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E-learning in Science and Design and Technology : Proceedings of IDATER on-line conference 2005 - 2006

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**E-learning
in Science and Design and Technology**
Proceedings of IDATER on-line conference 2005 - 2006

Edited by Howard Denton, Gren Ireson and John Twidle

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The reader may access all papers with hypertext links by visiting the Loughborough University Repository at:

<http://dspace.lboro.ac.uk/dspace/>

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E-learning in Science and Design and Technology

Proceedings of IDATER on-line conference 2005 - 2006

Introduction

A background to IDATER

In 1988 the Department of Design and Technology at Loughborough University launched the first *National Conference in Design and Technology Educational Research and Curriculum Development*. Growing each year, the Conference went international with the first IDATER conference in 1992. This grew to become one of the most significant research conferences in its field and the Conference Proceedings became standard reference sources for those involved in design and technology education research and curriculum development across the world.

From the beginning, the Conference aimed to provide a forum for both practitioners and researchers in the field of design and technology education. This ranged from primary schools, through secondary and higher education. Through the mechanism of Special Interest Groups (sigs) established by conference delegates rather than conference organisers, the emerging research agenda was set.

As part of the IDATER 2000 programme an on-going research seminar was established to discuss international research collaboration and extend the conference beyond a specific annual gathering. At the same time it was acknowledged that rising costs meant that members could not attend in the numbers required for a viable and vigorous international conference. It was, therefore, decided to build upon the IDATER research seminar concept and develop a rolling on-line, e-conference. This book is the hard-copy record of the first of these e-conferences; in this case aimed at *e-learning in design and technology and science*.

By adopting an e-format the Conference was able to offer members several advantages:

- the Conference could run over a longer time frame than a conventional conference;
- delegates had the opportunity to consider, at length, any paper as opposed to a more usual 15 or 20 minutes;
- an international audience could be reached with minimal cost to both presenters and delegates. This, particularly, opened opportunities for practitioner based research;
- a series of conferences with specific foci could be run.

Each e-conference will be opened with a set of invitation papers acting as stimuli for discussion, by authorities in the particular field under consideration. Papers can be submitted for full, double blind refereeing or more simply as curriculum development papers. In addition on-line forums are possible. Each conference will close after a suitable period and all papers will be archived through the Design Education Research Group ([DERG](http://idater.lboro.ac.uk/)) at Loughborough University for free on-line access (<http://idater.lboro.ac.uk/>). In addition a hard copy will be made available, this book being the first in the series.

This publication

This book has 2 roles. Firstly, to bring together up-to-date contributions to the field of e-learning. Secondly, to provide a vehicle for practitioners in the fields of science and design and technology to share good practice.

E-learning is taken to mean any technique which employs ICT-based equipment to facilitate learning. Examples could include web-based materials at either Intra or Internet levels and stand-alone materials used in classrooms such as practitioner generated interactive databases etc.

There are three sections:

- Lead papers from authorities in the field of e-learning;
- Papers which have been subjected to double blind peer review;
- Curriculum development contributions from practitioners (non-refereed).

Lead papers

The first lead paper, ***e-learning as technology, e-learning as learning***, by Torben Steeg explores two themes: Firstly, what we understand about the economic, technical and social impacts of new technologies and how this might relate to the complex range of technologies that fall under the title 'e-learning'. It argues that detailed exploration of the likely impacts of various e-learning technologies is a key task. Secondly, understanding of how learning happens, from a constructivist viewpoint, is used to develop a set of criteria against which e-learning approaches can be judged.

The second lead paper is by Patrick Fullick: ***Classroom and chatroom: why school science pupils should discuss practical science work on-line***. This argues that such discussion may, if suitably managed, lead to increased understanding among pupils of the nature of science. The author also argues that the rapidly increasing use of networked computers (in schools and at home) provides a natural way of doing this.

The third lead paper offers a very important warning to the limits and limitations of Internet-based learning. Tara Brabazon, in ***BA (Google): graduating to information literacy***, argues that the increasing use of the web and search engines such as Google by students is having seriously negative effects on their abilities to develop arguments and take well informed decisions. She points out that while search engines enable the rapid collection of data from web sources, those sources are not, necessarily reliable or appropriate. She notes that 'making students think, rather than assume, and read rather than cut and paste is proving a challenge'. This is a particularly timely warning. The problem is not confined to students; staff may fall into the trap of constructing e-learning materials where there are multiple links and the student need go no further than the virtual boundary of the site.

Refereed papers

Within this section there are six papers. These are presented in the following sequence. Firstly Peter Simmons and Kevin Badni offers a review of the literature on website effectiveness, noting that the impact that websites have is rarely assessed in an educational context. It identifies three distinct phases of effectiveness: before use, during use and after use. The paper uncovers gaps in the research in two areas; primarily a need for further research concerning influence after a website has been used and requirements for ensuring a wide knowledge of the websites existence. The paper also discovers some conflicting ideas of importance between a websites' usability and likeability.

