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TALES FROM THE EDGE
How the web is changing learning

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Abstract

The eighties and nineties have been a period of strong growth for the use of the World Wide Web in schools, vocational education and training, and higher education in Australia. The focus has been about providing quality educational resources, services and adequate bandwidth for accessing information. However, as educational authorities have been trying to play catch-up, the uses of the web have changed considerably. For example, Amazon.com, eBay, Wikipedia and Google have shown success on the web using the attributes of the web to best advantage, creating innovative ways of harnessing the new technologies. These highly successful services have lead to new thinking about web services which is being called Web 2.0. These creative uses of the web to provide services are changing the ways that people think, work and learn.

Interactive Personal Technologies (IPN) which have been developed more recently have seen remarkable take-up in Australia and globally. Although information technologies have made an impact on education and training, the increase in IPNs will impact even further on learners and can be utilised in education and training to great effect.

A report on emerging technologies prepared by education.au limited in 2005, for the ACT Department of Education and Training, highlighted many potential opportunities in education and training. However, the reluctance in education and training to explore and utilise many of these new technologies in appropriate ways may reflect on the current preparedness of education and training to plan for the future.

This paper and presentation argue that the appropriate use of IPN web technologies can provide learners with greater choices in what they learn and how they learn through personalisation and customisation of educational services. The IPN web can be an extraordinary support for teachers and learners.
1 Introduction

The advent of the web and elearning are potentially the most important events in education and training for many decades. They have the potential to transform traditional didactic teaching and learning into forms that will provide greater choice for learners and global access to quality information and services. Elearning is likely to lead to higher levels of attainment in student outcomes if it is adopted vigorously by teachers.

In education, most online content, services and networks will be free of cost. These online services will be built using open standards in education and probably mostly use open source software.

The real cost of elearning will be in the efforts of educators to build communities of users and share learning experiences using online services. That is where the most effective use of online services in education is likely to occur and where teachers will be able to realise the best returns for their professional efforts.

However, the web services that will be most useful in education will be those that focus on users as learners to provide services that are easy to use and are free of service costs such as Wikipedia, Google, MySpace, Flickr, Facebook and many more. These services are a threat to traditional education where control of information, print-age literacy skills and standardisation are paramount.

This paper is not meant to be an exhaustive examination of possibilities for using web services for learning. It is meant to stimulate and provoke thinking about how best to use ICT web services to support improved learning outcomes and to benefit learning.

In order to understand the web and what it can offer, this paper will begin with a short history of the web and the emergence of social or relational software which can be utilised as Interactive Personal Networking (IPN) very effectively in education and training.

2 History of the web

In 1969 DARPA1 finalised agreement on the standard protocol for the internet: a standard called TCP/IP2. This standard was to become the basis for the internet upon which services could be built which was demonstrated by the National Science Foundation (NSF) in 1983. Then twenty years after agreement of TCP/IP, in 1989, Sir Tim Berners-Lee and Robert Cailliau at CERN in Switzerland co-invented a graphics layer which they called the World Wide Web (WWW). They envisaged a service that could managed documents and was multimedia enabled. However, simple text dominated for the next seventeen years as services using the internet became more common.

1 DARPA is the Defense Advanced Research Projects Agency in the US.
2 TCP/IP is Transport Control Protocol/ Internet Protocol
The early years of the internet saw a movement to place printed documents on the internet as web ‘pages’ prompting administrative and company information to be posted copiously. In effect, this became a cost shifting exercise as government and businesses saw the cost advantages of placing documents online once and having large groups of users download and print those same documents.

Moving printed information online gave way to providing online and marketing services in the late 20th century and early 21st century. Airlines and transport companies, book and music sellers, travel agents and information services moved quickly to gain advantages from using the web. The milestones of the Qantas website (www.qantas.com.au) is an excellent example of the evolution from administrative information website, to marketing, to the provision of services and today an online web service provider.

