These personal position papers supported and facilitated discussion at the Oxford Internet Institute’s Next Level in e-Learning Forum held on 22 and 23 January 2004. They are also one of the sources for a discussion paper based on the Forum that will be posted on www.oii.ac.uk.

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Inclusion in the Information Age

In a materialist society it is easy to cite the distribution of income and wealth, or the lack of it, as the main driver of social hierarchy but beneath that there is a more profound arbiter in the form of self-esteem. One of the most accurate measures of self-esteem is public curiosity; the socially excluded are bad askers.

It is therefore important, when looking at new technologies for learning, to ask how far these retard or advance self-esteem. Recent Forrester research for Microsoft indicates that 60 percent of its users think that they are not entirely competent with its products. What does that say about control and confidence, about self-esteem and the ability to act without public curiosity? This research says what we all know; that, for a majority of the population, PC-based technology is intimidating and widens the socio-economic divide. In spite of solid gains in all sectors, comparative disadvantage is widening.

In the field of e-Learning this analysis presages a nightmare scenario; might not PC-based e-Learning widen the education gap instead of narrowing it? There may be a theoretical advantage to self-paced learning but if the user interface is intimidating or bewildering, bang goes the theory.

Recently a good and honest scientist at Fujitsu underwent a ‘Damascene conversion’ in looking at the needs of elderly potential PC users and in response he developed what he called a ‘Radically simple’ interface. I wish he had read the research as the sudden conversion might never have come. We who live with contemporary computing have powerful, automatic occlusion mechanisms; we don’t mind pressing ‘start’ to switch something off! But what does this do for autonomy and self-esteem?

Except for those purposes where self expression is required, I would put to one side the PC, the CD-ROM, the dancing portal, even the Dublin Core Metadata Initiative to improve online interoperability – and combine the best of broadcasting with the development, through broadband, of dialogue. In the UK in particular, broadcasting is trusted and, as Adam Singer once put it, every country has a hobby, for the French it is cinema, for the UK it is broadcasting. It is therefore an even more tragic irony that broadcasting has profoundly affected every aspect of our lives except primary and secondary education. However, dialogue has, since Plato, formed the basis of our education; and it is the perfect way to build self-esteem and to teach the kind of public curiosity that can operate within a realm of trust.

So before we go any further we need to establish a sub-discipline concerning the technologies of self-esteem based on research. We want users to be able to say at the end of a course that they know more people, trust more people, ask more questions and are happier.

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3 Quoted by Ed Richards, Ed Richards, Senior Partner Strategy and Market Developments at Ofcom, in his Speech to the Royal Television Society Dinner, 4 December 2003 (see www.ofcom.org.uk).
Cisco
Bill Fowler, Education Director, Cisco Internet Business Solutions Group
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Key Actions and Issues

Cisco Systems, the worldwide leader in networking for the Internet, has championed the use of e-learning as a competitive differentiator for enterprise, as a key to providing educational opportunity for students and citizens globally and as the lynch pin in the Cisco Networking Academy. That programme has grown to over 500,000 students in 152 countries in just seven years; testimony to the power of e-learning and the creativity and innovation of teachers and educational leaders.

For this kind of success to take hold more broadly we believe there must be two key events:
1. Governments must take a more pro-active role in breaking down statutory barriers to wider use of e-learning and paper-based reporting requirements rooted in agrarian era school systems. Linking curriculum with assessment and reporting requires standardised procedures to facilitate easy transfer of data. Governments must also help establish level playing fields with logical, stable and predictable requirements for student data, privacy, data interoperability and security.
2. More schools must begin to look beyond simply doing what they have always done and challenge conventional schedules, traditional terms and standard days. At present it is just the innovative few that are successfully challenging the status quo. There is some progress in this direction but expensive resources should be available for wider use and the Internet can both facilitate access and accelerate the learning opportunities while providing the opportunity to re-integrate schools into the technology society. We know that a student’s peak learning times are not coincident with their teachers’, and change during their schools careers. Further, many students are left out due to learning styles, disabilities or economic disadvantage. While no technology can solve these issues alone, IT can provide more equitable access, timely instruction and make learning available whenever the ‘Aha! moment’ of learning takes place.

The education industry, publishers, technology companies, and suppliers need to lead the way for schools with processes and supporting technologies that reduce administrative overhead whilst providing better outcomes for students and services to schools and communities. Moving expenditures into the classroom and shifting school employment away from clerical and administrative tasks to instructional, behavioural and special support will only be possible if the solutions are available and scalable.

We would propose the follow issues for the OII Forum.
- What is the value of e-learning in the context of public value/benefit? Is it having an impact proportionate to that in the private sector?
- There is considerable research on the impact of ICT on teaching and learning – the Internet is just an extension of that. What is more important is that use is not ubiquitous and students and teachers are unable to make choices about when and where to use ICT because resources are badly allocated or tied up in computer rooms – the definition of e-learning given in the strategy document is where ICT is used to support the teaching and learning process. The issue then for me is how can we improve on the impact of ICT
through pedagogically sound e-learning resources that are available as and when needed compared to a more bolt-on process as is currently the case. What then are the benefits to teachers that may justify the costs and how can we better insure that they are able and effective users?

- Home use of computers and technology by teachers has quietly reached levels of 80 percent and higher in most developed world communities, but the intransient Luddite remains apocryphal in schools. When do we no longer accept the ‘decision’ to not use technology? The question then is what needs to change in e-learning that will encourage teachers to make greater use of it – and is it more a matter of encouraging teachers to be adventurous and creative so that time can be spent adapting and adopting e-learning? If so what are the mechanisms for doing this?

- Should e-learning continue to be so bound and restricted by existing curricula? The example of the Cisco Networking Academy programme has demonstrated that e-learning can bring curricular changes that provide students with skills relevant to the economy. In addition, are there opportunities to bring together diverse areas of the curriculum through e-learning strategies, so that students can become problem solvers as well as having a deeper understanding of subjects and their position in society?

- What are the key initiatives governments must undertake to address problems of dropouts amongst the disadvantaged, poor relative performance by ethnic minorities and ‘bad schools’ in ‘bad areas’?

- What opportunities are created by the impending retirement boom? Is this time to reconsider how we recruit, train and retain teachers and administrators? Should teaching be a full-time, full-year profession with appropriate pay and commensurate responsibilities for preparation and student focus and curriculum development?

- What are three things that attendees can act upon after attending the Forum?
Stephen Coleman, Cisco Professor of e-Democracy, Oxford Internet Institute

Digital Technologies and Democratic Structures, Practices and Cultures

My research interest is in the relationship between digital information and communication technologies and democratic structures, practices and cultures. I am interested in the following questions:

1. How do young people learn to become citizens in a highly complex and interdependent society?
2. Can the Internet be used to make democracy more comprehensible and accessible to traditionally disengaged people?
3. To what extent can the Internet be used to give voice to traditionally marginalised or unheard sections of the population, such as children?
4. How far can education for democratic citizenship be effectively conducted within the formal (sometimes authoritarian) confines of the school?
5. Is civic education becoming a more dispersed activity, happening within new online spaces and networks?

I have mainly questions to raise for others to answer. But, on the basis of previous research, I would submit the following undeveloped observations:

- It would be a mistake to think of the pedagogical value of the Internet as being shaped or bounded by the classroom.
- The Internet offers opportunities for developing new networks of the previously silent, such as children in care or whose first language is not English or who have been excluded from school. There has been some, but not enough, experimentation in this area.
- One should think imaginatively about multimedia applications for e-learning, utilising, for example, PCs, TV and mobile text messaging, in the way that they have been used in recent ‘reality TV’ genres.
- The Internet is global and surely has vast potential for encouraging new levels of communication and understanding between young people in different countries.

Relevant Publications


Applying ICT Effectively in Teaching and Learning

The arrival of useable technology in UK classrooms has taken considerably longer than promised but increased investment from public and private sectors has only very recently achieved significant infrastructure improvements in terms of ICT hardware provision and broadband Internet connectivity for classroom-based teaching and learning.

Classroom-teaching entirely dominates the teaching and learning that goes on in schools, and any discussion of technology’s role in changing them must be grounded in a wider recognition of how they work: classrooms have always been and still are enclosed spaces where teacher and pupils together try to negotiate multiple purposes within a unifying environment. Up until the introduction of the National Curriculum in 1990, schools education tended towards relatively open-ended content choices within a limited and traditional pedagogy. Since the National Curriculum, classroom pedagogies have become considerably more open, whilst content has become considerably more restricted – both by curriculum and assessment. Within this current practice, use of the Internet is seen to be merely an alternative means for accessing preselected digital assets; the Internet increasing the range of such assets readily available and the use of the technology motivating pupils. Is this motivation in part because pupils are under an illusion that they have greater ownership of the learning process? Wider choice of pathways?

The underlying assumption about effective learning advocated with respect to formative assessment – ‘that students have to be actively involved’ (Black and Wiliam 1998: 4) – expresses the general progressive trend of the last decade. It is hardly radical or particularly original, but the fact remains that classrooms have not been and are still often not places for active and independent learning. Having made a considerable effort to develop pedagogically effective ways of meeting all the many goals of the National Curriculum, and of other related strategies and syllabuses, it is easy to understand why teachers might feel resistant to any suggestion that they might like to do things differently, now that e-learning is fully established on the official education agenda.

The pressures on teachers are constricting – their methods, curriculum conformity and goal-achievement are under constant inspection and judgement – and do not sufficiently incline them to risky innovation. The fact that there seems to be no sufficiently good reason for junking methods that work in order to change to technology-driven methods and resources is not a philosophical reflection but a simple empirical observation: despite all the training, government investment and rhetoric, many teachers evidently do not wish to abandon routines, strategies and resources which they know to work well enough in favour of quite different, technologically-based approaches that: (i) might not be better at achieving curriculum goals than established methods; (ii) might expose them as incompetent or under-prepared; and (iii) might go wrong.

Since the beginning of the 2003/4 academic year, all Oxfordshire schools have had access to a radically improved ICT infrastructure: considerable improvements in hardware provision,
universal connectivity to broadband Internet, a county-wide email and communications system, centrally provided support, training and content provision. The evidence so far suggests a somewhat cautious and reserved take-up of all this provision, but that impression might simply reflect wrong expectations on our part.

**Issues for Further Investigation**

At this stage, the following thoughts deserve further discussion and investigation, we think:

- A fairly small number of teachers at all levels of schooling are keen to foreground innovative uses of ICT in general and broadband Internet in particular in their teaching. Such positive attitudes to ICT seem to derive more from idiosyncrasies in their professional biographies than from generalised government-led efforts to encourage such innovation. (It might be misleading to call them early adopters, if that is taken to suggest that others will sooner or later follow suit.)

- The greater proportion of teachers are more reserved in the scope of their attempts to incorporate the benefits of the new infrastructure into their classroom work, and tend to feel exposed because of that reserve. Their efforts to use ICT/broadband are generally low-key rather than foregrounded, and tend to be very brief.

- In all cases observed, whether foregrounded or low-key, teachers’ uses of ICT/broadband are subservient to the structures and goals of the official curriculum, and innovation is generally restricted to finding ways of using ICT to make the study of a closed curriculum more engaging. Assessment targets and current forms of assessment overwhelmingly dominate. These provide little encouragement or accord little value to collaborative work using the Internet.

- Teachers generally prefer to use secondary sources from the Internet; they also often prefer to cache these in advance (linked to widespread concern currently about children accessing inappropriate material or making inappropriate and potentially dangerous associations through the medium of the Internet; this concern reflects more anxiety about new technology than any realistic judgement of risk).

- Claims about the motivational benefits of using ICT/broadband in the classroom are well supported by the evidence of our own observations so far. Recent evidence on motivation (Passey et al. 2003) shows that significant drivers in pupils’ willingness to engage with ICT activities were not just the ‘intrinsic motivation’ of the technology (engagement, attention holding) but also learning and academic efficacy – ICT enabled pupils to be able to recognise endpoints and their progress towards them. But the latter drivers are dependent on teachers providing appropriate tasks and a supportive environment.

- Claims about the pedagogically transformative benefits of using ICT are generally not supported, although those teachers who foreground technology in their lessons do provide some instances of offering opportunities to communicate or explore beyond the confines of the classroom.