The second paper offers a discussion of constructivist theory relating to the use of a virtual reality learning environment (VRLE) to assist in the teaching of ideation in Icelandic schools (Thorsteinsson and Denton).

The third paper (Wishart) issues a timely warning of safety issues relating to Internet use in schools and is based on an audit of Internet safety practices in English schools.

The fourth paper looks at the way use of the Internet has been promoted by government bodies in the UK. Pritchard shows how the National Curriculum in England includes schemes of work aimed at helping pupils search large databases, the Internet and interpret information. It is noted that levels of engagement in learning can be enhanced using this technology.

The fifth paper provides an example of the use of specific desktop computer based software to enhance student understanding of classification in science lessons. Chapple and Simpson describe using Inspiration, PowerPoint and MicroWorlds to build dichotomous keys and represent the data.

The final refereed paper, by Denton, describes the development and evaluation of a virtual learning environment (VLE) to support conventional studio based design work by undergraduate industrial designers. This VLE was designed and operated on a university intra-net; that is it was accessible only to students of that university, though they could be anywhere in the world. The VLE also offered links to appropriate sites, verified as authoritative by staff, which lay in the wider web based world.

Curriculum development papers

There are eight papers presented by practitioners. The first, by Turner describes her progress as a trainee teacher in terms of learning to use the Internet to support her teaching. The process of professional reflection described is a valuable reminder of the difficulties some staff experience in using these technologies.

Following this there is a set of four papers based in teaching and learning science within schools. Simpson and Chapple describe their experiences incorporating e-learning into a Year 8 ecology study unit. Ellison gives illustrations of good practice in the use of Inter and Intranets in her school. Walsh describes an online approach to teaching a General National Vocational Qualification (GNVQ) science course using digital materials produced by 3E's Multimedia delivered via the Digitalbrain platform. Gammon then describes some of the strategies she uses with search engines and the Internet to provide a more interesting approach to the topic of animal classification.

Pritchard looks at using the Internet to support designing and making activities in schools. He describes how websites can offer pupils different ways of gaining insights into scientific and technical principles relating to design and making and how the National Grid for Learning can support the busy teacher.

Kennedy and Turner provide a useful guide for using HTML in the production of teaching materials. Finally, these authors also present a paper on an interactive web-based virtual experiment as a teaching and learning resource.

Forthcoming publications in this series include Action Research in Science and Technology Education and Technology and Designing.

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BA (Google): Graduating to information literacy

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Academic research involves three steps: finding relevant information, assessing the quality of that information, and then using appropriate information either to try to conclude something, to uncover something, or to argue something. The Internet is useful for the first step, somewhat useful for the second, and not at all useful for the third.

Beth Stafford (1999: 145)

A problem has emerged in my teaching during the last three years that requires attention. As each semester progresses, a greater proportion of my students are reading less, referencing infrequently and writing with little clarity and boldness. There will always be the top twenty five percent of the class who are rigorous and committed scholars in the making. They require little meta-learning, but can operate in models of student-centred teaching and facilitation. Increasingly the middle fifty percent - that require greater guidance, attention and commitment from teaching staff to pass a course - is producing inadequate work. This group writes assignments days before they are due, runs a spelling checker through the document rather than draft it, and relies on the internet for research material, rather than refereed course readings. These problems are not caused by Google. Technology is never the cause of societal problems, inside or outside a university. Instead, the popularity of Google is facilitating laziness, poor scholarship and compliant thinking. It is a panacea for our time-poor students.

This paper conducts a thought experiment. I locate 'a teaching problem,' use literacy theory to understand it, and then offer solutions. I can no longer assume that students enrolled in an Arts degree enjoy reading and writing or are intellectually curious. My goal is to develop an information scaffold, attempting to align my goals and expectations with a student desire for educational achievement.

Google time

Google, and its naturalized mode of searching, encourages bad behaviour. When confronted by an open search engine, most of us will enact the ultimate of vain acts: inserting our own name into the blinking cursor. This process now has a name: googling. It is a self absorbed practice, rather than outward and reflexive process. It is not a search of the World Wide Web, but the construction of an Individual Narrow Portal.

It is important to be completely honest about the internet – let alone the web – being searched by Google. The web is large, occasionally irrelevant, filled with advertising, outdated and increasingly corporatized. It seems appropriate that Google is ubiquitous at the moment when teachers and librarians are overworked and less available to see students. David Loertscher confirmed that

Search engines such as Google are so easy and immediate that many young people, faced with a research assignment, just 'google' their way through the internet rather than struggle through the hoops of a more traditional library environment (2003: 14).

