

# The Virtual University: From Turf to Surf-Same Journey

## Different Routes

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### Abstract

The modern university developed in response to the needs of the industrial society and was enabled by the railways. The virtual university is emerging in response to the needs of the global knowledge society, and is enabled by the Internet. The core business of universities is the creation, storage, processing and dissemination of knowledge a primary factor of production and competitive advantage in the global economy. While the modern university responded to national needs, the virtual university will respond to the needs of an increasingly interconnected, multicultural, multilingual and globalised world. As a means of addressing the pressures of rising enrolments and increasing fiscal constraints, universities worldwide are assuming virtual dimensions to address the issues of globalisation itself. This article examines some implications.

### Keywords

Modern university; Virtual university; the Internet; Virtual reality; HyperReality; Virtual Class; HyperClass; Global virtual university

### Introduction

As universities seek to realign themselves in response to the new societal needs, paradigms and communications and information technology (ICTs) infrastructures, branding is causing semantic confusion. The label 'university' has a long pedigree, its core business being the creation, processing and disseminating knowledge in the search for truth, and remains sacrosanct. Universities do not change because there was no incentive to change. Therefore they enjoyed a degree of stability in the last 400 years entrenching their built-in capacity to resist change. But technology forces that bring dot.com corporates to their knees changing all aspects of human endeavour will do the same to the university.

The university's core business remains its *raison d'être*. But its *modus operandi* is changing. The use of adjectives as prefixes are mushrooming and traditional distance education now acquires new taxonomy including: open learning, e-learning, borderless education, and virtual education, leading to open universities, tele-universities and virtual universities. The Catholic University, the Methodist University, the Baptist University, and the Islamic University clearly indicate their mission and strategic intent. The universities of Cambridge, Oxford, Wisconsin, Ohio, Heidelberg, Delhi, Beijing and Malaya emphasise location. However, like most innovations in the early stages, the new brand of universities is still struggling to define and distinguish itself from its antecedents.

In 1996 Web search gave over 200 hits on the term virtual university (Bacsich 1996). The term 'virtual university' has morphed into many interpretations, connotations and manifestations. AltaVista search on the term gives 325,137 hits (1 June 2004). A scan through the sites reveal a variety of different dimensions of virtuality, from a single web-based course online, a part of a degree in conjunction with a campus-based university offered in asynchronous mode, or a virtual seminar, but does not enlighten the phenomenon with any plausibility, leaving one non the wiser as to the nature of the activity. What it did show, however, is the vast complexity of the concepts associated with virtual universities as the Internet becomes more pervasive, where new trajectories of meaning are introduced leading to new geopolitics, changing the way we think, work, play, bank, shop and learn.

In this article virtual universities mean the use of the Internet, virtual reality, HyperReality, nanotechnology, artificial intelligence (AI) to bring teachers, learners knowledge and problems/subject of enquiry together to effect the process of education (Tiffin and Rajasingham 1995, 2003). In the modern university, these factors of education come together in classrooms and buildings using transport technologies that rely on decreasing extractive fuels and so becoming costly. Taking the Webster's College Dictionary (1981) virtual reality is defined as 'reality in effect, not in fact', and in Nicholas Negroponte's terms, the factors of education, teachers and students come together as bits of information rather than atomic substance (Negroponte 1995).

### Why become virtual?

Winston Churchill observed that 'future empires will be empires of the mind' implying the centrality of knowledge. Universities are assuming virtual dimensions to respond to a set of real world global issues in the dawn of the 21<sup>st</sup> century. The pressures of rising enrolments and increasing fiscal constraints, and the inability of currently designed university systems to address the increasing bifurcation of society into the information rich and information poor are significant impetus for universities to go virtual.

The increase in the number of tertiary students in most countries is in part because more school leavers are going on to further education but it is also due to the growing number of adults and particularly women returning to the educational system.

