:

- Each of the three campuses has a well-equipped and centrally located INSPIRE room linked to a supportive staff development programme, where staff can develop and explore use of technology. This ease of access, combined with support from advanced practitioners and learning technologists, offers both structured and ad hoc support that is responsive to staff needs and helps to maintain momentum.
- A formal process sees the heads of school review the use of information and learning technology (ILT) with the ILT and learning resources manager, from the perspective of both learning and technology. The process explores current and future ambitions and needs by using a series of topic headings. A twice-yearly review cycle with demonstrations of progress ensures planning moves to practical implementation.

- A bespoke solution has been developed to support staff in monitoring retention and progression. The Students At Risk and Students Reaching Individual Performance Excellence (StARs and STRIPes) programme draws key information from discrete data systems into one web-accessible interface that is simple to use. A combination of close monitoring through StARs and StRIPEs and dedicated work from the Motor Vehicle team saw an increase in retention of 28.5% in one academic year.
- Sport, business and travel and tourism courses have been using Sony PSP games consoles to engage learners, improve attendance and achieve higher grades. The technology allows learners to view and create content, to video themselves and peers, and to analyse and improve their performance in ways that are active and relevant to their study needs.

In addition to traditional capture methods, the college is exploring newer approaches to capturing learner feedback: closed blogs enable learners to send multimedia feedback direct to module leaders, while business studies learners are researching how learners want to use the VLE, Moodle, as part of an assignment.

After feedback showed that learners increasingly use personal devices, the college installed a Wi-Fi system and additional power points so that learners can recharge their devices.

The college regularly reviews policies to ensure they reflect current practice. For example, although Facebook is available, use has been restricted in response to learner feedback, and it is not available during peak learning times.

The approach at Gloucestershire College is that of distributed leadership with clear direction, communication and support. It is a model that enables everyone to develop practice and

Preparing for the future

“For us it has never been about the technology, it has always been about changing the culture, changing people’s thoughts and attitudes.”

James Clay, Information Learning Technology and Learning Resources Manager, Gloucestershire College

has positioned the college well to reap the pedagogical rewards, with staff using technology in a variety of ways to help learners succeed.

Useful to know

- **Locating the INSPIRE rooms in highly visible central locations generates curiosity among staff and learners and informs staff that technology is an integral feature in the overall improvement strategy.**
- **Removing logistical barriers to use and ensuring the technology is readily available in the teaching environment fosters a sense of ownership and confidence.**
- **Whole-college transformation involves all staff: teaching and non-teaching. A shared vision for technology-enhanced learning enables support services such as the IT Services team and estates managers to contribute and provide high-quality support to all staff.**
- **Middle managers were identified as key players in creating the culture; they receive regular updates from the ILT team and are supported and encouraged to try out new technologies such as Twitter.**
- **Getting involved in external projects such as the LSN-led MoLeNET⁸ mobile learning initiative and Becta’s Technology Exemplar Network⁹ programme provides much more than valued funding. The process of collaborative development and shared exploration enables individual institutions to benefit from economies of scale, learn beyond institutional confines and gain exposure to new ideas.**
- **Celebrating successes and learning from less successful interventions is instrumental to developing effective practice.**

Moving forward

A holistic combination of strategic direction, a solution-focused approach, a supportive culture and mechanisms for sharing contribute to the college’s aim of achieving ‘outstanding’ status at Ofsted review. The view of James Clay, ILT and Learning Resources Manager, is that embedding technology, rather than the actual practice, is the innovation.


In the longer term, it may be the investment in the culture rather than the technology that will help the whole college to move forward, sustain progress and remain agile and responsive in a world of rapid change.

For detailed case studies, visit www.jisc.ac.uk/digiemerge



“These technologies are changing the jobs people do. We need to use these technologies because they transform the nature of teaching and learning, and because the world people are going into – the jobs, the economy that education is supposed to be servicing and supporting – is being changed by these technologies.”

Professor John Traxler, Professor of Mobile Learning and Director, Learning Lab, University of Wolverhampton



Moving forward: from innovation to embedded practice

The case studies presented here illustrate aspects of emerging practice and show how institutions, practitioners and learners are investigating the potential affordances that new technologies can offer learning and teaching. They emphasise the importance of horizon scanning (being aware of changing circumstances and new possibilities), creating a culture of innovation that embraces change and encompasses all stakeholders, and the need to build effective communication and engagement strategies that incorporate internal and external partners. Each case study provides snapshots of journeys that will continue to develop. We hope the descriptions of these evolving journeys will inform and inspire your practice.

