E-Learning in Higher Education

Diana Laurillard

Abstract

This chapter examines the nature of change in Higher Education with respect to the introduction and growth of e-learning. While the ostensible aim is to use e-learning to improve the quality of the learning experience for students, the drivers of change are numerous, and learning quality ranks poorly in relation to most of them. Those of us working to improve student learning, and seeking to exploit e-learning to do so, have to ride each new wave of technological innovation in an attempt to divert it from its more natural course of techno-hype, and drive it towards the quality agenda. We have to build the means for e-learning to evolve and mature as part of the educational change process, so that it achieves its promise of an improved system of higher education.

Why is e-learning important for HE?

A student who is learning in a way that uses information and communication technologies (ICTs) is using e-learning. These interactive technologies support many different types of capability:

- internet access to digital versions of materials unavailable locally
- internet access to search, and transactional services
- interactive diagnostic or adaptive tutorials
- interactive educational games
- remote control access to local physical devices
- personalised information and guidance for learning support
- simulations or models of scientific systems
- communications tools for collaboration with other students and teachers
- tools for creativity and design
- virtual reality environments for development and manipulation
- data analysis, modelling or organisation tools and applications
- electronic devices to assist disabled learners

For each of these, there is a learning application that could be exploited within HE. Each one encompasses a wide range of different types of interaction – internet access to services, for example, includes news services, blogs, online auctions, self-testing sites, etc. Moreover, the list above could be extended further by considering combinations of applications. Imagine, for example, a remotely controlled observatory webcam embedded in an online conference environment for astronomy students; or a computer-aided design device embedded in a role-play environment for students of urban planning.

The range and scale of possible applications of new technologies in HE is almost beyond imagining because, while we try to cope with what is possible now, another technological application is becoming available that will extend those possibilities even further. Everything in this chapter will need updating again when 3G mobile phones begin to have an impact on our behaviour. Never mind; we keep the focus on principles and try to maintain our equanimity in the face of these potentially seismic changes.

E-learning is defined for our purpose here as the use of any of the new technologies or applications in the service of learning or learner support. It is important because e-learning can make a significant difference: to how learners learn, how quickly they master a skill, how easy it is to study; and, equally important, how much they enjoy learning. Such a complex set of technologies will make different kinds of impact on the experience of learning:

cultural – students are comfortable with e-learning methods, as they are similar to the forms of information search and communications methods they use in other parts of their lives

intellectual – interactive technology offers a new mode of engagement with ideas via both material and social interactivity online

social - the reduction in social difference afforded by online networking fits with the idea that students should take greater responsibility for their own learning

practical – e-learning offers the ability to manage quality at scale, and share resources across networks; its greater flexibility of provision in time and place makes it good for widening participation

There is also a financial impact. Networks and access to online materials offer an alternative to place-based education which reduces the requirement for expensive buildings, and the costs of delivery of distance learning materials. However, learners still need people support, so the expected financial gains are usually overwhelmed by the investment costs of a new system and the cost of learning how to do it. We cannot yet build the case for e-learning on cost reduction arguments – we are better placed to argue for investment to improve value than to save costs.

Changing HE towards the use of e-learning

E-learning could be a highly disruptive technology for education - if we allow it to be. We should do, because it serves the very paradigm shift that educators have been arguing for throughout the last century. Whatever their original discipline, the most eminent writers on learning have emphasised the importance of active learning. The choice of language may vary ~

Dewey's inquiry-based education,

Piaget's constructivism,

Vygotsky's social constructivism,

Bruner's discovery learning,

Pask's conversation theory,

Schank's problem-based learning,

Marton's deep learning,

Lave's socio-cultural learning

~ but the shared essence is the recognition that learning concerns what the *learner is doing*, rather than what the teacher is doing, and the promotion of active learning in a social context should be the focus of our design of the teaching-learning process. It is especially the social situatedness of learning, in the Vygotskyan tradition, that is the focus of David McConnell's chapter in this book.

If the organisation of teaching and learning in HE were driven by the insights of these scholars, then e-learning would have been embraced rapidly as the means to deliver active learning. But change in HE requires a subtler understanding of the forces at work, and here Lewis Elton is a valuable guide.

