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Vocational Learning Outside Institutions: online pedagogy and deschooling

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ABSTRACT *This analysis of current developments in online learning for vocational education and training uses Ivan Illich's book* Deschooling Society *as a frame. Illich argued that formal educational institutions are flawed; that a mix of compulsion, indoctrination, certification and education creates an authoritarian atmosphere. Key benefits of online learning include its flexibility and its capacity to support dialogue between learners. On the basis of the capabilities of online technologies, and current developments in education, the authors predict that vocational learning will be profoundly changed. Inevitably, these developments will also challenge established colleges and universities, including their current dominance in major areas of vocational education and training. Education will probably become more pluralistic and more international. This paper calls for an inclusive approach—which makes the elements of an online course available to informal learners and free to people who cannot afford course fees.*

Education in the developed world is changing rapidly, driven in part by the Internet-based technologies which facilitate online learning. These technologies make information available, support online dialogue with a tutor or with other learners, allow the formation of virtual communities and make learning resources available online. At the same time, a new consensus on lifelong learning is emerging which warns us all to anticipate several career transitions during our lives and stresses the growing importance of education and training. We are told that in the ever-increasing pace of post-industrial society, we need to engage in learning continuously. According to Vaill (1996, p. 76), as learning becomes more important and makes increasing demands on time and money, we need to do more learning at work and in all other aspects of life. We are inclined to agree with him; prolonged periods of full-time education for most of the population would be too costly. Human life and the resources of private individuals, employers and the state are finite—setting an upper limit to participation. It will be necessary to find ways to learn as we work and live. In the process, vocational education and training will become more widespread; we believe that online learning will support this growth.

New technologies are accelerating change in vocational education and training. In

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the rapids of this revolution, some educational institutions will be lost and others born. The growth of formal courses online for fee-paying students is visible and accelerating. This paper describes some of these developments and also pleads for open access to the elements of an online course for those who cannot afford fees or who wish to learn informally, with no thoughts of gaining qualifications. Our plea is not addressed to educational conservatives or to the builders of new educational empires online, but to the radicals and reformers who work to make education more benign. It is our hope that online learning will support education outside institutions. This hope will be shared by educators who want to make it easier to participate in education. The learning of those unwilling or unable to pay is as valuable as learning for the affluent. The learning of those who wish to pursue their own needs and interests is as important as the learning of people who prefer to follow a set course of study. The white waters ahead teem with dangers and opportunities. In this paper, we call for freedom in education. This call is a challenge to professional educators, since the kind of development we advocate is unlikely to optimise the income of the institutions which employ them.

This paper focuses on vocational learning outside institutions but we do recognise that many learners want to attend educational institutions and aspire towards formal qualifications. Our concern is that this should not be the only available route. We begin by outlining some of the educational thinking of Ivan Illich, from whom we have drawn the concept of *deschooling*. Much of our exposition of his ideas follows his original wording.

Illich's *Deschooling society*

The opening of this paper identifies some of the factors driving change in education. These include online information, dialogue, communities and learning resources. As components of a new learning environment, they seem closely related to the resources specified by radical education reformers working and writing in the late 1960s and 1970s. Their opposition to compulsory schooling was based on a cogent critique of an education system rather like the one we still have.

Prominent among these prophets of radical change is Ivan Illich and we will be drawing on ideas from his book *Deschooling Society* (Illich, 1971). His argument begins by considering equality in education. He quickly concluded that education which offers the children of poor families the same educational prospects as middle-class children in (to use his example) the United States would be unrealistically expensive. Compulsory schools which offer real equality must, he argued, be recognised as *at least* economically unfeasible. But he also saw compulsory schooling as undesirable. He is not anti-educational, but he portrayed formal educational institutions as authoritarian and therefore poorly suited to their educational mission. In particular, he was critical of institutions which try to combine compulsion, certification and education. He argued that the mere existence of school discourages and disables the poor from taking control of their own learning. Certainly, anyone who sees freedom and self-direction as essential to the educational process will recognise a contradiction between education and coercion. In another book—and in

a more strident mood—Illich wrote that our schools are prisons (Postman & Weingartner, 1971) and this remark certainly reflects the feelings of a minority of reluctant teenagers trapped in compulsory school systems. Whether Illich's comment is applicable to the majority is debatable—and the rights and wrongs of compulsory schooling for children are beyond the scope of this particular discussion.

