

Digital natives or digital refugees? Why we have failed Gen Y?

Barbara Combes
Lecturer
Edith Cowan University
Australia

This research forum paper presents the conclusion of a much broader PhD study which examines the information-seeking behaviour of the Net Generation or Generation Y. The overarching premise of this study centres on the belief that a greater understanding of how young adults seek and interact with information and the online environment, is an important first step in developing strategies to prepare them for tertiary education, the workplace and a future that will be characterised by an increasingly complex and constantly evolving information landscape. This paper will present the final analysis of the PhD findings, discuss what this means for the current generation of students and examine where schools and particularly teacher librarians need to focus if we are to cater for future generations.

Net Generation, Generation Y, information-seeking behaviour

Introduction

In a recent publication by two Harvard academics (Palfrey and Gasser, 2008) the focus of discussion has been on the need for teachers and senior education administrators to re-think how the current generation of young people are catered for and educated in classroom/learning environments that often contain traditional as well as elearning components. According to these authors, this current generation will only engage if we include electronic/digital information resources and use information communications technologies (ICTs) to enhance the learning experience across all areas, including curriculum delivery, learning resources and assessment practices. Educationalists need to embed the use of these technologies in curriculum programs and classroom practice, because they increasingly represent how young people work, play and view the world in the twenty-first century. It is also generally accepted that young people already have the skills to be able to use them as part of their learning. They are already tech-savvy.

Background

The idea that Generation Y or the Net Generation (children born after 1985) have an in-depth grasp and almost 'intuitive' knowledge of how to use technology, simply because they have never known a world without the Internet and technological change, first appeared in 1998 in the popular press in the publication, *Growing up digital: The rise of the Net Generation* by social commentator Donald Tapscott (Tapscott, 1998). This idea was expanded further in 2001 by Marc Prensky who first coined the terms digital natives and digital immigrants (Prensky, 2001). These publications use the Internet and the World Wide Web (WWW) as a global advertising forum and as a consequence have been picked up by the popular press, to such an extent that these labels and the attributes said to characterise the members of Gen Y now appear to have become accepted as a universal social phenomenon. The nature of the Internet, not only ensures the global acceptance of an intuitive user, but also allows it to be maintained and constantly recycled. So even though the idea of a tech-savvy, digital native first appeared during the first flourish of the Internet when there were relatively few public users (as distinct from corporate and educational users) (Internet World Stats,

2009), it has persisted and continues to affect how young people acquire their information-seeking skills using this medium.

Unlike previous generations, where social commentary relied on tastes in fashion, music, personal values and attitudes to work, politics, and leisure to define generational boundaries; attributes and characteristics assigned to the Net Generation or Generation Y include a complex technological, skills set. Gen Y are presented as super users of technology and assigned labels such as tech-savvy, Web-savvy, Internet-savvy and computer-savvy. These terms have become so accepted by society in general, they have also appeared in major educational policy documents such as the US National Technology Plan *Toward a New Golden Age in American Education* (U.S. Department of Education/Office of Educational Technology, 2004) and *Voices & Views from Today's Tech-Savvy Students*, part of a national report sponsored by the non-profit group NetDay (NetDay, 2004; Murray, 2004). In these systemic documents today's students are assumed to have a level of proficiency when seeking and using information found on the Internet and via electronic resources. The Australian Curriculum Corporation's report from the Le@rning Federation also describes the current generation of students as capable users who are able to acquire, communicate and manipulate information, and respond creatively to new technologies (Curriculum Corporation, 2005). One student summarises this attitude by boasting: 'we have technology in our blood' (U.S. Department of Education/Office of Educational Technology, 2004, p. 10). In these major policy documents it is the teachers who are described as the 'digital immigrants' and who need to play catch-up if they are going to meet the needs of a generation of users who are already proficient.