Whilst we, as a team comprising implementers and researchers, are searching for striking evidence of innovation and change we might be in danger of ignoring significant but subtle incorporations of technology into the life and work of classrooms. But there does appear to be a lack of a radical vision for learning (regarding school-age children) which technology could support – all current illustrations are still based around the model of pupils moving around schools to different subject lessons with a cohort of their peers.

Would a new pedagogy involve pupils negotiating individual learning pathways through materials on the Internet and using collaboration with people regardless of location, teacher
acting much more as facilitator/mentor? This model is in conflict with current classroom organisation – examples of shift towards more learner centred model are usually within the parameters of the classroom. Best examples here are with groups who are disadvantaged by conventional methods of teaching – drivers for change here are inclusiveness and much broader social agenda e.g. notschool.

References


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Classroom Innovation and the Internet: Key Questions and Issues

The growing significance of international digital networks is becoming increasingly characterised by an oscillating relationship between local and global processes, values and interests. This is particularly notable within education and training which is becoming increasingly competitive and global, due at least in part to a greater choice of learning providers, including corporate and online universities. These providers are offering new learners the chance to study from different geographical locations, use mobile communications to facilitate learning and to learn throughout the duration of their lives. In this way, e-learning is providing the benefits of scalability and global reach, with which to spread local and national educational content and approaches to a global market of learners. This offers the potential for offering greater choice and flexibility for learners.

Against this perhaps overarching competitive and increasingly global context for learning there are the more localised debates at stake that lead to a general re-consideration of rather more local, regional and national issues and concerns of education and training. The 'next level of e-learning' therefore will continue to offer an opportunity for debate about how the local and global interests of the learning community can be best served. This debate may promote a deeper consideration of key issues at stake, including those covered in the following sections.

Changing role of tutors and learners

- The role of tutor and learner are changing in tandem and how we reorganise our formal learning structures to accommodate this change will be critical to the success of the next level of e-learning.

- Rather than considering a new pedagogy, e-learning promotes the migration between different pedagogic models. It would be incorrect to consider that a new pedagogy would be a panacea to the complexities of applying learning theory. In my own view we already have a large number of theories and approaches, and many tutors are not aware of theories but rather draw from their own experience, a method that may in fact reflect a more pragmatic approach to teaching and learning. Arguably, if we want to support more innovative teaching and learning, both tutors and learners should be given greater flexibility and choice over the content and methods used.

Continuing professional development for tutors

- Professional development for tutors should support this agenda for greater flexibility and choice. Teacher training is key to the wider take-up and use of e-learning in all formal learning contexts, in terms of supporting inventive learning.

Curriculum

- The curriculum, it has been argued, has been preventing rather than supporting, creative learning through experimentation (Papert 1998). While there is creative teaching in schools, for all the reasons that Papert poses in his article, there are also obstacles to
this creativity and curriculum ‘learning chunks’ are often too prescriptive. The use of the Internet and other e-learning tools could begin to break down these kinds of barriers, and if supported by teacher training could lead to more varied and inventive learning. Therefore, there is a need to re-evaluate the prescriptive nature of the curriculum to support more creative and varied teaching and learning practice. While the standard model for education has proved useful in raising standards, it would seem as though the need for more variation would fit better with the more differentiated learner that is emerging.

- There is a need for more localised control over curriculum development.

**Institutional approaches and structures**

- The need for different institutional structures and sectors to interface more effectively with one another is also critical to the ongoing development of the e-learning project. There is a need for greater research that compares how different cultures bring different sectors together, for example in the US schools and industry are linked together and this successful model may have transferable lessons for the UK.

**New forms and modes of assessment**

- Online assessment is in part prompting a re-evaluation of assessment in general and a more critical stance towards over-assessment is emerging. In tandem, the need for formative self-assessment and collaborative assessment are refreshing the debates about traditional assessment.

**Social inclusion and widening participation**

- Issues of social inclusion are prompted by the inequality of access to digital networks and computers (Warschauer 2003). The so-called digital divide is producing a global social division based upon the ‘haves and have nots’, including those excluded on the basis of a particular geographical location, a specific socio-economic grouping or having particular physical or learning disabilities. However without significant investment this inequality is set to increase and this is particularly concerning as it is a global issue and not simply a national one. Thus, the potential of the Internet needs to be balanced with the requirement for social inclusion. It is anticipated that this issue will continue to frame future debate about the use of the Internet and its social implications.

- Widening participation to excluded groups of learners will take an enormous public and political commitment as many excluded learners have significant learning difficulties and need significant support to overcome them. In order to achieve this goal and widen rather than increase participation, more visual forms of learning will need to be developed. This may include broader use of multimedia content and may lead to changes in how we develop content.

**Innovative approaches to course development**

- The need to move away from the standardised model of the learner, and to widen participation to new groups of learners, means that developing and supporting innovative approaches to teaching and learning is crucial.

- Innovative approaches to teaching and learning in the future may include wider use of: multimedia content, mobile learning, immersive learning environments, games,
simulations and new combined forms of assessment. But this ambitious goal can only be achieved through teacher training and through promotion of innovation through communities of practice.

Networked learning and online communities of learning

- The role of networked learning and networks of learners for supporting collaborative learning and professional groups is being explored in a range of different contexts (e.g. National College for School Leadership’s Talking Heads online community), in terms of issues of support for distance learners and disparate learning communities, in terms of supporting learners this may become a significant benefit of the Internet.
- There is scope for a deeper consideration of the interaction between learning at home and school. How we fit the interests of formal and informal learning together will provide a key challenge to demonstrating the successful use of the Internet to support communities of learners.
- Whilst approaches to e-learning and the Internet are substantially changing how we consider learning in the twentieth-first century, this seems an appropriate time to reassert the British nineteenth century vision of ‘education for all’ and it is sadly notable that this aim still has not been achieved on a global level. However, it is worth considering that open and fair access to ‘education for all’ on a global level can and may still be achieved through the embedded use of ICT, networked communities of learners and culturally sensitive globalised approaches to learning. In this way, the next level of e-learning must consider as its primary aim an ongoing continued commitment to extending ‘education for all’ to a broader global and local population.

References


William Dutton, Director, Oxford Internet Institute

For Want of a New Paradigm

Innovation is Neither Good nor Bad, but Inevitable

The diffusion of an innovation refers to the spread of a new idea, product, process or service across a population (Rogers 1995). An innovation is anything new to an adopting organisation. An old idea in one context could be new in another, for example if the approach used in the Oxford tutorial were to diffuse across higher education to organisations following different methods – and some visions of the future of education are built on the idea of a technologically-simulated tutorial (Bork 2002). Innovation could also refer to a new product, like a laptop computer, or a new process, such as student-centred learning. This is why innovation researchers distinguish between ‘product’ and ‘process’ innovations.

There is nothing inherently good or bad about stability or change per se. The diffusion of innovations believed to be in the interest of the public at large have been widely studied, from the spread of hybrid seed corn to the adoption of e-government services. However, a new idea or other innovation could be silly, harmful, have unintended negative consequences, or could fail to diffuse. In addition, current practices might not be sustainable in the face of technological and economic change.

From an economic perspective, new technology could increase the cost of education unless it enables us to accomplish our work in more cost-effective ways. Resources could be wasted by either under-scaling or over-scaling, investing too little or too much, in particular technical initiatives. This is occurring during a period when education budgets are severely constrained and demands are increasing dramatically, such as in student numbers. Technologically, nearly everyone of school age in most advanced industrial societies use the Internet. This and related technological trends put real pressure on educators to keep up with the state of the practice. But do we have a model to guide us?

The Next Level of e-Learning: A New Model for Teaching and Learning

A premise of this forum is the recognition that innovation has occurred to a certain extent at all levels of education through the diffusion across educational institutions of many innovative e-learning products and services (Dutton and Loader 2002). For example, a growing number of institutions of higher education have some course management system or virtual learning environment (VLE), including proprietary systems (e.g. Blackboard, www.blackboard.com, and WebCT, www.webct.com), and open source software (e.g. Bodington Common, http://bodington.org/index.html). Likewise, state schools in many nations are getting broadband Internet connections. Most schools have computer labs, multimedia labs and so forth. However, it appears that most of these new products and services are used in marginal ways to support traditional teaching and learning strategies. Is that the right course, or is there is a need to reach the ‘next-level’ of innovation?

For instance, PowerPoint might have replaced the overhead projector, but it continues to be used more as a substitute for the overhead projector rather than a means for enabling new approaches to learning and education. Some teachers use computer presentations creatively to enable them to up-date their lectures in real-time, and provide students with access to the material at times and places of their choosing – incrementally changing the boundaries of the
classroom and thereby reconfiguring access to information, people, services and technologies (Dutton forthcoming).

Similarly, in one study I undertook with colleagues (Dutton, Cheong and Park 2004), we found a VLE to be used largely as a replacement for the copy machine. A few professors and students employed the VLE for more interactive discussion and remote access to the instructor and virtual study groups, but it was used more often in traditional ways: as a substitute for older media rather than a new way for teachers and students to work. One factor that seems to constrain more significant use of the new technologies is the lack of consensus on a new approach.

A characteristic of higher education culture throughout the world is that instructors generally teach the way they were taught, using a traditional one-many teaching paradigm based on class lectures and discussion. With notable exceptions, such as the one-on-one tutorial approach, this paradigm is entrenched in most institutional cultures in the education sector, which generally ties teaching rewards to the quality of lectures and discussion. These paradigms are key influences shaping outcomes from the introduction of a VLE and other ICTs within institutions of higher education.

Traditional teaching paradigms are in fact designed into many e-learning products, such as VLEs. They are even sold using analogies to what teachers already know, in order to make the system’s functionality more understandable. BlackBoard, for example, uses the analogy of the ‘chalk-and-talk’ to convey its centrality to traditional conceptions of teaching. The Bodington Common’s VLE employs an analogy to university buildings to help teachers and students understand how to move around in its virtual space. However, these traditional analogies can lead to built-in constraints on the use of VLEs. For instance, the Virtual Learning Environment that we studied was not designed to enable students to form their own groups. Nevertheless, an engineering class used their know-how to create a system that was able to support their study group.

Nevertheless, VLEs and other similar e-learning innovations are more than just better white boards. Without a new paradigm for education and e-learning, educators are likely to see ICTs as a means of carrying on doing things as before – perhaps more quickly or professionally, but with more expensive technologies (Dutton 1999: 216). It takes time for individuals to discover how new technologies enable them not only to do things in new ways, but also to do new things, such as enabling students to get access to presentations outside the classroom and at times of their choosing.

There has been a positive vision that technology would move learning and education from a one-to-many teacher-centred approach to student-centred learning, where the instructor moves into the role of facilitator or coach, rather than lecturer or authority (Gell and Cochrane 1996). However, this often seems unrealistic in the context of curriculum guidelines and league tables and the student-teacher ratios that might be required. Exciting visions of virtual universities and distance learning have also been criticised for being technologically deterministic and otherwise lacking credibility (Hara and Kling 2000; Robins and Webster 2002). That said, technology is changing the context.

**New Technological Synergies: For Better or Worse?**

Even in the advanced industrial nations, a lack of access to ICTs in classrooms and households has constrained the use of innovations such as VLEs and the Internet more generally. This is
exemplified by an art history instructor at a US university who had placed images on the Web for her class, but her class was not equipped with the projection equipment and network connections to display the slides, limiting its role in her teaching.

As VLEs, laptops, wireless and multimedia wired classrooms continue to diffuse, these constraints will diminish. Moreover, as is already apparent in high-end multimedia classroom environments, access to the Internet, VLEs and other multimedia systems can create a synergistic effect on the use of each technology. It is in these classrooms that the students appear to gain the greatest role in managing information and communication resources in a multimedia, multitasking environment, for better or worse.

In the OII’s summer doctoral programme, for example, 28 advanced doctoral students from 15 countries came into the classroom together with 22 laptops, all linked to the Internet. When professors gave lectures, usually with computer slides, some students sat transfixed on the lecture, while others could be seen multitasking in ways that few of us anticipated. They were variously – and often simultaneously – engaged in a vast range of tasks, such as: downloading slides; engaging in discussion and checking the schedules on the course VLE; instant messaging their colleagues; e-mailing; searching related Web sites; and working on their own presentations and papers. All this was taking place while they listened more or less attentively to aspects of the lectures and discussion. They were excellent students. They enjoyed the class. They felt they gained from the programme. But this was a traditional classroom only in the most superficial sense of that term.

