E-learning: a philosophical enquiry

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Abstract

This paper focuses on successes and failures in the history of technology. It attempts to assess the wisdom of possible future courses of action with regard to technology in e-learning and education.

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Technology and its reception

In the history of technology we tend to remember the "big" winners – the wheel, the printing press, the gun, the mechanical loom, the telephone, the aeroplane and so on – but of course it is also a history filled with failures – devices and inventions that have been long since forgotten. More interestingly than mere flops, however, are those inventions and developments that in their days were hailed as the heralds of a major revolution, but which, for one reason or another, have in the end proved not to be so.

One such example is nuclear power, plausibly and reasonably hailed as the means by which human beings would cease to be dependent on fossil fuel, an outcome to be welcomed with enthusiasm and relief, given the polluting nature of coal, gas and oil, and the finite quantity of resources that would ultimately be exhausted. By contrast, nuclear power promised to be atmospherically clean and effectively limitless. And so indeed it is. Yet despite this, a variety of factors, some having to do with political opinion and attitudes to risk, and some the result of purely contingent events like those at Three Mile Island and Chernobyl, have brought about that the nuclear revolution in power has not happened and is unlikely to do so in the foreseeable future.

This example should make us cautious about predicting the impact of new technologies even when we have a clear and informed understanding of their specially distinctive properties and merits. All that was said by the proponents of nuclear power is true. Its safety record far excels that of coal, gas or oil, and being cleaner than all these other forms of power generation, it contributes nothing to the greenhouse effect which is said to lie at the heart of global warming. This second point is specially important for those who share the view that global warming is the most serious contemporary threat that human beings face. But the key to nuclear power's failure lay in its reception, not in its nature. Curiously to my mind, people have romantically lamented the demise of coal, despite the large number of mining disasters that have taken many lives indefinitely, while at the same time entertaining the darkest fears about nuclear energy, during the production of which not a single death has been officially recorded. Likewise, environmentalists who are loudest in their warning of climate change, are equally loud in their rejection of a technology that might do something to deduce the effects they fear. But whether such attitudes are contradictory or not, they are influential, and the result has been the near demise of nuclear power.

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What this shows is that we should be cautiously sceptical when it is predicted that some new technology will have a revolutionary impact on the way we live, because, as in the case of nuclear power, this crucially turns not just on the nature of the technology itself but on the attitudes of those who are to use it. Technological determinism – the doctrine that ways of life are determined by the technology that underlies them – is a recurrent theme in social theory, but whatever truth it has, it should also accommodate those incontestable instances in which a powerful new technology has by and large been rejected.

There is also this further possibility. The impact of new technologies may be limited because the truly innovative capacities they have are largely unemployed. It is well known that most computer users exploit only a small proportion of the technology available to them, and that immensely powerful machines are often used as little more than hi-tech typewriters and calculators. In this way, what we might call the conservative adaptability of human beings, can convert something that has the potential for revolutionary impact into something rather more mundane. Arguably, this is what has happened with television. Now that computers, home video and rising levels of prosperity have eroded much of television's former pre-eminence, there is a case to be made for the view that this putative "revolution" in communication has at the end amounted to little more than an alternative medium for entertainment and the dissemination of news.

Prediction and assessment

For anyone concerned with the prospects for e-learning, these are important caveats. Time and again, enthusiasts for this or that dash ahead of the pack with schemes based upon little more than their own enthusiasm. The result, very often, is expensive upheaval that is, if anything, counterproductive. At the same time, to retreat to the comfortable belief that there is nothing new under the sun, and that consequently innovators can be ignored, is also a mistake. It simply is implausible to deny that there have been technological innovations, developed and promoted by individuals whose enthusiasm has sometimes approached obsession, that have had huge, lasting and beneficial effects. The examples with which we began – the printing press, the loom, electric light, the telephone, the motorcar and the aeroplane – are all of this kind. No doubt they have had their downsides, but unquestionably human experience and modes of existence have been fundamentally changed by them and in ways that have been hugely beneficial to enormous number of people on a social as well as an economic level.

Of course, this is a judgement made in hindsight, and judgement in hindsight is easy. The more intriguing problem is to make such judgements in advance, to spot the developments that are worth investing thought, time and money in. Given the example of nuclear power and similar instances, how is this to be done with confidence? In fact, can it be done?