New technologies are changing the way people communicate, work, and create, share and manage knowledge. Their emergence is situated in a complex climate of economic pressure, changing relationships and cultural shifts:

- The learner and the quality of the learning experience remain the central focus, but the relationship is changing, with the transition from the traditional locus of control to a more student-led approach. The powerful shift in emphasis that sees learners engaged in leading change and collaborating with academic teams is creating a more open and inclusive learning community – an environment in which innovation, creativity and growth can flourish.

Changing student demographics are bringing a wider variety of learners into education. Our ability to respond to their needs will depend on us understanding and profiling their needs, and using all available resources to deliver the most effective pedagogical approaches.

In our enthusiasm to embrace the new we should not assume that ownership of new technologies and the apparent fluency with which they are used in daily life

implies knowledge of how to use them effectively to support learning. We need a better understanding of the digital literacies that students and staff need to take advantage of the new opportunities, and we need to integrate these in our programmes of study and continuing professional development.

- We have opportunities to build on current expertise and knowledge to develop new approaches to learning and teaching informed by sound pedagogical principles. This will require research and experimentation as well as consideration of the needs of new audiences such as work-based learners, employers and the wider community, as well as the choices that learners make to accommodate learning around home, work, care and other commitments. The potential value of technology to education and its embedded use in so many aspects of our working and social lives makes it important that the role of technology is considered as part of the design for learning. There may also be new opportunities to reach new learners by creating bridges that facilitate the progression between vocational and academic learning, supporting personal learning ambitions and workforce development.

In a world where boundaries are blurring, technology offers the capacity to exploit less formal ways of learning, mindful of the preferences of individuals and the boundaries they want to maintain. For many, learning is a collaborative process, and the new communication channels that technologies afford can provide active experiences that support group learning, interactions between peers, and access to local, subject and global networks, as well as creative ways to provide personalised support and mentorship for individuals.

There are also opportunities to design into all activities relevant assessment strategies that lead to longer-term



learning, and to embed opportunities that enhance learners' capacity to make informed judgements about their work.

Of course, we need to explore the costs and benefits of these different pedagogical models to ensure we are providing the most appropriate learning in the most effective way. We also need to consider the processes that will ensure new pedagogical interventions lead to enhancements in the quality of learning experiences.

- The pace of technological change has been dramatic in recent years and is likely to continue for the foreseeable future. Keeping pace with trends presents difficulties for institutions and practitioners. Although technologies such as context-aware and pervasive computing are enabling devices and applications that are easy to use, they sometimes have very complex programs and systems behind them that require specialist knowledge and expertise to configure.

Growing environmental awareness and concerns mean that technological progress must also be balanced by 'green IT' responsibilities to ensure that technology is manufactured, used and disposed of in a way that minimises adverse environmental impacts.

Improved wireless internet access and the low cost of portable devices have made computing power widely available to a large segment of the population, enhancing usability and accessibility. The growth in student-owned devices may allow institutions to reconsider the facilities they provide and to develop schemes that prevent inequalities in access.

However, increased access also fuels rising expectations that the network and services will always be on and always ready. Students also expect to be able to use technology in increasingly sophisticated ways: they are aware of the potential of technology and will expect



“In a complex and fast-changing technological world, we must always remember that there are enduring principles of good teaching and ways of engaging students which transcend different media and technologies.”

Professor Peter Chatterton, Director, Daedalus e-World Ltd, and Visiting Professor, University of Hertfordshire

efficiencies in administration and communication to transfer from daily and commercial practices into their learning lives.

Collaborative initiatives made possible by technology, such as open source and cloud computing, and virtualisation, are changing the way we use and manage computing resources, enabling us to harness a wider collective resource and to construct personalised architectures. New arrangements using managed or shared services and outsourcing present alternative solutions that share the development costs and risks.

The challenge then is how institutions can respond to the multiplicity of sometimes competing, sometimes harmonising drivers to design engaging learning experiences and reap the benefits of advances in technology – how we move from innovation to embedded practice.