In contrast, a UK teacher in a state school in a relatively distressed area has had a completely different experience. Teaching information technology in a well equipped multimedia classroom to his students, he felt a complete loss of control over their attention and activities. As he stands at the front of the room moving through the curriculum, they search the Web for games to play. The synergies among technologies are therefore a two-edge sword, perhaps widening knowledge gaps across the students starting at different levels of capability, personal efficacy and motivation.

In summary, the dynamics of the classroom are changing in dramatic ways and under the eyes of excellent teachers, whether or not we have a model for this new world. ICTs are redrawing classroom borders in many ways – reconfiguring access to information, people, services and technologies in learning and education. Change, therefore, will not await the arrival of a new model for how we do what we do in e-learning and education. At the same time, there seems to be an urgent need to understand how best to approach teaching and learning in this new technological and social context.

**The Ecology of Games Shaping Innovation in e-Learning and Education**

Finally, innovation in e-learning and education needs to be understood as the outcome of an ecology of choices made by a wide ranging set of actors, who are more often focussed in their own particular ‘games’ on the pursuit of goals and objectives other than innovation (Dutton 1999). Administrators are often seeking economies of scale to stay within budget; students are pursuing good marks or friendships; teachers want to score well on evaluations; and so on. Few involved in education are interested in innovation per se. It is therefore necessary for innovations to support the diverse goals of multiple actors if they are to gain widespread support and acceptance.

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Embedding e-Learning in Good Classroom Practice

The next level of e-learning must be flexible enough to become embedded into good classroom practice. At the moment, there is a marked mismatch between the new technologies and the pedagogies needed to use e-learning to enhance student progress and so raise educational performance. The British Government is committed to raise educational performance and initiatives such as the Literacy, Numeracy and ICT strategies, each focusing on good teaching and classroom practice to raise standards. Government funding has also been essential in improving the provision of hardware and connectivity within schools; the training of teachers in basic ICT skills (through the New Opportunities Fund ICT Training Initiative, or now through the ITT programme); and the provision of educational software through e-learning credits. The Government has demonstrated a commitment to continue this funding; however, what is needed now is the development of the pedagogies to pull together all these strands and give ‘value for money’. These pedagogies are needed to put the process of e-learning in the driving seat of educational achievement.

The mere provision of computers in schools does not raise standards, neither does the use of computers themselves raise standards, but the creative use of e-learning by good teachers does raise standards (Cox and Webb 2004). The priority now is not only to develop suitable pedagogies but, also, to provide a means and mechanism for their dissemination. These pedagogies should address the needs of all learners; encourage self-determination and confidence. Whatever the form that e-learning takes it will be essential to evaluate its impact and link it to the development and innovation of new technologies and software.

At the moment we have ‘the tools’, but there is no consensus on how these tools should or could be used and what our expectation of their output should be. What needs to develop is the process and this process needs to focus on the needs of the individual learner.

The following are significant points from the perspective of the teacher.

The Architecture of the Classroom

Initial resistance to the use of ICT stems from a lack of staff skills, together with the alien environment of a classroom full of computers. In the worst cases the architecture of the room demands that students face the walls and have little opportunity to communicate with each other or their teacher – they are plugged into their machine by headphone and (with luck) held on task by the screen. Education is a social practice; it involves contact with others to share experience and to test and develop ideas. To be successful, e-learning needs to facilitate and encourage this collaboration and interaction.

Good pedagogy will need to be supported by good architecture. The use of interactive whiteboards has made a significant impact – they have put the teacher back where they belong: as educators. Without this many teachers eschewed the use of ICT as they felt that computers came between them and their students. Not only are educational opportunities lost, but teachers can feel uneasy about classroom discipline in this strange environment.

Pedagogy
Even with the best technology, effective e-learning requires a pedagogy which will maximise its potential. Assessment for learning (formative assessment) has been demonstrated to be a powerful tool in raising educational performance (Black et al. 2004). It is characterised by three phases: finding out where the student is; making explicit where they need to go; and finally, what they need to do next. This process, where the teacher and the student work together and learning patterns are directed by the needs of the learner, should be at the centre of all aspects of education, including e-learning.

At the present time, using ICT for assessment is usually summative, but not formative, and information is dispensed in the e-learning environment, all too often, as a media-rich textbook. There is little interaction between the student, the teacher and e-learning, certainly none that is flexible enough to provide a collaborative environment.

The use of computers needs to become an integral part of assessment for learning; they need to become channels of communication; and educational software needs to be adaptive enough to be able to not only monitor progress, but to provide challenging and creative e-learning environment. (I think that educational software writers may have much to learn from the games industry about how to encourage and engage an audience.)

Teachers need to be able to moderate, influence and direct learning – they need to lead e-learning and not feel that they are being led by e-learning. They need to be able to interact and communicate with their students via this new medium. e-Learning is one tool amongst many that can raise standards: at the moment, the pedagogy needed to develop e-learning is in its infancy, but the infant is precocious. Its potential needs to be harnessed, directed and controlled. Teachers need to be able to use e-learning in a collaborative, creative and interactive way to meet the needs of the individual student.

Meeting the Needs of the Individual

The use of e-learning has potential to allow teachers to shape the learning programme of each student. This requires a change in the way that schools work. There needs to be a clearer emphasis on the development of learning skills and an encouragement for students to become proactive rather than reactive. If young people receive an e-learning programme that is able to react and adapt to their individual needs, then education will become more inclusive. At the extremes, gifted students can be given every opportunity to blossom; whereas now, there is a danger that to move them forward would mean that they became more separate from their peers and thus more demanding to teach.

Inclusion involves, not only recognising the individual within the school environment, but also those outside it. Outside the school, learning can be limited by many factors, e.g. distance (subjects not offered in a particular school, but may be offered elsewhere, too far for the student to travel) and non-attendance through choice or exclusion. A desire to learn (at any age), or a need to learn new skills should be met, and could be met, by e-learning. The transmission of learning to the learner holds great promise for inclusion of all into the learning environment.

If over time, learning programmes could be developed which anyone could pick up, at any time, at any age when they were ready, this would lift educational standards across the county.

Architecture of the School
If learning is to move to the learner, then just as the architecture of the classroom needs to change to meet the new pedagogy of e-learning, so schools themselves need to respond and reflect these changes. Constraints of place and time should, no longer, become limiting factors in learning. What will become much more important is the time and the resources needed, by teachers, to develop resources, or to adapt and change these resources to match the needs of their students. The new technologies will become the conduit through which e-learning flows. Teachers will need to provide the impetus and creativity to encourage students to turn this information into knowledge.

Global Citizenship

E-learning has a place to play in developing understanding between differences in culture, religion and ethnicity. Today, news is immediate; sounds and pictures are transmitted and received within minutes and the viewer needs to be information literate in order to make sense of the world around them. e-Learning needs to reflect the needs of the individual, but it needs to be in the context of the globe.

At the moment, best practice in e-learning concentrates on content and not on process. The future of e-learning depends upon the breaking down of place and time to a virtual space where the student and educator collaborate via a common agenda; where each participant feels that they are able to contribute, shape the process and effect change through effective learning.

References


e-Learning: A Cross Cultural Perspective

Positioning Questions

Given the global reach of the Internet and its promise to revolutionize ‘education,’ should the next level of e-learning embrace in a more determined manner the various cross-cultural concepts and dimensions that may ensure quality and relevant progress in research, instruction, and practice? Will academicians, practitioners, and policy makers alike be motivated to study and practice cross-cultural implications of e-learning that could be expanded globally for society as a whole?

According to Global Reach (2004), a marketing communications consultancy, as of September 2003, only 35.6 percent of the world’s online population use English; 34.9 percent use other European languages; and 29.4 percent use Asian languages. However, it seems that many e-learning programs are developed with a Western perspective where English is the preferred language of learning. Taking a broader view relative to the education and training of peoples, should e-learning programs be developed with a greater consciousness toward influencing social change in developing and underdeveloped countries? Will the blending of cross-cultural sensitivities into the content of e-learning programs as well as into the delivery infrastructure of pedagogy and instructor background provide countries with a means to impact economic and social change conducive to institutional and national goals?

Cross-cultural Considerations for the Next Level of E-Learning

As e-learning is poised to move to the next level, educators will be called to broadly examine cross-cultural issues, invite diverse perspectives, and adapt content, strategies, and language to successfully engage global learners. In our position of infusing the ‘cross-cultural’ element into e-learning, several considerations are described below.

A. Language and Translation

Shall English become the standard for the Internet or for that matter, e-learning? It is common knowledge that a language does not always represent similar meanings when communicated across cultures. Often, a language term may not be found in a particular culture. For example, as shared by an Egyptian representative at a conference on ‘caring’, the term ‘caring’ does not exist in the Egyptian culture and the closest meaning is described by the term ‘community service.’ Crossing cultural boundaries to inspire others to learn requires great sensitivity and must not be taken for granted, especially when referring to individual societies.

Why bother translating? The psychology of learning involves maximum accessibility to the content with any potential barriers removed (Sakurai 2002: 29). Barriers include lack of training
time, time away from work to train and the resultant productivity loss, the language barrier, and so on. Should training be delivered to people in their own language as much as possible, particularly if the content or subject matter is mission-critical or impacts a life-versus-death situation, e.g. air traffic controller? Furthermore, beyond translating the language, educators must pay attention to ‘the whole look and feel of the material and experience, making people feel the material is written for them’ (Van Dam and Rogers 2002: 32). In other words, any translation or localization must be transparent to the learner.

This raises some important issues:

• Although many speak English as a second language, receiving content in one’s own language maximizes accessibility, eliminating a potential barrier to learning (Hofstede 1997: 216; Sakurai 2002: 30). In certain instances, learning in one’s own language is critical, such as an airplane mechanic learning about servicing an airplane. However, in other instances, using English (or another designated language) as a common international language is an appropriate and essential part of the curricula and pedagogy, such as in cross-cultural negotiations and global business courses.

• With the current state of Internet technology, the lowest common denominator is often the use of text as the medium of communication.

• In verbal communications, one may avoid cross-cultural pitfalls by considering the tone, symbols, and styles of communication.

• The maturing of technology will allow e-learning to reach the next level with greater use of video and audio, e.g. voice over IP.

B. Nonverbal Communication

In cross-cultural communications, such as in Asian cultures, the use of gestures and other nonverbal forms of communication are relied upon as customary means of communication.

• How important is it for e-learning to be made more effective by integrating nonverbal modes of communication as represented by physical gestures, the use of space, time, and paralanguage in the cross-cultural contexts of communication?

• With e-learning, nonverbal cues are unavailable for the most part, with the exception of using video over the Internet or applying a blended approach to e-learning. According to Van Dam and Rogers (2002: 33), a blended approach to e-learning would enable educators to address cultural dimensions. Will a blended approach become an important and necessary pedagogy for cross-cultural e-learning programs?

C. Global Mindset

One must consider all aspects of culture in creating a global mindset of e-learners. In addition to students, the cultural heritage of the instructor and the culture of the teaching institution will impact and be impacted in any movement to achieve global thinking.

• ‘Despite the rapidly growing number of people that are becoming electronically interconnected, we are not likely to witness a sudden outbreak of cultural homogenization. The cultures of the world are becoming increasingly more diverse and insistent upon maintaining their unique identities’ (Ferraro 2002: 165).

• No single e-learning model works best in all situations. Likewise, cross-cultural considerations must be examined on a case-by-case basis. Should there be a set of global competencies for instructors, learners and researchers to guide e-learning efforts?
As culture is learned, a global mindset can be developed, according to Ferraro (2002: 160). The Internet is a tool that can help learners develop this mindset. The global mindset includes: developing a broad, cross-functional perspective; balancing contradictions; being curious, building relationships; seeing conflicts as opportunities; problem-solving through networked processes; valuing team-work; viewing change as an opportunity; and valuing life-long learning (ibid.: 160–91).