Is this the case? Is there such a being as a digital native? The Net Generation theory contradicts traditional information theory which contends that information-seeking behaviour is a complex activity that is affected by cultural, educational and social contexts (Case, 2002). The adherence to the idea of a tech-savvy generation of users as used in these systemic education policy documents, foster the perception that young people from the Net/Generation Y already have the necessary skills to use ICTs when seeking information. As a result, a major implication is that teachers do not integrate the teaching of information-seeking skills into curriculum programs. There is also a considerable body of research that supports the claim that schools have been slow to integrate technology into educational programs (Combes, 2005). In Australia, the perception by government and the general public that computers and ICTs are essential prerequisites for educational success is exemplified by the Prime Minister's announcement on taking office in 2007 that a major new initiative would be to provide every student in Australia with access to a computer. There is no mention in this initiative about education or training for students or teachers.

During the last eight years an increasing number of rigorous research studies have been conducted which largely refutes the idea of a tech-savvy generation of users (Banwell, & Gannon-Leary, 2000; Barr, et. al, 2006; Combes, 2006, 2007 & 2008; ETS, 2006; Fallows, 2005; Livingstone, et. al., 2005; Livingstone & Bober 2004; Nicholas et. al. 2008). While young people actively use technology and the Internet, they do not use it as described by the Net/Generation Y theorists. The Net/Generation Y theory supports the idea of a generation of users who are independent learners preoccupied with free expression as a result of being exposed to a lot of information on the Internet (Tapscott, 1998); are predominantly visual learners who know what they want and have greater digital literacy skills (Skiba, 2003, Oblinger & Oblinger, 2005); are intuitive visual communicators, have strong visual-spatial skills and readily integrate the virtual with the physical world (network literacy) (Oblinger &

Oblinger, 2005); are experiential learners and multi-taskers with sophisticated information skills that enable them evaluate and secure authenticity of the information they use (Dorman, 2000); are socially inclusive and communicate with a broad range of users (Tapscott, 1998, Dorman, 2000) that makes them a force for social change. Detailed, longitudinal research studies on Internet use and the information-seeking behaviour of young people such as the large scale population study UK Children Go Online (UKCGO) (Livingstone, et. al., 2005; Livingstone & Bober 2004) and the American Pew Internet & American Life Project (Fallows, 2005) indicate that the Net/Generation Y attributes are a perception rather than a reality. While very confident, young people do not exhibit high levels of competence when using the Internet for information-seeking (Combes, 2006, 2007, 2008). This fact has major repercussions for young people who are entering a world where information is increasingly, only available in digital format.

Method

The overarching premise of this study centres on the belief that a greater understanding of how young adults seek and interact with information and the online environment, is an important first step in developing strategies to prepare them for tertiary education, the workplace and a future that will be characterised by an increasingly complex and constantly evolving information landscape. The research used both quantitative and qualitative data collection to provide the most complete, rich, and in-depth picture of how young people are using technology. It included:

- an in-depth analysis of the literature to determine emerging trends in how members of the Net Generation are using technology;
- an empirical Web survey (533 participants) based on the Net Generation theory attributes:
 - to collect general data about the information-seeking behaviour of young adult Internet users; and
 - to score individual participants according to a metric based on affective (level of confidence) and effective (level of use) to determine their index of 'Net Gen-ness';
- a qualitative semi-structured, in-depth interview (40 participants); and
- the analysis of two information-seeking tasks, one recreational (data gathering) and one academic (interpretive and using multiple information sources), by the interviewees.

Findings from the literature review were reported at the 35th *Annual Conference of the IASL: The Multiple Faces of Literacy, Reading, Knowing, Doing*, Lisbon, Portugal (Combes, 2006); results from the empirical dataset were reported at the 36th *Annual Conference of the IASL: Cyberspace, D-world, E-learning: Giving libraries and schools the cutting edge*, National Taiwan Normal University, Taipei, Taiwan (Combes, 2007); while findings from the interviews and preliminary findings from the task analysis were reported at the 37th *Annual Conference of the IASL: World Class Literacy and Learning Through School Libraries*, Berkeley University, California (Combes, 2008). A triangulation of the three datasets and a comparative analysis with findings in the literature was then conducted to determine how young people are using technology and their culture of information use when using the Internet and electronic resources for information-seeking.