The emergence of new business models came with the success and popularity of searching with Google, buying and selling with eBay, browsing and buying books from Amazon.com and as a starting point for studying a topic referring to Wikipedia. Then in late 2003, John Schacter launched the personal storing, sharing, and discovering web bookmarks service called del.icio.us (http://del.icio.us/) which became very popular in 2005. This new service paved the way for customisation and personalisation of web services.

Today the advent of interactive personalised networking (IPN), sometimes called ‘social networking’ or ‘relational networking’ on the web, has rapidly expanded, as exemplified by the rise of blogs for self-and group publishing online. IPN has developed a culture which supports the user through its ability to enable micro-publishing, sharing and interactivity. There are some very valuable services available for learning. One such example is Wikipedia (http://www.wikipedia.org/), arguably one of the best encyclopaedias in the world. It is free and available in many languages.

3 Criteria for take-up

There is so much high quality free content and free web services available today for teachers and learners that a timely reflection how to select them could be useful.

Stephen Downes (2006) in his keynote address to the 11th Instructional Technology Conference in Tennessee advanced four basic principles which could be used as a set of selection criteria. They are autonomy, diversity, openness and interaction and can be summarised as:

- Autonomy allows the users to make their own decisions about the use of services, and configuration where the user is not dependent.
- Diversity allows use of a variety of approaches from devices, operating systems, computer types, web services and software.
- Openness allows users to access content, add content, use content without cumbersome licenses or restriction.
- Interaction allows users to access online help, be connected and communicate with groups, communities and networks.
These criteria are very useful to apply when selecting of content, web services, networks and applications. They ensure that the selection enables user choice without unnecessary restrictions and encumbrances that act as barriers to effective use. As criteria they should be applied by teachers in selecting content, services and networks for use in education.

Technology already enables learners to communicate globally, wherever access to the internet and its services, such as the World Wide Web, are available. The availability of high quality, global, digital services will enable learners and teachers to make real choices in selecting and using the most appropriate content, services and networks. Teachers will be able to cater for different learning styles and online services will provide tools to suit pedagogical approaches used by teachers to engage learners. Any educational discussion of the use of content, services and networks must use pedagogy as the starting point.

An excellent list of tools that can be used for IPN is outlined in Web Office: the next wave of productivity tools (2006, Boothby) and can be accessed at: http://www.innovationcreators.com/Whitepapers.html.

Although elearning brings with it new challenges and issues to be resolved in education and training, the benefits to teachers and learners will be incalculable. One of those elearning issues to be resolved, in favour of education, is the unbearable yoke of copyright around education’s neck. Notwithstanding, elearning can save teachers time and will prove to be the most effective aid for learning available for many years to come.

4 Use in education

In 2004, Mr Geoff Spring, one of Australia’s most eminent educators, completed a seminal Australian report for the national government, titled Australia’s Future Using education Technology. In that report, Spring argued that ‘ICT could be a major force for improving education while enabling choice for learners’. He went further to say:

   It is at the point where the promise of better outcomes for students and real cost benefits are now achievable with minimal costs. We are on the cusp of the first major shift in teaching and learning methodology for hundreds of years where it could be available to anyone, anytime, anywhere. Providing accessibility and flexibility for students and teachers for their own teaching and learning needs remain key challenges. (Commonwealth of Australia, 2000, p17)

Spring was arguing that given accessibility and flexibility of access to the WWW, that learners could make choices about where and when they learn. Learners, in this sense, could be considered to be both teachers involved in professional development and students at a variety of levels. As the services of the WWW become more prolific, the availability of high quality educational material and services for teachers and learners has become realistic.
5 Communication in education

Education uses communication as a fundamental tool for conveying concepts, information and ideas which can be processed by learners. ICT is about information and communication, giving teachers new ways for teaching concepts, information and ideas.

In his paper for the Global Summit 2006\(^3\), (http://www.educationau.edu.au/jahia/Jahia/home/pid/305) entitled Tools, culture, and education: past - present – future (http://www.educationau.edu.au/jahia/Jahia/home/pid/318), Professor Jim Bosco outlines methods that humans have used to transmit information throughout history.