There are consequences for the proliferation of Google, which is the most popular search engine, but not the most effective for all research tasks. AltaVista has more features and search capabilities. Google is also heavily immersed in the English language, which creates a shielded world view and increasing marginalization of indigenous vocabularies. There is a reason for the limited vista of this virtual landscape.

Larry Page, one of the founders of Google, developed the technology while a doctoral candidate in engineering at Stanford. The word Google is derived from the mathematical term googol, a one followed by 100 zeros. This origin is important, as founding ideologies invariably frame the meaning of structures in the long term. The cultural orientation of the search engine was engineering, not education, library, internet or cultural studies. There is a suite of Google products, including the image search, a Usenet discussion service, Froogle – a virtual shopping mall - and a catalogue search. In November 2003, a new software package – the Google desk bar – was released, which allowed the user to access the search engine without opening a new web browser. The software was released for free because of the exposure granted to the logo.

The underpinning technology for Google is PageRank, which is an 'objective' measurement of important web pages assembled by the number of links that point to them. Therefore Google ranks their search results via the number of links and hits to that site. For example, when "Tara Brabazon" is entered into Google, the number one returned search is my Home Page, the site developed (by me) to promote my career. It is an advertisement. The links with less hits, but perhaps more critical information, are far lower on the ranking. My personal web page has so many hits because a link is presented at the bottom of each email I send from my work computer. Not surprisingly, hundreds of curious undergraduates with a bouncy index finger click to their teacher's profile. This is one example from one person. Ponder the more serious consequences when students click onto highly ideological sites that are assessed by popularity, not importance or significance. There are many other ways that this ranking could be assembled. The assumption of Google is that popularity is synonymous with quality. Pop Idol, American Idol and Australian Idol were popular. They did not promote quality singing. Google is the internet equivalent of reality television: popular, fast and shallow.

The success of Google is of such a scale that it is one of the few products and nouns that has transformed into a verb. Googling has become a verb for surfing, following a similar path to Xeroxing and Hoovering. Like these other nouns turned verbs, it is a standardized response to plural and complex problems. Photocopying requires an understanding of copyright law as much as where to insert paper into the Xerox machine. House cleaning requires time, rather than simply the purchasing of a Hoover. These nouns-turned-verbs make us forget about process, structure and obstacles. Googling is a one-size-fits all response to information sharing, and assumes that a user has the literacy to not only utilize the search engine but the interpretative skills to handle the results.

By December 2002, Google indexed three billion web documents, and supported 150 million searches a day. Profitable since 2001, it won the contract to be AOL's search engine and handles 75% of searching traffic (Clyde 2003: 44-45). In 2003,

the Expanded Academic Database, one of the most important full-text databases for education and the humanities in particular, also featured a link to Google at the top of every search page. Teachers and librarians need to encourage refereed research, stressing that Google is the start – not the entirety – of a search. There are major consequences to our students, their future and our educational system if we are apathetic rather than pro-active in the building of an information scaffold, rather than allowing a search engine to define the parameters of effective research.

Earlier this year, I was asked to assist two colleagues in a Sydney school. Jacinta Squires and Lee FitzGerald, a high school teacher and teacher librarian respectively, conducted action research on the information scaffold constructed by their students, and the consequences to learning outcomes. They discovered when surveying high school history students that they use Google as a first search, and mobilize the internet ahead of books. They also showed that the students hardly ever read learning outcomes, marking criteria or the library catalogue. Significantly, students also accessed encyclopaedias for gaining information. Squires and FitzGerald's action research is timely and important, but has profound consequences when students make it to university.

Students commence my first year course demonstrating superficial research and comprehension skills, and awkward writing modalities. They presume that if something is written down, then it must be correct. Making students think, rather than assume, and read rather than cut and paste is proving a challenge. Let me display what was submitted to me in 2003. It provides an indication of the problems I am trying to correct. To my embarrassment and horror, here is an example of a bibliography submitted for my 'research paper' at University level.

Reference List:

<http://www.beatlesagain.com/breflib/love.html>

<http://www.beatlesagain.com/breflib/teens.html>

http://ia.essortment.com/historyoftheb_rmdq.htm

<http://www2.canisius.edu/~dierenfb/his389.htm>

<http://www.beatlesagain.com/breflib/teens.html>

I provide students with a course reader of one hundred extracts from books and articles, featuring the most relevant and important material in a subject area. This student has ignored all this material – on popular music, youth culture and fandom for example – to write a paper on the Beatles using a Google search for “Beatles fans.” My comments on this bibliography were clear.