Also, the economic level of the participants and their past schooling experiences will influence levels of understanding. e-Learning opportunities abound to expose others to cultures other than one’s own. Multiple instructors (or facilitators) may be required to bridge the cultural and language gaps, thus, pushing for change toward learning models more relevant for the twenty-first century.

D. Standards

The next level of e-learning may need to consider a seamless model for e-learning to provide consistency across cultures. Shall standards be developed and deployed in areas that include, but are not limited to, presentation, content, reference sources, testing, grading, participation, group work, to name a few? Do we create ISO-type standards or a minimally-recognized global, unified measurement system?

E. Technology and Research

e-Learning increases the ease of cross-cultural participation, providing a tremendous opportunity to expedite research, diversify research thinking, and create new models to improve the development of new and better products, services and systems throughout the world:

- Asynchronous methods allow learners to bridge time differences.
- Areas with limited bandwidth access (the digital divide) will have additional challenges such as losing ground to those countries that have the technology and having lower expectations about the level of sophistication for delivering content (Jussawalla and Taylor 2003).
- In regions where access to technology exists, content must be robust. The issue of content filtering also comes into play in those societies that are more restrictive than others.
- Mass-customize education. Is it possible for Internet technology to customize and deliver learning objects/lessons similar to the way Amazon.com and eBay have customized the retail experience? Thompson and Randall (2001) note that e-learning would be most effective if it gave people access to carefully focused learning materials when and where required (ibid.: 291).
- Digital libraries represent a new infrastructure and environment that have been created by the integration and use of computing, communications, and digital content on a global scale. Digital libraries are destined to become an essential part of the information infrastructure in the twenty-first century since such repositories will make cultural heritage and scientific content available to all citizens and will sustain and preserve a universal collection of knowledge and creativity for future generations. New distance learning research, technologies and applications will thus greatly contribute to the advancement of the use of distributed, networked information of all types in the world (e.g. see the Network of Excellence for Digital Libraries, [http://delos-noe.iei.pi.cnr.it/](http://delos-noe.iei.pi.cnr.it/)).
- Digital library research such as Europe’s DELOS Network of Excellence on Digital Libraries is an initiative funded by the European Commission’s Information Society
Technologies 5th Framework Program (IST-FP5) and can be expanded around the globe.

- With a research focus on eCulture and eScience (i.e. culture and science in a networked environment), societies will need a lasting infrastructure of technologies, guidelines, standards, human and institutional networks that will support and extend the role of libraries, museums and archives in the digital age. Who should be responsible for setting and administering the standards and technologies, if at all?

These cross-cultural considerations could take e-learning to a next level of sophistication and impact life-long learning and greater societal change!

References


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Inhibiting Factors and Innovation in Learning

Inhibiting Factors and Barriers

- **Uncertain leadership.** Educational leaders are not yet fully engaged in exploiting e-learning and e-systems in their institutions. They need more support to enable them to lead and manage the challenging change processes involved.
- **Lack of innovation.** Technology is leading change at a fast pace, with the result that there is too little attention to exploring the new forms of pedagogy made possible by e-learning. Teachers and researchers need more time and support if they are to exploit the educational potential that interactive technologies offer.
- **Lack of professional expertise.** There is too little training or reward for teachers and lecturers who wish to adopt or develop e-learning – we need to offer more courses and more incentives, such as qualifications, career promotion, and access to technology.
- **Traditional assessment.** Assessment is an important driver in education, and can easily be a barrier to innovation – learners want to be sure their assessment captures the new skills and capabilities they are acquiring through using e-learning to study.
- **System fragmentation.** There is too little cross-sector collaboration in supporting learners as they move through the education system – we need a greater focus on linking our public sector systems to provide unified support for learners throughout life.
- **Immature e-learning market.** We have an under-developed digital teaching and learning resources market at present, which is a concern for both consumers and suppliers – we need to improve education-industry partnerships to achieve innovative, effective and sustainable e-learning resources.
- **Poor interoperability.** e-Learning resources present educators with new kinds of problems for technical and quality standards – we need common standards to ensure that e-learning software is both shareable and affordable.

The proposed e-learning strategy for the Department of Education and Skills in the UK seeks to address all these areas through a systemic, cross-sector approach to embedding e-learning.

Given the above analysis, what will enable and encourage the creative innovation that fully exploits digital technologies?

**Interactivity, Innovation and Learning**

Over the last century or so, a wide range of researchers and commentators on education and learning have identified what they believe to be the essential core of what it takes to learn (Table 1). They span several disciplines and methodological approaches, and they have coined many different terms for describing learning. What they share in common is the concept of the learner as **active agent** in the learning process. This is not about teaching, but learning as an activity.

To be active agents, learners need to be, for example:
- engaged in goal-oriented tasks;
- practising skills;
• exploring and experimenting;
• using feedback to adapt what they do;
• discussing what they do;
• reflecting on what happens; and
• articulating what happens.

Table 1. Key researchers and commentators on education and learning

<table>
<thead>
<tr>
<th>Year</th>
<th>Person</th>
<th>Contribution</th>
</tr>
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<tbody>
<tr>
<td>1890</td>
<td>John Dewey</td>
<td>Inquiry-based education</td>
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<tr>
<td></td>
<td>Jean Piaget</td>
<td>Constructivism</td>
</tr>
<tr>
<td></td>
<td>Lev Vygotsky</td>
<td>Mediated learning</td>
</tr>
<tr>
<td>1940</td>
<td>Jerome Bruner</td>
<td>Discovery learning</td>
</tr>
<tr>
<td></td>
<td>Paulo Freire</td>
<td>Learning as problematization</td>
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<tr>
<td></td>
<td>Gordon Pask</td>
<td>Learning as conversation</td>
</tr>
<tr>
<td>1960</td>
<td>Terry Winograd</td>
<td>Problem-based learning</td>
</tr>
<tr>
<td></td>
<td>Seymour Papert</td>
<td>Reflective practice</td>
</tr>
<tr>
<td></td>
<td>Lauren Resnick</td>
<td>Metacognition</td>
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<tr>
<td>1980</td>
<td>John Seely Brown</td>
<td>Experiential learning</td>
</tr>
<tr>
<td></td>
<td>Ference Marton</td>
<td>Learner-oriented approach</td>
</tr>
<tr>
<td></td>
<td>John Biggs</td>
<td>Social constructivism</td>
</tr>
<tr>
<td>2000</td>
<td>Jean Lave</td>
<td>Situated learning</td>
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</table>

To be active learners, they need to be taking part in a continually iterative process of attending, adapting, reflecting, discussing, articulating – a ‘conversational framework’ for the learning process (Laurillard 2002). The role of teachers, in addition to the traditional role of ‘telling the story of their subject’, is to support learners by:
• defining an achievable goal;
• providing meaningful feedback on their actions;
• providing the means to reflect on the feedback;
• allowing repeat actions with feedback to achieve the goal;
• encouraging discussion of the task; and
• providing the means and rewards for articulating their ideas.

Using information technology, learners can explore a wide range of well-produced materials online, but these texts remain unresponsive, not exploiting the interactive potential of the medium, the same complaint Socrates made about books in comparison with dialogue: ‘Writing has one grave fault in common with painting; for the creations of the painter have the attitude of life. And yet if you ask them a question they preserve a solemn silence. And the same may be said of books. You would imagine that books had intelligence, but if you require any explanation of something that has been said, they preserve one unvarying meaning.’

It is ironic that the majority of texts made available online, in the guise of e-learning, are no different from books in this sense. And yet we are working with interactive technologies capable of giving personalised support to the learner in the full range of activities outlined above, for example:
• A simulation of a physical or human system can be manipulated by learners exploring its behaviour, providing meaningful feedback on their actions.
• A strategy game with counters can give learners an experience akin to manipulating algebraic equations, allowing repeat actions with feedback to achieve a defined goal.
An online discussion environment means that learners can discuss how to achieve their goal in the familiar space of a chat room, offering the means and motivation to discuss and debate ideas.

There are many other such examples, all of which could be configured as ‘learning activity design tools’ for teachers and lecturers. Teachers are already familiar with designing their own learning activities in the form of a lesson plan, and populating it with prepared learning resources such as books, posters, exercise sheets, etc. In the digital world this process should become a liberating and exciting innovation environment. The tools for selecting a sequence from a range of interactive and communicative learning activities should be as easy to operate as PowerPoint; the process of populating these activities with digital resources such as diagrams, animations, video clips, games, etc should be as easy as customizing a presentation.

If such tools and resources were available, then teachers could not only lead the discovery of the new pedagogies, they would also have the means to capture, share and improve on each others’ designs. This kind of community of innovative practice is exactly what we need to drive the improvements that will take us to the next level of e-learning – the level at which we are at last exploiting the capability of digital technology in the service of personalized, active learning.

The e-learning strategy proposes strategic action on leadership, innovation, teacher training, assessment methods, integrated systems, the e-learning market, and technical and quality standards, as the minimum requirements for the holistic design of an education system capable of sustainable self-improvement in response to a changing environment.

It is the role of Government to make such a system possible – achieving reform not through the top-down command and control of a mechanistic system, but through the dialogic processes inherent in an adaptive system (Bentley and Wilsdon 2002). The ‘adaptive state’ would be a learning system in the sense that it could achieve sustainable improvement. The e-learning strategy is based on the idea that such processes empower teachers and learners to take responsibility for the ongoing improvement of the quality of the learning process.

References


Learning from the Past to Bring Hope to the Future

Failures of the Past

There is a general assumption that e-learning has failed in some form or other, but it is unclear as to how this can be asserted, bearing in mind we have no yardsticks or targets to measure it by. However, on a broad level it is clear that in many sectors of education e-learning has failed to take hold on the levels that some people envisaged in the early 1990s and if we accept this then it worth considering why. Outside of the problems of the technology, and the often very poor content, there are two main factors as to why this has happened:

1. The failure to address the practitioners’ needs – much discussion in the e-learning arena focuses on learner-centred approaches, and pure online learning. Although the former has considerable merit it is suggested that this has often been at the expense of considering the practitioners, i.e. the teachers and lecturers. Although we do not want to simply build bad practice upon bad practice, the promoters of e-learning have too often ignored the needs of the staff who are being asked to carry through the developments. Moreover, until recently the discussion has been too focused on remote/distance learners, ignoring the reality that most education is set in a traditional environment, and at best could be described as blended. We should note, of course, that there is also the major problem of allowing the practitioners sufficient time and presenting them with incentives to engage in e-learning or the development of their teaching, especially in Higher Education (HE). Successive Governments have failed to address either of these.

2. The term e-learning – by its nature the term sets itself aside from traditional learning thus giving many an excuse to ignore it. Moreover, it is attempting to do too many things. Granted, there is commonality between the educational sectors, but there are also considerable differences in terms of methods, motivations, infrastructure, and so on. Furthermore, it is suggested that as you move through the sectors to HE the subject differences and requirements become more and more accentuated. To attempt to encapsulate all these problems, and differences, under a single heading with single solutions is doomed to failure. E-learning has often ignored the differences between the sectors, the clear differences between the subjects (in terms of teaching methods and assessment), and even where there is commonality the institutional barriers that must be overcome (e.g. top-down collective decisions are much easier to introduce in the schools sector than in the HE sector where academic freedom is prized).

Hope for the Future

However, it is the belief of this author that there is considerable scope for the development of e-learning over the next decade or so if we recognise a few factors. First, we must take notice of the above, namely that we must bring the practitioners along with us by addressing their needs. We must recognise that these are early days, and that although many lecturers will engage with technology at a very basic level (i.e. mounting their notes in a Virtual Learning Environment) they are still engaging – and once this shift in cultural perception has firmly rooted itself, then we are ready for the next stage. There is no shame in concentrating some of our efforts on using ICT to support teaching, or the administrative functions surrounding it, and not solely and constantly on the teaching process itself. That is not to say we should not have visionary
projects or ideals, but we must not distance ourselves from the practitioners by constantly focusing on the latest technology, or the perfect learning theory (if such a thing should ever exist, which is highly doubtful). We must also recognise the clear differences between the sectors and the subjects, and although there is some commonality, we must always seek to accommodate the differences.