Education and learning, Bosco argues, have been based around transmitting information for social, cultural, vocational and personal development. Verbal and written communication has been a basic tool for transmitting information for centuries. Educators have developed and used sophisticated methods for constructing and measuring learning environments for centuries, as well as supporting students to create knowledge and judge learning outcomes, using verbal and written forms of communication.

Today, ICT offers borderless global access to unlimited information for use by educators, in a connected world. Knowledge can be created in different ways that are unfamiliar to many teachers. These new methods of teaching and learning have been neither tested nor researched by comparison with more traditional pedagogies. Neither the use of information technologies nor communications technologies bear the imprint of long standing and sound research into effective teaching and learning.

However, we do know that effective use of ICTs does improve learning outcomes. For example, the research that BECTa\(^4\) has undertaken demonstrates a clear correlation between the uses of ICTs and improved learning outcomes, even though intuitively educators know that improved discussion capabilities and unlimited access to quality information are clearly assets that can be used for educational advantage.

For further expansion of this correlation between the use of ICTs and improved learning outcomes, readers are referred to the excellent work of BECTa as a highly regarded starting point, which can be accessed at: http://partners.becta.org.uk/index.php?section=rhs.

Readers need be mindful of issues associated with research that utilises methods unfamiliar to digital environments. Instead, considering the use of ICTs as part of developing and trialling new learning environments and new learning activities, in order to reflect on their educational potency and effectiveness for learners, may be more worthwhile.

\(^3\) The Global Summit 2006: technology connected futures will be held in Sydney from 17\(^{th}\) to 19\(^{th}\) October, 2006.

\(^4\) British Education and Communications Technology agency
6 Conditions

In order to use ICTs effectively for education, there are a number of conditions that have to be skilfully managed. These include accessibility, flexibility, a shared vision and collaboration.

6.1 Accessibility

Access to computers and connected network services, such as the WWW, need to be readily available without major barriers, for the use of ICTs in education to be effective for anyone, anytime and anywhere.

Accessibility to ICTs in education requires adequate bandwidth, unrestricted copyright, the use of agreed technical standards, and products such as computers, middleware and software.

Bandwidth for education, especially in schools, is a major issue because the numbers of learners who may access online services at any one time does require generous broadband provision. In Australia, education authorities have made considerable inroads in the provision of bandwidth to schools and networking within schools. However, public provision of suitably priced broadband for education by telecommunications utilities in Australia is sadly lacking.

Currently, Australia ranks 17th in the OECD countries with about 14% broadband access according to recent OECD statistics. Such low provision bodes poorly for Australia where 81% of the workforce is occupied in the service industries which rely on access to information. If education is to flourish in a knowledge economy with high levels of literacy and numeracy as goals, then education must be better provisioned in regard to accessibility especially broadband provision.

6.2 Flexibility

In the report, Australia’s Future Using Education Technology, Spring categorises five modes of elearning. There are, he states:

… five different modes in which elearning can provide substantial gains in effectiveness, quality and cost benefits

  Classroom interactive learning between students and teachers and among students.

  Independent learning where students or teachers are learning and studying alone in a variety of environments and modes including aspects of self directed lifelong learning.

  Networked learning through contact with groups, individuals and sources where quite different influences and experiences are creating a qualitative difference to both standard and blended learning.

  Organisational learning including learning communities, learning precincts and learning cities.

5 Comparison of OECD broadband markets, OECD May 2006 (data Dec 2005), Wairua Consulting
Managed learning where education technology is creating, through computer managed communication and learning management systems, capability to enable teachers to negotiate and provide individualised curricula and learning experiences for students. (DEST, 2004, p29)

This is a good categorisation of the different modes of elearning and indicates the degree of flexibility that may be required for teachers and learners to apply for effective learning.

Although there will be different costs for each mode of elearning depending on the scale of implementation, and the levels of access and services made available, the different modes of elearning do provide a challenge to traditional teaching and learning.