The fact remains that schools, colleges and universities are not uniformly popular places in which the learning experience is a comfortable one for everyone. Many adult learners simply do not want to go "back to school", and some vocational education and training is deliberately designed to avoid reminders of the adult learners' school days. Perhaps part of the explanation for this is that the coupling of learning and certification is inherently problematic. Some learners are uncomfortable with the idea that the teacher or tutor who supports their learning will also judge their achievement. It seems reasonable to observe that certification by educational institutions tends to intensify the power relation between learner and teacher. This can vary, of course, depending on how courses are assessed and certificates awarded—and it is also fair to observe that some learners *want* their progress to be judged by their teacher or tutor. But Illich's analysis is an important contribution to the debate on the institutionalisation of education and seems to strike a chord with some further education professionals who are increasingly involved in assessing the students they teach and awarding qualifications. But even if we accept that the mix of roles performed by traditional educational institutions is uncomfortable, we might feel that these tensions are inevitable—so it seems reasonable to ask what alternative Illich proposed.

He called for research on the possible use of technology to create new educational organisations which serve personal, creative and autonomous interaction. He suggested an alternative approach to learning: that what is needed are new networks, readily available to the public and designed to spread equal opportunity for learning. These new networks would be more informal and congenial than the schools, colleges and universities which dominate education today, hence the term *deschooling*. Illich identified *learning webs* which, he believed, are a sufficient replacement for formal educational institutions. He recognised no more than four distinct "channels" which could contain all the resources needed for real learning. They are:

- things,
- people who serve as models for skills and values,
- peers who challenge, argue, compete, co-operate, and understand,
- elders, experienced people who really care and expose the learner to confrontation or criticism.

Things like machines, animals or events such as meetings are often vitally important for learning. Someone learning to maintain equipment, for example, or to minute a meeting needs access to good examples. Things and events are often readily available to learners outside formal educational institutions, not least in their place of work. If necessary, some objects could be reserved for educational purposes, stored in libraries, rental agencies, laboratories and places like museums.

Illich proposed a *skill exchange* which permits *people who can serve as models for skills*

and values to list their skills, the conditions under which they are willing to serve as models for others who want to learn these skills and how they can be reached.

Peers who challenge, argue, compete, co-operate, and understand can be identified through *peer matching*, establishing a communications network which permits people to describe the learning activity in which they wish to engage, in the hope of finding a partner for the inquiry. To use one of his examples, Illich suggested that in a large city someone could identify themselves to a computer, listing an address and telephone number and indicating a book, article, film or recording on which that person seeks a partner for discussion. Within days, he suggested, a list of others who recently had taken the same initiative could be mailed. This list would be used to arrange a meeting with people who initially would be known exclusively by the fact that they requested a dialogue about the same subject.

Experienced "elders" offer confrontation or criticism. Illich proposed a *reference service* to educators-at-large, who could be listed in a directory giving the addresses and self-descriptions of professionals, paraprofessionals, and freelancers—along with conditions of access to their services. He suggested that they could be selected by individual learners by polling or consulting their former clients—perhaps in a similar way to the recommendation of online vendors and products through customer comments and satisfaction ratings.

Illich envisaged that matching services, storehouses for learning objects and the fees of educators-at-large would be funded by the state through an educational passport or an "edu-credit card" provided to each citizen at birth. An "edu-credit card" system would cost money—but savings to the state would come from the reduced funding of formal institutions.

Illich's analysis of educational institutions may have been cogent but his proposals for change were stillborn. In 1970, he thought that the deschooling revolution was inevitable and imminent. In retrospect, it seems that he was wrong. It would not be difficult to argue that education is more institutionalised now than it was in 1970. Although some critics see him as a false prophet, it seems inappropriate to dismiss his analysis and his proposals on that basis alone.