The answer is twofold, a sort of no and yes. The negative part of the answer arises from the fact that human beings are bad at prediction, especially when it comes to social prediction. This is a truth that cannot be repeated too often because planners and others are so inclined to forget it. Even the most well-informed and astute economists failed to predict the Wall Street crash of 1929, and a positive army of Kremlinologists failed to predict the collapse of the Soviet Union. Technological prediction fares no better. Asked in 1898 to speculate on the invention most likely to have a major impact in the 20th century, no one at the Chicago World Fair mentioned the motor car.

On the other hand, since we live in a world of invention and innovation and simply do not have the option of standing still, it seems that we must make some attempt to assess the wisdom of future courses of action. This includes the assessment of proposals relating to technological change and social re-organization. What is needed is a frame work within which to think of such things.

The key elements in this framework will seek answers to the following five questions.

(1) What is the anticipated benefit of the innovation and will it be a genuinely additional benefit?
(2) Is the chance of its being implemented successfully much higher than the chance of its failure?
(3) What is the cost of its introduction in terms of disruption to existing systems that are known, tried and reliable?
(4) How stable is the circumstance in which the proposed innovation is to be made?
(5) Are there recurrent patterns of behaviour that would give some pointers to its likely reception?

Even if it is accepted that future gazing is futile, all these, it seems to me, are questions that admit of more and less plausible answers. More importantly, they are the questions that bear most directly on the lives of the people for whom the innovation is intended and by whom it must be implemented. It is only positive answers to these questions that is honestly arrived and that which

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can make the proposed innovation a rational one, and it is the same questions upon which the fairness with which producers treat purchasers and managers treat employees is to be assessed.

There are many instances in which the introduction of computer technology has been undertaken without these questions having received satisfactory answers, or even being asked at all. One that has been documented extensively is the introduction of a company wide IT system by the Canadian telephone company BCTel. It was brought to the attention of the management of this company that there were a number of incompatible computer systems within it. The claim was made that if all the different sectors – finance, marketing, operations, and so on – were able to "talk" to each other on a company wide basis, the outcome would be a better service to customers provided by a smaller workforce, thereby reducing costs. On this basis a software system was purchased and introduced at a very considerable expense. The result was near disaster. Almost nothing worked, and under conditions of great strain and stress the employees used their ingenuity and commitment to devise "work round" solutions until, after a year, some measure of stability was arrived at. But by then, in the changing landscape of telecommunications, BCTel was involved in negotiating a merger with another company. Unfortunately, this other company had recently installed a similar but significantly different IT system, and when the merger finally went ahead it was this other company's IT that was selected for use across the newly merged entity. So BCTel's replacement system was abandoned, together with all the "work round" solutions in which its employees had invested energy, imagination and commitment. In short, in the name of technological improvement a huge cost in terms of personnel as well as money had been incurred quite pointlessly.

BCTel's experience is not unique, at least in outline. Nevertheless it is a single instance from which we cannot validly infer very much. But the point of referring to it is not to begin a process of generalization, so much as to illustrate the pertinence of the key questions I have identified. First, it is plausible to hold in this case that the anticipated benefits of the new system were marginal rather than substantial, especially since the suggestion did not arise from customer complaint and regular failure of the existing system. Second, when it comes to the introduction of large scale software, we have quite a lot of experience to go on, and we know that the chance of trouble free introduction is small. Third, given that what was proposed was a total, all at once, systemic change in a large company, very high ancillary costs in terms of burdens on staff could be expected. Fourth, the instability of the telecommunications industry in the wake of mobile phones was well known. The fifth question – about patterns of behaviour – is not strictly relevant here, though it has some bearing on the question of marginal versus substantial benefits. But as we will see it is relevant to the main subject in hand, and to which we now turn, e-learning.

Technology, cost and benefit

Perhaps we should begin by attempting to characterise what we mean by "e-learning". I shall mean the extensive deployment of e-mail and the Internet to serve the personal, vocational and professional education of individuals. Now the impulse to move in the direction of e-learning can come from the supply side or the demand side, from teachers (and educational institutions) or from learners. There is a general assumption, I think, that the interests of both sides will coincide, but it is not entirely clear that this is the case. What is nowadays referred to as the "delivery" of courses may be cheaper and more efficient from the point of view of the providing institutions (in which we should include governments) while being less effective or satisfactory from the point of view of the student. Conversely, methods of learning that are cheap and convenient for students may place new and costly burdens on teachers and/or the organizations for which they work. However, though this is a matter to be returned to briefly, for the moment we will assume that the desirability of the widespread introduction of e-learning can be assessed from a single point of view that incorporates the interests of both teachers and learners.