Home to nearly half the world's students, the demand for higher education in Asia is rising in proportion to living standards. According to IDP Education Australia, this number is predicted to rise from 17 million in 1995 to 87 million by 2020 especially in China and India. The modern university cannot cope. China will be unable to supply the 20 million university places required to meet the needs of its growing economy, and by 2015 India will struggle to supply 9 million places that will be needed. Therefore e-learning solutions are gaining popularity (Rowe 2003).

The population of India has grown from 300 million in 1950 to a billion mark in 2000. The demand for

university education has far surpassed the capacity of traditional state funded universities, and availability has been largely confined to the urban areas. Yet, only 7% of the eligible population enrol for graduate level study as compared with 50% in the developed countries (Gupta 2003). The reasons are similar to those that gave rise to distance education as a viable mode of learning in the 1950s and 60s, the inability to physically attend universities because of distance, transportation costs, gender discrimination and equity where education was not regarded as desirable for women and girls.

Malaysia's UNITAR (Malaysia) which is the region's first virtual university was created in 1998 is seen as the key to turn Malaysia into a fully industrialised country by 2020 (<http://www.unesco.org/iiep/virtualuniversity/files/unitar.pdf> (Retrieved 14 April 2004)). Courses and programmes in UNITAR are fully recognised by the Ministry of Education and its students are eligible for loans. UNITAR recognises the need for a 'campus', echoing the importance of social aspects of education, and are currently working on this.

Indonesia's first virtual university, Bankit University Teledukasi (IBU Teledukasi) began enrolling students in 2001 (See further information online: IBU Teledukasi Indonesia).

The African Virtual University, an online university funded by the World Bank began operating in 1997 ([www.col.org](http://www.col.org)) and now has 31 learning centres at partner universities in 17 African countries. In 2003, 23,000 Africans were enrolled in courses such as journalism, languages and accounting, and the goal for the next five years is to expand the network to 150 learning centres in 50 countries, offering four-year degree courses in computer science and business studies available in 2004. ([http://www.thes.co.uk/current\\_edition/story.aspx?story\\_id=2010992](http://www.thes.co.uk/current_edition/story.aspx?story_id=2010992) (Retrieved 20 April 2004)).

Furthermore, the United Nations launched the Global Virtual University of the United Nations University (GVU) in 2003, an online school that will focus on sustainable development and the needs of the developing world. Comprising of a network of universities, including some from Ghana, Uganda and South Africa it will be headed by the UN Environmental Programme with Norway's Adger University as the core partner, and will offer common diplomas and joint degrees <http://www.globetechnology.com/servlet/story/RTGAM.20030618.wun0617/BNStory/Technology> (Retrieved 20 April 2004).

Similarly, The Commonwealth of Learning that embraces 54 mainly developing countries is currently working on developing The Virtual University of the Small States of the Commonwealth ([www.col.org](http://www.col.org)).

The modern university developed in response to the requirements of the industrial society and was enabled by the railways. The virtual university is emerging in response to the needs of the knowledge society and is enabled by the Internet, the communication tool of globalisation. Traditionally, universities were considered repositories of knowledge where learners, teachers and researchers were committed to academic enquiry for the creation and application of knowledge. Networks of scholars serving national economies, universities were embedded in the prevailing paradigm of social ecological realities, and generally, were elitist, based on national needs and heavily subsidised by governments through taxation.

To survive in a fast changing future, all societies face massive demand for lifelong learning especially at tertiary level. As knowledge becomes capital in a knowledge society complementing or replacing land and labour as units of exchange in the industrial society, universities are re-inventing themselves, and with the commodification and commercialisation of knowledge on the Internet, face new challenges as trade in higher education services becomes a significantly profitable industry according to WTO's GATS (General Agreement on Trade Services) that includes education as a service industry.

Businesses seek to build on their traditional objectives of making products and profits, and rapid advances in information and communications technology have demanded intrinsic changes in how organisations operate, their values, paradigms and their core business. The core business of universities is the creation, dissemination and application of knowledge to domains of enquiry, (problems) remains the universals of a university, and is key to improving performance and productivity and the attainment of social justice. The challenge is that at the same time, the university finds itself competing in a free global market in the education business. The idea of a market where teachers and learners can trade is not new. It is the medium in which it takes place that is new. All education since time began is in the neo-Vygotskian sense, the simple interaction between teacher, learner, knowledge and problem and are basic components of any university paradigm no matter the episteme or country. It is the nature of these components and the style and means of communication between them that vary with the episteme.