Reference List:

<http://www.beatlesagain.com/breflib/love.html>

<http://www.beatlesagain.com/breflib/teens.html>

http://ia.essortment.com/historyoftheb_rndq.htm

<http://www2.canisius.edu/~dierenfb/his389.htm>

<http://www.beatlesagain.com/breflib/teens.html>

You must never
use internet-based
sources as self-
standing references.

Where are your readings
from the course?

Another example where a student wrote a paper on "Asian gangs" reveals the problem in an even more troubling fashion. Instead of questioning how and why Australian police single out Asian citizens, the student did not deploy this level of interpretation, but merely took information from highly politicized sites.

2020/18/21

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<http://www.gangland.net/Yakuza.htm>
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<http://www.cgiaonline.org/gangs2000/asian90s.html>
[Accessed 30 October 2003]

Highly racist statements splattered from this bibliography and into the essay, with assumptions expressed about "Asians" being intrinsically violent, tribal and insular. Once more, she inserted "Asian Gangs" into Google and these results emerged. These bibliographies occurred even after I placed the following information in their study guides.

In terms of research material, please remember that I reward a diversity of media in my marking. In other words, I will not be happy if a student constructs an essay on refugees or Kill Bill, taps into Google and constructs a bibliography of sites. The net is an important, diverse database but it also

has major limitations. Your effort in seeking out textual diversity will be rewarded (Brabazon 2003: 9).

Students ignored this warning and utilized the most simple of searches, not even bothering to deploy course readings that had been photocopied for them.

Google standardizes searching at the time when there is a great diversity of both information and users. In a fast food, fast data environment, the web transforms into an information drive through. It encourages a “type in-download-cut-paste-submit” educational culture. A 2001 study reported that 71% of American students relied mostly on the internet for major assignments at school. In this same study, 24% relied mostly on the library and only 4% used both the internet and the library (Lenhart 2001). My aim is to lift that 4% figure so that students are actively moving between the digital and the analogue, the unrefereed web and scholarly databases. Angela Dudfield described this intellectual mobility as “hybrid forms of literate behaviour” (1999).

Google has increased the accessibility of web sites, transforming the landscape of digital information into a manageable formation. It also encourages sound bite solutions that are not researched or theorized. In such an environment, we have to encourage intellectual rigour in an edu-tainment landscape. Google makes searching for information more democratic, but it is also demeaning of the critical and creative thinking involved in well-planned research strategies and refereed scholarship.

Being literate

The future requires no footnotes.
Heather-Jane Robertson (2003:380)

Literacy takes many forms and is saturated with the political interests and investments of myriad groups. My concern with the scale of reading and research deployed by my students opens an envelope of ideas about how literacy is shaped and changed through the digital environment. Such a study is not technologically determinant, but places the internet in a socio-cultural context of education. The problem is not Google. The problem is that I am teaching a cohort of students who are the first generation in their family to attend University, are in part-time work, and do not have either the experience or expectations about the requirements of advanced and internationally-competitive scholarship. My words here must not be taken to suggest that first-generation students should not be admitted to University. My brother and I were the first generation in my family to attend University. I remember the feelings during my first year: panic, confusion and little understanding of teacher’s expectations. However instead of ignoring the set texts, I took the opposite path, reading everything on course lists. This effort was triggered by fear (of failure) and uncertainty about expectations and standards. Crucially though, the proliferation and popularity of the internet and the World Wide Web in education has confirmed that literacy is not an endpoint - a skill to be achieved - but a process of ongoing development and change. Colin Lankshear has shown how reading and writing are social practices that require context to grant meaning. He stated that “literacies are inseparable from practices in which they are embedded and the effects of these practices” (1998: 44). This paper, through the investigation of critical and interpretative literacies in the digital environment, demonstrates that the ability to decode text on a screen does not always create an apparatus to transform information into knowledge. In creating a “New word order,” (Lankshear 1996: 47) there is need to create the participation, building and

translation of information platforms to facilitate conditions conducive to learning and teaching. New 'basics' emerge through the movement from Fordism to (Post) Fordism, aligning with other changes to capitalism and the nation state. The older forms of literacy, based on encoding and decoding, need grafting to higher level comprehension skills. Post-Fordist theorists such as Richard Florida, by acknowledging the casualized and flexible workforce, are translating the languages and imperatives of capitalism by stressing innovation and creativity.