One of the challenges for teachers, in an age when quality global information is available, may be to re-examine the most effective role for a teacher in supporting learning. One of the inescapable conclusions will doubtless be that teachers need to become experts in the processes of learning which varies from learner to learner and is contextually bound.

### 6.3 Shared vision

The high cost of implementing large scale WWW services for educational use in schools and the requirement for the application of consistent technical standards to ensure that seamless connections and effective information transfers occur, does require careful planning and collaboration among education authorities.

Collaboration can only be effective where a vision for improvement and a better future for education are shared. A shared vision requires leadership for an idea that focusses minds towards agreed targets. The agreed targets need to be both be measurable and a celebration of success.

The vision and targets for the implementation of ICTs need to be considered following an examination and reflection of what is happening globally in education and what is feasible at the national, regional and local levels.

One useful document that examines this issue is the *Australian Contemporary Learning: Learning in an Online World* published by the Australian Ministers of Education. This document can be accessed at: http://icttaskforce.edna.edu.au/icttaskforce/Jahia/home/pid/18.

### 6.4 Collaboration

In discussing accessibility, flexibility and a shared vision in the above sections, there has been an assumption, both implicit and explicit, of collaboration and cooperation at national, regional and local levels.

Although decisions at a national level in Australia have focussed on policy, infrastructure and standards, these decisions have been made using regional collaboration. Collaboration can assist to ensure that resources are used wisely and that regional educational leaders understand what shared resources are being made available nationally that can be further enhanced at the local level.
Collaboration occurs when groups come together to share a vision, agree targets, resources and timelines and share commitment to a project. For a brief and succinct summary about collaboration, the document *Collaboration Principles and Practices* (*education.au limited*, 2004) is a useful starting point. It can be accessed at: [http://www.educationau.edu.au/jahia/Jahia/home/pid/167](http://www.educationau.edu.au/jahia/Jahia/home/pid/167).

This document identifies a number of needs including policy leadership at national level, educational leadership to inspire professional educators and management leadership to assist Principals and local education authorities.

Arguably, educational leadership and inspiration, to improve learning outcomes and improve teaching capability without increasing teacher workload, is the most important aspect of the change process that will be initiated with the implementation of the use of ICTs in education. Leaders will need to be open minded about educational improvement and change because the use of ICTs in education will challenge many of the existing educational assumptions about learning. These assumptions arose in the industrial, factory based manufacturing era and although they remain applicable to education today, they are not sufficient by themselves to engage learners.

For example, educators have known for many years that students learn in a variety of ways which vary depending on the topic, the people involved, the local context and many other factors. ICTs can enable different learning styles or modes to take place concurrently. This challenges some teachers’ ideas of control, learning measurement and care of educational resources. Therefore trail and error approaches to teaching, facilitated by reflection by educational leaders to find effective practices in local contexts, are essential for the implementation of ICTs to be successful.

In 2002, educators in Australia met at the first *education.au limited* Global Summit to consider major questions of policy, leadership and management for successful implementation of the use of ICTs in education and training. The key themes to emerge were needs to:

- Establish and extend online knowledge networks
- Re-conceive the role of teachers and teaching
- Leverage resources to enhance online knowledge networks
- Demystify online education
- Maintain pressure on issues of technology access
- Develop ICT skills for education and training personnel across geographical and organisational boundaries
- Establish a seamless global learning/research framework, and
- Create greater public awareness of the benefits of online knowledge networks. (*education.au limited*, 2002)

These themes have helped to drive policy considerations over the past four years, in Australia.
7 Outcomes

In discussing many of the benefits and conditions for implementing ICTs in education above, one could be forgiven for thinking that there is a big job to be done which will take a long time, use scarce resources and require extensive professional effort. Perhaps it is time in this paper to again reflect on the benefits of using ICTs in education, as the world moves towards becoming a multitude of differently focussed knowledge based societies.

The outcomes of effectively using ICTs in education can lead to:

- More engaged students
- Improved learning outcomes
- More effective teaching and learning without significant increases in teacher workload
- Reduced costs,
- Improved educational services, and
- Economic benefits.