## Universities in Crisis

The prevailing neoliberal, mainly Eurocentric discourse on the future of universities and higher education has since the 1960s lamented the parlous state of education (Coombs 1968, 1985). More than two decades on, the crises in education in all societies persists, and is deepening as governments grapple for solutions.

Readings (1996) suggests that the contemporary university is a "ruined" institution, shifting from its core functions of knowledge discourse to the new "marketspeak" of managerialism, strategic planning, performance indicators and so on that have little to do with higher order thinking and knowledge creation. Another theorist whose work has influenced the re-thinking of the role of universities is Jean-Francois Lyotard (1984). He argues that the changing nature of knowledge in capitalist societies has led to commodification, which has changed the nature of universities' future role in higher education (Lyotard 1984) a view shared by Tehranian (1996) and Noam (1995).

Why are our education systems that have been so successful for thousands of years now out of synch with societies' needs? Does the problem lie in the way education is administered, the methods of instruction and the content of curricula? These are the issues that advanced industrial societies focus on as they attempt to find a solution. Tiffin and Rajasingham (1995) are concerned with the extent to which the problem lies with the classroom as a communication system for learning. The argument is that the classroom is a technology that emulates the way people live and work in an industrial society. It does not relate to the way people will live and work in a knowledge society.

To borrow a metaphor from the building trade, the Western educational paradigm can be regarded as a two by four by six activity. It is contained within the two covers of a book; takes place within the four walls of a classroom; and happens during six periods of the day, captives of clock and calendar. Traditional education was place-based and book-paced. People had to travel by foot, rickshaw, buses and cars to education, just as they had to travel to shop, bank and work. These transactions took place at prescribed times where students were in lockstep with everyone else in their age group; learning took place during prescribed times; and it was essentially reductionist, atomised discrete units of instruction, hierarchical and teacher-centred. More and more was learnt about less and less.

This deeply ingrained idea is changing. According to Robin Mason (1999) the new growth area in education is lifelong learning (1999, p.77). As the Internet redefines the environment in which business exists, Peter Senge defines a learning organisation as "...a place where people are continually discovering how they create their reality. And how they can change it" (Senge, 1995, p. 13). Advances in science and technology mean that increasingly industrial processes are knowledge-based and driven. Workers have to maintain their employability by constantly renewing their knowledge and skills particularly to satisfy the growing demand for knowledge workers with global competitive skills. Global problems such as environmental problems, genetic engineering, pandemics like AIDS, biotechnology and cultural upheavals require global problem-solving skills.

There is also now an increase in the use of classroom teaching as an adjunct to on the job training. The edges between training and education are blurring. Polytechnics and community colleges form a bridge between university education and technical training. Industry becomes increasingly involved with universities and we see the emergence of staff development and research sections in businesses, and transnational corporations such as Goldman Sachs, IBM and Microsoft.

Today policymakers and educationalists worldwide face the challenge of how to improve access to effective, lifelong education and training that can match the skills related to technological change for the knowledge economy, delivered interactively and cost-efficiently in culturally appropriate ways at the convenience of the learner. This is possible with distance education approaches and concepts that use new ICTs such as virtual reality (VR) HyperReality (HR) and artificial intelligence (AI) on the Internet. There is an urgent need to develop a new educational model suited to the needs of the 21<sup>st</sup> century's knowledge society.

The buzzword today is E-commerce as market forces redefine universities as businesses. Peter Drucker (1993) and Michael Porter (1990) emphasise the importance of knowledge in the competitive new economic environment. Lester Thurow (1996) said:

*Today knowledge and skills now stand alone as the only source of comparative advantage. They have become the key ingredient in ... economic activity (p. 68).*

Issues such as user pays and research outputs measured in dollars are seriously undermining the core functions of universities, one of which is to act as critique and conscience of society as suggested by Immanuel Kant in 1798.