The key to managing this complexity is in recognising the core principles of good teaching and learning, good communications, and good business practices that are enduring irrespective of technology, and in utilising what is already known in terms of change management techniques to address cultural aspects and influence change. It is about aligning innovations offered by emerging practice with institutional goals, drivers and needs, and embedding use of technology in strategies, processes and systems. In this way, it will be possible to monitor and evaluate trends to develop qualitative, responsive, lean and cost-effective provision.

JISC has a series of resources designed to support colleges and universities to develop and implement institutional approaches to embedding and sustaining emerging practice:

- **JISC Sustaining and Embedding Innovations Good Practice Guide**³² – distils lessons learned from various JISC innovation programmes to support institutions in their decision-making processes
- **JISC Design Studio**³³ – a developing toolkit which draws together a range of existing and emergent resources around curriculum design and delivery and the role technology plays in supporting these processes and practices
- **JISC Mobile Learning Infokit**³⁴ – a resource from JISC infoNet focusing on practical strategic implementations of mobile learning within further and higher education institutions

³² <https://sustainembed.pbworks.com>

³³ <http://jiscdesignstudio.pbworks.com>

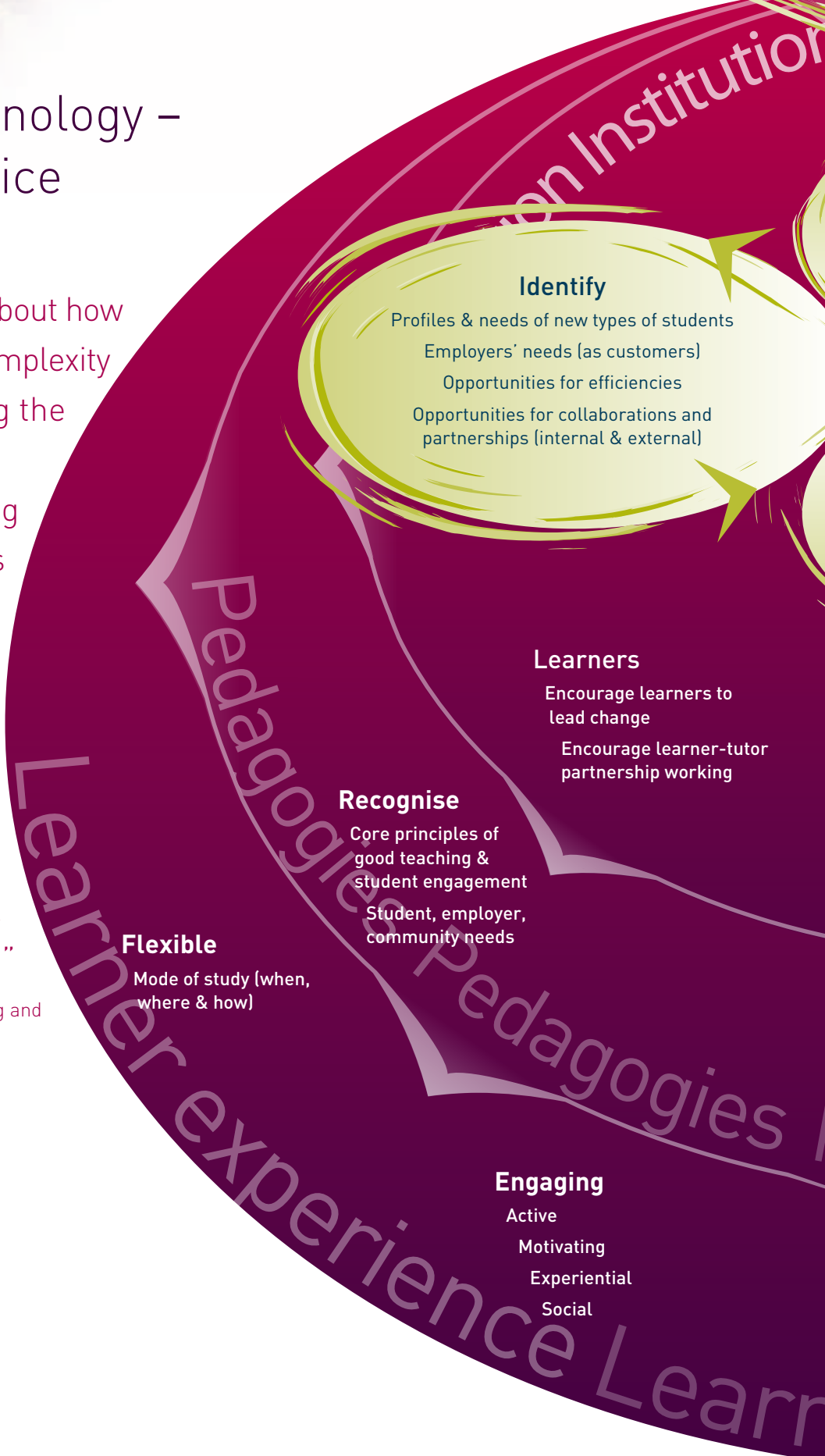
³⁴ <http://bit.ly/mobilelearninginfokit>