Main findings

The Net/Generation Y theory says the participants should all fall in the High-Confidence/High-Use category, however a major finding from the Web survey indicates that the survey group are very homogeneous, and rather than being very confident, high-end users of technology, they are discerning and average users of technology. Almost twenty percent of the survey group did not like using technology for learning and while males were more confident than females, the four points difference in the confidence metric was not significant and indicates that girls are fast closing the gap. Almost all of the survey participants fell within one standard deviation of the mean for confidence and use of technology (Combes, 2007).

Some of the major findings from the empirical study (533 participants) include the following.

1. All participants were using the Internet, with 72% reporting very frequent use.
2. Almost all of the participants (88%) reported they had taught themselves how to use the Internet by experimentation, with a further 35% relying on friends and only 8% citing the influence of a teacher librarian as major or essential help.
3. Not all were confident users, with a small group (7.5%) rating themselves as non-users, and a further eighteen percent (18%) claiming beginner status.
4. Approximately twenty percent (20%) did not like using technology for study.
5. For nearly 70%, using technology had not been a part of their previous school experience although 72.5% reported long term use (> 7 years).
6. Participants were using email (89%) and chat/instant messaging for communication (53%), with only small numbers using Internet telephony such as Skype (11%) and surprisingly, only 24.5% were using social networking such as MySpace and FaceBook.
7. Most participants owned a mobile phone (86%). Approximately half owned a digital camera (50.6%) and/or an ipod/mp3 player (48.5%). A large number owned or had access to a computer (84.5%) or a laptop (62.5%).
8. Almost all (85%) were using a printer to print information from the screen.

Some of the major findings from the interviews (40 participants) included the following.

1. Nearly everyone was using the Internet daily (38). This result is not unexpected since most administrative transactions and some of the teaching-learning materials at both universities are (increasingly only) available online. Only 3 participants admitted to having their computers on 24/7. A large number of the interviewees had more than seven years experience using the Internet (37), with 12 having over ten years. As in the survey, most (38) cited experiential learning by themselves as the major method for skills acquisition when using the Internet. Participants in both the Web survey and the interviews were long term users of the Internet, having begun using the Internet during the period from 1997 – 2000, when the Internet first became widely available to the general public (Internet World Stats, 2009).
2. Interview participants who were using social networking tools such as MySpace (19) and FaceBook (16), appear to be using them as an alternative to email to establish and maintain contact with old/previous friendship groups such as Primary School friends. A small number expressed dislike for social networking (3) and 2 no longer used them. These results support the Web survey and indicate that young people using social networking sites, may have adapted the tools for a different type of communication than is presented in the

popular press. Interviewees also indicated that their use of these sites had waned or changed as they grew older, an aspect that has also been noted in the media (Lee, 2006). These results indicate that educators need to resist falling victim to media reports, social commentators and corporations with a vested interest in social networking for marketing purposes. During the last 3-4 years there has been a concerted campaign to introduce the use of such sites into educational programs, sometimes with disastrous results. Unless there is a sound pedagogical reason for including a technological tool in the curriculum and teaching students appropriate and ethical use is part of the program, then they should not be included. When technologies are included they should be part of the teaching-learning outcomes and assessment, while ethics and appropriate use should be embedded into the teaching-learning program at every available opportunity.

3. Not everyone interviewed was using the Internet for business transactions with 17 using it regularly for netbanking and etrade and only 6 using it for shopping. Surprisingly, the males were more likely to use the Internet for these purposes than the females.

4. Very few of the participants were actively involved in political/social activist sites on the Internet with 4 admitting to lurking and one actively involved. Only 3 participants had had bad experiences on the Internet. One male student had been involved in illegal activities and had just completed a court ban on Internet use; one female had had a relationship with an older man; and one female had been caught in the middle of a FaceBook 'war' between friendship groups. The male student who had been involved in illegal activities was the only participant in the interview group who actively spoke with strangers over the Internet and who had even stayed overseas with people he had met online.