The lines between education and business are blurring. Michael Marquardt (1996) suggests that "companies which do not become learning organisations will soon go the way of the dinosaur; they will die because they were unable to adjust to the changing environment around them" (p.xvi). There are signs that universities unable or unwilling to adapt, maybe, like the dinosaurs destined for oblivion.

Given the centrality of knowledge to improve production and performance, the *sine qua non* of a learning organisation, labelling universities "learning organisations" seems an oxymoron. Yet, as the nature of knowledge itself is changing, universities must be leaders in creating "...a fundamental shift or movement of mind" (Senge 1995, p.13). This means the need to look at what we teach, and how we teach in a new geopolitical paradigm.

This article takes a retrospective look at the texts by Tiffin and Rajasingham (1995, 2003) seeking a new university paradigm, and situates it in their 12 year research experience in Asia, North America and Europe where there are today strong initiatives seeking a better way of tertiary education for the emerging knowledge society.

## Universities as Communications Systems

A Virtual Roundtable (2000) involving four experts in the field including Jaron Lanier concluded that the e-learning revolution 'is not about computers; it's about communication... where there is intergenerational discourse' (Training 2000, pp. 64, 66).

Communications systems are concerned with the storage of information over time, the transmission of information over space, and the processing of information to create new knowledge (Tiffin and Rajasingham, 1995). In the university context, these functions translate into the role of libraries and in the heads of teachers as repositories of knowledge, and the transmission technology/media in a classroom to disseminate new knowledge as teachers help learners to apply knowledge to problems. How are these functions carried out in virtual universities? This article looks at some differences between how conventional universities and virtual universities will maintain their core business with integrity in the future.

## Creating Knowledge

The creation of knowledge is the *raison d'être* of universities as institutions engaged in research. In these postmodern times and liberal economies, applied research with tangible measurable outputs funded by industry and hence tagged are favoured by cash-strapped modern universities, over basic research as a process of enquiry and search for new knowledge with less tangible outcomes. How do universities foster research environments to add to the corpus of world knowledge?

University research today is increasingly being commercialised. Postgraduate students are a source of cheap labour for industry and business, and universities that are government subsidised can undercut research institutes. In a highly competitive environment where universities compete with each other for students and enrolment-based research funding, and as government subsidies diminish, for universities short of resources, external commercial funding of research becomes attractive. However, the more research is commercially funded, the more it ceases to be a public good, open to critique and scrutiny that legitimises research.

What is knowledge in a university? Is it what is in the library, in a department, in a course of study, or in the head of an academic? Knowledge resides in all these. In the first universities in Greece and India, people sought knowledge with the guidance of teachers. In the medieval theology-based university, knowledge was divine and ultimately unknowable and one tried to understand it with the help of teachers and books. In the modern university based on scientific rationalism, knowledge becomes discoverable, quantifiable and formulaic and something that can be purchased or captured. The idea of 'knowledge capture' appears to have its roots in 'expert systems', computer programs which can be used to respond to a domain of problems by mimicking human experts. While explicit knowledge in the form of texts, films, paintings or music manuscripts lends itself to be captured and managed as knowledge management courses and software are introduced. Where academics are engaged in the creation of new knowledge that

is implicit as it gestates in their heads, it is proving to be fuzzier and more elusive than first imagined. Super expert knowledge machines are yet to emerge (Tiffin and Rajasingham 2003).

Knowledge is always abstract whereas problems to be solved in real life are concrete. Furthermore, in an interconnected, multicultural and multilingual world, new kinds of 'knowledges' emerge as societies seek solutions to problems from their own cultural milieus. To remain sustainable and relevant, the future virtual university must respond appropriately.