Assessment and Certification

For many professional educators, particularly those in traditional institutions, these proposals seem like positive suggestions—but the idea that they could *replace* established educational institutions raises immediate concerns about assessment and certification. How will employers, for example, know enough about performance at school, college or university to make reasonable recruitment decisions? As we have seen, part of Illich's answer is that the coupling of learning and certification is inherently problematic. In any case, what an individual knows, understands and can do are much more important for employment or further study than how and where these capabilities were developed. An early version of this paper was presented to a group of teachers and lecturers in the United Kingdom in 2000. Our experience of broaching the idea of outlawing the use of formal qualifications to inform selection for employment or education is that many professional educators consider it far too

extreme, even ridiculous. That many educators respond this way is, of course, consistent with Illich's analysis of formal institutions and the professionals who serve them. The fact remains that many professional educators place the provision of courses and certification of successful completion at the heart of their work. This is not the place to try to settle the differences between colleagues who value that dual role and those who find it uncomfortable. But perhaps we can make Illich's observations and suggestions more palatable by illustrating the diversity of assessment and certification which already exists. Attending a course is, after all, not the only way to earn a formal qualification, and formal qualifications are not the only way to demonstrate the capabilities necessary for a job or (say) advanced vocational training.

We turn our attention first to employment. Although many employers advertise vacancies or pre-select candidates on the basis of formal qualifications, some do not. A few employers use a selection process of their own design and pay scant attention to formal qualifications. Moreover, when employers do require formal qualifications, the link between qualification and job content is sometimes questionable (Dore, 1976/1997). Is it really appropriate to require secondary school academic certificates for entry to craft apprenticeships? Similarly, could some graduate-only government jobs be filled by able, self-educated individuals? We can recognise areas of employment, medical surgery for example, where it would be difficult to persuade governments to do without certification altogether (but see Illich, 1977). But it is important to note that some recruitment does not rely on formal qualifications and that this could be extended.

A simple way of extending job opportunities to people without appropriate formal qualifications would be to rely more heavily on job interviews, trade tests, work trials and the like. If informal vocational learners find that they need certification of their learning, it seems reasonable to offer accreditation of their capabilities without ever asking them to attend a course. We welcome developments in the accreditation of prior learning, particularly accreditation of prior experiential learning (Merrifield *et al.*, 2000; Weil & McGill, 1989). For the informal learner who wants or needs formal certification, another option is to sit an examination of some sort and it seems probable that online assessment will contribute to the development of new forms of assessment. It could be difficult or even inappropriate to devise an online examination for some vocational skills but it seems feasible for others—and there are signs of development in related areas. For example, Bennett (1998) and Owston (1997) report development of testing for a General Equivalency Diploma in the United States which will, they believe, increasingly utilise new technologies for mass testing. Some educators are sceptical about the role and validity of public examinations. An historically important example is the Radford Report, which had a powerful reforming influence on Australian education (Radford, 1970). In the present paper we do not recommend the wholesale introduction of mass examination in every country, but urge educators to recognise diversity and work towards extending it. What matters, we believe, is that there should be a variety of routes into education, training or employment for those who learn by attending a formal course and for those who do not.

Our aim has been to make Illich's ideas on accreditation and employment seem less outrageous but we do not mean to say that the legislative program he recommends is a realistic proposition. We do not know of any state which has enacted a law of this sort, nor of any current and realistic campaign to do so.

As we turn to assessment and certification as a means of entry to further training or study, our intention is to highlight existing arrangements which facilitate entry for those who have learned without gaining formal certification. The remarks we have already made about interviews, trade tests and public examination apply here too. In this context, accreditation of prior learning might be unnecessary; recognition of prior learning is sufficient.

There are many examples of higher education institutions which, like the UK's Open University, accept students without the usual academic prerequisites. We should also mention the possibility of extending selection based on a portfolio of work built up by learners over a period of time. In some institutions, for example Art schools, this practice is well established. Once again, we should emphasise that we do not want to recommend all of these approaches in every context and without reservation. Instead, we think it is important to support enough diversity to allow informal learners to proceed to further education and training where appropriate. An overall shift away from selection based on formal certificates seems possible, even desirable.

If this discussion of assessment and certification leaves some of our readers feeling that informal vocational learners would be better advised to join a formal course and work towards a qualification, we should correct any impression that we see informal learning as, primarily, a route to certification or further study. Although it seems impossible to quantify the balance between formal and informal learning, our instinct is that human learning, including vocational learning, is predominantly informal. (On the whole, vocational trainers seem comfortable with the idea of learning for a specific purpose without assessment or certification but to some colleagues in schools and universities, this notion seems relatively unfamiliar.) Educators should value and support informal vocational learning because it develops capabilities important to learners. When people learn in this mode, it seems reasonable to establish routes to employment and further learning which allow informal learners to make their way in life without real disadvantage.