5. Most participants (34) were using the Internet to access course materials in at least some of their courses at university, although 2 did not associate using a Learning Management System (LMS) such as BlackBoard/WebCT with the Internet. Most were using it for study purposes (36), 28 used it for personal interest, 20 for downloading/listening to music (4 no longer did this), 12 downloaded movies (3 no longer did this) and there were 8 online gamers (3 females), 2 males who participated occasionally and 2 males who no longer engaged in this activity. Seven (7) participants reported using the Internet as part of their work environment. Only 12 used the Internet for news and current affairs, a result which supports other findings in the Web survey and the interviews suggesting that young people do not use the Internet to be politically aware or socially active citizens. They use it primarily for communication, entertainment and for seeking information, but usually only when their information-seeking is purposeful and associated with study at university. They don't necessarily use the Internet for general information-seeking, unless it is to contact friends. These results support traditional information seeking behaviour studies which show that people tend to seek information from other people first (Lonsdale, & Armstrong, 2004; Johnson, 2004, Borgatti, & Cross 2003).

6. Convenience was a major reason for using the internet for information-seeking (20) with more males (14) than females (6) citing this as a major advantage. More males (13) than females (5) also cited ease of use. Speed (12) and the promise of eventually finding something (10) was less of a factor. Two (2) participants did not find using the Internet for information-seeking easy. However, these young people (26) do like using search engines such as Google to find information. Seventeen (17) admitted that they were not always successful finding information using electronic resources and the Internet, especially specific information (21). Only 6 of the participants interviewed reported always finding the information they required. While 5 could always find it again, half of those interviewed

admitted they had difficulties re-locating information on the Internet. Issues using the Internet included the amount of information available (27), establishing authority (25), time taken (16), feelings of frustration (12) and using the wrong keywords or finding relevant information (29). Only one participant reported having no difficulties when using the internet to find information. While reporting high levels of confidence, almost half of the participants in these interviews, were also ready to admit that they were not always effective when information-seeking using electronic resources.

7. Thirty-two (32) of the interviewees rated their information-seeking skills using the Internet as average or good, with no one rating themselves as an expert. When comparing their skills with peers at university, 18 felt they were better than their peers and 18 felt they were the same. Comparing their skills with peers outside university, 24 felt their experiences at university had improved their skills and 9 felt they were still the same. However, when comparing their skills to their generation only one female and 12 males felt their skill levels were higher, with 10 participants (8 females) stating that younger people in their generation had better skill levels because they had been exposed to newer technologies longer. It would appear that as Generation Y get older, some members also believe the major principle of the Net Generation theory – that the longer an individual is exposed to technology, particularly youth, the more competent they will be when using both current and future technologies.

8. Almost all participants feel they have difficulty working with text on screen and as a result, many print everything (25) with 11 citing cost as a major factor. Only one participant reported printing rarely or never. Reasons for printing include a preference for hardcopy because it is easier to read (25) and easier to understand (22). Participants feel they engage with the content better when it is presented in traditional print form.

9. All of the participants interviewed are using Google and simple keyword search methodology to find information on the Internet. Only one student uses other search engines regularly, four use them sometimes and 2 have used them in the past. One student uses advanced search in Google. An established culture of use is evident amongst the interviewees, with 23 also using keywords when searching the library databases. No one uses Boolean search methods or appears to understand this term. During this discussion 18 participants used the term relevance and authority interchangeably, ie. if it is seems to be relevant to my topic and appears on the first page of a search result, then it is good information. Only 2 participants reported going beyond the first results page when seeking information using a search engine. All participants reported using the same method when searching (keyword), simply because it works for them (34). These results indicate that young people have developed an established culture of use when using the Internet for information-seeking that is also transferred to other electronic sources. In fact they appear to have difficulty distinguishing between closed systems (the library and the LMS), semi open systems (library databases) and the public domain Web, ie, they have poor Internet literacy skills and rarely know where they are in virtual space. These results were verified when participants completed their information-seeking the tasks.