The argument is that creativity is required to foster economic productivity and competitiveness, which then enables (and intertwines) globalization and information technology. For teachers, this social and economic transformation appears to encourage an investment in training and life-long learning. Clearly though, there is much of the old economy in this sexed-up new economy. What I am seeing in my classroom is approximately half of each year's cohort placing education, research and scholarship very low on their list of priorities. Ironically, in the midst of the knowledge economy, students are less creative, innovative and dynamic. Dick Hebdige stated that,

With the public sector, education, the welfare state – all the big, 'safe' institutions – up against the wall, there's nothing good or clever or heroic about going under. When all is said and done, why bother to think 'deeply' when you're not being paid to think deeply? (1988: 167)

Hebdige published these words in 1988. His analysis is even more shockingly accurate in the 2000s and provides a context for student behaviour. They are writing Fordist essays: mass produced papers with standardized search engines. Supposedly, an education geared for an assembly line is inappropriate in the midst of a 'creative' Third Way. When Tony Blair stressed the changes to the economy in his 1997 election campaign, he concurrently placed education (education education) as his top three priorities (Coyle: 2001, 46-54). The reason was clear: knowledge is not only something to teach or share, but exploit. Literacy theorists need to monitor these changes in language, work patterns and technology. If the knowledge economy is to be more than a slogan of the Third Way political agenda, then a negotiation of critical literacies must be granted primary attention.

The difficulty is that most literacy debates focus on student 'problems' in reading and writing, and the methods used to 'correct' or 'solve' these problems. A culture of blame and guilt is established. For example, the front page of The Australian's Higher Education Supplement on April 21, 2004 screamed the headline "Phonics at core of new literacy war" (Cooper: 2004, 21). This newspaper article presented (again) the controversial split between a whole language approach, which encourages students to use context and visual clues to 'decode' the meaning of words, and phonics, which relies on decoding words by breaking them into syllables. What the story did not stress was how different students learn in distinct ways. 'Testing' is seen to track or represent 'learning.' But testing and learning are different cultural formations. Invariably meta-skills – such as an awareness of what is not being asked in a test and why - are difficult to assess, but usefully arch beyond formal education. Further, there is no discussion of the framework in which this literacy war is being waged. Luke placed this debate in context.

This may be the story of literacy education in the late 1990s. It is not a story about the triumph of method but a story about government cutbacks and institutional downsizing, about shrinking resource and taxation bases, and about students and communities, teachers and schools, trying to cope with

rapid and unprecedented economic, social and technological change (1998: 301).

Instead of placing attention on ahistorical 'national standards,' with little attention to technological change or resourcing, literacy teaching and learning needs to be situated within economic and political conditions. The past can never be an indicator or method to evaluate current literacy standards as demographic changes through immigration, and political critiques such as through feminism, have radically altered the meanings and appropriateness of teaching, learning and curricula development. Capitalism is changing: literacies morph in response. An important part of this discussion is a recognition that 'acquiring' literacies rarely occurs solely in an educational institution, but reinforces the skills and ideologies taught in the home (Gee 1991: 9). Formal education is a place to practice already existing knowledge and abilities. The different approaches to literacy development – such as whole language, phonetics, genre pedagogy and critical literacy – also need to monitor the relationship between young people, poverty and literacy. Too often encoding and decoding text is a marker of intelligence, rather than (only) an opportunity to learn and practice encoding and decoding.

In such difficult times, when we are frequently teaching undergraduates who have no idea why they are at University and are ill-prepared for the rigour of scholarship, teachers can become desperate and vulnerable to the promises of technology. Student enrolment figures are increasing with the desire – initiated by Tony Blair but providing a model for Australia – to have half the cohort of young people in tertiary education (Teichler 2003: 171-185). Standards of achievement for our students are changing, and forcing teachers each day to ask about the acceptable parameters of research, writing and scholarship. The movement to mass participation has emerged concurrently with a decline in public funding for Universities. Internet-mediated communication seems an ideal solution to overcrowded tutorial rooms. However (well funded) research has failed to find concrete, verifiable and positive correlations between computer-mediated education and student achievement (Cuban 2001: 178).

Critical literacy is an ambiguous but important phrase, confirming that discussions of literacy must move beyond print-based representations and into how texts are building blocks of identity. There is a gulf between competency-base literacy – encoding and decoding – and critical literacy, which – to cite Macken-Horarik – "problematizes the relationship between meaning making (reading and writing) and social process" (1996: 75). She argues that critical literacy is not an 'add on' to literacy debates, but requires a mastery of everyday, applied and theoretical knowledges before moving to a reflexive negotiation of a knowledge area, text or language (Macken-Horarik 1998: 77).

Mary Macken-Horarik's Model of Literacy

Everyday	Applied	Theoretical	Reflexive
Diverse and open ended	Attaining a particular expertise	Gain disciplinary knowledge	Negotiation of social diversity
Confluent with spoken language	Use of spoken and written words to enable activity	Production and interpretation of epistemic texts	Probing assumed and specialized knowledge systems
Moving through roles and relationships in the family and community	Skill-based literacy	Situated in educational learning environments	Finding alternatives
Personal growth literacy		Specialized literacies	Challenging commonsense
		Assimilating and reproducing knowledge	Meaning determined through diverse media
			Critical literacy

Table based on Mary Macken-Horarik (1998:78).

