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Will Technology Enhanced Learning ever deliver 'genuine' innovation?

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Introduction

I have chosen a provocative thesis to consider at the culmination of the K2 programme based on the argument that much of the research work we are engaged in today is a strong echo of the work that we were engaged in a decade ago.

That is, not "genuinely" innovative.

The argument suggests that we are recreating and reinforcing our existing learning models and missing the opportunity to change and improve how our students learn. Regardless of where you stand in such a debate, the argument at least provides you with the opportunity to assess the potential for change offered by new technologies and to look for examples that refute it – genuinely innovative case studies that can come out of the laboratory and be robustly applied. The examples we can find help us to frame the key research and design challenges for the 'technology' in TEL. Also they oblige us to honestly assess how we know if our R&D effort is making a difference?

Much of the real debate is not, per se, about technologies at all, but about the political and social aspects of learning change. I will argue that critical to the future success in TEL research and development are new partnerships. I will briefly describe one emerging partnership funded by the 6th framework – the Network of Excellence, Prolearn. The focus on professional learning gives us an interesting perspecitive on the debate! It has often been argued that conventional universities were not seriously challenging their own role and business models against the demand characteristics of the emerging technologies that can support technology enhance learning (Laurillard, 1993). However, some of the newer 'forms' of

university can be seen to be embracing this change with both new models of learning and new technology hand-in-hand. Daniel (1999) discusses the emergence of the 'mega-university' from the newer correspondence, television, distance and 'open' higher education institutions. For these university operations it is the power of 'scale' that is the critical economic driver. Indeed, one could argue that it is precisely the fact that these university systems have been *required* to work with alternative pedagogical models to those of the conventional universities, particularly with professional learners in mind, that makes them innovative.

Daniel asserts that it is "knowledge-media", which will help these alternative visions of 'the university' (especially what he terms the 'mega university') to succeed. In this presentation I will explore some of the different examples of such knowledge media technologies and show how they can provide a vision of the future for technology enhanced learning research.

First, let me use this paper to cover some ground that I wont need to repeat in the presentation (see instead Scott, 2005, in press). Some new technologies are very exciting to TEL researchers. Indeed, some banal wins for future-prediction technology pundits include communication leaps such as Bluetooth, WiFi, mobile devices like 3G telephones, Radio Frequency Identification tagging, and even Grid Computing. The first three of these are part of a general trend towards increasing ubiquity in computing devices, such that one can bring the network to everywhere. Bluetooth is a low-power, short-range wireless technology suited to wirelessly connecting any device with any other (http://www.bluetooth.com/). So high-street shops now stock Bluetooth enabled mice, cameras, games, printers, phones, etc. This allows for the creation of 'Personal Networks' of interesting devices. WiFi extends the range and bandwidth of the wireless network connection to a local-area network for higher-powered devices such as laptops and PDAs. Most travelling workers now seek out WiFi public 'hot-spots' where they can connect without plugging in. Also, mobile phones are getting to be more like PDAs and laptops so that computing power is getting more pocket-sized and hand-held. Similarly, the use of 3G 'digital' mobile phone networks greatly improves the amount of data such devices can use.

Right down at the other end of the spectrum, Radio Frequency Identification (RFID) is another low-power, short-range wireless technology. RFID devices listen for an appropriate and authenticated radio query and respond by transmitting a unique ID code. These devices are typically very low power – the tags, for example, can typically respond using only the power from the radio signal that is trying to read

them. Without a power supply, the tags themselves can be very long lived, cheap and tiny – at the moment manufacturers are making the chips smaller than a grain of sand, and perhaps even washable (though frequently they are attached to larger articles such as key-rings or cards, to incorporate an aerial, see e.g. http://www.rfidjournal.com/). In principle, they could become cheap enough to 'powerlessly' tag anything in a networked world. They don't carry much data, unlike the other network technologies, but enough so that, for instance, all the boxes in the warehouse can "call out" to the inventory computer to say what they contain and where they are at the moment.