Alternative ways institutions are responding
collaboration, change, engagement

Embedding technology – enhancing practice

“Fundamentally, it is all about how institutions respond to complexity and about understanding the underlying drivers and processes, about building a network of stakeholders with insight and influence to establish a creative dialogue, sharing diverse perspectives and establishing clear strategic priorities. It is about learning to network and networking to learn.”

Professor Mark Stubbs, Head of Learning and Research Technologies, Manchester Metropolitan University



Drivers for change

To increase personalisation and choice

To develop students' employability potential

To develop new markets

Economic pressures

Changing behaviours

Research

Educational futures
Socio-economic futures
Technological trends

Develop

Costing models for new pedagogies and technologies
Culture of innovation
Change management approaches
Usable tools and resources
Quality enhancement strategies

Integrate

Ensure key strategies, systems, policies and processes are updated to reflect new practices
Design joined up approaches to support services for staff and students
Create organisational structures to support embedding & sustainability

Technology

Monitor emerging technologies & uses (horizon scanning)
Facilitate collaboration & engagement
Improve access
Manage costs
Encourage sustainable computing/green technology

Staff

Recognise change in locus of control
Develop staff digital literacies
Develop professional practice

Develop

Progression routes
Flexible modes of delivery

Professional attributes

Assessment for longer term
Cost-effective pedagogic models

Supported

Access to online resources, systems information & data
Seamless e-administration

Investigate

New forms of learning (active, group/collaborative, informal, peer, problem-based, enquiry/research-led, critical thinking)

Developmental

Digital literacies embedded
Professional skills & attributes enhanced
Independent learning encouraged
Innovation & enterprise fostered

Collaborative

Co-development of own learning by collaborating with peers, tutors, experts, subject communities & wider networks.

What is on the horizon

These snapshots of emerging practice, funded by JISC and other partners, highlight how institutions are investigating the potential of newer technologies to support learning and teaching. Drawing on forecasted trends from education and business analysts^{6,12} they illustrate innovative practice and signpost future possibilities.

e-Books

An e-book is a book that is available in an electronic format.

DUCKLING project, University of Leicester

In Delivering University Curricula: Knowledge, Learning & INnovation Gains (DUCKLING), the University of Leicester provided increased flexibility for distance and mobile learners and cost benefits for the institution. The university has produced a guide to converting Microsoft® Word® documents into ePub format (available as an open education resource), case studies and a video recording of a discussion with postgraduate students about e-books and e-readers.

Social media

A collection of technologies that enable web-based interactions with a focus on collaboration, information sharing and user-generated content.

Scaffolding learning with Twitter, University of Glamorgan

Undergraduate healthcare students have been using the social networking site Twitter to 'tweet' very short messages to each other while watching videos of a mannequin-based patient simulator. The tweets were in response to the evolving condition of the 'patient', key clinical decision points or to questions posed by tutors. Students valued the interactive approach, being able to respond to questions and the instantaneous feedback.

Augmented reality (AR)

Augmented Reality (AR) is a way of 'layering' information from a digital device such as a smartphone on top of the everyday world.

Unlocking the hidden curriculum, University of Exeter

An imaginative and creative approach to explore the richness and beauty of biodiversity at the university's main campus, using scientific data collected by students about flora and fauna. Students, staff and visitors with compatible smartphones will be able to view graphical and multimedia content, gaining access to a 'living laboratory'. An AR toolkit will assist others interested in the technology.

Next generation interfaces

'Next generation interfaces' is a collective term for alternative means to the traditional keyboard and mouse of interacting with technology. Examples include voice control, touch screens and other haptic technologies.