## Preserving knowledge

The Library as the repository of knowledge has always been regarded as the engine of the university. The first real evidence of something that could be regarded as a university comes from what we know from the later writings of the school Pythagoras founded at Crotona in Southern Italy in 518BC and from the Pythagoreans we can trace a continuous tradition of Greek scholarship that lasted up to the final sacking of the great library of Alexandria in AD640 (Dewdney, 1999). A gap known as the Dark Age of between four and five centuries ensued before the first medieval university.

The library of Alexandria may have held up to 700,000 texts in the form of papyrus rolls and here in one place was the accumulated written knowledge of the ancient civilisations of the Mediterranean and the Near East, and the best minds of the day and those seeking answers to the great problems of geography, mathematics, science and philosophy were drawn to it. Teachers and students from all over the known world travelled to Alexandria because that was where knowledge was. As the production of information/knowledge grows exponentially, so does the cost of printed texts and its storage space. Consequently, university libraries are increasingly turning to electronic storage-databases, CD-ROMs, and access.

Now we have the World Wide Web, the world's largest library ever known, available to anyone with Internet access. With the advances in multimedia, virtual reality, HyperReality, artificial intelligence and so on, the WWW has the potential to solve library access problems of the developed and developing world. However the Web as a chaotic, if democratic tool, has its own set of problems because it was not specifically designed to be a university library. It is growing so vast as a giant, indiscriminate hypertextual dump that searching it and evaluating what is found becomes increasingly difficult. Herein lies a major challenge for teachers in a virtual university as they move from being sage on stage to guides and information mappers.

## Processing and transmitting knowledge

This involves the teaching/learning axis, where from a neo-Vygotskyian perspective, teachers help learners to apply knowledge to problems in culturally appropriate ways. Most of all, university teachers teach students how to critique and learn, and students learn to learn. A communications activity, the processing of information into knowledge that can be applied is enabled by communications and information technologies. In the modern university, teachers and learners came together using transport and building technologies, the infrastructure of the industrial society. In the future, universities would need to use the Internet, the defining infrastructure of the emerging knowledge society for this process.

As the Internet further disseminates the sources of production and distribution of knowledge allowing global connectivity, education on the Internet will by definition be virtual and global in scope, not to replace the modern university, but will provide an alternative, complementary learning space for lifelong learning opportunities.

Socialisation is a critical part of education and at universities it requires a high order of socialisation where communication and collaboration between teacher and learner, as well as between learners is critical to become aware of other ways of seeing, and not insist on our own single-minded ways of perceiving (Tehrani, 1996). The socialisation that takes place in a multimediated environment of a classroom is not easily replicated in a virtual class because technology for communication using all five senses is yet to emerge. What are the antecedents of the virtual university?

## The Virtual Class

Roxanne Hiltz coined the term 'virtual classroom' for the use of computer generated communications 'to create an electronic analogue of the communications forms that usually occur in a classroom including discussion as well as lectures and tests' (Hiltz, 1986, p.95). In a long-term action research programme which began in 1986 to conduct what we called a virtual class where students communicated with computers linked by telecommunications. We used the term 'class' in the sense of an interactive instructional communication function between teachers and students and between students and the term 'virtual' in the sense of existing in effect, but not in fact, and hypothesized that learning could be effected by means of computers interlinked by telecommunications without the physical facts of classrooms, schools, colleges and universities. We assumed that education delivered in this way would not be analogous to conventional educational practice, but would be modified by the new information technology and take new forms and that in time this would include fully immersive computer-generated virtual realities. A class need not necessarily be synchronous and the people in it form a virtual network independent of place (Tiffin and Rajasingham, 1995).

The virtual class is the core system of a virtual university where teachers and learners communicate using ICTs to replicate the communications functions of a conventional class. In the 1990s the Internet enabled the virtual class, but in the next decades, we can expect to see new and more sophisticated clusters and new generations of technologies that are emerging, such as HyperReality. This will allow text and place-based universities and virtual universities to function in tandem allowing the creation and application of new knowledges using text, aural and three-dimensional modes appropriate to the new multilocal cultural ecologies. We are looking at a paradigm shift.