The question is if – and then how – internet-mediated information encourages or facilitates the movement from the everyday to the critical. Google searches use conversational language and gather superficial information about many topics. By Macken-Horarik's definition, there is little encouragement to gain dense or deep expertise through applied, skill-based critical literacy. Further, with Google hits ranked by popularity rather than interventionist librarianship, disciplinary knowledge and expertise in methodology and epistemology is lacking. Seeing alternatives and negotiating social diversity is difficult to initiate with the majority of websites in English, and the saturation of Google in national languages.

It is necessary to focus time and attention on the building of an information scaffold, to orient students into the world of the text, so that they are able to evaluate Google searches – and websites generally – by moving outside the digital environment and into other media. To obtain this goal, Macken-Horarik recommends teaching strategies that facilitate “explicitness” (1998: 82). The aim of this process is to give students – and citizens – the ability to move texts into diverse contexts and observe how meanings change. For example, when does political resistance become terrorism? How does the justification of violence change when the guns and bombs are moved from Iraq to the United States of America? All (Googled) truths must be granted a history.

Explicitness in method is required to establish an “enacted curriculum” (Wyatt-Smith 1999: 29-35), rather than constructing (another) list of assessment criteria unread by students. There will never be a single way to teach literacy. Learning is a fragile process. In such an environment, pinpointing emancipatory education is difficult. Critical literacy remains an intervention, signaling more than a decoding of text, or a compliant reading of an ideologue's rantings. Operational literacy – encoding and decoding - is a cultural practice of reproduction. Critical literacy requires the production of argument, interpretation, critique and analysis.

Building an information scaffold

One of the best disguised escapes from anxiety is the escape into information.

Hugh Mackay (1993: 226)

Obviously, I have a problem to solve in my assessment structures. After surveying literacy theories, I realize that there is a mismatch between my expectations of research and scholarship and what my students believe is University-level work. I have assumed that operational literacy would inevitably lead to cultural and critical literacy. Google has facilitated a quick and simple 'method' for completing their assignments, assuming that they can answer complex questions about Gramscian hegemony or theories of textual poaching as easily as finding their old school friends. I must change the assessment to actually mark their ability to find diverse sources and interpret them. It is important that I commence this process at first year level.

The first time I attempted to embed and assess an information scaffold in my curricula was successful. At that time, my strategy was prescriptive rather than flexible. In 2002, I wrote the curriculum for a course titled Repetitive Beat Generation, which I taught with Professor Steve Redhead based on his book of the same name (2000). It was an upper-level undergraduate course, small in number and competitive in entry requirements. Only the best and brightest gained admission. Before writing a research essay, students were required to submit an annotated bibliography.

Annotated Bibliography

There are strict requirements on this component of the exercise. Students must include at least thirty sources. Each source is accompanied by a 20-50 word description, showing how they are to be used in the project.

Of these thirty sources,

At least twelve must be refereed articles and books, split evenly between the two categories. Students must therefore learn how to use databases, such as the expanded academic database. Come and see Tara – she will show you how these operate. Please note: these books and articles must be non-fiction.

There must be at least five references from popular music.

There must be at least one film or television programme.

There must be at least five web sites.

There must be at least two magazine or newspaper articles.

There must be at least two novels or collections of short stories.

This is obviously a difficult exercise, but it is important for students to increase their research capabilities, and develop analytical skills in a wide array of media (Brabazon 2002: 21).

The results from this highly regulatory assessment were innovative, considered and balanced. The essays derived from this bibliographic exercise were of the highest standard I have seen in my academic career. Most of the students in the group then went on to honours and postgraduate work. Two students left the course, unable to complete this assignment. Although I was unaware of it at the time, I created a scaffold for learning which slowed the research process, creating time for reflection and planning.

This year, in my upper level course, Cultural Difference and Diversity, I attempted this process again – not for the undergraduates, but for the honours version of the course. I made the Essay Outline and Annotated Bibliography worth only 10% of the overall mark, in case the assessment was not successful.

Essay Outline and Annotated Bibliography (10%)

Length: 1500 words (a combined and maximum limit for the two parts)

Due date: Monday, April 19, 2004

This assessment is aimed at helping students develop their main essay. The assignment has two parts.

(A) Essay Outline

A topic for the main essay must be presented, alongside both a clearly crafted question and thesis statement. Ensure that you present the structure of the paper. Also, display what you believe will be the strengths and problems you may confront in researching this paper.

(B) Annotated Bibliography

Present at least 10 references, with a short description of how these sources will contribute to your paper.