3D virtual dental work station, Kings College, London

At King's College London Dental Institute, the hapTEL project has been using a 3D virtual dental workstation to enhance learning for undergraduate students and professionals. Haptic technology and synthetic devices enable students to get a sense of touch that improves their manual dexterity and provides realistic simulations at a fraction of the cost of traditional dental chair simulators and plastic teeth.

BISCT, GameLab London, London Metropolitan University and Nottingham Trent University

The Blind Interactive Simulation Cricket user Training (BISCT) project created a virtual practice and training environment for sportspeople who are blind or have visual impairments. Using a personal surround-sound space (3D audio through headphones) combined with interactive Wii™ haptic technology enabled London Metropolitan University to create an immersive simulation of the real-world blind cricket game, with potential for use in other contexts where kinaesthetic learning styles and ear-hand coordination may be appropriate.

Cloud computing

Cloud computing is standardised IT capability (services, software or infrastructure) delivered via internet technologies in a pay-per-use, self-service way. Potential benefits include scalability, reduction of capital investment, geographical independence, more efficient use of hardware and consistent performance (JISC, 2011).¹²

Making the new diploma a success, Lewisham College

In preparation for the launch of the new diploma, Lewisham's College developed a learner portal, eME. eME uses aggregated systems to deliver personalised information to learners in a cohesive way, making efficient and effective use of technology to support academic, social and pastoral activity. Using open source solutions delivered through a Moodle service contract, and incorporating other cloud computing solutions such as Google Docs™, the college is also achieving significant yearly savings on annual licences.

Game-based learning

Game-based learning, sometimes also termed 'serious games', refers to different kinds of software applications that use games for learning or educational purposes.

Handheld device enhanced learning with Nintendo's Applications Beyond Institution and Country (HANABI), University of Edinburgh

Nintendo DSi™ handheld games consoles were used to support undergraduate MA students from the University of Edinburgh during their year-long placement in Japan. Addressing issues such as social isolation and limited access to pedagogical support, the consoles allow users to practise non-alphabetical Japanese handwriting skills using the touch screen and stylus, receive e-learning support, and create and share handwritten scripts via Wi-Fi.

“My aspiration for education? Educational institutions that build sustainable, fair and democratic futures for their students and the societies that they depend upon.”

Professor Keri Facer, Professor of Education, Education and Social Research Institute, Manchester Metropolitan University, speaking at the JISC Innovating e-Learning Online Conference 2010



Conclusion

The intention of this guide has been to explore emerging practice in the light of new technologies available in this digital age, and to investigate the ways in which institutions can respond to the opportunities and challenges.

Technology is but one aspect of change: we have looked at emerging practice from learner, pedagogical and institutional perspectives to explore some of the complexities, pressures, advantages and aspirations. The case studies show how the institutions featured are involving students in the change processes and designing active and engaging opportunities for learning that take advantage of the ability for students to collaborate and share, to form personal learning networks, to learn on the move, wherever and whenever it suits them, and to draw on a variety of rich data and content to construct learning opportunities that are relevant to them. The case studies show how organisations are creating cultures that encourage innovation, forging new alliances and developing sustainable solutions, looking ahead to build educational futures that live up to the potential that is within our grasp.

Organisations will need to determine what approaches best meet the needs of their learning communities, but of necessity this will be an evolving story.



“ Dale Potter Students' Project Coordinator, University of Exeter

“ Engaged students – the leaders of tomorrow – are encouraged to see how their own ideas can lead to collaborative change ... If institutions can embrace

passionate student advocates, they will be in a good position to drive forward innovation and to make a real and genuine difference to the services they provide. ”

Student voice



Blog (web log): An online reflective journal on which other internet users can post comments. Blogging tools integrated into VLEs allow access to be restricted to members of a closed group (for example, a course, module or tutorial group).

Chatbot: A programmed avatar that simulates intelligent conversation using text or speech.

Cloud computing: A range of web-based services that host applications that offer potential reductions in cost and management aspects traditionally associated with running IT services. A common example is web-based email where the software and storage is accessed through, but not installed on, the user's computer.