Blagovest Sendov (1986) suggested that our basic problem is "not how to introduce computers into education, but how to build education in the presence of the computer" (p. 16).

The conventional classroom is a multimediated environment where learning occurs through all five senses, but primarily through writing and speech. However, at this time of the society of the 'spectacle' where our agendas are increasingly set electronically by television, the Internet and the World Wide Web, the processing of images and making semantic sense of visuals that we are increasingly being bombarded with become critical skills.

## A HyperClass (HC)

The HyperClass is based on HyperReality (HR) a technological platform developed by Nobiyoshi Terashima (1996). HyperReality intermeshes physical reality and virtual reality allowing people who are physically present in different places to meet as telepresences to work together on a common task. Terashima's idea is a spatio-temporal field of communication that makes connection not only between the real and virtual, but also between artificial intelligence (AI) and human intelligence. This foreshadows the potential use of AI in education, for example, avatars as just in time tutors (JITAITs) suggested by Tiffin and Rajasingham (2001).

An important concept in a HC is a coaction field conceptualised by Terashima (2001, pp. 9-12) where students and teachers in a conventional classroom can synchronously interact for the purpose of learning with students and teachers in other universities, possibly in other countries. The HyperClass is where real and virtual dimensions of students and teachers intersect on the monitor providing a common field to reconcile the learning that is local with learning that is global in order to understand the subject from multiple perspectives of other cultures than one's own (Tiffin and Rajasingham, 2001, pp. 110-125).

A HyperClass is a natural seamless inter-relating of virtual people, virtual objects and virtual settings with real people, real objects and in real settings. The HyperClass will address the cultural aspects of learning as groups of people interact at a cognitive level, modelling and modifying learning objects in three dimensions via information technology from their own physical reality, instead of as in virtual reality, having to work with learning objects created and embodying the cultural perspectives of the creators. Terashima (Email, 12 June 2004) is developing a Windows version of the HyperReality platform that easily exists on a PC sometime in the next decade. Like Hugh Lofting's Push Me Pull You in the animal menagerie of Dr Seuss, we will be challenged by this technology that will confront us and not go away.

## The Virtual University

The infrastructure of the virtual university which is on the Internet is the technology that makes possible telelearning, telebanking, teleworking, teleshoping and telemedicine without leaving one's home. Distance from any place is no longer a limiting factor. It does not matter where the university is physically located and learners in any country can as easily access courses from the global virtual university as they can from their neighbourhood university. In fact as Internet access increases, for people who are housebound, in hospitals or at work or are travelling, it offers an invaluable alternative access to educational opportunities.

Courses designed for distance education in this century were based on print technology and conventional postal systems. They have the same faculties, curricula and value systems as a virtual university as they have as a conventional university. In the case of national universities, what constitutes a degree programme, who can teach and how, is legally defined by the country that supports the university through taxation. Curricula were set in stone and it took years to bring in changes. Inevitably, national universities as virtual universities promulgate the national culture. This was acceptable and successful in the industrial age. But in the knowledge society, it creates problems for global education that is multilingual and multicultural in the future.

What distinguishes a virtual university is that it uses the Internet that allows mass as well as individualised educational opportunities. But it is more complex than that. The Internet is a strangely dynamic environment that changes the nature of access to knowledge and hence the very nature of higher education. Knowledge is no longer based on the scientific paradigm, fixed and an end in itself. We need to learn how to process new 'knowledges' from multisources, in dynamic ecological infrastructures and environments. The challenge is to design the kind of university will be needed for skills that are yet to emerge, such as addressing global issues of environmental degradation, pandemics, biotechnology and genetic modification. Virtual universities on the Internet opens up choice in content as well as learning styles, and provided there is access to the Internet, equity of opportunity becomes an achievable ideal.