In his analysis of strategies for innovation and change in higher education (Elton 1999), he draws a distinction between hierarchical and cybernetic models of governance, which have contrasting approaches to change, the former being top-down, the latter relying on a network structure that allows the opportunity for bottom-up as well. Achieving the right balance between the two enables innovation to be embraced within a model of change management:

> "New ways of learning … require new forms of institutional management" [Ibid, p219]

so if universities are to rethink their methods of teaching, they need a management structure that is capable of supporting innovation:

> "The process of change must be initiated from both 'bottom up' and 'top down', with the bottom having the knowledge and the top the power… The top must use its power, not overtly and directly, but to facilitate the work from the bottom and to provide conditions under which it can prosper" [Ibid, p215]

A top down management structure is inimical to successful innovation precisely because management does not have the knowledge necessary. A similar point is made in a collection of articles in a recent Demos publication on the process of reform in the public services in general. Here the 'mechanistic state' is contrasted with the 'adaptive state' [Demos, 2004]. Again, the point is made that if we try to innovate through command and control methods, the innovative idea weakens as it travels down the hierarchy and confronts the local system knowledge it is failing to use in its process of reform. In an adaptive, or cybernetic structure, the model is not a unidirectional graph, but a network, with multiple two-way links between all nodes, even if there is a hierarchical organisational structure. These local dialogues allow localised versions of the innovation to spread downwards, customised versions to spread sideways to peer groups, and generalised versions to travel upwards to managers and leaders.

> We need systems capable of continuously reconfiguring themselves to create new sources of public value. This means interactively linking the different layer and functions of governance, not searching for a static

> blueprint that predefines their relative weight. (Bentley and Wilsdon, 2003:16)

Another source for this kind of analysis is the literature on knowledge management, which draws our attention to the importance of continual innovation, if an organisation is to remain competitive. Senge's analysis derives from a systems approach, and concludes that the organisation must be 'continually expanding its capacity to create its future ... "adaptive learning" must be joined by "generative learning" - learning that enhances our capacity to create' (Senge, 1993: 14). The quote captures the twin tasks of both generating new knowledge, and monitoring existing activities, to ensure adaptive change in response to the external environment. Similarly, Nonaka made the link between knowledge creation and competition in his seminal paper on organisational knowledge, and his model draws attention to the relationship between individual learning and organisational learning (Nonaka 1994). Organisational knowledge creation is seen as a continual dynamic process of conversion between tacit (experiential) and explicit (articulated) knowledge, iterating between the different levels of the individual, the group and the organisation. Again, the network, rather than the directed graph, is the optimal model for innovation, and the dialogic process between individuals and groups at different levels of description of the organisation, is very similar to the principles embodied within the Conversational Framework for learning (Laurillard, 2002, 215ff).

Interestingly, Higher Education already fosters an excellent model for innovation and progression through a cybernetic/adaptive model of change. The academic research community has perfected a process that fosters the creation and development of knowledge, and that is so effective that its basic characteristics are common to all disciplines. I think it is fair to say that all academic disciplines share a fundamental set of requirements for high quality and rigorous research. The academic professional as researcher is:

1. fully trained through an apprenticeship program, giving them access to competence and personal engagement with the skills of scholarship in their field;
2. highly knowledgeable in some specialist area;
3. licensed to practice as both practitioner and mentor to others in the field;
4. building on the work of others in their field whenever they begin new work;
5. conducting practical work using the agreed-upon protocols and standards of evidence of their field;
6. working in collaborative teams of respected peers;
7. seeking new insights and ways of rethinking their field; and
8. disseminating findings for peer review and use by others.

In the context of research, academics measure up well to the idea of 'the reflective practitioner' (Schön, 1983) working within a 'community of practice' (Wenger, 1999). The progress of innovation is rapid and effective.

Now run through the above list again and consider whether the academic professional as *teacher* possesses those characteristics in relation to the field of the pedagogy of their subject. None of them, typically, apply. Not even number 2, since academics are rarely specialists in the *pedagogy of the subject*, beyond a simple reliance on expert knowledge.

