

# USING THE LEVER OF TECHNOLOGY TO IMPROVE THE QUALITY OF EDUCATION THROUGH COOPERATION

**David Brown**  
*Faculty of Science,*  
*Universiti Brunei Darussalam*  
*djhbrown@fos.ubd.edu.bn*

## ABSTRACT

A radical change in the organisation and administration of factual education is suggested. The change is a shift from the localisation of resources and content to a widespread cooperative organisation supporting the assimilation of cooperatively-produced technology-delivered materials of a common international syllabus through local tutors.

**Keywords:** Technology cooperation, Reorganization of information, Communication

## 1. INTRODUCTION

The term “lecture” literally means “reading”. The notion of a lecturer delivering a lecture predates the invention of the printing press, before which, the only way information could be transmitted to a large audience was by a speaker reading aloud her handwritten notes to them, passing on the tribal wisdom of the elders.

Although one can take in more information per second by reading oneself than by listening to another speaking, the psychosocial attractions of such gatherings make them still popular, even as mankind embarks upon the fourth phase of its “Information Revolution” - fueled by cinematic and electronic information technologies of various kinds – the first three phases having been the inventions of painting, writing and printing respectively.

In theory, the opportunity for a student to engage in a dialogue with a lecturer gives the theatre stage performance extra value over a passively-received cinematic presentation. But the practical reality that few people have the extroversion needed to expose themselves in public mean that the large majority of a lecture hall do not take up their theoretical opportunity for personal edification.

## 2. SOME COSTS AND BENEFITS OF DIFFERENT MODES OF INFORMATION DELIVERY

The human brain allocates over half its capacity to the processing of dynamic visual

images (Schutte, 1998). That input channel capacity is clearly under utilised by feeding it linear strings of abstract symbols such as written words – and even more so to transmit those words aurally.

It might require more than a thousand words to convey all the textures and symbolism of Figure 1. Imagine how many more it would require if the picture were moving!



Figure 1: *The Metamorphosis of Narcissus* by Salvador Dali

It requires less electromotive energy to deliver a multimedia webpage or broadcast video transmission from one side of the earth to 10,000 people on the other side than it does to air condition 100 100-seat lecture theatres. The persuasiveness of moving pictures with sound has not gone unnoticed by politicians and salespersons with ideas to inculcate, but the medium has yet to be as fully exploited in the educational sphere as in the advertising one.

Shipping people to information is expensive: "The cost of traffic jams to British business is £20 billion every year.... During term time at 08:50 one car in five on urban roads is taking children to school" (BBC, 2002).

Shipping information to people is not so costly; for example, Britain's Open University (OU) offers tertiary educational institutions the opportunity to record and use its broadcast television documentaries for £7-20 per programme (Open University, 2005).

One of its productions is a 24-minute video called "Attack on the Wires" (Open University, 2005a) that was rebroadcast on the BBC World Service TV channel last year.

On September 11, 2001, telephone links to New York were swamped and closed down except for emergency services, but Internet channels stayed up; people seeking news of their loved ones turned to websites created for that purpose.

This demonstrates that Internet technology provides a robust and reliable medium for disseminating information. The OU documentary was able to incorporate filmed interviews with many people involved in the communications network management and repair works and graphic images of the problems that confronted them, bringing a vividness to the exposition that a bald monologue would find it hard to emulate.

Internet, even with broadband links to a backbone, still does not have the capacity to deliver quality video images in real time. And Internet2 (Internet 2, 2005), which does have the bandwidth, is not cheap. But DVDs are cheap to reproduce and incur lower freight charges than paper media per bit of information (Shannon, 1948) contained therein. The compilation and production of video information is indeed a more expensive effort than hiring one man with a chalk stick (as witness the length of the credits accompanying any television documentary), but economies of scale apply: one good video course requiring the cooperation of 50 people costs less than employing 100 people in different places to recreate and deliver course notes on the same material. Subjects such as science and engineering require no parochially-tailored treatment other than soundtrack dubbing.

Electronic transmission methods for factual information transmission are cost-effective. A combination of broadcast satellite TV transmission or DVD distribution and wireless packet-switched asynchronous Internet communication is technically feasible and would be cheaper and more efficient per minute of transmission time than hiring information labourers to orally transmit the same (or less) information in different rooms around the world. Small-group tutorials are effective and 1:1 sessions even more so; the time saved on lecture preparation and delivery could be spent profitably on providing tutorial and practical guidance services to students. And yet, even in this realm, there is some evidence that programmed learning can be more productive than human-aided learning (Jenks and Springer, 2002; Hale, 2005).