These benefits are worth every effort. Apart from the obvious personal and social benefits of improved education, there would also appear to be economic benefits. In a recent report from the Australian Flexible Learning Framework entitled Strategic Conversations: the future of elearning (DEST, 2006), the following statement is important:

It is estimated that every 1% increase in the stock of skilled workers will lead to a 0.65% increase in gross domestic product. (GDP). (DEST, 2006, p3)

ICTs underpin skill development in today’s world and so this may be a very significant statement to consider when thinking about the benefits of implementing ICTs in education.

8 National online educational services

There are many examples of excellent national educational online services. In this paper, only a few have been mentioned. However for a comprehensive review of national education online services resulting from a global scan, the reader is referred to the research report on global gateways entitled Global Gateways: Transforming Global Gateways through Online Knowledge Networks. (education.au limited, 2004) This research is reviewed and updated every two years to keep abreast of the provision of national education online services around the globe.

This paper focusses on four such examples of innovative services only.

8.1 EdNA (www.edna.edu.au)

Education Network Australia or EdNA (www.edna.edu.au) is a free Australian repository of quality global and Australian education digital resources for schools, vocational and technical education, adult and community education, and higher education. EdNA has the capacity to locate the best digital resources in the first few search items unlike Google which may have several pages of
resources unchecked for quality. Using EdNA to find resources is much quicker and more reliable, in locating quality educational resources, than using Google. EdNA is a dedicated educational resource that is federated globally and utilises quality educational materials.

In addition, EdNA provides collaborative working spaces for educators throughout Australia where documents can be stored. IPN networking services are available, and tools and services for communication and information sharing are provided. Communities using EdNA’s collaborative services are managed by themselves. Managers of collaborative communities can elect to manage a public service that is an open service, or a private or closed service.

In a recent review of the value of EdNA, the reviewers stated:

EdNA Online provides a benefit to cost value of a least $10 for every dollar invested by the Australian government and State and territory governments. (DEST, 2004, p3)

This review undertaken jointly by the Australian Government Information Management Office (AGIMO) and DEST, using a value-demand methodology, reaffirms the cost benefits of the provision of strategically managed national online services for education.

8.2 Learning objects

A small selection of learning objects from The Le@rning Federation (www.thelearningfederation.edu.au) are presented here as examples of a large scale production of games-like interactive online activities. These learning objects are unable to be reassembled into various teaching sequences such as small modular learning objects can because they have been modelled on self contained digital interactive games. They are compelling, interactive, and relevant for Australian curriculum and have been produced at a cost of about 5c per learning object per student, for Australian and New Zealand schools.

The Learning Federation is an excellent example of collaboration to achieve economies of scale to develop online learning content. Collaboration, in this example, comprised a variety of education sections coming from several different contexts but all having a common purpose. The development costs of the learning objects was reduced through national collaboration and a concentration of expertise which has resulted in high quality digital resources. Australian and New Zealand schools will be the beneficiaries of these centrally developed learning objects which can be used in multiple ways in K-12 classrooms.

8.3 HotMaths (www.hotmaths.com)

Another innovative example of online learning comes from a privately funded service called HotMaths (www.hotmaths.com). This online mathematics service has developed extraordinary mathematics modules which can be manipulated by students and teachers to assist in learning basic and more complex mathematical concepts. HotMaths is using the best of digital technologies to assist teachers and learners. In addition, HotMaths has provided activity sheets which can be printed for use by teachers and students.
HotMaths freely provides online number practice services in the two basic arithmetic processes of addition and subtraction plus their recursive processes multiplication and division. These freely available services allow the student to measure their performance for each session to help judge improvement. The extensive lesson modules, which are world class, are available through the purchase of a license for HotMaths by education authorities anywhere.

8.4 Careers with myfuture (www.myfuture.edu.au)

The fourth and final example given in this paper is somewhat different. It is a service called myfuture (www.myfuture.edu.au) which is an Australian careers service enabling school leavers to assess the careers in which they may be interested and then to explore the courses that are available in Australia. The myfuture service enables easy access to comprehensive information to guide students through making careers choices. This pre-eminent global service is unique in the world and very important to Australian students in making career choices.