Yet there is hope. It is clear that basic use of ICT amongst most teachers and lecturers is now set in. This can be built upon. Second, we are in an age of accepting the impossible. Although software has hardly advanced much over the past ten years, hardware and peripherals most certainly have. People find the computers of the mid-1990s archaic. In a few years time they will find the computers of today similarly ancient. Gradually, what we consider the past and what we consider state-of-the-art are getting nearer and nearer so that in the future, last month’s hardware may seem outdated. This is instilling in people a general acceptance of the technology, an inherent skill of keeping up with the latest development (supported by emerging community practice of keeping friends and colleagues abreast), and an acceptance of the impossible.

We no longer question someone when they tell us of a new breakthrough in technology, instead we go straight to Google to find it. These are major shifts in the nation’s psyche and will have an effect on e-learning and its acceptance. Furthermore, the students who appear in HE in 2008–9 will all have memories only of a world in which the Web and the graphical browser existed (i.e. they were 3 or 4 when the pioneering NCSA Mosaic browser appeared). This in turn will coincide with an emerging IT-literate teaching body, plus an influx of new appointments (certainly in the UK) due to the number of retiring staff appointed during the massive expansion in HE in the 1960s.

The future is hopeful, therefore, but we must tread carefully.
e-Learning presents a unique opportunity to increase opportunity for learners, educators and educational institutions. Despite a heavy investment in ICT, especially in schools, over the last 5 years, most ICT is used to automate historical learning models (for example, a classroom teacher using a laptop and a digital whiteboard to present material to a class). The next phase of transformational change (where technology is used to create models of learning which could not be achieved using traditional resources) will produce the breakthroughs in learning enabled by technology.

Although there will be many benefits of e-learning, Microsoft believes that the key breakthroughs will happen in the following three areas:

- **Personalised learning experience.** The ability of ICT to provide instant feedback and to provide contextual information to the learner enables the learner to learn at their own pace and style, even when part of a larger learning group. For example, a student at a lecture can ask questions in real time and drill down into background or supplementary information while following the lecture. Or systems can analyse the way in which a learner addresses a task and provide feedback and guidance for improvement. For example, the m-learning project at Birmingham University is seeking to create a model for higher-education learning that embodies the latest collaboration technology.

- **Connected learning communities.** Collaboration technology now enables learners and educators to work together and share knowledge even when separated in time and space. So learners learning foreign languages can interact with native speakers and educators can create and share examples of good practice with colleagues anywhere in the country. For example, the MFL Learning Gateway at Monkseaton Community High School, Whitley Bay enables non-specialist primary teachers to get support from specialists at a Language College.

- **Anywhere Anytime Learning.** Since learning starts and ends outside of formal education institutions, ICT has the capability to extend the learning experience to wherever the learner happens to be and at the time of their choosing. This has the power to extend the concepts of learning beyond traditional institutional thresholds and models. For example, The School that Never Sleeps, being developed by Kent County Council enables students to access learning at any time.

Above all, e-learning must not be seen as something different to learning. It is what learning should become when enabled with technology.
The nature of the UK education system means that the development of high quality e-learning in practice within schools and colleges is slow. There are some excellent pockets of good practice with which we are involved, but sufficient change is not happening system-wide. Microsoft is working to ensure that the benefits of e-learning are realised before questions are raised over its value.

Microsoft sees four questions that we must address in order to realise the full benefits of e-learning:

- How do we create a culture amongst educators that allows the rapid transmission of ideas, pedagogy and practice?
- How do we align the assessment system to measure the skills acquired through e-learning?
- How do we ensure that engaging, compelling content is available?
- How do enable education leaders to think strategically about information flows within their institutions?

**Skills and Pedagogy**

Although there is a need for a systemic approach across a number of action areas, the key to success in establishing e-learning is the development of the education workforce itself. Without the establishment of a strong cadre of confident teachers using ICT as an integral part of the educational experience, the benefits of breakthroughs in other areas will not be realised.

Training investment from the £270 million New Opportunities Fund (NOF) enabled some teachers to gain core ICT skills, but the results were not universally realised and ICT skills alone are only part of the picture. Once teachers have the skills to use ICT they also need the motivation and skills to use it as part of the pedagogy. The advent of e-learning tools has created an imperative to create a new pedagogy that uses these tools to create new, more engaging and effective learning experiences.

Microsoft sees the current task as much about creating a new pedagogy that harnesses the capabilities of new technology as simply embedding ICT into the current pedagogy. Teachers need to be in the forefront of this work.

In addition to the development of skills, changes of culture are also required. Given the high cost of developing some e-learning resources, teachers need to be more comfortable with the notion of adapting and using resources created by others. A key element of this cultural development is the establishment of mechanisms for teachers to share ideas and practice with each other as part of connected learning communities.

**Assessment**

Although a clear link has been established between the use of ICT and educational attainment (Becta 2003), the greatest educational benefits from ICT derive from developing skills that are very important, but very hard to measure. For example, the ability to find, validate, synthesise and present information (digital literacy) is a critical workplace skill that is undervalued within the current assessment system. The need to focus on skills as well as knowledge is cited in Mike Tomlinson’s interim report to the UK Department for Education and Skills on reforming the curriculum and qualifications for 14–19 year olds, and it is these skills that are most developed through the use of ICT.
However, the assessment system drives behaviour within the education system and until the assessment system is modernised, the full benefits of ICT in education will not become fully visible.

**Content**

Currently, educational content does not even begin to approach the capabilities of the technology. Whereas the games industry has developed sophisticated, photorealistic, immersive worlds, the same technology is not yet being applied to the creation of educational content.

Some intervention is required to break out of a vicious circle where limited content inhibits the adoption of e-learning and a limited e-learning market inhibits private sector investment in e-learning resources. E Learning Credits go some way towards fulfilling this.

Microsoft contends that the most appropriate way forward is a hybrid route, with a thriving private sector complemented by centrally funded content filling curriculum areas that would not otherwise be addressed.

Although private sector partners are able to produce major pieces of sophisticated educational content, there is an equal need to enable practitioners to create and share content. Microsoft, through the Innovative Teachers programme, has invested in design tools to enable teachers to create Virtual Classroom Tours and share their practice with others. The adoption of open standards for sharing content and pedagogy would be an important step in the creation of a ‘market’ (though not necessarily mediated by money) of high quality practice created by teachers.

**Leadership**

The strategic use of ICT by business only developed once leadership teams had the ability to manage ICT as a tool for improvement across the organisation and we believe that the same conditions now apply within educational institutions. We do not advocate the need for educational leaders to develop technical knowledge, merely that they develop the techniques to manage ICT to achieve major change.

**Summary of Part I**

The ICT infrastructure that has been established within the education system over the last ten years or more has historically been primarily used to automate existing models of learning. We now stand at the beginning of an exciting new period where transformation uses are developed that enable learning models that could not be created without the use of ICT. While Microsoft can map some of the contours of this new e-learning, developments will evolve from the ground up.

The challenge is to overcome four key barriers to the development of a culture where these transformational developments will occur. If stakeholders in the education system can ensure that the skills, assessment, content and leadership are in place to encourage innovation and support it as it occurs, we will see the establishment of a Golden Age of e-learning within the education system.

**Part II: A Long-term Perspective on e-Learning (by Chris Yapp)**
Overall Theme

My belief is that the long-term implications of networked information technologies is that we can scale a system of ‘Learning on Demand’ in which the move from a curriculum led or teacher-led approach is replaced by a learner-centric approach.

Looking at ‘on demand systems’, such as Just-In-Time (JIT) in manufacturing, may give some clues as to the overall efficiency and flexibility goals which can theoretically be achieved as technology becomes more pervasive. The study of ‘agile organisations’ may be fruitful in trying to understand what is both possible and those characteristics of learning that are really unique, rather than ‘custom and practice’.

Three Key Goals

The transformation of learning supported by the appropriate deployment of e-learning technologies for me then consists of a series of key policy drivers: the infrastructure of learning; curriculum and assessment; and use of e-learning to support a transformed system.

The Infrastructure of Learning

This is about organisational change and innovation in the context of schools, colleges and universities, along with the workplace and home. In particular, the ability of ICTs to integrate previously discrete organisations with the creation of an ‘e-learning supply chain’. This has been embodied in areas such as EAZs, NGfL, People’s Network, UFI/Learn Direct and NHS U. Examples such as C2K in Northern Ireland show a move towards an integrated approach for the provision of infrastructure.

Curriculum and Assessment

There has always been a tension in learning between the transmission of the best from generation to generation and the preparation of the rising generation for a new world. e-Learning will not make that go away innovation in the private sector can be described as the ‘intersection of invention with insight’. One of the problems in the debate over the future of curriculum is a difficulty in drawing out the future needs of learners.

Technology can also be divided into two classes of supportive and disruptive technologies. Disruptive technologies cause us to question both what we do and how we do it. The creation of tools for curriculum and assessment to support lifelong learning is nearly impossible without some insight into where we are headed. We could build learning objects for e-learning into a flexible user-centred architecture I’m sure, but much of what has actually been done so far is automating the past. That is not where I think the gains may be.

I’m also interested to know if we are overconfident in traditional assessment methodologies and defensive about them in a way that is unhelpful in moving forward. Arguments over ‘gold standards’ and the like spring to mind. There is enough evidence about Nobel Prize winners with thirds, entrepreneurs who did badly at school and high-achieving dyslexics for us to question the traditional assessment tools. I often argue that children learn from play and once you’ve graduated you go back to play but call it research because you are grown up, but in the intermediate phase responsibility for learning is taken off the learner. I have argued that the Internet is fundamentally a research/play tool rather than a teaching tool. This is where the
arguments over pedagogy seem to fall short for me, in that it seems to be more about ‘modernising the teacher’ rather than ‘modernising learning’.

**Supporting a Transformed System**

To use e-learning to support a transformed system of learning on demand implies to me a move towards a more collaborative and team-working approach among ‘teaching professionals’. I would suggest that we need to look at roles other than student and teacher to understand e-learning. From my earlier comments, the roles of researchers, librarians, assessors, parents and counsellors for instance alongside the classroom teacher need to be embodied in the discussions.

**Challenges**

In supporting these three goals, a number of challenges arise out of a learner-centred approach where we have significant gaps in understanding or consensus:

- The extent to which learning styles and modalities impact on learning.
- The externalities of learning, such as transferability of skills, ability to handle risk and uncertainty, serendipity, self-esteem and so on.
- Change management approaches in moving from pathfinders and pilots towards wider deployment in a highly skilled, professional environment.
- The economics of learning and wider impacts, such as tackling the consequences of exclusion, e.g. crime and poor health.

**References**

Policy Approaches to e-Learning

The Political Context of e-Learning

Reading through much of the policy-driven literature on e-learning, it becomes clear that the Internet and other related ICTs are expected to offer a significant step-change in the way that education is delivered and consumed. Policy documents from different countries, however, display quite different political approaches to the question of how such innovative potential is to be maximised.

Given their less direct role in setting local education policy, it is perhaps unsurprising that both the US Department of Education and the European Union adopt a ‘broad-brush’ approach to reporting on the steps towards roll-out of e-learning.

The reports published by the US Department of Educational Technology over the past two years present a largely utopian perspective on the radical social, pedagogical and technological changes which are envisioned, but provide surprisingly little insight as to how such a vision is ever to be realised (President’s Information Technology Advisory Committee 2001; Department of Education 2002). More concretely, an inter-agency working group has just been set up to foster the development, application and deployment of advanced technologies in education and training in the US, and it remains to be seen whether this will lead to more detailed guidelines and policies being produced, but it seems likely that some further degree of national guidance is needed.

European reports document the expected economic benefits but focus primarily on funding mechanisms, network-building and market conditions rather than the minutiae of institutional, cultural, pedagogic or other incentives and barriers European Commission (2001, 2003). There is, of course, a great emphasis on the importance of research and pilot projects, with substantial funding being devoted towards this end, but it is interesting to note that the new 2004-2006 European e-Learning Programme prioritises the dissemination of the results of such EU-funded projects due to the apparent failure of earlier attempts to generate the diffusion of innovation.