10. Six (6) of the females and all except two (2) of the males admit to regularly using Wikipedia as an academic information source, while one female and 14 males use it for personal use. Interestingly, 5 females and 7 males admit to using Wikipedia, but don't cite it as an academic source. Ten (10) participants said they are not allowed to use it for university, while 17 feel it is unreliable. Only one participant believes that Wikipedia is a reliable information source and should be used for university and one student is an active editor. These results indicate that while students have been told not to use Wikipedia, many

still do use it and some use it as a sole information source. The interview results suggest they do not use Wikipedia because they understand how to authenticate information on the Internet, but rather, because they have been told not to use it and will be penalised if they do.

11. This is indeed the connected generation with everyone owning a mobile phone, although only 5 use it for email and 10 use the camera facility regularly. These results indicate that the era of a widely used, generic, multifunctional device has yet to be realised, with cost a major factor limiting mobile phone use to text and traditional calls. Only 3 participants use their phones as organisers, for music or for podcasts. Twenty-two (22) participants feel they could not live without their mobile phones, while 11 (9 males) feel they could not live without the Internet and other communications technologies.

12. Seven (7) of the participants stated they are not multi-taskers, while a further 18 feel that the term that best describes their behaviour is task-switching. Eleven (11) reported they are capable of doing several different tasks at once and 10 felt they could do several related tasks at any one time.

Some of the major findings from the task analysis (40 participants) included the following.

1. This generation have real difficulty reading text on screen. During the information-seeking tasks participants' behaviour when looking for and reading information on the screen fell into three categories. Either they would scroll rapidly up and down the page looking for bolded headings or hotlinks, peer very closely at the screen (within an inch) or use the cursor as a line-of-sight guide to assist their reading. This behaviour was most noticeable when they were searching for specific information or taking notes. Almost half of the group took notes using a pen and paper or created notes by copying (typing) text directly from the web page. Only a few cut and pasted bits of information. Participants also missed a lot of information on sites simply because it was not highlighted/bolded, hidden within a deeper menu structure (which required more exploration) or behind an icon/image which the users did not perceive as a link. These results suggest superficial use of web sites and poor visual discrimination and visual literacy (interpretive) skills.

2. When information-seeking on the Internet all participants exhibited 'satisficing' (first piece of information is good enough) and 'snaffling' (click on the first link in the results list) behaviour. They would even click on sub-links in the results page, apparently unaware that this was a sub-page of a site they had already visited. This behaviour indicates a belief that the first results are the most appropriate for their search term and a trust in the search engine results. This belief and trust was also evident in the interviews and has been reported in other studies (Livingstone, Bober & Helsper, 2005; Scott, & O'Sullivan, 2005; Fallows, 2005; Everhart, & Valenza, 2004). Both satisficing and snaffling behaviour indicate that young people do not know how, nor do they feel the need, to authenticate information they find on the Web. Since this behaviour is also part of their culture of use, they transfer it when searching other electronic resources such as databases. Hence, some participants clicked on the first results in a database search, even though it was obvious from the title and abstract that the article had no relevance to their search or topic. Others exhibited the same behaviour while searching for specific articles in the journal titles database, using the same keyword search terms they had used in Google. Participants' lack of understanding about search engines and how they work was also evident when copying and pasting URLs into their notes that were the result of a database search and the frustration later when they could not relocate an article. The snaffling behaviour particularly, was extremely fast, indicating that there was little or no reading of the result abstract. As a result, almost half of the participants indicated

levels of frustration and experienced anxiety during the tasks when they could not find the information they required. Some participants also appeared to expect all the information to be available on one web site and persisted in searching for a single information source, even when they had already found sites containing most of the required information. Relying on one information source has been reported in other research studies (Fallows, 2005) and may be linked to participants' use of sites such as Wikipedia, which is popular due to the perception that it is a 'one-stop-shop' for information. Participants did not appear to distinguish between the public domain and the Deep Web, had poor Internet literacy skills and sometimes relied on landmarks or sites where they had previously had success. Hence, one participant searched a public domain, science journal index, even though he was looking for a peer reviewed, full text article on lifelong learning.