9 LMSs

The stimulation of elearning could be argued to have been driven by enthusiasts, technology vendors, educational administrators and theorists. Certainly enthusiasts have assisted in bringing technology into education and training, and educational administrators have initiated large scale projects to provide infrastructure and equipment to enable access to technology, especially internet services.

However, it has been the educational visionaries and excellent teachers that have pioneered new ways of learning using the technology. Although the road to implementing ICT in learning programs has not been easy, the rich dialogue and discussion that has occurred about implementation experiences has helped enormously to share and improve conceptual thinking about new ways of learning.

Some examples of such rich dialogue can be seen on:
- collaborative spaces (http://www.groups.edna.edu.au/course/view.php?id=40),
- blogs (http://www.elearningcentre.co.uk/eclipse/Resources/elblogs.htm),
- wikis (http://en.wikipedia.org/wiki/Elearning) and
- web sites (www.edna.edu.au and http://www.groups.edna.edu.au/).

Teachers and visionaries have experimented with software that has come to be known as learning management systems (LMS). Companies marketing LMSs into education and training have done so under the banner of elearning.

Commercial LMSs are usually closed software packages that deliver and manage content such as courses, as well as allowing some group discussion, management of records and student engagement in courses. LMSs have been used very successfully in distance education where course delivery and student management are important. Some examples of commercially provided LMS packages used in Australia are WebCT (www.webct.com), Blackboard (www.blackboard.com), TopClass (http://www.wbtsystems.com/) and Janison (http://www.janison.com.au/janison/default.asp). Teacher
and learner choices in operating these systems are limited as they are designed as distance education delivery packages.

Distance education is primarily focussed on delivering traditional curriculum, to be undertaken within a specific time frame and proceed at a predetermined rate, but also has a separation of perceptions between teacher and learner. Stephen Downes (1995) would argue that much of the early work in distance education about course delivery has been adapted for use with the internet and online educational services.

In a social constructivist approach to learning social and interactive processes are considered to be essential to learning. In his excellent article Social software: Elearning beyond learning management systems, Dalsgaard goes further and suggests:

The approach to elearning … suggest that focus move away from learning management systems. Instead of integrating all functions within a system, the approach suggests making available several separate tools to support different needs of students – in other words providing students with a tool box of different opportunities (2006, Dalsgaard).

Recently, a number of open source tool set software packages have emerged which have shown the way to a new genre of elearning tools. Two well known Australian software packages are Moodle (moodle.org) and the Learning Activity Management System (LAMS) (http://www.lamsinternational.com/), and in North American, a package called Sakai (http://www.sakaiproject.org/).

The above mentioned packages have been designed for education by educators and have been based on sound learning theories of connectedness and social constructivist learning. Teachers and learners are able to select the most appropriate content, services and networks for their learning programs. These open source packages also enable teachers and learners to choose how they wish to work.

10 Simplicity

Learners and teachers are busy people, especially in schools. Their time is limited and often constrained by other factors such as school events, timetables and administrative requirements. Learners and teachers need to maintain their focus on learning activity without disruption by the tools and services that they use.

Online learning environment services used in schools therefore need to be fast; they need to be easy to install; they need to be cheap and finally, they need to be very simple or intuitive to use. In this way using online learning systems could become seamless with learning activities.

The need for fast operating speed seems obvious. However, many online learning services and tools do not take this into account sufficiently. Access to sufficient bandwidth is absolutely essential for successful use of online learning services in schools.
Often when using online learning systems, there is the need to install an additional module or add-on or program extension. When confronted with the need to install additional tools or services, then installation needs to be very easily accomplished. If this is not the case then the learning momentum can easily be lost.

Schools have many pressures for funds, not the least of which is associated with resources, information, services and tools for learners and teachers. Content, information, services, and tools can be expensive, especially for limited or selective use in learning programs. This usually means that they need to be inexpensive or cheap for use in schools.