Recent UK documents and reports are notably more pragmatic. For example, the most recent consultation paper from the UK Department for Education and Skills (DfES 2003), Towards a Unified e-Learning Strategy, works hard to identify the concrete steps which need to be taken if the potential of e-learning is to be released. This document, which seeks feedback on issues such as the impact of assessment and training and workforce development, recognises that achieving innovation in e-learning will involve significant changes in the institutional framework of education in the UK – and that it cannot be achieved as an add-on to existing structures and processes.

There are, however, several other important issues requiring political intervention which might inhibit the effective roll-out and development of e-learning, none of which are addressed in any of these reports. That is not to say that they are not being dealt with behind the scenes with the involvement of appropriate professional and research bodies, but further discussion within the forum could be useful if only to expose this activity. Those would include the following issues.
• **Time pressures and class sizes.** It is quite clear from Department for Education and Skills statements and papers that substantial commitment to the training needs of new and existing teaching staff is in place. This is all well and good, but given the pressures of the National Curriculum, limited planning time and large class sizes, it is not obvious that state-school sector teachers, in particular, would necessarily have the time, patience or motivation to apply such newfound skills, especially where the potential effects are uncertain. In the long term, more extensive and innovative use of the Internet may promise efficiency savings for the average teacher, but if longer and more stressful working hours are required in the short term, this may prove inhibiting.

• **Risk culture, or its absence.** Building on the previous point, we also need to understand to what extent the current UK institutional culture of education encourages or stifles risk-taking. Innovative use of the Internet would be precisely that – innovative. This implies that such usage would be previously untried, unpredictable or risky. No matter how successful pilot projects or examples of ‘best practice’ seem to be, the introduction of radically new methods or tools into the classroom represents, for any one teacher, or any one school, a significant risk in an institutional culture where testing and League Tables are the norm, and where the marketization of education means falling results can lead to lower pupil numbers and reduced funding.

• **Restrictions of physical architecture and classroom design.** Having recently worked with CABE (Commission for Architecture and the Built Environment) to commission a piece of research which looks at the future for school design in 2020, it has become increasingly clear the extent to which physical design can limit or shape classroom activity. As Roger Higton (2004) mentions in his position paper for this Forum, in many schools, computers often have to be used at desks around the edge of a classroom, which limits the potential for pupil-teacher interaction. Although to some extent the development of the digital whiteboard, hand-held and mobile devices means that the Internet can be accessed in ever more flexible ways, this raises new challenges for school design. We have yet to see much research which considers whether the potential of physical mobility, interactivity and connectivity will be limited by current classroom design.

• **The social context of teaching and learning.** Some models of innovative use of the Internet and other ICTs in the classroom may challenge existing expectations about the sorts of social relationships in which teachers and pupils are embedded. These real or perceived challenges need to be explored and addressed if creative use is to spread, as discussed in the next section.

**The Social Context of Teaching and Learning**

The US Department of Education’s (2002) paper on transforming education and training through advanced technologies is, to be fair, designed to offer a fairly radical and visionary perspective on how ICTs could alter education. Nonetheless, some of its contributed papers offer a rather alarming view of a future where e-learning has replaced physical human interaction with purely ‘virtual’ experiences, either where students connect with ‘real’ teachers and pupils located elsewhere, or where their primary contact is with recorded lectures/lessons and artificial personalities. Whilst some of these essays are intended to serve as a warning, others seem to aspire to the view that physical interaction with a co-present teacher or peer-groups is not a key part of the learning process. Undoubtedly, some projects, such as Ultralab’s NotSchool have made a virtue of this separation, showing how those who feel most excluded from mainstream schools can flourish when working at their own pace in a relaxed home environment connecting only electronically to teachers and mentors. But it would seem to be a dangerous mistake to ignore the potentially positive as well as negative effects of social relationships on the learning
process, and not to factor these into any consideration of how to maximise the benefits of e-learning.

There are several ways in which such relationships might impact both on the uptake of technological innovation in schools as well as on the learning experience itself:

- **Spreading good practice.** As David Hargreaves’ (2003) pamphlet for Demos has argued, a key asset of the successfully innovating school must be its social capital – the trust enjoyed between teachers, pupils and their wider community, as well as the extent of the professional networks in which teachers are embedded. The concept of ‘best practice’ has become a familiar one under the current Labour government, but abstract knowledge is rarely enough to encourage the spread of innovation. Simply reading about a successful pilot project or research programme is less likely to stimulate others to experiment than direct participation in such a project, or learning about it from others that one trusts. If networks of support and trust between schools, or between schools and businesses, are currently lacking, this may make diffusion of innovative practice much harder.

- **Developing trust.** As the Notschool project has demonstrated, trust in the learning process is not necessarily established solely through face-to-face interaction with teaching staff in the traditional classroom. But for most students, coming to trust those who teach them is essential if progress is to be made, and normally this is developed through physical interaction. As we look to the Internet and other ICTs for ever more exciting ways of teaching and learning, we need to be sure that this bond of trust is maintained. Eye contact, personal support, and face-to-face interaction in situations loaded with complex meaning are key aspects of this process of building and maintaining trust. Whilst distance learning and provision of online courses may be the answer to guaranteeing the availability of hard-to-recruit-for subjects, or for supporting lifelong learning, it would be understandable if schools and institutions were cautious in implementing new practices which potentially challenged such well-understood ways of working and relationship-building.

- **Communication skills.** Part of the learning experience for pupils and students is the development of communication skills as a result of interaction with peer groups. Recent UK policy has highlighted the value of interaction in conditions of social diversity, whilst the impact of peer-group composition on learning outcomes has been the subject of much research. Such network effects might be encouraged or discouraged through innovative use of the Internet. As argued in the JAIMS position paper for this Forum (see above), the possibility of enhanced inter-cultural communication and understanding is just one appealing feature of e-learning. The 2004–2006 European e-Learning Programme has set aside almost half its funding for an ‘e-twinning’ programme which would pair up schools across the European Union in the hope of improving language skills and building mutual understanding. However, it is also true that intensive use of ICTs in the classroom may challenge accepted ideals of communication, just as some teachers despaired of children’s use of text-messaging terminology in English exams. Once again, caution in introducing new practices is clearly understandable, even if the potential benefit is also great.

**Conclusions**

There are several important social, physical and institutional factors which may throw up challenges to the way that creative use of the Internet in schools and education develops. It remains to be seen how inhibiting these factors may prove, if at all, but some policy focus may
be needed – if only to reassure education professionals and institutions that these need not slow the pace of change.

References


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e-Learning Frameworks, Pedagogy and Innovation: Taking Us Beyond The Fringe

Summary of JISC-funded e-Learning Programme

- How can we enhance current knowledge about what constitutes ‘effective’ e-learning and pedagogy?
- How can we support practitioners with their developments in the use of e-learning?
- How can we promote the development of terminology and frameworks that will improve understanding and sharing of practice in e-learning?
- What are the current approaches to the design of e-learning activities and how can these be developed in the future to ensure that we are using sound pedagogical models?

These are some of the issues that will be addressed in consultation with practitioners from the JISC community in the new e-Learning Programme funded by the JISC Committee for Learning and Teaching (JCLT), which will run until August 2007. The programme’s overarching aim is to identify how e-learning approaches might be used to facilitate learning and to advise on how these approaches might be effectively implemented. It focuses on three areas: e-Learning and Pedagogy; Technical Frameworks for e-learning; and Innovation.

This paper focuses on the e-Learning and Pedagogy Programme as this is directly relevant to the focus of the forum: one of the two aims of the programme is to inform the development of new and more pedagogically focused Virtual Learning Environments (VLEs), or other learning tools.

Although there are already some planned activities under this programme, which are referred to later in this paper, this new programme offers practitioners the opportunity to be closely involved with its future development. Through extensive consultation with practitioner communities representing Further Education (FE), Adult and Community Learning (ACL) and Higher Education (HE) sectors, the activities and outcomes from the programme will be refined and developed accordingly. This will ensure that the programme produces practical tools and advice that meets the needs of these communities. It is envisaged that the programme, where relevant, will also feed into other National Learning Network (NLN) initiatives, for example, the further development of the Ferl Practitioners’ Programme.

The programme focuses on three areas: pedagogy; technical frameworks; and innovation. Initial activities in the programme will explore the areas separately but will inform each other, so that there is a continuum of investigation that spans current practice in the use of e-learning and the technology needed to support this practice. The programme will identify the technology that is required for effective practice and produce exemplars of this practice. By collating user requirements for technical systems, it will also influence developers to produce systems that are appropriate for the needs of learners and teachers.
The programme is ambitious and it may achieve all its aims in full, but the intention is to create a substantial focus of activity that will move forward in some way our collective understanding of appropriate e-learning practice and the technology required to support it.

1. **Background and definitions**

Throughout this paper, e-learning is defined as ‘learning facilitated and supported through the use of information and communications technology (ICT)’. The e-learning and Pedagogy Programme aims to ensure that e-learning, as practised in HE and FE, should be ‘pedagogically sound, learner-focused and accessible.’ The general background for this programme is the ongoing need to support practitioners in realising this aim.

A more specific context is given by the following developments.

1. Widespread implementation and increasing use of VLEs in UK HE and FE has led to demand from practitioners for more effective guidance on good pedagogical practice.\(^1\)
   A specific call has been for help in designing e-learning activities in these environments.\(^2\)

2. Developments in international standards and specifications for learning content offer increasingly powerful ways of describing educational materials.\(^3\)
   These open standards also allow different e-learning tools to be drawn together in a common environment (e.g. Zope). An invitation to tender for work under a new JISC ‘e-learning Frameworks’ programme will see the emergence of a technical framework to support the development of flexible learning systems for UK HE and FE.

3. The focus has now moved from specification of learning objects to specification of learning activities. Developments in learning design offer new ways of integrating materials and activities in a pedagogically-informed way. They also offer richer frameworks for modelling learning interactions in virtual environments. So far they have not been widely available to practitioners.\(^4\)

4. The Department for Education and Skills’ *Towards a Unified e-Learning Strategy* consultation document, points to the need for effective learning design tools to help practitioners to develop and deliver their own learning activities (DfES 2003: 56).

5. There is evidence that neither learning object metadata, nor learning environments, nor existing practitioner-based vocabularies for describing learning and teaching, are in themselves effective in supporting the development and transfer of effective e-pedagogical practice (McAndrew 2003).

6. There is a growing and related awareness of a need for effective dialogue among practitioner communities, educational research communities and developer communities.

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\(^1\) ‘Pedagogical issues… appear to have been of secondary concern until now’, JISC/UCISA (2003) report *Managed Learning Environment Activity in Further and Higher Education in the UK*. The JISC-commissioned *A Framework for Pedagogical Evaluation of Virtual Learning Environments* consultation document provides an important context for the work of this programme by taking account of new developments in VLE systems and usage (see [www.jisc.ac.uk/index.cfm?name=elearning_pedagogy](http://www.jisc.ac.uk/index.cfm?name=elearning_pedagogy)).

\(^2\) Symptomatic of this demand among practitioners has been the success of Gilly Salmon’s (2002) book, *e-tivities* (see also [www.e-tivities.com](http://www.e-tivities.com)).

\(^3\) See IMS Learning Design v1.0 [www.imsglobal.org/learningdesign/index.cfm](http://www.imsglobal.org/learningdesign/index.cfm); SCORM’s Content Aggregation Model and Run-Time Environment for learning objects: [www.adlnet.org/index.cfm?fuseaction=scormabt](http://www.adlnet.org/index.cfm?fuseaction=scormabt)

\(^4\) IMS Learning Design specification envisages systems that allow more pedagogic flexibility in coordinating learning materials and activities. Early exemplars include the Educational Modelling Language ([http://euml.ou.nl/euml-ou-nl.htm](http://euml.ou.nl/euml-ou-nl.htm)) and the Learning Activity Management System (see [http://www.cetis.ac.uk/content2/20031105152011](http://www.cetis.ac.uk/content2/20031105152011) for more details).
(both systems and standards), who share a common focus on learning interactions and activities (DfES 2003: 64–7).

2. Aims and objectives

Given this context, the funding programme has a series of aims and objectives.

Aims

1. Provide the FE and HE community with accurate, up-to-date and research- or evidence-based information about effective practice in the use of e-learning applications.
2. Promote the application and development of e-learning tools and standards to better support effective practice.
3. Develop and evaluate a framework to facilitate interoperability across learning, teaching, research and their supporting systems.
4. Consider and promote the use of innovative technologies and models to support e-learning.