3. It became evident during the tasks that the way (method) participants approach their information-seeking when using the Internet and electronic resources affects their level of success. Confidence is also a major factor. Participants who scored high on the index of Net Gen-ness (high use and high confidence), were more likely to open multiple windows from a single Google search (usually the first 4-6 results) and spend a good deal of time switching between these looking for information. Less confident participants tended to open one page at a time and work through the text on the screen, often using the cursor to guide their reading. Even though they were slower and often more hesitant, they tended to complete more of the task content than their apparently more tech-savvy peers. This result indicates that confidence in using technology does not necessarily translate into competence. While our young people are using the Internet and electronic resources they do so in a very superficial manner. Participants completing the second task (interpretive and asking for different sources) also exhibited poor information literacy skills initially when interpreting the question/task and then when locating authoritative and relevant information. Several participants did not appear to understand the difference between a web site (public domain) and a journal article (database in the Deep Web).

Conclusions

This research indicates that members of the Net Generation may be tech-savvy, if by this we mean they are confident and disposed to use technology. They are definitely not information literate. They are unable to locate, authenticate, deconstruct (make meaning from) and use information effectively or efficiently from a range of electronic sources. They are easily satisfied with the first piece of information they find, trust search engine results and exhibit a snatch and grab behaviour or snaffling, where there is little or no reading/interpretation of search results. Members of the Net/Gen Y are teaching themselves how to use the Internet at a relatively young age (average of 10 years) which has led to the development of an entrenched culture of use that is based on simple search techniques and Google. Thus, the idea of a generation of super users who can find information easily on the internet is not a reality. They are also extremely confident, which means breaking their culture of use is going to be difficult and must occur at a young age. Using the Internet for information-seeking and developing information literacy skills needs to be embedded in curriculum programs in the early primary school years if educators are going to impose a different culture of use on this generation of users. A lack of consistent curriculum programming has already produced a generation who do not have the skills to navigate the rapidly evolving information landscape, simply because education and the general public have accepted the idea that constant exposure to technology combined with the natural inquisitiveness of youth equal competence. Emerging research also indicates that teachers as well as their students do

not have the necessary skills to navigate the Internet and electronic resources for information (Lonsdale, & Armstrong, 2004; Williams & Coles, 2007).

Is this important? Does it really matter if the next generation use these technologies in a superficial manner when information-seeking? It can reasonably be argued that it isn't important unless the consequences are serious. Since there has been a concerted effort on the part of governments in Australia and the rest of the world to cut costs by placing everything online as a means of providing 'open and transparent government' and immediate access to service provision for citizens, being able to navigate the new information landscape is becoming increasingly important for our citizens of tomorrow. Information and service provision is currently in a transition phase, with organisations still offering online, in-person and traditional print services. However, it is assumed that the next generation will require only online, since they already have the skills necessary to use this environment to find information. Hence the latest draft policy document from the Commonwealth Government of Australia designed to direct the future development of online service provision in Australia for the next five years (Commonwealth Government of Australia, 2008), deals with infrastructure and security issues, with no mention of access and training people how to use ICTs to locate essential information. It is assumed that people, particularly the next generation already have these skills and want to use technology to access information.