Online Learning—place and time

One of the important differences between learning in the workplace and formal learning in an educational institution is proximity. In most traditional colleges or universities, learners are near learning resources, information resources, peers and academics/teachers. In the workplace, learners are near co-workers, mentors, equipment and the workplace itself, the very context in which the learning must be applied. There are few coherent educational programs in the workplace, where learners have ready access to educational expertise, appropriate resources, mentors and peers. Typically, learners would benefit in different ways from *either* learning located in the workplace *or* from the expertise, comradeship and resources of a

formal educational institution. Because of the physical distance between the two, learners must choose one—or try to bridge them somehow. Before the advent of online technologies, this gap was bridged mainly by travel, mail and telephone—but online technologies promise to be faster, cheaper, flexible and more responsive. Online learning offers the potential to bring a course into the workplace itself.

Few educators would dismiss the importance of the workplace as a learning resource. The kinds of benefits cited include an increased chance of transferring new skills into the working environment and improved retention as new capabilities are put to immediate use. The importance of proximity can be highlighted by the difficulty and expense of running certain kinds of technical courses in the further education sector. In disciplines like Engineering, Computing or Design, further education institutions duplicate equipment commonly found in the workplace in their own buildings. In some other courses, learners make do with theoretical teaching illustrated by photographs or diagrams of the real thing.

Time is another important factor. In many workplaces, employers are willing to release an employee for training while they are unoccupied but often there seems to be no pattern to downtime—which makes it difficult for employers to commit to education and training. In some workplaces, employees would use downtime for education and training if they could also be available to begin work immediately, for example when a customer comes into a store or a big delivery arrives. A study of open learning in small firms in the United Kingdom by Hilary Temple (1995) found that open learning was seen by some employers as the only viable option for staff training because they did not feel they could release staff for courses. The strength of online learning is its capability to support learning wherever and whenever the learner is available. To be fair, this could be said of a number of electronic and print media—and certain kinds of online discussion are possible only when learners can participate simultaneously—but online communication offers a flexibility and ease of use which makes it attractive to both learners and educators.

It is difficult to chart the growth of online learning in the workplace when examples are still rare, but a survey by the American Society for Training and Development (www.astd.org) in 1998 illustrated the trend towards using electronic media. Computer-based training was used by 66% of "leading edge" companies, with 44% using CD-ROM, 53% using videoconferencing and 31% other multimedia. Because of the impressive technical capabilities of online learning, we anticipate that it will supersede many of the other electronic media.

Online Learning—dialogue

Online learning is different enough from, say, a mid-twentieth-century correspondence course to constitute a qualitative change. At the core of this, we believe, is the Internet's capacity to support *dialogue*. Some media are essentially broadcast media, allowing one-way communication only. TV and radio, a printed book, a lecture or a speech are all broadcast media. The telephone and the seminar are examples of media that support dialogue. In traditional educational settings, the lecture is a broadcast, the seminar a dialogue. The lecture is *delivered*, the seminar is *facilitated.*

For educational purposes, the most important feature of the Internet, particularly the World Wide Web, is that it is dialogical. (It can also, of course, be used for broadcast.)

Dialogue is a horizontal relationship in which one individual is *with* the other. In Freire's words (Freire, 1974), it is positive, hopeful, trusting and critical. It involves two-way communication. Broadcast is a vertical relationship in which one person is higher than the other. To borrow Friere's words again, it is loveless, arrogant, hopeless, mistrustful, acritical. Broadcast does not communicate but issues communiques; information passes in one direction.

The Internet has the potential to support a variety of different kinds of dialogue. The Internet facilitates dialogue between people through e-mail, chat rooms, online notice boards, mail bases and so on. This dialogue can be synchronous or there can be a delay between responses—but comments and responses can be viewed online as a coherent and informed conversation between real people who can also be contacted privately by e-mail.

Like courses in a conventional school or college, much of this dialogue will be between learners (see, for example, Gibson & Rutherford, 1998) but there is often a place for tutors too (Salmon, 2000). Online tutors provide important guidance for the learners. They give feedback on the ongoing discussion and steer the thread of conversation, ensuring that key points can be explored. A particularly important feature of many courses is the development of trust between the learners and the formation of an online learning community (Palloff & Pratt, 1999). Tutors often play a key role in this process and are often pivotal to the success of the course.

Is Online Learning Better, Cheaper and Faster?