This assignment worked extremely well and the feedback from students was excellent. They found that the project crystallized their main essay and confirmed the research material available to them. The task for me is to now translate these earlier successes – in a specialist and competitive upper-level undergraduate course and an honours course respectively – into a first year course.

In previous versions, my first year course Introduction to Cultural Studies featured four modes of assessment.

Prior Assessment Structure for Introduction to Cultural Studies

1. Textual Analysis (20%)
2. Main Essay (40%)
3. Take-home exam (30%)
4. Tutorial participation (10%)

For 2004, I have removed the textual analysis, which assesses students' ability to understand and apply semiotic terms, and replaced it with a project tethered to the main essay, which assists students in building an information scaffold

Current Assessment Structure for Introduction to Cultural Studies

1. Essay Justification and Annotated Bibliography (20%)
2. Main Essay (40%)
3. Take-home exam (30%)
4. Tutorial participation (10%)

The form of this new assessment, when considering the directives of critical literacy theory, needs to be overt with assumptions unmasked. The following assignment reveals how I have worded the question in their study guides.

1. Essay Justification and Annotated Bibliography

Due Date: At any point of the semester, as long as it is submitted by the end of week nine (October 1, 2004)

Weighting: 20% of the course

Word Length: 1000 words

This assignment prepares students for writing their main paper. You therefore must decide on the topic for the main essay before completing this first exercise.

You must do the following.

STAGE ONE

Present your chosen question, justifying your choice and identifying any problems – in terms of material, interpretation or argument - that you foresee. Outline the primary theorists and major argument of the essay: that is, the point you are trying to prove. This section will be between 400-600 words in length. Write in full sentences and paragraphs. If I see a bullet point, then I will kill myself and/or the student responsible for this affront to scholarly writing.

STAGE TWO

It is expected that students will use between 10 and 20 sources from the Reader for the Main Essay. Therefore this second stage for your first assignment focuses on students finding sources **OUTSIDE THE READER**. Students are required to locate **TEN FURTHER SOURCES** and write between 20 and 40 words on each, explaining their relevance to the project. This explanatory paragraph creates an 'annotated bibliography,' rather than simply a 'bibliography.'

The ten sources must be of the following type.

- Two scholarly monographs. (Please note: a monograph is a book. Ensure that the text is produced by a recognized scholarly publisher, such as a University Press.)
- Two print-based refereed articles. (Refereeing is the process whereby a journal sends out an article to scholars in the field to assess if it is of international quality and rigour. Students know that articles are refereed because the inside cover of the journal lists an editorial board, and the process of review will be outlined. Examples of refereed journals include the Cultural Studies Review, The International Journal of Cultural Studies, Media International Australia, Cultural Studies and Continuum. These are all available in the Murdoch University Library. Other refereed articles are also accessible through full-text, refereed databases of the Library.)
- One web-based refereed article. (Students must ensure that the site they use – such as M/C or First Monday – is a refereed online journal. Again, you will find that the journal lists an editorial board and states that it is refereed.)
- One web-site that is non-refereed (that is an online article from publications such as Online Opinion, Arts Hub, a blog or fan club site)
- One magazine or newspaper article.
- One track or album of popular music
- One advertisement (from radio, television, magazines or the online environment), an item of fashion, food product or sporting equipment.
- One television programme or film.

Remember - after each source is listed - students must then write 20-40 words about the text, including why it was selected for the project.

The aim of this exercise is to teach students how to find information and how to assess the relevance of research. Once completed, this material becomes the further reading for the main assignment. When writing the main essay, students simply intertwine these sources with the set course reading. Your research for the main essay is done!

You are learning something new. Do not be frightened. CHALLENGES ARE GOOD. Your brain is growing.

You are not on your own. Tara is happy to help in any way, explaining the nature of information and source material. Do not hesitate: come and see me – or email me – with any queries.

The word length for both parts of this project is a combined maximum of 1000 words

While I am not yet content with the precise wording of this assignment, it does address the problems that have worried me in the last few years. Expectations about reading and research are revealed, and the 'unspoken assumptions' about University education are presented. Further, for those students without these knowledges about finding research material, I have constructed an information scaffold so that they know what is required, and if they do not then they must ask me.

This process aims to make students think about the quality of information and how it is structured. It slows their research process and creates space for critical literacies. Speed searching blurs the distinction between data, information and knowledge. Through the convergence of technology, communication and entertainment, we are losing the capacity (and/or time) to evaluate material. There is an abundance of information, but what is scarce is the right information in an appropriate context. Evaluating the quality of web and print sources requires training and skill development. Often forgotten is the rigorous refereeing process that formulates the production process for books and articles. While some material on the web is refereed, generally the pieces are short and the arguments less developed.