Electronic voting system (EVS): A system in which computer software collects and records the responses made by learners using handsets to questions posed during a class, lecture or presentation. Percentage responses to options can then be displayed.

e-Portfolio or web-based e-portfolio: An e-portfolio is a purposeful aggregation of digital items – ideas, evidence, reflections, feedback etc which presents a selected audience with evidence of a person's learning and/or ability.

Geo-spatial data: Data that links the relationships between real-world entities (eg their geographic location and dimensions) and other information about those entities (eg the location of an entrance to a building).

Geo-spatial store: The place where a collection of geo-spatial data is stored in one location.

Haptic: A term used to describe a sense of touch. Haptic technology is hand-held technology where the user interface makes use of touch, eg the rumble generator in an Xbox game controller.

Internal video-hosting service: A video-hosting service stored on an internal server (internal to the organisation) that allows individuals to upload video clips to an internet website for others to view.

Open source software: Software for which the original source code is freely available and may be modified and redistributed.

Optical mark recognition or Optical mark reader (OMR): The electronic process of capturing human-marked data from

document forms such as tests and surveys using a specially configured scanning device.

Pervasive computing: The integration of ICT into people's lives and environments. Progressively smaller and more powerful computing devices, with associated connectivity, are embedded in everyday objects, allowing data to be collected and shared.

Podcast: A podcast is a recording, for example of the content of a lecture, made available for download from a website or VLE.

Quick response (QR) code: A graphical two-dimensional barcode that connects a physical object to an online resource when scanned using a mobile phone.

Smartphone: A sophisticated mobile telephone with advanced computing ability such as internet and web-browsing capability, Wi-Fi and broadband access, portable media players, video calling, cameras, possibly a touch screen, GPS navigation and the ability to run applications known as apps.

Social software or social media: A range of software tools which allow users to interact and share data with other users via the web, eg Twitter, Facebook.

Virtualisation: The creation of a virtual (rather than an actual) version of a hardware platform, an operating system, a storage device or network resources on a local machine or a remote machine accessed over the internet.

Virtual Learning Environment (VLE): An online system comprising a range of tools to support learning and the management of learning. VLEs, for example, provide online access to learning resources and support peer-to-peer and learner-to-tutor communication.

Wi-Fi: A term for wireless local area networks which enable computers and mobile devices to connect to the internet in a given location.

Wiki: A series of web pages which users can add to or edit via any internet browser. Wikis used for collaborative activities can be password protected.

Wireless Uniform Resource File (WURFL): A file that lists mobile devices and their capabilities. Developed as part of an open source initiative, WURFLs are used to ensure mobile devices receive content in a format appropriate to their capabilities.

Further information

JISC programmes

e-Learning programme

www.jisc.ac.uk/elearningprogramme

- Developing Digital Literacies
www.jisc.ac.uk/developingdigitalliteracies
- Institutional Approaches to Curriculum Design
www.jisc.ac.uk/curriculumdesign
- Learning and Teaching Innovation Grants
www.jisc.ac.uk/ltig
- Lifelong Learning and Workforce Development
www.jisc.ac.uk/whatwedo/programmes/institutionalinnovation/workforcedev
- Open Educational Resources (in conjunction with the HEA)
www.jisc.ac.uk/oer
- Supporting Learners in a Digital Age
www.jisc.ac.uk/slida
- Technology Enhanced Learning Environments
www.jisc.ac.uk/whatwedo/programmes/elearning/tele
- Transforming Curriculum Delivery through Technology
www.jisc.ac.uk/curriculumdelivery

JISC publications, projects and reports

BISCT project, GameLab, London Metropolitan University and Nottingham Trent University

www.jisc.ac.uk/whatwedo/programmes/elearning/ltig/bisct

Design Studio

<https://jiscdesignstudio.pbworks.com>

Design Studio wiki for Digital Literacy Skills

<http://jiscdesignstudio.pbworks.com/w/page/38511966/digital-literacy>

DUCKLING project, University of Leicester

www.jisc.ac.uk/whatwedo/programmes/elearning/curriculumdelivery/duckling

Effective Practice in a Digital Age

www.jisc.ac.uk/practice

Erewhon project (Mobile Oxford), University of Oxford

www.jisc.ac.uk/whatwedo/programmes/institutionalinnovation/erewhon

HANABI project, University of Edinburgh

www.jisc.ac.uk/whatwedo/programmes/elearning/ltig/hanabi

Innovative Practice with e-Learning

www.jisc.ac.uk/eli_practice

INTEGRATE project, University of Exeter

<http://jiscdesignstudio.pbworks.com/w/page/23494047/Integrative%20Technologies%20Project>