If there is to be innovation and change in university teaching—as the new technology requires, as the knowledge economy requires, and as students demand—someone has to take responsibility for it. Who should that be, other than the university academic community? Private providers are ready to try – despite the near-universal failure of 'e-university' organisations since the dot.com boom, the private sector is innovative and inventive and will eventually discover how to turn degree-level education into a profitable business. The demand can only increase. The knowledge economy needs employees who are intellectually confident, capable of taking the initiative in information-acquisition, -handling and -generation, and able to take responsibility for their personal development of knowledge and skills. The generation and acquisition of new knowledge is widespread and rapid in a maturing knowledge economy. Students being educated to cope with it must not be sheltered from the processes of knowledge development. We are in danger of doing that if we allow universities to separate research from teaching as a way of coping with the crises of funding and the professionalism of academics. Knowledge creation is not confined to universities, and graduates will be taking part in the generation and communication of both expert and practitioner knowledge as an inevitable part of their professional life. A university education capable of equipping students for the 21st century must pay close attention to the skills of scholarship - keeping abreast of existing knowledge, rigorous argument, and evaluation of evidence - no matter what the discipline.

All academics, therefore, need to cover the full range of professional skills of both research and teaching. They will differ in proportion, of course, but there is no easy exit from the responsibility of every university to offer its students access to expert teaching informed by current research, to give them the capabilities they need for their own professional lives.

University teaching must aspire to a realignment of research and teaching and to teaching methods that support students in the generic skills of scholarship, not the mere acquisition of knowledge. Forward to the past: universities have to manage on the large scale the same values, aspirations and modus operandi they used for a privileged elite.

We might expect to conclude, from the previous discussion, that the most productive form of system redesign for innovation in pedagogic style in HE would be to return to the undirected collegial networks of earlier decades, before top-down management took hold. The technology itself serves that shift because it creates the means by which multiple networks can co-exist, inter-operate, and self-generate. But technology does not yet adapt to major change in a seamless, incremental way. The technological changes we exploit on the grand scale demand giant upheavals in the physical and organisational infrastructure. The motorcar prompted incremental changes from lanes and carriageways to tarmac roads, but it also demanded the

complex centralised infrastructure of motorways and licensing laws. ICT is making many incremental changes to local ways of working, but it also requires the pooling of resources to create shared networks, and agreed technical standards to enable those networks to interoperate. These changes do not happen without planning and coordination. The change towards e-learning creates the peculiar challenge that it needs both the network-style 'cybernetic systems' approach to innovation, and the top-down, 'command and control' approach to shared infrastructure and standardisation.

We could position e-learning, therefore, as the means by which universities and academics manage the difficult trick of making the learner's interaction with the academic feel like a personalised learning experience, focused on their needs and aspirations, developing their skills and knowledge to the high level universities always aspired to, while doing this on the large scale. E-learning enables academics and students to communicate through networks of communities of practice in the cybernetic approach that makes change and innovation an inherent property of the system. At the same time, we need a way of creating the common infrastructure of agreed standards of interoperability that enable, and do not frustrate innovation.

Technological change and the learning experience

The information revolution is sometimes compared with the Gutenberg revolution, when the printing press harnessed a mass delivery system to the medium of the written word. It is a good parallel to draw for the impact of the Internet, but it undervalues the other key feature of the interactive computer - its ability to adapt. The simple fact that it can adapt its behaviour according to a person's input means that we can engage with knowledge through this medium in a radically different way.

A better analogy than the printing press, to give a sense of the power of this revolution, is the invention of writing. When our society had to represent its accumulated wisdom through oral communication alone, the process of accretion of communal knowledge was necessarily slow. Writing gave us the means to record our knowledge, reflect on it, re-articulate it, and hence critique it. The means by which the individual was able to engage with the ideas of the society became radically different as we developed a written culture. When a text is available in written form, it becomes easier to cope with more information, to compare one part with another, to re-read, re-analyse, reorganise and retrieve. All these aspects of 'knowledge management' became feasible in a way that had not been possible when knowledge could only be remembered. The earliest surviving text - the Rosetta Stone - shows that 'information management' was an important benefit of the medium, recording the resources available, allowing a tally to be kept, enabling better management of the way the society operated.