I have realized through the last three years that I will have to teach my students how to gather and interpret information. I had made suppositions about education, libraries, reading and writing and assumed these ideas were understood by my students. Obviously that was an arrogant presumption. Curricula must be reframed to ensure that students can make meaning from a textual environment. For the next few years, in each of the courses I now write, the aim will be to develop interpretative capital, linking form and content.

Student users must approach web searching with thought and consideration. Two words in Google is not an endpoint of the research process. Planning for searches creates electronic and intellectual expectations. It also commences critical thinking and interpretation before slamming into an information glut. This rational and ordered approach to information management is distinct from the random, emotive and conversational mode of searching through Google. Finding old high school friends through Google is fine. Conducting research for high school using the same

method is inappropriate. The key is not how many hits are returned from a search, but how many were relevant, current and live sites.

While web use for academic research is increasing, the quality of sources varies tremendously. Students are confusing quality and quantity information. The triviality of the material found means that we too often become enthused with access to sites and do not ask why we needed access this material in the first place. The key skill that most of us need to learn – which is facilitated by the expertise of librarians – is how to manage and balance print and electronic resources. Collection management is even more important in an internet-mediated environment than outside of the digitized realm. Richard Sayers realized that “our challenge is to convince the techno-faddists and economic rationalists that Google is still not yet one of the seven wonders of the modern world” (2003: 410). It is rare for technologies to destroy each other. Google is a disruptive, not destructive, technology. Newspapers, radio, television and the internet co-exist. Books did not die with the internet. Offices and schools are not paperless. Google will only be one stop in a long journey through research and scholarship.

Some of the best modes of teaching do not begin with the presentation of information. The difficult decision for me to make through this process of curricula revision is to relinquish the ‘testing’ of content, via the first semiotics-based assignment. While I believe that it is important that students gain detailed knowledge about cultural studies, it is also now necessary that they be ‘encouraged’ to read more widely and with consciousness. Teaching form rather than content allows students to be active participants in the building of an information scaffold, facilitating the creation of critical literacies. That objective is as much a part of cultural studies as textual analysis.

As our first lesson in schools and universities, must teach, test and re-teach how to assess the quality of all information. I now encourage students to ask five preliminary questions.

1. Who authored the information?
2. What expertise does the writer have to comment?
3. What evidence is used?
4. What genre is the document: journalism, academic paper, blog, polemic?
5. Is the site funded by an institution?

Asking students to answer these questions is a way to limit the free range of searching on the internet. They must pause, reflect and think. These questions foster recognition that finding information is not necessarily convergent with understanding information. Without such critical pauses, the inclusion of the internet into the school and university curriculum may ensure access to information, but does not promote the development of critical thinking, wide-ranging research, high quality writing and innovative interpretations. Google’s popularity does not facilitate or encourage the discipline and structure that many of our students require. The technology itself is not to blame, but the poor funding of schools and universities – and the low credibility granted to teachers and librarians – is at fault. The difficulty is that information – through Google – is seen to be both abundant and cheap. The abilities required to assess this information are more difficult and costly to obtain. If my first year students can understand the meaning and purpose of refereeing and recognize that not all sources are equivalent, then I have been successful.

There remains a gulf – a wide and expansive canyon – between principles and practice. I am not sure how my students will respond to this change in assessment.

The historian in me is worried that if I remove overt assessment/checking of their semiotic ability then they will be unable to complete the main essay which requires this knowledge. But my desire – at least for one semester – is to attempt an intervention in poor research methods and broaden students' reading. Providing students with tools does not mean that they are used. Hoping that students will magically read widely without the building of an information scaffold is an intellectual relic of an earlier age.

If this paper has an agenda, then it is the importance of techno-skepticism. The skill and techniques of well trained teachers and librarians are required in this information age to block students from googling their way through a degree. Until their testamur reads Bachelor of Arts (Google), such interventions will be required.

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Biography

Tara Brabazon is an Associate Professor in Media, Communication and Culture at Murdoch University and Director of the Popular Culture Collective (<http://www.popularculturecollective.com>). Her research interests include internet studies, sport, popular music, creative industries initiatives, city imaging, multiculturalism and education. She has published three books, Tracking the Jack: A retracing of the Antipodes, Ladies who Lunge: celebrating difficult women and Digital Hemlock: internet education and the poisoning of teaching. A fourth book, Liverpool of the South Seas: Perth and its popular music, is released by the University of Western Australia Press in October 2004. A fifth book, From Revolution to Revelation: Generation X, Popular Memory, Cultural Studies is published by Ashgate in November 2004. She is a previous winner of a national Australian Teaching Award for the Humanities. For further information please refer to <http://www.brabazon.net>(.) Contact Tara via t.brabazon@murdoch.edu.au(.)