JISC CETIS Observatory (2011). Technology Forecasting Literature Review

<http://blog.observatory.jisc.ac.uk>

JISC TechDis HEAT scheme

www.jisctechdis.ac.uk/techdis/keyinitiatives/organisationaleffectiveness/enablingtechnology/heat

Learning Literacies in a Digital Age

www.jisc.ac.uk/whatwedo/projects/elearningllida

Making the new Diploma a success

<http://jiscdesignstudio.pbworks.com/w/page/24175537/Making-the-New-Diploma-a-Success-Project>

Mobile Learning Infokit

<http://bit.ly/mobilelearninginfokit>

Piloting the use of quick response codes in teaching and learning, University of Bath

www.jisc.ac.uk/whatwedo/programmes/elearning/ltig/qr

PREVIEW, Coventry University

www.jisc.ac.uk/whatwedo/programmes/usersandinnovation/preview

Scaffolding Learning with Twitter, University of Glamorgan

www.jisc.ac.uk/whatwedo/programmes/elearning/ltig/scale

Springboard TV, College of West Anglia

www.springboardtv.com and <http://jiscdesignstudio.pbworks.com/w/page/23492507/SpringboardTV%20Project>

Study on the effective use of social software by further and higher education in the UK to support student learning and engagement

www.jisc.ac.uk/media/documents/projects/effective-use-of-social-software-in-education-finalreport.pdf

Sustaining and Embedding Innovations Good Practice Guide
<https://sustainembed.pbworks.com>

Unlocking the hidden curriculum, University of Exeter
www.jisc.ac.uk/whatwedo/programmes/elearning/ltig/augmentedreality

Work-based learning maturity toolkit
<http://wbltoolkit.pbworks.com/w/page/37779499/Video-introduction-to-the-toolkit>

Other references

ALPS Mobile Enabled Disabled Students (MEDS) project
www.alps-cetl.ac.uk/documents/ALPSMEDS.pdf

Assessment and Learning in Practice Settings (ALPS)
www.alps-cetl.ac.uk

Becta Technology Exemplar Network
www.excellencegateway.org.uk/exemplarnetwork

Common Inspection Framework (Ofsted forms and guidance)
www.ofsted.gov.uk/resources/common-inspection-framework-for-further-education-and-skills-2009

Educause Learning Initiative and New Media Consortium
(2011) The Horizon Report, 2011 Edition
www.educause.edu/ELI/Resources/2011HorizonReport/223140

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hapTEL project
www.tlrp.org/tel/haptel

HEFCE Online Learning Task Force (2011)
Collaborate to compete: Seizing the opportunity of online learning for UK higher education
www.hefce.ac.uk/learning/enhance/taskforce

HEFCE strategic plan for 2006–11 (2009)
www.hefce.ac.uk/pubs/hefce/2009/09_21

Hocking, C (2010) Inclusive Learning and Teaching: Research Synthesis HEA: York

Kay, J et al (2010) Rethinking the values of higher education – students as change agents? QAA: Gloucester

LSN MoLeNET
www.molenet.org.uk

Melville, D (2009) Higher Education in a Web 2.0 World: Report of Committee of Enquiry into the Changing Learner Experience
www.jisc.ac.uk/media/documents/publications/heweb20rptv1.pdf

Molly project
<http://mollyproject.org>

NUS (2010) Student Perspectives on Technology: Demand, perceptions and training needs
www.hefce.ac.uk/news/hefce/2010/nus.htm

NUS Student Engagement Hub
www.nusconnect.org.uk/campaigns/highereducation/student-engagement-hub

NUS Student Engagement Project
www.nusconnect.org.uk/campaigns/highereducation/student-engagement-hub/nus-heaproject

PREVIEW-Psych
www.previewpsych.org

Sharpe, R et al (2006) The undergraduate experience of blended e-learning: a review of UK literature and practice
www.heacademy.ac.uk/assets/York/documents/ourwork/research/literature_reviews/blended_elearning_full_review.pdf

UCISA (2010) Survey of Technology Enhanced Learning for higher education in the UK
www.ucisa.ac.uk/groups/ssg/~media/groups/ssg/surveys/TEL%20survey%202010_FINAL.ashx