Objectives

1. Identify an agreed set of user groups and stakeholders, ensure programme outcomes are appropriate to their needs and support implementation by establishing an iterative, consultative evaluation and feedback process.
2. Review and – where possible – enhance current knowledge about effective pedagogies for e-learning.
3. Explore how this knowledge can be effectively applied by practitioners in developing e-learning and teaching practice.
4. Develop terminology that will improve understanding and sharing of practice in e-learning.
5. Investigate approaches to the design of e-learning activities and make recommendations for further development (of software, guidelines or standards).
6. Develop recommendations and resources for the community, e.g. practical toolsets, methodologies etc.
7. Identify, in consultation with the user community, the key current requirements of a common e-learning technical framework(s).
8. Develop a generic framework (a set of models, specifications and patterns that provide a common basis for designing architectures) to join-up systems and support a diversity of pedagogic models and institutional types.
9. Where possible or appropriate, commission the development of new open source tools and interfaces.

In pursuing these objectives the programme will:

- Work closely with partner agencies and concurrent projects.
- Consult with existing practitioner networks and JISC user groups.
- Review existing resources and work-in-progress, identifying key lessons and significant gaps.

Examples of this trend include the establishment of the CETIS Learning Design and Pedagogy SIGs, and the number of e-learning departments being established in partnership with Education Departments and Learning and Teaching (CPD) Units.
• Commission a limited number of desk studies.
• Commission evaluative projects to investigate applications and approaches to learning design.
• Support an ongoing process of collation, synthesis, review and planning in relation to programme outcomes.
• Create coherent tools and resources to communicate programme outcomes.

3. E-learning and Pedagogy

The e-learning and pedagogy strand is most relevant perhaps to the discussion topic of the forum. The following section explores the challenges and possible solutions in more detail.

(1) To provide the FE and HE community with accurate, up-to-date, evidence- and research-based information about effective practice in the use of e-learning tools.

The programme will scope the range of available information on pedagogy for e-learning, drawing on all three communities identified in 1(6) above. It will evaluate the approaches that seem effective for learners, and the forms of information and support that are relevant to practitioners. Further research and development may be promoted to fill significant gaps in the knowledge base.

Challenge: There is already a huge volume of information about e-learning practice, for example in case studies, academic articles, project outcomes, staff development guidelines, educational research. The information is of variable quality and variable usability by practitioners.

Solutions: The programme must take account of work already reported. It will need to develop a framework for evaluating the outcomes of existing work, both in terms of pedagogical effectiveness, and in terms of usefulness to practitioners.

The focus on design of learning activities will help to manage the volume of information available. The programme will work in close partnership with other organisations and ongoing projects, drawing together outcomes from across the relevant communities.

Challenge: There is no common terminology for describing the learning activities and learning interactions that are at the heart of this programme and of practitioners’ concerns.

Solutions: The programme will prioritise a review of terminologies and will work in partnership with the UK Centre for Educational Technology Interoperability Standards (CETIS) to take research and development forward in this area.

The programme will devote a significant tranche of funding to promoting dialogue among the relevant communities via working groups and consultation exercises. These will focus on analysis, interpretation, synthesis and review of ongoing outcomes, on developing shared understanding of these, and on planning future areas of focus for the programme.

(2) To promote the application and development of e-learning tools and standards to better support effective practice.

The programme will explore applications and approaches that support the design and delivery of learning activities, including learning design tools and commercial learning environments. The focus will be on evaluating specific applications of these tools, in order to build up a repertoire of effective models and to identify those approaches that are both useable by practitioners and effective for learners.
Challenge: Learning design tools are at an early stage of implementation by practitioners. Solutions: The programme will prioritise evaluation and review of pilot projects and will keep a watching brief on emerging alternatives.

Challenge: Learning environments are claimed not to support any specific pedagogical approach and are therefore difficult to evaluate in terms of learning design. Solutions: Leaving aside the issue of pedagogical neutrality, the programme will focus on evaluating specific learning activities and interactions within the online learning environment. It will not undertake to evaluate the affordances of the environments themselves, except where these have a specific limiting or enabling effect on the activities under review.

Challenge: Effective support for learning design may be provided by enabling tools and systems, but may equally effectively be provided by paper-based guidance or staff development opportunities. Solution: In evaluating successful instances of learning design, the programme will take impartial account of all forms of support available to practitioners.

References


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e-Learning Scope and Key Focal Points

Introduction

We welcome the concept of this forum and look forward to contributing to the debate around the issues raised. The questions asked in the forum objectives are relevant and timely and are areas that need to be better understood as e-learning develops and becomes more prevalent.

As a precursor to the debate, we would like to raise the following issues/comments.

1. The Scope of E-learning

There are currently many definitions of e-learning. It is important that the members of the forum reach consensus as to what is meant by the term e-learning for the purpose of this discussion. In the recent white paper ‘Evaluating Investment in ICT and E-learning’, RM, Microsoft, Learning and Skills Council (LSC) of England and British Educational Communications and Technology Agency (Becta) defined e-learning as:

‘All activities required for the delivery of effective teaching and learning through the use of ICT in its broadest sense. This includes:

• Classroom delivery
• Online learning
• Tutorials and coaching
• Staff/student communication
• Planning, preparation and assessment’

This should also be considered in the context of distributed and electronic learning as identified in The Spectrum of Distributed and Electronic Learning, a report by the Learning and Skills Council’s Distributed and Electronic Learning Group (DELG) in September 2002 (see Table 1).

Innovation with e-learning, therefore, is more than just access to and use of the Internet and could comprise a number of things such as:

• Use of a projector and networked Tablet PC wirelessly linked to deliver elements of a lesson
• Remote access for students who are off sick through video conferencing or personal portals
• Use of online conferencing to facilitate student collaboration on lesson topics

At RM the rapid uptake of the Tablet PC has provided us with a new perspective on how technology can change classroom pedagogies. The Tablet PC, wirelessly connected to a projector in the classroom, means that the teacher is no longer tethered to the front of their class – either through a blackboard, desk and PC or even an interactive whiteboard. They now
have the freedom to drive the lesson from wherever they need to be in the class, sitting down with individuals to help them understand a point, or by handing over the lesson to the pupils so that they can drive the lesson from their desks.

Table 1. Distributed education and learning

<table>
<thead>
<tr>
<th>At own pace</th>
<th>Real Location</th>
<th>Cohorted</th>
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<tbody>
<tr>
<td>Drop-in learning centre provision</td>
<td>Enhanced traditional class based-learning</td>
<td></td>
</tr>
<tr>
<td>Just-in-time ‘pure’ e-learning at home and in the workplace</td>
<td>Video conference enhanced ‘distance’ seminar</td>
<td></td>
</tr>
<tr>
<td>Anywhere</td>
<td></td>
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</tbody>
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Source: Report of the Learning and Skills Council’s Distributed and Electronic Learning Group, September 2002

To illustrate further, in a recent document for a partner Further Education college, RM identified the following modes of e-learning developing within the college:

- Whole class teaching about IT (typically ICT and Key skills)
- Whole class teaching with PCs for each student – show and practice (typically business admin and key skills)
- Whole class teaching of theory components of all subjects using IT in any of:
  - projectors, interactive whiteboards;
  - Microsoft Office, Microsoft Powerpoint, the Internet;
  - subject specific applications;
  - content – from office spreadsheet to multimedia title,
  (Generally this would not be whole lessons. For example a tutor might use the Web for 10 minutes on screen to demonstrate a point, then go back to chalk. Use would be ad hoc as well as planned and therefore would be difficult to timetable at the start of year).
- Each student in front of a PC doing:
  - self-paced, self-sustained, learning materials;
  - assignments, research, etc;
  - tutor-supported exercises;
  - exercises supported by learning assistants.
  (This could be used in all subjects for reinforcement, etc. The key challenge is location and levels of guidance and support required)
- ICT-based experimentation/laboratory/simulation.
  (Using ICT to support the practical side of many subjects: motor vehicle diagnostics, heart rate monitoring, 3D review of hairstyles, simulated dangerous experiments)
- Autonomous self-paced learning
  (A ‘LearnDirect’ style which could expand anywhere. Real scope for remedial work, catch-up and revision in all subjects)
- One-to-one coaching
  (All subjects. Could be tutor and student at a single PC reviewing work, student at home or workplace at PC, tutor at PC, review of shared view of work/portfolio on screen)
- Small group work, ad hoc tutorials
  (All subjects. Could be breaking into small project groups, breaking into tutorials, running small group tutorials with support staff. Will be flexible and ad hoc, not scheduled)
through the year. Example: ‘I need 6 stations and a big table for this group for a 4 week project every Tuesday pm.’

- Planning, preparation, review, recording
  (Teaching staff in staff rooms, and ‘teachers PC’ in all classrooms)
- Assessment – self timed or structured, class or individual
- Student access to PCs for social, \textit{ad hoc} communication using email, etc.
  (email stations – standup, graze and move on. Browse intranet for timetables and move on. These are public access terminals for students)

2. The Need for Management Focus and Culture Change

Effective e-learning requires leadership from a senior level and recognition that the culture throughout an establishment must embrace e-learning as a viable, accessible tool that should be considered automatically as part of the pedagogy of any learning programme.

Evidence suggests that only early adopters can demonstrate that this is happening. Managing this culture change will be critical to the success of e-learning. Evidence suggests that there is inherent resistance to change within many establishments. One model that RM have found to be appropriate comes from Knoster, and states that the critical factors for change to be effective are:

- Vision
- Skills
- Incentives
- Resources
- Action

Leaders need to have the conviction of their beliefs and the credibility and respect of their staff to make things change. One key aspect here is that people learn from what they see others doing. A leader that says all the right inspirational things will not be successful in converting their staff if they are not/refusing to, use the technology. A leader has to be seen to be doing what he asks others to do.

Two critical areas to consider are around staff. Too often these factors are not sufficiently considered with respect to middle management teams and this then becomes a barrier to the widespread take-up of e-learning.

Another issue is the lack of confidence of teaching staff to really apply e-learning within the curriculum as they do not have the necessary (e-learning as opposed to ICT) skills or access to development and opportunities to share best practice.

3. New Pedagogies and the Role of the Teacher

As good practice in e-learning develops within the classroom, then the role of the teacher will change. New pedagogies and new uses for technology will develop.

There are so many choices of what ICT can enable. We believe we’re at one of the major decision points now: a T-Junction in the development of the use of ICT in schools, where we have a choice of turning in two opposite directions. The decision we are being faced with is about Teaching and Learning. But it shouldn’t be a choice between teaching and learning. Traditional views of e-learning are about empowering the learner, and that the role of the teacher changes to somebody who may stand on the sidelines. There are models being
adopted from the world of Higher Education, which suggest that the future of learning is where individuals work on their own with technology, using today’s distance learning techniques. While we accept that it has a place in the future of learning, we don’t believe it should be done at the expense of teaching.

To make individualised learning effective, we need to focus very clearly on supporting teachers in their role, and providing the right blend of resources and support that they need to succeed. Many people talk about self-paced learning – do we really want 13-year old boys learning at their pace, or do you want to drive their learning at the pace you know they are capable of?

The teacher’s purpose should remain unchanged in the advent of new technologies; they are not and have never been just a facilitator (guide on the side). Therefore we should not consider a straight replacement of the teacher for an online learning resource. As we open up opportunities for collaborative learning outside of the school walls again, there needs to be consideration of the balance and blend of personal face-to-face interaction and online tutorials. A PC cannot motivate, encourage, provide advice to and to be a role model to, the individual they are looking after. What will change about the role of the teacher is what they are able to focus their time and attentions on.

At our National Conferences for Senior Managers in Secondary Schools in 2003 we used the classic Hooper and Reiber adoption model to illustrate the steps schools and teachers need to make in order to integrate e learning and technology into their classroom teaching and learning.

The first step is Familiarisation, where teachers become familiar with technology for the first time, but may not adopt it – a typical example is where a teacher attends an INSET course or conference, but hasn’t yet moved into using it in their teaching. This might be because they don’t have access to the technology they’ve learnt about, or because they don’t see a real need for it in their situation, or because they haven’t got round to doing it yet.