Finally, resources, information, services and tools need to be simple, almost intuitive, to use. There is nothing more frustrating for a learner or teacher than to be confronted with complex or difficult interfaces with online services.

In summary, online learning services for use by learners and teachers need to be quick (Q), Easy to install (E), Cheap (C) and Simple (S) to use. As an acronym we will call this QECS. If an online learning system is not QECS, then learners and teachers will avoid its use.

Learners need to be able to enter and leave online services at any stage. In addition, the capacity of online learning systems to store documents, working sheets and the like, and to save searches, links, content, activity progress and other necessary items, are also important. This aspect of enabling online learning services to be personalised can assist learners and teachers to be more effective and efficient.

Teachers need to be able to arrange a service to suit the requirements of their learners. In doing so, a form of customisation can enable preparation for whole class groups, small groups or individual learner assistance.

Besides being QECS, online services need to also have the capacity to enable learners and teachers to customise and personalise the online services that they use. Customisation and personalisation should be considered fundamental to the selection of any online learning service in education.

11 On the edge

Some examples of different online web services that use IPN are notschool (http://www.notschool.net/what/) in the UK and ischoolwebmedia (http://ischoolwebboard.orgfree.com) in the Philippines.

In the words of the notschool program, a spin-off from FutureLab which is represented in Australia by education.au limited:

Notschool.net is an online research project looking at ways of re-engaging young people at school age back into learning. These young people have been out of the more traditional educational systems for a variety of personal and logistical reasons.
They include the phobic, ill, disaffected, sick, pregnant and the excluded. Notschool.net is specifically aimed at those for whom traditional alternatives such as home tutoring had not worked (2006).

Notschool has used IPN to re-engage students who have dropped out of school by focussing on learning without the rules of institutions to intrude. This research project in the UK has clearly demonstrated that students want to learn and provided another forum for them to enter learning environments.

The ischoolwebboard (CICT, 2006) managed by John Macasio in the Philippines is a concept that is well worth utilising in education. It is based on the fact that there is ample high quality content available for use in education and that the applications to run and manage set of carefully selected tools are also available freely. Both assumptions are true. There is ample high quality content and services available freely on the web and the tools to use them can be accessed and used freely.

The ischoolwebboard has gone one step further than many similar Free and Open Source Software (FOSS) projects in that the selected software has been matched against the curriculum in the Philippines. That means that teachers can use content directly relevant to their curriculum and learners can use sets of tools that are suitable to them that match their learning styles and the projects at hand.

## 12 A way forward

The way forward in education is clear. There would appear be to be two main elements, the first of which is openness and the second sharing.

Education is a profession which has shared professional practice world wide much in the same way as science has been for centuries. In this sense, openness has been welcomed and applauded and should continue to be so. Closed services are not consistent with educational usage. Highly valued services in education will be through open networks with open content and open web services.

Already some excellent world-wide services are beginning to emerge. Three examples from an ever increasing pool are the Ubuntu project emanating from South Africa (http://www.ubuntu.com/), the SUN Microsystems Global Education Learning Community (https://edu-gelc.dev.java.net/nonav/educators.html) which seeks to provide the best of open content and Intel’s Skoool-Learning Teaching and Technology (http://lgfl.skooool.co.uk/content.aspx?id=80).

However, an even more set of powerful tools have emerged in the Interactive Personal Networking (IPN) space. Services such as MySpace (http://www.myspace.com/), FaceBook (http://www.facebook.com/), Wikipedia (www.wikipedia.com) and Flickr (www.flickr.com) and many others have captured user’s attention.

The advantages of IPNs are their interactive and social nature, their capacity to personalise and share information, networks and resources (text, audio, graphics, and video), and their functionality in micropublishing views and opinions. As White (2005) suggests:
An integrated suite of online services needs to include choice for learners and teachers to be able to select the sources of services, information or data to suit the context of their learning programs.