Commonsense tells us that social interaction is better facilitated by physical juxtaposition but the phenomenal explosion of Internet Chat rooms and people walking around with cellphones in their ears suggests that teleinteraction is psychologically satisfying too. In 1993, the author experimented with audio recordings as a means of allowing distance education students to “eavesdrop” on in-house tutorials, under the premiss that if one student has a certain enquiry, there are sure to be many others in the same boat. Despite poor audio quality from rather rudimentary recording technology, the distance education students all commented that being able to listen to the taped tutorial sessions made them feel less isolated and they were very valuable learning aides.

### **3. MANY HEADS ARE BETTER THAN ONE**

Whereas proponents of free enterprise are quick to argue that competition breeds progress, history shows us that humankind relies upon cooperation to achieve its more grandiose projects such as railways and space stations.

Private enterprises hide information from each other to gain competitive advantage. Public

education enterprises might benefit from sharing information and resources to gain cooperative advantage.

The best disseminators of knowledge are not all employed by a single institution, even one with a prestigious name or one especially created to provide distance education. Science and technology is not dependent upon local cultures or philosophies. A "Multiversity" comprised of cooperating Universities has a better chance of delivering high quality lecture materials than does any one of their respective lecturers working alone.

In many fields, science and technology advances at such a rate that it is desirable to update materials every year or so. It is asking a lot of any one person to keep up with a whole field of players, and all most people can do is keep up as best they can, usually within a niche area, which lends an idiosyncratic edge to their teaching. This is fine for the lecturer, but arguably less so for the students.

Massachusetts Institute of Technology (MIT), justifiably confident that it will not jeopardise its revenues from fee-paying in-house students, has announced its intention to put all its course content on the web, freely available to all. This provides a wonderful opportunity for educators and students of other institutions to benefit from some of the best expositions available (MIT, 2005). Their materials, together with products from other sources such as the Open University provide a good base from which a Multiversity could develop world-class instructional packages.

A live lecture provides is largely a one-way synchronous broadcast from one lecturer to many students. In contrast, a multiperson-created "e-package" effectively provides an asynchronous channel from many lecturers to one student. An advantage of asynchronicity is that each student can view and review the material at their own pace, which is not possible with synchronous transmission. Thus the mode is more student-centred than lecturer-centred. When dialogue is desirable – as it usually is – this can be achieved by e-communication and/or interaction with local tutors. Participating institutions can organise local students into tutorial groups, so that they have the opportunity for peer exchange – whether in person or electronically - as well.

The financial model for a Multiversity cooperative could be "user pays" (the user may be an individual or a government sponsoring a number of its citizens). The cooperative would be a distributed enterprise, employing people and resources in many countries, as do multinational private enterprises. Because international cooperation requires national level policy decisions, what is recommended for Australia's interstate cooperation (Farr, 2002) also applies to international cooperation: "The key element of the change process required is the understanding and commitment of the senior executives nationally in the training sector" (ibid, p20).

## 4. IMPEDIMENTS TO COOPERATION

**4.1 Financial Localisation.** The globalisation of capital markets enables multinational corporations to provide in-service training for their own employees by drawing upon geographically disparate sources of expertise within the corporation's own hegemony, but public education continues to be restricted to resources under local control. And, despite the fact that many individual educational institutions are funded by national exchequers, the cost-centre mechanism of institutional financing inhibits product sharing even within national boundaries.

**4.2 Free-market gravity.** Profit-oriented private communications network providers, such as satellite or cable television companies, rely upon advertising revenues which require mass-market programme content appeal in order to gain the audience figures advertisers require to invest in the propoganda space for sale between programme segments. This drives the programme content to the lowest common denominator of intellectual demand, making private enterprise mass media largely unsuitable as sources of content. Despite this, there are some truly excellent non-trivial educational offerings from such commercial channels as Discovery, National Geographic, and the publicly-funded BBC World.

**4.3 Protectionism.** Much has been written about the prospect of the democratisation of knowledge afforded by Internet, but the economic realities of free market capitalism have seen Internet evolve from an educational medium to one of e-commerce. Any search on any popular search engine will turn up far more metainformation on information for sale than information per se. The most striking example of Internet-enabled information democratisation is the inspirational Napster technology and its descendants, which enable people to share information (recorded music), but commercial providers are working hard to retain their plutocracy, with some success. It will be interesting to see how the scene develops over the next few decades.

## 5. CONCLUSION

The opportunity for leveraging education quality through cooperation and technology is plain to see. But will this competitive world of ours take advantage of it? History has shown us that when less-advantaged political organisations unite, they can increase their political power. If less-advantaged educational institutions were to unite, they could increase their educational power. To be sure, there are many geopolitical, economic and linguistic impediments to international and inter-institutional cooperative education, but they may not be insurmountable.

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