The nature of the medium has a critical impact on the way we engage with the knowledge being mediated. The oral medium has the strength of having a greater emotional impact on us which enables action through motivation; the written medium has the strength of enabling a more analytical approach to action. As we create and generate knowledge and information we naturally use different media, depending on the nature of the content and the objective

we want to achieve. It is impossible, for example, to use a verbatim transcript of a lively lecture for a print version. The spoken word written down usually reads badly. Medium and message are interdependent; there is an internal relation between them.

What does the new medium of the interactive computer do that is so significantly different from the earlier media? The written medium had a transformational effect on an oral culture because it enabled the representation, analysis and reworking of information and ideas. These are clues we can use. The interactive computer provides a means for representing information and ideas not simply as words and pictures, but as structured systems. A program is an information processing system, which embodies a working model with which the user can interact – not just analysing and reworking, but testing and challenging. This is true even of the familiar word processing program. It does not just record the words, as a typewriter does; it also has information about the words - how many there are, how they are arranged, what shape the letters are. Because of that it can offer options which enable the user to input changes to the system and see the resulting output. We can experiment with layout, font, structure, in ways that are not possible with a typewriter, and are excessively time-consuming with pen and paper. So the adaptive nature of an interactive computer enables enhanced action because it holds a working model with which we can interact to produce an improved output. Graphics programs, and presentation authoring tools, all work on the same principle.

A spreadsheet holds a different kind of working model. It holds not just data but also ways of calculating with the data to represent different behaviours of a system. A common application is for modelling cash flow for a business. The user can determine the initial data about costs and pricing, for example, and the spreadsheet calculates the profit. By changing the prices, the user can experiment with the effects on profits. The cash flow model embodies an assumption about the effect of prices on sales - for example, that they will fall if the price goes above a certain limit. But the user can also change that assumption, by changing the formulae the spreadsheet uses for calculating profits. So there are two ways in which the user can engage with this model of the cash flow system: by changing the inputs to the model, and by changing the model. The adaptive nature of the medium offers a creative environment in which the user can inspect, critique, re-version, customise, re-create, design, create, and articulate a model of the world, wholly different from the kind of model that can be created through the written word.

These two examples illustrate the power of the interactive computer to do a lot more than simply provide access to information. It makes the processing of that information possible, so that the interaction becomes a knowledge-building exercise. Yet the excitement about information technology has been focused much more on the *access* than on the *processing* it offers. And the technology developments so far have reflected that. The focus has been on the presentation of information to the user, not on tools for the user to manipulate information.

The sequence of technological change in interactive technologies has been a historical accident, driven by curiosity, the market, luck, politics – never by

the needs of learners. Learning technologies have been developing haphazardly, and a little too rapidly for those of us who wish to turn them to advantage in learning. This becomes apparent if we compare these technological developments with the historical development of other key technologies for education. Table 1 shows some of the main developments in information, communication, and delivery technologies over the last three decades, and against each one proposes a functional equivalent from the historic media and delivery technologies. The story begins with interactive computers because the move away from batch processing brought computing to non-programmers. The user had access to a new medium which responded immediately to the information they put in. As a medium for information processing, it was radically different from the much more attenuated relationship between reading and writing, thus creating a new kind of medium for engaging with ideas.

Date	**New technology**	**Old technology equivalent**	**Learning support function**
1970's	Interactive computers	Writing	New medium for articulating and engaging with ideas
	Local hard drives and floppy discs	Paper	Local storage with the user
1980's	WIMP interfaces	Contents, indexes, page numbers	Devices for ease of access to content
	Internet	Printing	Mass production and distribution of content
	Multimedia	Photography, sound, and film	Elaborated forms of content presentation
1990's	Worldwide Web	Libraries	Wide access to extensive content
	Laptops	Published books	Personal portable access to the medium
	Email	Postal services	Mass delivery of communications messages
	Search engines	Bibliographic services	Easier access to extensive content
	Broadband	Broadcasting, telephones	Choice of elaborated content and immediacy of communication
2000's	3G Mobiles	Paperbacks	Low-cost access to elaborate content
	Blogs	Pamphlets	Personal mass publishing

Table 1: New media and delivery technologies for information processing and communications compared with their functional equivalents for reading and writing

There is one very striking point about Table 1. The development in information and communication technologies over the *last three decades* is comparable with the development in information and communication technologies over the *last three millennia*. No doubt there are alternative ways of drafting such a table, but that point at least is likely to be common to any analysis of ICT.