The results of this research study indicate that a generation of young people who are digital natives is a perception rather than a reality. Schools have already failed the Net/Generation Y, since they have not provided in-depth teaching on how to develop the skills necessary to use electronic resources and the Internet when seeking information. Teacher Librarians (TLs) have traditionally been the keepers of the information skills toolkit and conducted 'library lessons' in isolation. To change the culture of use now evident amongst the Net/Gen Y, TLs must take on a new role and assist teachers in the design of curriculum that is resource based and embeds the use of technology and information literacy skills across the curriculum. To prepare citizens of the future who are empowered and able to navigate the information landscape of the twenty-first century, educationalists need to accept that this landscape and the technologies that help to create it, have had, and continue to have a profound effect on all aspects of our lives. The following quote from Donohew, Tipton and Harvey in 1978 is now more relevant than ever before:

Information seeking must be one of our most fundamental methods for coping with our environment. The strategies we learn to use in gathering information may turn out to be far more important in the long run than specific pieces of knowledge we may pick up in our formal education and then soon forget as we go about wrestling with our day-to-day problems (Donohew, Tipton & Harvey, 1978, cited in Case, 2002, p. 17).

How the citizen of the future functions in society will depend on how well schools prepare the next generation to be information literate. At the moment schools and education systems worldwide are at a crossroad. Rapid change in technology and the increasingly complex nature of the information landscape, mean that traditional, content based education can no longer prepare students for the future. Information, how we access it, locate it and use it will define our future society. The challenge facing TLs and schools is how to overturn fifteen years of perception about young people and their relationship with technology, break the current culture of use and graduate students who will not become the digital refugees of the future.

References

- Banwell, L. & Gannon-Leary, P. (2000). JUBILEE: Monitoring user information behaviour in the electronic age. *OCLC Systems and Services*, 16(4).
- Barr, D., Garrett, P., Balzer, D., Heine, C. & Houston, B. (200). Search challenges as assessment tools: A collaboration between the library and the 21st Century Information Fluency Project in Illinois. *Proceedings of the ALIA Click06 Biennial Conference*, 22 September, 2006, Retrieved April 3, 2009
http://conferences.alia.org.au/alia2006/Papers/David_Barr_and_Paula_Garr_ett.pdf
- Borgatti, S.P. & Cross, R. (2003). A relational view of information seeking and learning in social networks, *Management Science*, 49 (4) 432.
- Case, D.O. (2002). *Looking for information: A survey of research on information seeking, needs and behaviour*, California: Academic Press.
- Combes, B. (2005). Computers, ICTs and online curriculum: A role for the Teacher Librarian? *IASL Reports, 2005, Information leadership in a culture of change*, Hong Kong, China.
- Combes, B. (2006). Techno savvy and all-knowing or techno-oriented? Information-seeking behaviour and the Net Generation. *IASL Reports 2006: The Multiple Faces of Literacy, Reading, Knowing, Doing*, Lisbon, Portugal.
- Combes, B. (2007). The search for information and the Net Generation. *Cyberspace, D-world, E-learning: Giving libraries and schools the cutting edge, The 2007 IASL Conference*, National Taiwan Normal University, Taipei, Taiwan.
- Combes, B. (2008). The Net Generation: Tech-savvy or lost in virtual space? *37th Annual Conference of the IASL: World Class Literacy and Learning Through School Libraries*, Berkeley University, California, 3-7 August, 2008.
- Commonwealth Government of Australia. (2008). *Digital economy future directions consultation paper: Draft for industry and other stakeholders' input and comment*. Retrieved January 30, 2009 from
http://www.dbcde.gov.au/_data/assets/pdf_file/0006/94191/Consultation_Draft_-_DEFDP_-_17_Dec_2008_final.pdf
- Curriculum Corporation. (2005). *Pedagogy strategy: Learning in an online world*, MCEETYA, Australia – New Zealand. Retrieved April 3, 2009 from www.mceetya.edu.au
- Dorman, S.M. (2000). Implications of growing up digital. Review of Tapscott's Growing up digital. *The Journal of School Health*, 70(10) 420-422.
- Educational Testing Service (ETS). 2006, *2006 ICT literacy assessment: Preliminary findings*, November 2006, Retrieved December 7, 2009 from www.ets.org/ictliteracy
- Everhart, N. and Valenza, J. (2004). Research into practice: Internet-savvy students and their schools. *Knowledge Quest* 32 (4) 50-55.
- Fallows, D. (2005). Search engine users, *PEW Internet & American Life Project* Retrieved April 3, 2009 from
http://www.pewinternet.org/~media/Files/Reports/2005/PIP_Searchengine_users.pdf
- Johnson, C.A. (2004). Choosing people: The role of social capital in information seeking behaviour. *Information Research*, 10 (1)
- Lee, E. (2006). Social sites becoming too much of a good thing: Many young folks burning out on online sharing. *San Francisco Chronicle*. Retrieved April 27, 2009 from <http://sfgate.com/cgi-bin/article.cgi?file=/c/a/2006/11/02/MNGG3M4KB31.DTL>