The final hardware flavour-of-the-moment 'grid computing' leverages the interesting potential of peer-to-peer networking (http://www.gridcomputing.com/). The peer-to-peer concept is that computers can transfer data directly to each other instead of via servers. Where the 'peers' are themselves significant servers, then "supercomputers" can become 'emergent properties' of many computers acting together in concert, and sharing processing out amongst each other in vast 'grid' systems. These new devices and the increasing reach of new network technologies are making computing and learning more accessible from very different locations and very different platforms. However, for the learner it is the very different learning models that these technologies can support that may make something of real value, in the future. The technologies themselves are quite banal unless they support a new model of interaction, or in our case, learning!

Ergo, I will discuss working examples of 3 'killer' soft technologies that will have a significant impact on learning in the medium-term, near-term and immediate future. These will be *knowledge systems, rich media, and presence systems*, respectively.

To take just a glimpse at one promising innovative *presence systems* technology that is currently being deployed, consider the concept of large-scale video presence. For example, the Hexagon system (see http://cnm.open.ac.uk/projects/hexagon/) allows a community of users to use a web application to share a configurable collection of web-camera views. The community can see a large live view from the cameras of all members from within a web browser running only Macromedia Flash™ (figure 1). Each user can move any of the images of 'buddies' around the screen, can click to have an "instant message" text chat with them and can even have an "open microphone" live audio chat in a space that they have designated the "coffee room".

The technology itself allows for a range of new learning scenarios that are hard to imagine working in any other way.

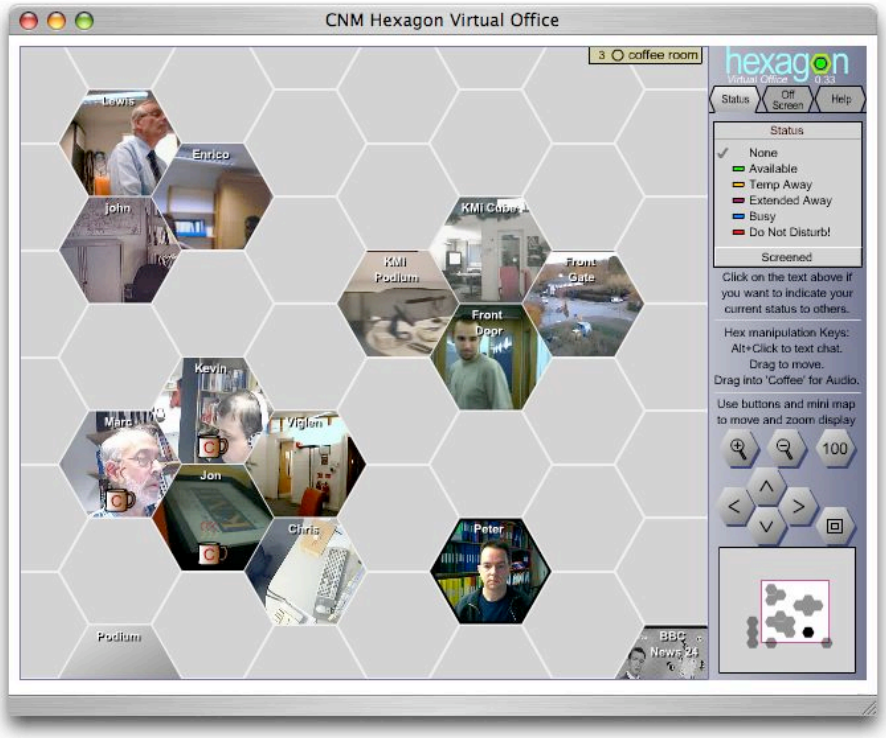

Figure 1. A 'video wall' Hexagon community.

The generic argument I will present is that knowledge systems, and in particular agents and the semantic web will influence the medium-term future for learners (i.e. within the next 5-10 years). Rich media systems will have a significant impact within the next 5 years, and presence systems (such as Hexagon above) will be of immediate 'emerging' significance (say 1-3 years). These technologies are already demonstrably significant – but it is worth looking in some more detail at examples that may highlight how they might change the face of Technology Enhance Learning.

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