Attempting to construct these equivalences is instructive in itself. It is difficult to represent the importance of computer-mediated conferencing, for example, as there is really no clear historical equivalent to enabling large group discussion across huge distances. Table 1 does not cover the full range of new technology forms, but succeeds, nonetheless, in illustrating the extraordinary capabilities of the technologies we are now struggling to exploit. We have to be aware of the impact this fecund inventiveness is having on our intellectual life. The chronological sequence of discoveries obeys no user requirements analysis of learners' needs – electronic inventions are

> created by engineers and computer scientists working in a spirit of enthusiastic co-operation, debugged in the crucible of intensive peer-review (Naughton, 1999)

- but the sequence matters.

It is an accident of the history of technology, for example, that the glorious presentational media of sound, film and television became available for mass access, in the form of multimedia, so soon after the advent of the interactive computer. It meant that this medium, potentially as important as writing, has been unable to develop as a medium for design and creativity. We must be aware that this historical accident affects the user's engagement with the new technology. Whereas most people can write, very few people can create something with ICT. There is no real equivalent of pens and pencils. The focus of new technology development has been on exploiting its multimedia capabilities to give access to presentational media – the equivalents of books, libraries, bookshops, broadcasting, films, television, etc, rather than on the technologies for individual creativity like pens, pencils, and notebooks. Because we can write as well as read, there is the opportunity for ideas to build, to be questioned, critiqued, re-used, re-purposed, re-combined, for all of us to take part in a collaborative creative process. For most of us, our creative re-working that utilises new technology is confined to the use of word processing and email systems – the medium of writing made more convenient and with better delivery options. We use the internet to access information, just as we use books, newspapers and television. But most of us do not use it, yet, to design, or create, or take part in a collaborative creative process that mirrors the traditions of writing. The office applications of word processing and email have simply enhanced the medium of writing, rather than opened up a new kind of medium for intellectual activity.

The closest we have come to the equivalent of pens and pencils, the tools that enabled all of us to contribute to the written medium, is authoring tools such as '*Hypercard*', which allowed the user to create their own associations between texts and diagrams in the form of hyperlinks, thereby building their own information environment with no knowledge of programming necessary. It was meant to open up the world of personal computing to non-programmers. Sadly it failed, because almost immediately the Web arrived, and with it the world of web pages and browsers. It was another historical accident of technology development that was immensely successful at extending even further the salience of the written medium, but gave no opportunity for us to explore how we might ourselves engage as contributors within the new interactive medium. Bill Atkinson's *HyperCard* gave us creativity, the ability to

create the links ourselves, not merely follow the links created for us, and to experiment with some primitive forms of interactivity. More recent authoring tools, which offer 'blogging' opportunities for individuals to create their own weblogs (linking their own commentary to others' web-based material), mark the beginning of a more successful form of personal creative activity. However, as a form of personal mass publishing, they still make the written word predominant, not the interactive transaction.

We have not fully exploited the medium of conferencing-mediated conferencing as a transformational medium for education, in part, I suspect, because it has no historical equivalent. Scholars have always travelled to debate and confer. The commercial pressure to develop highly attractive and usable networked collaborative systems, of the kind that David McConnell discusses in his chapter, has not been sufficient. Perhaps the new fear of travel in the business world will change this, and education will be able to benefit

Technological change can affect the learning experience in profound ways, but the direction of change depends more on the historical accident of the chronological sequence of technological invention, and the drivers of business needs and opportunities. The interactive computer offers the potential for a new kind of personal capability as powerful as the change wrought on human understanding by the advent of writing. It could transform the learning experience in much more exciting ways than simply providing access to information and written communications. If we could harness the new technology to the needs of training and education, we would be focussing more on enhancing the personal capacity of learners, and driving technological development in that direction. That is what we consider in the next section.