In academic circles, the efficacy of online learning and pre-Internet computer-assisted learning is disputed. This is neatly illustrated by Russell's research bibliography on technology for distance education (Russell, 1999) which documents the "No Significant Difference Phenomenon". Russell reports being able to locate few academic studies, if any, in which using technological instruction or teaching was found to be statistically significantly superior in terms of learning. He tells us that studies with positive results using technology-based instruction are practically non-existent and the very few that do exist are offset by a similar number which show negative results. In the Foreword to the same book, Richard E. Clark suggests that Russell's work is one of the few rational sources of information about an otherwise irrational and commercialised issue (Russell, 1999, p. xiii).

To be fair to advocates of online learning, Russell's bibliography surveys decades of research and most of the cited findings do not come from studies of online learning. It might also be mean spirited to construe the "No Significant Difference Phenomenon" as evidence that technological innovations fare no better than traditional instruction, rather than concluding that they are "at least as good". Unfortunately, there is room for scepticism about how important pedagogical debates about the merits of online learning will turn out to be. Online learning is being driven forward by motives like ambition and faith in the future. If sound pedagogic

reasons for adopting it are absent, this could turn out to be an ironic but minor detail in the history of education. Powerful interest groups are already involved in these changes. Political and financial considerations may prove to be more influential in the development of online learning than well-considered social policy.

Education, Institutions and Multinational Corporations

The Internet and other electronic media open the way for penetration of the global education and training market by a variety of new providers. They range from clearing houses for listing distance learning courses to full-scale new institutions delivering their own fully accredited degree courses (Whittington & Sclater, 1998). Large employers and multinational corporations are emerging as important players in an increasingly global marketplace. New models for delivering courses are being developed to suit lifelong learners and some courses specifically target mid-career professionals.

In some cases, large employers generate courses in-house, which use electronic media to reduce training costs. The *Multimedia training newsletter* (www.multimediatraining.com) reported in 1995 that Price Waterhouse's multimedia training program had been used by 7,000 learners in 50 countries. Compared with their previous approach, the company reported a 50% reduction in the time needed for learners to attain the same standard of knowledge. Training costs were reduced from US$760 per learner to only $106 for the multimedia training. A number of global companies have now established their own "universities" to support the education and training (largely vocational) of their employees.

There are a relatively small number of international institutions engaged exclusively in online education such as Excelsior College (formerly Regents College) in the United States (www.regents.edu). UNITAR in Southeast Asia (www.unitar.edu.my) uses CD-ROM format to distribute multimedia learning materials, supported by online seminars and other services.

Many traditional universities and colleges are offering or developing online courses, often on a for-profit basis in partnership with commercial providers. Our own institution, the University of Glasgow, is part of an international grouping of universities called Universitas 21 (www.universitas.edu.au) which recently announced a partnership with the media company Thomson to found an international "e-university". Thomson estimates a global figure of 160 million people in higher education by 2025, a growth of more than 300% compared with 1990. It seems unlikely that traditional universities can grow to meet this demand but many traditional institutions are establishing online programs in response to anticipated growth.

Vocational education and training are available from a growing number of large profit-making organisations, some of which already have a major share of other global markets like software and electronic communication. Some of these developments are more important than the exploitation of new communications technologies for training and for profit. Until recently, defining the curriculum and accrediting learning has largely been the prerogative of government bodies and

traditional educational institutions. Examination boards and other not-for-profit organisations have traditionally defined school curricula, college curricula and assessment regimes. The curriculum and its accreditation in higher education has remained largely with the universities. In vocational educational, professional bodies representing the likes of accountants and project managers have devised and administered their own assessment regimes.

In some areas, this old order is being swept away as multinational companies, particularly in the high-technology industries, offer formal certification in the use of their products. These certificates are not simply in-house qualifications for a limited number of employees. The January 30, 2001, issue of the Microsoft Certified Professional (MCP) Magazine (online at www.mcpmag.com) reported that, as of November 3, 2000, 944,973 individuals had obtained MCP status. This is an example of the new for-profit program which extend the hegemony of global corporations. It is not surprising that people are prepared to pay for qualifications such as the *Microsoft Certified Systems Engineer* (MCSE) or the *Sun Certified Java Programmer* since they have become the required qualification for many well-paid IT posts.

All of the examples cited in this section are of courses for fee-paying learners. Where online learning is offered exclusively for profit and in the context of relatively rigid courses studied for formal certification, certain areas of education and employment become available exclusively to those who can afford to pay for training and certification. This is how social inequality is reinforced and poverty is entrenched. That observation leads us to a discussion of learning opportunities on the Internet of a different sort.