Let us return to the key questions and ask first of all, What are the anticipated benefits of e-learning and are they genuinely additional benefits? It is evident, I think, that the anticipated benefits lie primarily in greater accessibility with respect to both time and space. The educational experience that e-learning can provide is not restricted to any geographical or even spatial location, and depending on how facilities for inquiry and discussion are designed, there need be no temporal restriction either. This spatio-temporal flexibility, obviously, means hugely enhanced accessibility – in principle, we need to add, for there are qualifications to be entered. Electronic communication is not infallible, and it may be prone to forms of interruption, corruption and destruction that do not plague other media. There is also a measure of confinement that does not

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affect other media. Although unrestricted to any particular space, there is spatial restriction in this sense; the learner must be at a computer or other interface. As has been remarked frequently, the book has an advantage that the computer, even the laptop, generally lacks. It can be slipped in a pocket or a handbag and read on the bus, train or plane. So, the extent to which e-learning makes educational materials more widely accessible, is a matter of degree. The book is also a marvellous invention from this point of view, and consequently we need to be confident that the added benefit of e-learning media is sufficiently great to outweigh the additional cost of implementation.

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But surely, it will be said, the cost of e-learning is inevitably lower than traditional methods of education precisely because of the vastly higher levels of participation. It is worth remarking that nothing is inevitably the case here. Everything turns on an empirical calculation about contingent outcomes. The problem is that such calculations are extremely hard to make, and it is doubtful if they can ever be made with quantitative precision. This leaves them as a matter of judgement, and equally well informed and competent judges can differ. However, bearing the following considerations in mind, rational judges will avoid all claims of the form "it's bound to be the case". This is because we know that in addition to incurred costs, there are hidden, displaced and opportunity costs to be taken into account.

It is well known that when IT systems are in use, large amounts of staff time, sometimes at a high level, go into informal problem solving sessions. When efforts have been made to calculate these in terms of hourly payment, even conservative estimates turn out to be astonishingly high. If the head of a reasonably large section spends the equivalent of a morning a week helping employees solve their (low level) computing problems, in the course of the year this comes to a very considerable sum. Multiplied across a large organization with many sections, the total annual expenditure will constitute a major hidden cost attaching to the IT system.

This is a possibility that e-learning systems must also take into account, and here the hidden cost may also be a displaced one. The home based student, having problems with the technology, gets the help and advice of a relative, friend or neighbour. The resulting time spent cannot be easily assigned monetary value, but it is a cost nonetheless, and one not merely hidden but displaced – from the educational provider to the educational recipient. This is just one instance of a displaced cost, and others may be more easily quantifiable in monetary terms. IT purchase and maintenance, for example, may easily pass from institutional provider to individual learner, as does the cost of lighting, heating and maintaining the room in which the learning is undertaken. This is one point at which the interests of teachers and learners may pull apart. This much is true, certainly, we will not have properly assessed the cost of a shift to e-learning if we simply compute the costs to educational institutions of designing software, preparing materials and providing them on-line.

There is also opportunity cost. This applies to every kind of activity of course, and there is no reason to think that it presents e-learning with a special difficulty. However, notoriously, the creation of software and the preparation of materials almost always takes longer than anticipated, and their life-time (i.e. before revision and amendment is required) is almost always shorter than expected. There are few instances, in my experience, in which the amount of concentrated time given to Web page and similar construction is devoted to classroom instruction or the writing of text books, precisely because the former is thought of as innovative. If there were, if old and new were treated alike, the normal calculation in favour of web based material would not look so obvious.

These remarks are simply reminders and should not be taken to imply that e-learning is less efficient, and has fewer additional benefits. I do not think that such a sweeping generalization can be sustained. The calculation of benefits has to be made time and again for specific proposals and particular systems. The purpose of distinguishing hidden, displaced and opportunity costs in addition to the direct costs of acquisition and installation, is to underline the complexity of estimating benefit over cost and the various dimensions that have to be taken into account if it is to be made honestly.