Costs have always been a determinant to access to technology. An education system is said to be efficient when an optimum balance is found between minimising the costs and maximising the effects/quality. This is distance education that uses future online technologies, because of its reach and the ensuing reduction in unit cost. The same transmission technologies can reach one or two students or hundreds or thousands. Significant studies on costs of conventional universities and virtual universities have been conducted by researchers (Rumble, 1997, 1999, 2004; Turoff, 1996; Butcher and Roberts, 2004). Their conclusion is that virtual universities using ICTs are significantly less costly than conventional building-based universities, and as the cost of technology falls, it is suggested that virtual universities will become even more affordable.

We are only at the beginning of technological transformations on the Internet and indications are that as new clusters of technology such as HyperReality become available, a global virtual university will emerge that would serve not only the English speaking world, but will be multilingual.

Online education, virtual education is essentially learner-centred. Perhaps the professional group that faces the greatest challenge in this new education environment are teachers. No longer is the teacher the sole repository of knowledge; no longer is he or she the sage on stage. As education becomes virtual, learner-centred and available anywhere, anytime, teachers would need to change their roles and become instructional designers, knowledge brokers, knowledge navigators and knowledge mappers assisting learners to apply dynamic knowledge to solve real life problems, which increasingly are becoming global in nature. Learning becomes a collaborative activity between teachers and learners and the nature of knowledge itself negotiable.

What of the curriculum? The virtual university will prepare people for global skills that they will need in the 21<sup>st</sup> century. Skills in instructional design are critical to facilitate instruction on the Internet. Teacher retraining will become critical. Whereas conventional universities are geared to the study of what is known and what is knowable, virtual universities address the unknowable in order to prepare people who can shape the future. For example it will address intercultural communications, teletranslation for multilingual learning, e-commerce, disaster communications, management, Internet education and issues of globalisation itself.

Global virtual universities reflect a new paradigm of higher education and so they will need to foster a strong research culture. Methodologically it will be orientated toward action research and futures scenarios and encourage international and multicultural team research approaches to explore issues from multiple perspectives.

## Conclusion

The digital revolution and economic globalisation are herald a new era towards the global knowledge society where information, skills and competence become the driving forces of social and economic development. The problems associated with this transformation cannot any longer be solved by traditional means.

At no time is there a suggestion in this article that virtual universities will replace conventional universities. Rather they will be complementary and seek to work with them and through them. Both will exist in tandem because education is about contextualising, connectivity and networking in a global environmental ecology, giving the learner choice in where, when and how they access learning.

In researching the virtual university, there appears to be no intractable cognitive problem to learning and teaching with the Internet. However, students will go through great lengths to socialise with each other in physical reality. Universities are not just instructional automatons. They are a state of mind and this means social and cultural interaction. Education is both cognitive and affective. How do we teach values and ethics in the virtual university? What will replace the compassionate, pastoral functions of a good teacher? A global virtual university will by definition be open to competition and commercialism. What happens to education as a public good when it is open to market forces? These are serious issues beyond the scope of this article. However, we have to find a balance between the old and the new; and between the virtual and the real.

Imagine a number of countries separated by sea. Each country has vertical skyscrapers, which are conventional universities. There would be at least two or more in a country. These are linked by the Internet to form a national virtual university, for example, the Virtual University of Sri Lanka. Also one of the universities in Sri Lanka (possibly the Open University of Sri Lanka) is a virtual university in its own right because it has moved its courses onto the Internet so that they are available locally to students without them necessarily having to go to the campus for everything. The global virtual university quite simply relates to all these dimensions and to the international dimension. It can provide courses that are of international standing and are part of the degree programmes in any university. This adds a global dimension to the subject and skills being taught. However, at the affective level of learning, the local university will provide the culturally appropriate socialising skills and support systems that help to embed and network learning in the local environment in learning centres and community meeting places. A combination of local nodes and global networks, the university of the future will provide a platform for all players to act global and think local.

Finally it is acknowledged that effective learning requires upgraded multimedia educational materials which can only be utilised with the broadband Internet, that will allow multimediatised environments in virtual reality and HyperReality where learning can take place through all our senses including smell and taste. For this, the technology has yet some way to go. But we need to envision and so help shape the future university. The journey for the quest for knowledge remains the same. However, the route is changing, and will continue to change.

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