Learning without Institutions

Writing more than 30 years ago, Illich makes specific reference to computer technology and it is probably unnecessary for us to elaborate on the suitability of computer databases for the kind of matching that he proposes. Moreover, the Internet offers a freedom of access to databases which he could not anticipate. The fact that he called one of the chapters of his book *Learning Webs* is prophetic. For post-Internet readers, this title highlights the suitability of the Internet for providing free public access to the information databases he wanted. His assumption was that *skill exchanges*, *peer matching* to identify fellow learners and *reference services* to "elders" would lead to face-to-face meetings. As we have seen, online learning offers more than he thought necessary for real learning, notably its ability to support dialogue online—which might make face-to-face dialogue less important.

If this is all done for profit and only in the context of set courses studied for credit, online learning will not serve the poor, nor will it support informal learning. That is why we argue that educators have a responsibility to resist the wholesale commercialisation of online learning. Informal vocational learning benefits from the availability of learning resources, course outlines, online discussion groups of various

sorts and online "experts" *if* they are easy to find on the Web and free to users. Just as public libraries in the nineteenth and twentieth centuries made books available to people who could not afford to buy them, online facilities that are freely available need to become better and more diverse.

Neo-liberals and conservatives alike will complain that online education is a resource-hungry activity which cannot thrive in a free market economy without charging fees to learners. In response, we offer examples of sites that offer free access to services that seem rather like the *skill exchanges*, *peer matching* and *reference services* which Illich envisaged. At this stage in their development, free educational Websites often move location and are sometimes short lived. In this paper, we give enough detail to exemplify current developments and encourage interested readers to explore the Web using a search engine if they find that the Web addresses cited here are obsolete. We searched the Web using the phrase "education exchange" in January 2001, and describe two of the services we found.

The Education Exchange (http://homepages.go.com/homepages/b/r/a/brainpower42/) offers "a gateway" to free educational information and instruction. It connects visitors to many of the usual elements of an online course: online tutors (via mailing lists), online course guides, discussion groups and expert consultants. It states its mission as

> ... to offer an emancipated education to the populace. We hope to progress, to honor the individuality of students of all ages by trusting their innate abilities, respecting them as individuals, and providing them a variety of educational opportunities in which equal status is given to every pursuit.

This service is funded through companies like the online retailer Amazon.

We also accessed an example of an online bulletin board for educators—also called Education Exchange (http://216.25.56.45/etboard/). It might be intrusive to report the details of the messages we found but we list some of their titles—which give a flavour of the dialogue posted on the bulletin board.

> Wanted English Teacher
> Information needed
> where can I find?
> SAT, PSAT, ACT test prep
> Fibonacci Sequence
> I need a partner to teach English to Korean students!!!
> e-learning
> videotaping in classrooms

The site claims that "The purpose of Education Exchange is to stimulate thinking, to aid our understanding, and to improve our roles in the educational arena."

Another example worth mentioning here is the Globewide Network Academy (www.gnacademy.org) which sets out to promote access to educational opportuni-

ties for anybody, anywhere. Their tools can be used and copied without charge. The service is funded by carrying advertisements and asking for online "donations". Some of the work associated with building and maintaining the site is done by volunteers. This is a nice example of a non-profit site offering some things free to users—but also offering links to online courses and other services for which learners are expected to pay.

These three sites illustrate the way in which Internet-based services can perform the matching functions which, according to Illich, are central to informal learning outside institutions. In this mode the timing, location and content of learning are chosen by the learner—often in response to a specific problem. Learning might be prompted by challenges at work rather that taken up for its own sake. Faced with immediate challenges or problems, people are motivated to find time to acquire the new knowledge, skills or attitudes they need.