The use of open content and services can be integrated into educational services for use as IPNs to provide learning services that engage and support learning.

13 Emerging technologies

There are four excellent reports available about emerging technologies which come from Australia, the UK and the USA. In Australia, education.au limited completed Emerging technologies: a framework for thinking for the ACT Department of Education in 2005. This report can be accessed at: http://www.educationau.edu.au/jahia/Jahia/home/pid/52. The report from BECTa in the UK, titled Emerging technologies for learning (2006) is available at: http://ferl.becta.org.uk/display.cfm?resID=15793. The reports from the USA have been undertaken by the Consortium for School Networking (CoSN) and are available for members only: Hot technologies for k-12 schools (2005) and Collaborative technologies (2006).

Another report worth noting is mLearning in education (2006, education.au limited) which is an excellent summary of mlearning projects in Australia, UK and USA. The paper clearly links mlearning with sound education and provides ways that educators can use mobile learning that are emerging from trials and pilots in the three countries.

These five reports are quite consistent in suggesting that education needs to take the new technologies on board firstly in assessing their possible effectiveness in education through trials and pilot studies and secondly, selecting content, networks and services using criteria for openness and sharing. This paper has put forward the criteria used by Stephen Downes (see above) as the best available today. Once content and services have been selected using these criteria then it is the teacher’s task to decide their educational soundness within the context of the curriculum.

There is some concern expressed in these reports that rather than studying the possible potential use of new technologies and devices that the norm in education is to ban their use because they are not consistent with traditional didactic education. This is a worrying trend as young people will lose faith in an education service that is anachronistic in their view and secondly, it could mean that our education services are failing learners. The use of technology especially through IPNs and open content, networks and services is the future of education.

One way to get started to understand the potential of IPNs is to spend some time exploring the Web 2.0 software available. There are two suggestions made here. The first is to explore EdNA Groups http://groups.edna.edu.au which uses a huge list of IPN software and is free for education in Australia. EdNA Groups provides services such as:
### EdNA Groups IPN functions

<table>
<thead>
<tr>
<th>Blogs</th>
<th>Discussion forums</th>
<th>Survey creation</th>
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</thead>
<tbody>
<tr>
<td>Wikis</td>
<td>File sharing</td>
<td>Live Chat</td>
</tr>
<tr>
<td>Web page publishing</td>
<td>Shared Calendar</td>
<td>Quiz creation</td>
</tr>
<tr>
<td>Assignment submission</td>
<td>Database module</td>
<td>Personalised view (My Groups)</td>
</tr>
<tr>
<td>Instant messaging with members</td>
<td>RSS feed aggregation</td>
<td>Learning design (LAMS)</td>
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<td></td>
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<td>Repository module</td>
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<td></td>
<td></td>
<td>Repository API</td>
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<tr>
<td>Journal</td>
<td>Theming</td>
<td>Image database</td>
</tr>
<tr>
<td>ELGG</td>
<td>Podcasting</td>
<td>Web conferencing</td>
</tr>
</tbody>
</table>

A second way to get started is to explore the best of Web 2.0 software with a view to use in education as an IPN service or tool. One of the best lists available has been produced by Dion Hinchcliffe and can be accessed at: [http://web2.wsj2.com/the_best_web_20_software_of_2005.htm](http://web2.wsj2.com/the_best_web_20_software_of_2005.htm)

### 14 Conclusion

This paper suggests that open content, networks and services built on open standards and provided with open IPN tools can allow educators to devise very powerful learning services for teachers and learners mapped to any curriculum. IPNs can extend the reach of education to communities not traditionally served well by institutions and to communities of learners, teachers and parents.

The cost and expertise in developing such services will remain with educators in presenting the content and services, and judging their appropriateness. Of course adequate access to internet and world wide web services is a necessary condition to begin to take a productive part in the knowledge era in which we currently exist.

What is needed in education and training now and in the future is a web of trust where educators, learners and their supporters can be authenticated, that is, identified, and authorised to use quality content and services with a wide range of supplied IPN tools.

### 15 Bibliography