E-learning in university teaching

E-learning has been used very effectively in university teaching for enhancing the traditional forms of teaching and administration. Students on many courses in many universities now find they have web access to the lecture notes and selected digital resources in support of their study, they have personalised web environments in which they can join discussion forums with their class or group, and this new kind of access gives them much greater flexibility of study. Part time students can more easily access the course and this in turn supports the objectives of wider participation, removing the traditional barriers to HE study. David McConnell's chapter emphasises the importance of network technologies for enabling both campus and distant students to learn through social interaction and collaboration. Just as the historical inventions of the printing press, the postal service, and libraries opened up access to and participation in the medium of the written word, these technologies are opening up HE through its reliance on this form of access to ideas.

E-learning could do more. The interactive computer could be used to give students an alternative to writing as a form of active participation in knowledge-building. It can model real-world systems and transactions, and can therefore create an environment in which learners can explore,

manipulate, and experiment. The features of the digital environment are fully controlled by the program so that it can be designed to offer as much or as little freedom to the learner as is appropriate to their level of mastery. A simple example is a mathematical model of a well-researched system, such as population dynamics in biology, or unemployment fluctuations in economics. An interactive simulation enables students to explore how the model behaves according to the way they change parameters. The teacher can set challenging problems, such as finding the combination of changes in inflation and exchange rate that produces a sudden rise in unemployment. Students can inspect and experiment, build and test hypotheses, and generate a rich sense of how this model behaves, i.e. how this economic theory works. The teacher could extend this further, as they become more knowledgeable, by noting that the model fails to account for a recent set of data, for example, and offer a variation in the model which students must then further investigate and interpret in real-world terms. The nature of the intellectual activities they practise through this interactive medium is importantly different from the process of reading, critiquing, interpreting and articulating that is typical of their work in the written medium. It does not replace it, but it certainly increases their capability in understanding and critiquing an existing theory. Any system that can be modelled in this way, in any mathematically-based discipline, is open to interactive investigation of this kind.

In the humanities, there are other kinds of possibility: a design and editing program, for example, enables students to explore the effects of music on audience interpretation of a film scene, with the goal of producing a combination that generates a specific effect when tested with the target audience; students of art could investigate the principles of composition of paintings and collages, with the goal of using them to illustrate how certain visual effects are produced; drama students could investigate the effects of the timing of pauses in a monologue with the goal of 'directing' a given speech to produce their chosen interpretation.

In the social sciences, a role play model of human transactions can assign roles, tasks, and information to different groups or individuals, and process their decisions to simulate, say, political negotiations; students of child psychology could use a video display and editing program to practise their interpretation of video-recorded behaviours, with the goal of presenting their own evidence of a particular interpretation of a child's behaviour.

There is no discipline of academic study whose students would not benefit from this kind of intimate engagement with the concepts, interpretations, and theories of their field. It does not displace their work on the written word, but it does empower their engagement with it. A learner who has experimented with ways of manipulating a Picasso collage approaches an academic discussion of cubism with a much deeper sense of how it works as visual representation, than they do when they have only read an expert's thesis. They must do both, because they must learn the much more efficient forms of articulation of an idea that the written word offers. But the written word does not answer their questions – an interactive program can answer how it would look if the guitar section were not inverted… The interactive medium challenges, excites, and empowers the inquisitive learner who wishes to take some responsibility for what they know and how they come to know it. Embedded within a networked

collaborative system, for learners to discuss and debate their creations, ideas, and discoveries, we would have a truly powerful learning medium. Why are we not doing more to achieve this?

Concluding points

Lewis Elton's work touches this argument throughout his career – from his concern with student evaluation, to the role of computer assisted learning, to the importance of staff development, to the role of institutional change, and overall, in his tireless advocacy, on the international stage, of the needs of the learner.