- Livingstone, S., Bober, M. & Helsper, E. (2005). Internet literacy among children and young people: Findings from the UK Children go online project. *London School of Economics*. Retrieved April 27, 2009 from <http://www.lse.ac.uk/collections/children-go-online/>
- Livingstone, S & Bober, M. (2004). UK Children go online. Surveying the experiences of young people and their parents. *London School of Economics*. Retrieved April 27, 2009 from <http://www.lse.ac.uk/collections/children-go-online/>
- Lonsdale, R. & Armstrong, C. (2004). Crossing the educational divide: Issues surrounding the provision and use of electronic information resources in secondary and tertiary education. Paper presented and published in *From Aesop to e-book: the story goes on..., proceedings of the 2004 SLA/IASL Joint Conference*, Dublin, Republic of Ireland.
- Murray, C. (2004). Ultra-communicators demand more email access, better software. *eSchool News*. Retrieved April 3, 2009 from <http://www.schenectady.k12.ny.us/TechResources/olconline/articles.htm>
- NetDay. (2004). *Voices and Views from Today's Tech-Savvy Students*. Retrieved February 25, 2009 from www.netday.org/downloads/National_Findings_Highlights.pdf
- Nicholas, D., Rowlands, I. & Huntington, P. (2008). The information behaviour of the researcher of the future: *A CIBER briefing paper*, University College London. Retrieved April 27, 2009 from <http://www.jisc.ac.uk/whatwedo/programmes/resourcediscovery/googlegen.aspx>
- Oblinger, D. & Oblinger, J. (2005). (Eds), *Educating the Net Generation*. Retrieved February 18, 2009 from <http://www.educause.edu/educatingthenetgen>
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5).
- Internet World Stats (2009). *Internet growth statistics*. Retrieved March 9, 2009 from <http://www.internetworldstats.com/emarketing.htm>
- Scott, T.J. & O'Sullivan, M.K. (2005). Analyzing student search strategies: making a case for integrating information literacy skills into the curriculum. *Teacher Librarian*, 33 (1) 21-25.
- Skiba, D. (2003). The Net Generation: Implications for nursing education and practice. In *NLN Living Book*. Retrieved April 3, 2009 from <http://electronicvision.com/nln/chapter01/>
- Tapscott, D. (1998). *Growing up digital: The rise of the Net Generation*, McGraw-Hill, New York.
- U.S. Department of Education. (2004). *Toward A new golden age in American education: How the Internet, the law and today's students are revolutionizing expectations*, Washington, D.C. Retrieved February 25, 2009 from <http://www.ed.gov/about/offices/list/os/technology/plan/2004/index.html>
- Williams, D. & Coles, L. (2007). Evidence-based practice in teaching: An information perspective. *Journal of Documentation*, 63(6), 812-835.

Biography

Barbara lectures for the School of Computing and Information Science at Edith Cowan University, Western Australia. Her major research interest areas include the role of teacher librarians in education, plagiarism, online learning and distance education particularly for first time users, information literacy, policy and planning. Barbara's PhD research is examining the information-seeking behaviour of the Net Generation. She has published in a number of journals, presented at conferences worldwide and is the Vice President Advocacy and Promotion for the IASL.

Statement of Originality

This statement certifies that the paper above is based upon original research undertaken by the author and that the paper was conceived and written by the author(s) alone and has not been published elsewhere. All information and ideas from others is referenced.