Just as we are unable to quantify the changing balance between courses in traditional educational institutions and courses online, we are also unable to say what proportion of online services are available free to users—rather than mounted on secure sites or hidden from view. This paper asks professional educators to recognise the importance of making a range of learning facilities freely available online. We do not advocate allowing unrestricted access to the online chat areas or bulletin boards used as part of online learning courses, because that would undermine the effectiveness of online courses and invade the privacy of learners. Tutor moderation is time consuming and educational institutions would be unwise to open moderated discussion to anyone who wishes to join. But educators can support informal learning online by making texts, course outlines, databases and other learning resources freely available. On the whole, this would not threaten the learning experience of their students nor undermine the commercial viability of their institutions. To some extent this is already happening. Many universities and colleges, for example, make course outlines available online. It is our experience that when educators mount learning resource in secure areas, this is often done without thinking about informal learners—rather than out of a real desire to exclude. For informal learners, it is relatively easy to communicate on the Internet, to find opportunities for chat and establish areas for special discussion. As we have seen, there are a services offered free to users which help them identify peers, experts and online resources. If professional educators within the institutions are thoughtful about making resources freely available where this is appropriate and possible, all the major components of online learning environments will be available to informal learners.

Before we leave the topic of learning outside institutions, we would like to note that some state-sponsored providers seem to be embracing change. For example, the Pennsylvania Department of Education (USA) is investing approximately US$10 million over 2 years to create Digital School Districts. It states that "the ultimate goal of education needs to shift from receiving a diploma to life-long learning" (http://l2l.org/digitalsd/). The same department sponsors Pennsylvania's Distance Learning Exchange (http://dle.state.pa.us/), a Web-based clearing house of distance learning and Internet opportunities.

Speculations on the Future of Education and Training

Online learning technology is developing rapidly in response to the technological opportunity offered by the Internet, a drive towards better quality and cost effectiveness in education and the intervention of commercial interests. The relationship between the increased popularity of online learning as an activity and the technical development of the technologies which support it seems symbiotic and it is reasonable to anticipate accelerating growth. These changes will not happen in isolation; we anticipate a substantial challenge to formal educational institutions and the emergence of more global and pluralistic educational opportunities. Illich believed that compulsory schooling was unsustainable and he turned out to be mistaken, at least in the medium term. A much less radical vision of the future seems to be emerging, in which increasing demand for education will be met by new institutions, many of which will exploit new learning technologies.

A consequence of the application of online learning to vocational education and training will probably be an intensification of competition. Taken in total, vocational education and training is a vast enterprise involving huge amounts of time and money. In the United Kingdom, for example, the market for non-government training providers was worth an estimated £16 billion in 1998 (Baxter, 1998). Much of this training is currently provided by a patchwork of small institutions, often local colleges. When a learner or employer chooses a training provider, travelling time and delays associated with mailing are important considerations. If a training provider is located at a great distance from the learner, even expenses relating to postage or telephone calls become important. Overall, it is reasonable to choose a local provider, and in the quasi-capitalist economy of training provision the totality of these choices creates and supports a patchwork of institutions serving a local district. Competition between institutions is, effectively, limited—but when online learning is used, communication costs are the same for a local provider or for a provider in another town or country. If this analysis is right, online learning weakens the patchwork pattern of provision, intensifies competition and accelerates the globalisation of the market for vocational education and training.

Online learning is already an important feature of higher education and the further education sector is introducing online courses in many countries. These developments tend to take students away from existing courses and formal institutions. In itself, this may not lead to attrition in those institutions. If predictions about growing demand for formal qualifications and for lifelong learning are right, online learning will develop in an expanding education sector and many traditional institutions could be unscathed. Online learning itself will contribute to growth in educational activity, playing the dual role of stimulating and satisfying demand. The overall picture, however, will include a greater variety of learning opportunities with some casualties among the existing institutions.

Changes in the higher education and further education sectors are unlikely to extend to primary/elementary schools and may even have a limited impact on high schools. The burgeoning home schooling movement in North America (www.home-school.com) is challenging the prerogative of the state to be sole

provider of education for children and young people—and is already making extensive use of the Internet as a source of contacts and resources.

Conclusion

The emergence of new educational technologies offers an opportunity for us to rethink the shape and purpose of education and training. In this context, Illich's writing on deschooling is a helpful tool for identifying the essential elements of learning experiences and the probable consequences of a move towards online learning. Vocational education and training will benefit from technologies which support learning at any time in any place enriched by the technical capacity of the new medium to support dialogue. The capacity to support learning in the workplace is likely to shift the balance in learning activity away from traditional institutions and towards new modes of vocational education and training.

Earlier in this paper, we remarked that online technologies have the potential to support informal learning by people who want to enrich their lives and advance their capabilities without attaching themselves to any formal program of learning or institution—and without regard to certification. Professional educators have a part to play in making online learning available to them.

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