The second key issue is that realization. How likely is it that any proposed move from traditional education to e-learning will be brought to fruition? Here again there are complexities. Time scale is

one. There have been several expensive modern weapon systems whose introduction took far longer than anticipated. Ignoring the additional financial cost associated with delay, are these to be counted as successful changes? A solution to a problem postponed long enough is no solution. However, in the case of e-learning, I am inclined to think that the most interesting and important issue surrounding realization relates to the fifth of the key questions I raised – its relation to existing patterns of behaviour – and consequently, I will defer any extended examination of the question until that point.

Before that there remains the other two key questions – systematic disruption and contextual stability. The first is in some way the most important factor to be considered in any system change. Existing systems of organization, including both their underlying technology and the people who run them, are not merely systems extraneous to the knowledge or expertise that goes into their construction. They are also embodiments of expertise, and to scrap or replace them is to discard that expertise. The cost of this can be very high because the form of its embodiment is diffuse and often imperceptible. It will include acquired familiarity that often makes for maximum efficiency. An illuminating parallel will be found in driving a car or operating a mobile phone. Most people are so practised at these that they need to give virtually no attention to the direct operation itself and can concentrate all their attention on the purposes for which these skills have been acquired. So it is with the running of organizations. Accordingly, to replace them is like having everyone change from a car to a motorbike. Leaving other considerations aside, we would expect journey times to be long, stress levels to be higher, and the number of accidents to be greater because the knowledge base is lower. This is exactly what happens in most organizational changes of any magnitude. Of course over time, skilful use of the new system will be acquired, and this will eventually be embodied in the people and the technology that comprise it. But we need to know that the advantages of the new system sufficiently outweigh the cost of the disruption to warrant the change.

They do not always do so. In an educational institution known to me, the timetabling system by which classes were assigned to rooms was done on an historic adjustment basis. A review of the system revealed that this did not take into account of maximising room space use, and a software programme which promised to integrate multiple factors – class size, room size, student choice and staff availability – was purchased at considerable expense. The trouble was that it was wholly new and could draw on none of the knowledge derived from experience that was embodied in the old system. The result was that the start of the academic year approached more rapidly than familiarity with the new system which had to be abandoned at the last minute. The institution fell back on the old system, but without the same preparatory time (or staff confidence) and the result was that timetabling became more inflexible and inefficient than it had ever been.

Systematic disruption of this kind is hugely costly in terms of both skills and morale. Old systems that can appear inefficient from, so to speak, the point of view of the drawing board could have embodied skill and knowledge that is in fact very hard to replace. So it could be with e-learning. The embodied skills that teachers and learners have with respect to more traditional educational methods may contribute far more to the educational process than is evident and we therefore need good and substantial grounds to abandon them.

The issue of stability is a little different, and not to be spelt out in terms of costs and benefits, but in terms of the lifetime of an innovation. In the case of BCTel, the instability that rendered the new system redundant in a very short space of time, lay in the prevailing commercial conditions. This does not really apply in the e-learning case. But what applies is the potential instability in educational fashions and in the technology itself. The second point is an easy one to make. In general the pace of change in information technology is very rapid. For example, anyone who invested heavily in digital imaging technology at an early stage of its development speedily found themselves left with expensive equipment that was technically much inferior to the far cheaper systems that succeeded it. Commercial survival depended upon passing this loss onto customers, but though this proved possible in many cases, this does not detract from the fact that someone somewhere was paying the price of the mistake.

However, more interesting than instability in the technology itself, is instability in the educational culture that e-learning is intended to serve. Here I shall simply sketch one illustrative possibility. In the cours eof the second half of the 20th century there was a shift in Britain that took technical learning out of the workplace and into the classroom. Apprenticeship was replaced by a combination of work experience and day release. This removal to the class room had advantages and disadvantages, but that is not the point here. Let us suppose that e-learning as it develops is primarily derivative of and adapted from classroom teaching. Should it be the case that against this background, the earlier trend is reversed and technical education returns to the

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workplace, there is serious danger that a great many of the techniques, devices and materials that comprise e-learning are rendered redundant. I should stress that I am not contending that this is or will be the case, only that for the proponents of e-learning, and the possibility of contextual instability is as much an issue as it is in others cases.

Education and e-learning

It is time now to turn to the fifth key issue – the relation between e-learning and the patterns of behaviour that comprise the world of education. This is most interesting from a theoretical point of view because it involves reflection on one of the concepts that play a structuring role in securing a valuable and meaningful existence, namely education.