Ulster Student Transition and Retention project
www.ulster.ac.uk/star

Wilson et al (2008) Report: 1st Year Practicals: Their Role in Developing Future Bioscientists. Centre for Bioscience.
www.bioscience.heacademy.ac.uk/ftp/reports/pracworkshopreport.pdf

Tools and technologies

Apple Mac www.apple.com/uk/mac
Django www.djangoproject.com
Echo 360 <http://echo360.com>
ELTT QR code generator <http://wolseyweb.ucs.ac.uk/elttcode>
ELEVATE QR tour generator <http://wolseyweb.ucs.ac.uk/QRTour/index>
EndNote www.endnote.com
Facebook www.facebook.com
Flash www.adobe.com/software/flash
Flickr www.flickr.com
Flip video cameras www.theflip.com/en-gb
Gaboto <http://gaboto.sourceforge.net>
Google analytics www.google.com/analytics
iPhones www.apple.com/uk/iphone
Javascript www.javascript.com
Moodle <http://moodle.org>
OpenStreetMap www.openstreetmap.org
PebblePad www.pebblepad.co.uk
PHP www.php.net
Python www.python.org
MySQL www.mysql.com
Nintendo Wii www.nintendo.com/wii
Second Life <http://secondlife.com>
Sony PSP <http://uk.playstation.com/psp>
TurningPoint www.turningtechnologies.co.uk
Turnitin <http://turnitin.com/static/index.php>
Twitter <http://twitter.com>
Video conversion software www.any-video-converter.com
Vidiscrypt www.vidiscrypt.com/mainstreamdemo
YouTube www.youtube.com
Xbox www.xbox.com

Other agencies offering guidance

Futurelab (schools and colleges)
www.futurelab.org.uk
Higher Education Academy (HEA)
www.heacademy.ac.uk
JISC CETIS (Centre for Educational Technology and Interoperability Standards)
<http://jisc.cetis.ac.uk>
JISC OSS Watch (open source software advisory service)
www.oss-watch.ac.uk
JISC TechDis (for guidance on inclusivity)
www.techdis.ac.uk
Learning and Skills Improvement Service (LSIS) Excellence Gateway (for further education and skills)
www.excellencegateway.org.uk
TLRP Technology-enhanced Learning Programme
www.tlrp.org/tel

Alternative ways institutions are responding
 Innovation, change, engagement

Supplementary online resources

The supplementary online resources which accompany **Emerging Practice in a Digital Age** open up additional opportunities to learn more about the topics and themes covered in this guide.

Included in these resources are detailed versions of the case studies, video case studies and podcast material from the JISC Emerging Practice Symposium 2011.

To meet the different requirements of users, some resources are provided in alternative formats. These include Adobe® Acrobat® PDF and Microsoft Word versions of the guide and transcripts of the multimedia resources. A limited number of hard copies of the guide can be ordered free of charge.

Video clips are available in Windows® Media® and QuickTime® file formats and the podcasts as MP3 files. Downloadable transcripts are available alongside these resources for users of screen readers.

All the supplementary resources provide flexible and timely access to information and can be combined with locally available resources to generate wider discussion, for example in professional development contexts.

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Full-length case studies	Adobe Acrobat PDF format www.jisc.ac.uk/digiemerge
Online resources	Windows Media, QuickTime and MP3 file formats www.jisc.ac.uk/emergeresource
Videos Windows Media and QuickTime file formats	Assessment and Learning in Practice Settings Universities of Leeds, Bradford and Huddersfield, and Leeds Metropolitan and York St John Universities Mobile Oxford: opening access to information University of Oxford Moving into virtual worlds University of Derby and Aston University Springboard TV: Enhancing employability College of West Anglia Voices from the JISC Emerging Practice Symposium 2011
Podcasts MP3 file format	James Clay Gloucestershire College Cristina Costa University of Salford Shri Footring JISC Advance Emily-Ann Nash Students' Union, University of Brighton Karl Royle University of Wolverhampton Professor Maggi Savin-Baden Coventry University Professor Mike Sharples University of Nottingham Professor Mark Stubbs Manchester Metropolitan University Professor John Traxler University of Wolverhampton David White University of Oxford
Moving forward planner	Adobe Acrobat PDF and Microsoft Word formats

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