My personal sense of the value of Lewis's vision for education technology is illustrated perfectly when I remember the first piece of work I did for him, as a newly appointed assistant on his project *'Computers in the Undergraduate Science Curriculum'.* His idea was to give students an interactive simulation in which they could investigate the behaviour of an object in free fall with air resistance, and use this to decide the point at which a parachutist jumping under enemy fire should open his parachute in order to minimise his time in the air without crashing to the ground. We worked with a very primitive interactive graphics display to give students the opportunity to experiment with velocity-time and distance-time graphs, to see how the different types of motion, free fall and with parachute, behaved. They were then shown the real-time plot of the parachutist falling, on a distance-time graph, and had to estimate, using their knowledge of the model, when to interrupt the fall and open the parachute. I learned my first lesson of interactive design here: if the wrong answer is more interesting than the right answer, that is the one they will work to produce - the splat of a crashed parachutist, or his destruction by firing, was evidently much more rewarding than the gentle cruise safely to earth. But the form of the interactivity was engaging and challenging, and focused the students' attention on the key parameters and their meaning in a very direct way. That was in 1974. Thirty years later, despite the fabulous advance of the technology, there are surprisingly few real-time interactive simulation-games in education that challenge students in a similar way. This was an application of the interactive computer that fully exploited its potential to change the way learners engage with their subject. Lewis was a genuine pioneer and visionary in this field, as in so many others.

For the educational innovator, who seriously wishes to improve the quality of education and the learning experience, it is imperative that we create an education system that is clear about its values and sets its aims and ambitions high, and that is capable of rapid adaptation to its technological, as well as its social, cultural and political environment. The argument developed over this chapter suggests that we can do this if we exert some influence over the way in which e-learning is used in universities, and direct its power overtly towards the needs of learners. Change in universities is an aspect of their organisation, and again, the opportunities of the new learning technologies, including all their capabilities for information processing, communications, mass participation, design, and creativity, support the kind of system structure that would enable change to be organic and progressive – adaptive rather than mechanistic.

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Online learning involves courses offered by postsecondary institutions that are 100% virtual, excluding massively open online courses (MOOCs). Online learning, or virtual classes offered over the internet, is contrasted with traditional courses taken in a brick-and-mortar school building. It is the newest development in distance education that began in the mid-1990s with the spread of the internet and the World Wide Web. Learner experience is typically asynchronous, but may also incorporate Higher education in the United States, especially the public sector, is increasingly short of resources. States continue to cut appropriations in response to fiscal constraints and pressures to spend more on other things, such as health care and retirement expenses. Higher tuition revenues might be an escape valve, but there is great concern about tuition levels increasing resentment among students and their families and the attendant political reverberations.Â However, there is concern that at least some kinds of online learning are of low quality and that online learning in general depersonalizes education. ABSTRACT In the system of higher education, distance learning through the e-learning courses is becoming the most relevant and widely demanded learning mode over the past decade. This article assesses the introduction of distance-learning principles into the university teaching and learning process in terms of quality. The experiment involved 1.250 students learning at the Kazan Federal University. The survey helped to identify the main barriers to the effective implementation of modern distance learning technologies in the university teaching and learning process: non-readiness of teachers an Abstract New e-learning models are continually emerging as new e-learning technology tools and new research findings in the different areas of e-learning become available. In this paper proposed a six step model for e-learning adoption in higher education. We highlight important issues that have to be considered and evaluated and incorporated in strategic e-learning planning and implementation. We look in this model to a wider point of view within the learning theoretical perspectives. 1. Introduction. Distance learning in higher education of Great Britain and Russia. 2018 / Stepanova Svetlana Nickolaevna. Triple H-Avatar cloud platform based plug-ontology as a gateway to improvement of feedback control.Â However, proponents of e-learning still have to overcome the skepticism of conservative learners. Despite this, in recent years e-learning is very quickly integrated into the Russian educational system. It is well known that due to the vast territory of Russia in many remote regions, the only opportunity to get a full education is the use of Internet technologies, namely, e-learning. It should be taken into account that "the main priority requirements in education are accessibility, quality and efficiency" [2, p. 257].