What is the purpose of education? In answering this question all education can be classified in one of two ways. Either its purpose is to serve some further end or it is undertaken for its own sake. People learn to use a computer in order to do other things – write essays, e-mail their friends, buy travel tickets online – but they learn to play bridge for no other reason than playing bridge. Similarly, and at different levels, people study medicine in order to make sick people well, whereas they study history or philosophy for its own sake.

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Of course these two purposes, though distinguishable, are not necessarily exclusive. Many people find the study of medicine intrinsically interesting, and some people hold that philosophical and historical study generate transferable intellectual skills. But the ultimate explanation of medicine lies its use, not its interest, while the ultimate explanation of history lies in its interest not its use.

This distinction between use and interest can be applied across the whole spectrum of education. The difficulty of doing so arises not from the unclarity of the distinction itself, or form the fact that it is not exclusive, but from a powerful tendency in contemporary culture to regard the useful as the only mark of value. It is an assumption, interestingly, that often gets embodied in the word "information" especially in the expression "information technology". There is a widespread assumption that information technology simply stores and transmits information to be put to whatever purpose the end-user chooses. The information itself is purpose neutral.

This idea is importantly reinforced by the fact that electronic impulses are usually referred to as digital "information", and this is of course meaning fully neutral. A set of digital impulses can as easily transmit *mis*information as it can transmit the so called proper information, and the confusion between the digital information and information more generally has led to the mistaken assumption that the latter as well as the former is neutral. But it is not. As every teacher knows, the Internet is a ready source of misinformation and fabrication for the unwary student, some of it being placed there maliciously with the intent to deceive, but most of it arising from ignorance and error.

One essential point to be made is this. It is a central purpose of education to give, those who undergo it, the knowledge and critical abilities to assess and to judge the authenticity, relevance and value of the putative "information" with which are presented, its usefulness and interest. In other words, the mind that confronts the computer screen is not a passive recipient of something called "information". Rather the mind must actively scrutinise and question the material presented if it is to assimilate and learn from it.

This point applies of course to all sorts of information and not just that encountered on-line. But it is important to note that traditionally these critical skills have been acquired in the context of a community of teachers and learners – the classroom, the lecture hall, the lecture, the seminar. The question thus arises as to whether these pre-requisites can be replicated in e-learning. There are chat rooms, notice boards and the like, certainly, and it may indeed be the case that the essential context of learning, that both precedes and goes beyond the mere "delivery" of "information" (for which information technology is eminently suited) can indeed be realized in e-learning. But this needs to be shown rather than pre-supposed before we can proceed to introduce large scale e-learning systems with confidence.

However, there is a larger issue of a similar nature yet to be addressed. I noted earlier that some education is "for its own sake" rather than for some utilitarian purpose. Such education is meant to be enriching rather than useful.

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The person who takes up local history, or wants a better understanding and appreciation of the world of art, say, does so not to enhance career prospects or increase income, but as an intrinsic, non-material enrichment of the life they lead. Now what this suggests is that they do not simply require useful information, but a composite educational experience, and it may be that this is not something that digital technology can supply because it crucially imvolves learning with others. An analogy might be this. No amount or reading plays will substitute adequately for the experience of going to the theatre. To have read the plays is better than being entirely ignorant of them. In this way it is a valuable substitute, but not an entirely satisfactory one. So too, perhaps, with distance learning that employs the very best in multi-media digital technology. To attend a virtual school or college is certainly better than attending no school or college at all, but it may still fall considerably far short of the educational experience that people have generally sought and valued enough to favour over other rival activities.

In short, there is a question as to whether e-learning, whose advantages are many and perhaps sufficiently great to outweigh the earlier concerns of relative cost and benefit, and whose usefulness is not open to dispute, can fully replicate the nature of educational experience for its own sake. If it can, then the prospects for e-learning are bright. Whether it can or not is a matter that will be decided not by policy, but by the dialectic between the imaginations of supply side educationalists and technologists on one hand, and the desires, beliefs and aspirations of potential learners on the other. This is a dialectic from which, as in the BCTel case, managers and technicians have not always been able or willing to engage in. Perhaps those charged with promoting the future of e-learning will respond differently. In my view, the success and value of the ingenuity, time and resources devoted to it will crucially depend upon their doing so.