The next step is Utilisation – where the teacher tries out the technology in the classroom for the first time. They’re starting to use technology to replace their traditional teaching methods but this is all that they are doing, if the technology fails then they can return without any problem to their old method.

Next is Integration. This is where the teacher moves to a level where they cannot achieve the same learning outcomes without the technology – it becomes truly integrated into their classroom practice and becomes immoveable from their lesson. The teacher should expect to achieve more in each of those situations because of the use of technology.

The next step of the Hooper & Reiber model is called Reorientation. This is where the teacher starts to consider where it is most appropriate for the focus to switch from instructional, to student-led learning – where the teacher uses ICT to construct a learning environment in which they support and facilitate their pupil’s own learning. It’s about the ability to develop the use of technology to adapt the pupil:teacher relationship, as well as extend the learning beyond the classroom.

The final stage of the Hooper & Reiber model is Evolution – this is recognition of a continually changing classroom and technological environment. It recognises that there is a cycle of familiarising, using, integrating and reorienting happening continuously, as new technologies and new classroom practice are developed.
Our goal must be to get beyond Utilisation – that for schools to achieve excellence right across the school, the aim should be to achieve the level of integration – where teachers are achieving more through teaching with technology than they could do without it.

4. Business Processes

It is fair to comment that businesses are ahead in some ways in their use of ICT and the Internet. For example, it is now reasonably accepted that the sustained growth in productivity in the US over the last decade is as a result of the significant investment in IT made by US businesses. One area in particular would be that of business process and the development and implementation of integrated business systems – and hence the new business models that can only be successful with ICT. Whilst the primary ‘business’ of schools and colleges is teaching and learning, we believe that there are significant reductions in administration and bureaucracy that are available by an equivalent integration of education administration and curriculum systems as well as improvement in communication and sharing of knowledge and information.

Where are establishments now?

Today, schools encounter numerous databases which hold endless amounts of data about the learners in the school. These are not linked; they do not talk to each other and they are often on completely different platforms. A teacher will have to access each separately with a different username and password for each. There is also the reality that they would not have access rights to all.

Where do we want to be?

One central database, which could be housed in the school, the Local Education Authority, regionally or even nationally, that holds all the data/resources and content for an establishment, including academic results, pupil’s previous school information, attendance records, budget information, timetabling, user passwords for the network, lesson plans … the list goes on. All of this is common through one consistent Web-based front end, with one password that allows you to retrieve all the information you want at any one time in order to undertake the activity you wish to. The systems have a consistent level of interoperability in order to allow school systems, cluster schools or partner colleges to share information and access lessons plans, resources or pupils records.

However there is a cultural change that needs to take place in order to get them to this nirvana. We can’t just jump into the future. We need to take a step approach that changes the mindset and processes of teachers today.

5. Equality of Access

Recent surveys indicate that 90% of households now have Internet access. Student use of the Internet from outside of the traditional learning environment is increasing. A number of things should be considered if schools and colleges are to benefit from this. Firstly ensuring equality of access for all – how do we meet the needs of the students from the 10% of households that do not have Internet access – and particularly broadband access. Secondly understanding the differences in purpose, usage and support systems between school and home use.

6. ICT Service Levels
Consideration should also be given to the ICT services that are available within educational establishments. For many school pupils, the ICT they access at home can be more up-to-date and accessible than that at school. A recent study completed by RM concluded that many colleges do not yet have the robust and reliable ICT Service that they consider necessary to support effective e-learning.
Using Technology to Learn

As the Head Teacher of The Cornwallis School I was delighted to be invited to trial pre-production models of Tablet PCs before they reached the education market last year. Three developers from Microsoft in Seattle visited and questioned a group of 17 year olds who used the machines. One exchange went as follows:

‘What did you think of the on line tutorial?’

‘I didn’t use it.’

The question was addressed to a second student.

‘I must admit I ignored it as well.’

The developer posed the question a third time – ‘What did you think of the on line tutorial?’

‘What on line tutorial?’ was the embarrassed reply.

The developer’s head slumped on the desk and one of her colleagues remarked that she took three years working on the on line tutorial.

The students tried to retrieve the situation by explaining that they worked intuitively and there is no doubt that they had a very thorough knowledge of the potential of the tool they were using.

Bolstered by this conversation, the next time I opened my Tablet I decided to use it intuitively. After 15 minutes despairingly I returned to the on line tutorial. Intuitive behaviour in learning with IT is clearly an easy option for a 17 year old but not for someone who has reached 57.

However, this story is not about the vagaries of on line tutorials but concerns how differently many pupils now learn. They multi-task with ease, they engage with electronic games with delight and dedication and they collaborate and teach each other skills in an open and enthusiastic way which would have been deemed ‘copying’ by my secondary school teachers.

Two key messages emerge:

- At the centre of learning is not the teacher or the technology but the learner. This has never been more true or more significant than with the rapid developments in hardware or software taking place today. At The Cornwallis we have spent the last ten years trying to develop approaches to enhance learning by using ICT.
- Stop learning how to use technology: focus on using technology to learn. This is our motto.

I am impressed with the way less able pupils (boys in particular) in Key Stage 3 clamour to improve their literacy and numeracy using a Web-based resource developed at The Cornwallis. www.LitNum.com is a literacy and numeracy programme for pupils who arrive in secondary school with National Curriculum levels in literacy and numeracy at Level 4 or below. Key features of this programme which are highly relevant to our discussions include:
Web based materials usable at school, home or elsewhere.
An individually paced approach.
Interactive games environment.
Access to a powerful diagnostic database accessible to students, teachers and parents.
Mediation by parent, teacher or other adult.

The Cornwallis has established an ethos of experimentation and research which aims to put the learner at the centre of all we undertake.

We try to encourage students to be independent learners and interdependent learners with their peers, parents and teachers as an audience of fellow learners.

For example, John, an 11 year old with less than two hours of training, used Macromedia Flash to create an image of growth. This is part of his Key Stage 3 Science curriculum identifying qualities of living things. In a ‘film’ lasting three or four seconds John’s seed establishes roots, pushes to the earth’s surface, develops two leaves followed by a spectacularly colourful flower.

If he had merely listed the qualities of living things I suspect they would have been forgotten by the end of the week. I doubt if he will ever forget now – I certainly won’t (see www.ayeeg.com for this and other tentative efforts).

We need to be sufficiently brave to allow organic growth in schools. An atmosphere in which experimentation, risk taking and research needs to be embraced and celebrated. The danger is that bureaucrats count the hardware and the computer: pupil ratios and fail to enthuse about the tentative experiments of our teachers and students. This, in turn, fails to give the teachers sufficient confidence to learn for themselves and from their pupils, or to embrace the potential of parents as partners in the adventure of learning with ICT.

At a recent conference for secondary-school head teachers I listened to a captain of industry being remarkably blunt about what students learn in secondary school. ‘Content doesn’t matter’ he asserted. ‘Are your students:

- creative
- able to take initiative
- able to work cooperatively
- able to accept responsibility
- lifelong learners?’

Teachers need time and training to transform education into a less content focused and more learner focused experience.

A key question for the future is: Ought the technology to be with the student instead of, as at present, the possession of the school?
Dr Tristram Wyatt, Director of Distance and Online Learning, University of Oxford

e-Learning – Reaching Out to Schools from Universities?

Universities, working with museums and research institutes, could offer a rich set of e-learning resources to schools:
1. for school students;
2. for teachers to use in enriching lessons;
3. for teachers’ own updating and development.

These resources could be especially important for minority subjects (such as ancient Greek or Latin) or subjects with a shortage of teachers, such as in maths and the sciences.

As examples of (1) for individual pupils and (2) for teachers to use in teaching we have:
- Online versions of experiments too expensive, complex or dangerous to carry out in class:
  - experiments that teachers and students can control remotely from school, over the Web (e.g. pint.pcl.ox.ac.uk/~exp2/rgexpt/x2tl.html)
  - virtual practicals (www.chem.ox.ac.uk/vrchemistry/labintro/)
- Pre-university chemistry online, bridging the gap between school and university chemistry (www.chem.ox.ac.uk/vrchemistry/foundation.html)
- Interactive videoconferencing linking universities and classrooms, for example, the Motivate maths project www.motivate.maths.org supported by the UK National Endowment of Science, Technology and the Arts (NESTA).

However, the greatest contribution may be providing resources for teachers’ own updating. This is a key aim of the new UK National Science Learning Centre (NSLC) and its local network of science centres, funded by of the Department for Education and Skills (DfES) and the Wellcome Trust. The National Centre will be run by the White Rose Universities consortium (the Universities of Leeds, Sheffield, Sheffield Hallam and York) offering expertise both in science and science education. It will provide many of its resources online, including keynote talks over the Web from leading scientists and, perhaps more important, it will offer the chance for teachers to interact online directly with these speakers at their laboratories.

Like the National College for School Leadership (NCSL) (www.ncsl.org.uk), the National Science Learning Centre will use bulletin boards and Web-based discussion forums where teachers can share their ideas and engage in a community of practice before and after the courses, many of which will be online. Just-in-time resources will help with teaching challenges. A key draw may be easy access to the best teacher-reviewed and classroom-tested science teaching material. This could be modelled on the DfES Teachers Evaluating Educational Multimedia (www.teem.org.uk) and the USA MERLOT (Multimedia Educational Resource for Learning and Online Teaching) project (www.merlot.org), but here specifically for science teaching and going beyond multimedia – as new technologies are not always the best!

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6 The focus on science in this paper reflects my own background as a zoologist (though, ironically, I work on pheromones and smell, the only sense that cannot be sent over the Internet).
7 www.sciencelearningcentres.org.uk
The National College for School Leadership has devoted significant resources to developing and sustaining its online discussion and support initiative, talk2learn - among the online discussion areas is ‘Talking Heads’ for head teachers. More than 30 full time facilitators have been hired to run the discussion areas. ‘Talking Heads is an online community for all the heads in England. Using think.com software, its community based approach seeks to transform the continuing professional development of school leaders. It seeks to be a virtual space where the twenty four thousand heads in England are able to support, learn from each other and have the opportunity to engage in meaningful dialogue with policy advisers and decision makers’ (http://www.ultralab.ac.uk/papers/itte/paper2002.pdf).

During the discussion on the 23 January 2004, many of us started to wonder if networks might be one of the most important contributions that the net could offer in the short term to schools: online networks of teachers, generously funded with some full time staff to enable the networks to function long term without burnout from volunteers, could provide real support to teachers. These networks could work without the capital funding for prestige central buildings – and could therefore be offered to many subjects, including minority ones. The groupings might be by academic subject, by year group, type of school or a combination (e.g. ‘Primary science teachers’). Universities could provide specialist subject expertise to these networks and use the networks as a means of reaching out nationally, with materials produced in partnership with local schools.

Topics for Discussion

Universities have the academic expertise and some also have the online learning expertise, for example e-learning teams such as Oxford’s TALL (www.tall.ox.ac.uk), with specialists with skills in pedagogy for online learning, multimedia design, project management, audio/visual technologies, graphics and quality assurance.

BUT, there are many questions raised by the ideal of universities offering e-learning resources to schools:
1. What sort of initiatives would be best and sustainable?
2. University and research staff usually know little about the realities of schools teaching, for example about:
   • curriculum needs
   • range of school student abilities
   • school resources available
   • teachers’ needs
   • appropriate level and background knowledge that can be assumed
3. Most universities do not have the pedagogical and technical expertise in online learning.
4. University and research staff are driven by the Research Assessment Exercise (RAE) and promotion comes from research not teaching, let alone producing resources for schools or school teachers. So, it won’t happen … (this is itself a problem for developments in e-learning in universities themselves).
5. What is the role of national teaching bodies such as NSLC, NCSL, and other subject-based organizations such as the Association for Science Education (and their equivalents across the school curriculum)?
6. Who should fund this activity?
7. What are the challenges of making the online resources reusable in schools – the questions of granularity and reusability, as raised in the DfES (2003) e-learning strategy consultation document?
8. How can universities, public sector bodies (e.g. BBC Education), the private sector and schools best work together to produce e-learning resources?

Reference