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Press Any Key: Repositioning digital literacy as an enabler for self-regulated learning

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Abstract: Millennial students are often seen as digital experts. This generalisation implicitly assumes that millennial students are equipped with necessary digital literacy skills to undertake their university learning such as searching curriculum-based information. But are they? And what is digital literacy and how can it be embed in teaching and learning? This paper examines the key characteristics of a contemporary view and multiplicity of digital literacy. An implementation of digital literacies in a first year undergraduate unit is described.

Introduction

It is a well-accepted generalisation that the students born into the world of pervasive digital technologies demonstrate a technological literacy characterised by being 'digital native'. This generalisation has led many to make the glib assumption that these 'millennial' students' are able to use modern technologies in a way that characterises them as digitally literate (Howe & Strauss, 2006). There is no doubt that the millennial students are habituated with technologies and expecting a range of sophisticated technologies to be integrated into their learning (Brown, 2000; Frand, 2000; Oblinger, 2003). However, studies (Kennedy et al., 2008; Ladbrook & Probert, 2011) have shown that many millennial students have tendency to most value those technologies that provide immediate benefits and relevance to their personal lifestyles. The exposure to technologies from an early age may have helped the millennial students to see technologies as an extension of Self and as everyday objects (Prensky, 2001). This does not mean, however, that they value technologies such as computers and the Internet, as learning and productivity tools. Also, there appears to be a lack of formal support for integration of digital literacy in classrooms in high schools, which inevitably carries through to tertiary education where many students are ill-equipped and lack basic skills to embark their university learning involving searching and using curriculum-based information (Ladbrook & Probert, 2011).

The notion of literacy is integral to learning throughout primary and secondary education. In 2008, the National Assessment Program – Literacy and Numeracy (NAPLAN) was introduced in Australia to annually test high school students' skills in writing, spelling, grammar, punctuation, and numeracy. This was an effort to diagnose and assess areas for improvement in literacy and numeracy. A report on 2010 NAPLAN results showed that students improved their overall results (Australian Curriculum Assessment and Reporting Authority, 2010). Whether this is a testament to the success of the program, or to the ability of schools to 'play the game' in an environment that potentially promotes competition between institutions is debatable. Regardless of whether the intention of NAPLAN is noble, however, it has arguably led to an assessment-oriented focus on literacy and numeracy learning where schools spend significant amount of time preparing students to improve individual and state results. This foregrounding of literacy and numeracy in primary and secondary learning settings has also trickled 'upwards' to the tertiary sector to the extent that universities in Australia are refocusing on these core skills as part of their own curricula. In Edith Cowan University, a major project within the university's new curriculum framework is English Language and Numeracy Development (ELN). Embedded in this project is an assessment framework that through Post-Entry Language Assessment (PELA) and Post-Entry Language Numeracy Assessment (PENA) will diagnose literacy and numeracy deficits so that teachers can 'plan for, contextualise and embed evidence-based actions and strategies to advance these skills' (ECU, 2011).

Such projects are inherently limited, however. It could be argued that NAPLAN and ELN have provided an effective response to common criticisms about the lack of reading and writing within schools (Leung, 2006) but they raise a range of questions about the role of literacy generally. In particular, it could be argued that they have failed to see the totality of literacy and reflect the changes and paradigm shifts in literacy by remaining entrenched in historical definitions of reading and writing. This isolated view of literacy undermines other fundamental literacy skills, required to function in current digital and information society.

The multiplicity of literacy practices: digital literacies

To simply put, literacy means one's ability to read and write (Oxford English Dictionary). While the historical definition firmly focuses on literacy practice on print, a contemporary view of literacy is more inclusive fundamental skills embracing communication and information technologies, multimedia, and cultural diversity (Department of Education, Australian Curriculum, 2011). Digital literacy is a natural product of changes in literacy as people's literacy practices and communication behaviours have changed with the evolution of technologies. The definition of digital literacy encompasses much more complex learning processes involving a combination of technical procedural, cognitive, and socio-emotional skills (Eshet-Alkalai, 2004) sharing the core competencies and strategies of information literacy:

> the ability to identify, assess, retrieve, evaluate, adapt, organise and communicate information within an iterative context of review and reflection (Society of College, National and University Libraries, 1999).

It is not that these literacies are discrete or contradictory, but they exist as instantiations of a broader set of enabling skills. The concept of literacy is an evolving one but to see digital literacy is a hybrid offspring, blurring conceptual underpinnings of literacy is a reductive one that has the potential to create divisions between educational traditionalism and relativism. According to Gibson (2008), digital literacy is not an add-on component in literacy to further confuse the understanding of the concept; but it could be a key to bridge the literacy war by:

- exacting discipline;
- drawing attention to cognitive processes; and
- engaging in production skills.

The above tenets position digital literacy within an overarching framework of multiple literacies that include language and numeracy, certainly, but also a range of organisational, interpersonal and applied skills that have as a fundamental basis, the learner's ability to develop a capacity to regulate their own learning. In fact, the three facets proposed by Gibson share much in common with the notion of self-regulated learning (SLR). Studies into self-regulated learning tend to define it in terms of the integration of affective and cognitive processes which are enacted through and feed back into individuals' metacognitive awareness (e.g. Boekaerts 1997; Garcia & Pintrich, 1994). A previously published synthesized model for self-regulation specifically identifies discipline in the form of volitional control, attention to cognitive processes as cognitive self-monitoring and the production skills as the outcome of the cognitive regulatory and volitional control strategies that are developed in a metacognitive process of planning, monitoring and evaluation. (McMahon & Oliver, 2001).

What digital literacy provides is a context for these skills and as such can be summarised as a fluency of knowledge acquisition and utilisation *using digital technology*. Sharing Gibson's view of digital literacy, Eshet-Alkalai and Chajut (2009) provided a concrete conceptual model of digital literacy (Table 1).

Table 1: The conceptual model of digital literacy skills by Eshet-Alkalai and Chajut (2009, p. 713).

Digital literacy skills	Descriptions
Photovisual literacy	is the ability to work effectively with digital environments, such as user interfaces, that employ graphical communication.
Reproduction literacy	is the ability to create authentic, meaningful written and artwork by reproducing and manipulating preexisting digital text, visuals, and audio pieces.
Branching literacy	is the ability to construct knowledge by a nonlinear navigation through knowledge domains, such as in the Internet and other hypermedia environments.
Information literacy	is the ability to consume information critically and sort out false and biased information.
Socioemotional literacy	is the ability to communicate effectively in online communication platforms such as discussion groups and chatrooms.

Real-time skill	is the ability to process and evaluate large volumes of information in real time, such as in computer games and chatrooms.

All of these provide a contextual basis for the self-regulatory skills that underpin multiple domains. Reproduction literacy was less evident a skill in pre-digital times simply because it is the digitisation of data that has provided the ability to 'mash up' existing work into something original. In language learning, reproduction as a skill may be mediated by translation or even handwriting – the latter being a necessarily major focus of primary school education. Similarly, information literacy is foregrounded within a digital world because of the vast range of information available through the Internet and the need to assess both validity of this information and the reliability of the sources. It is not that information literacy did not exist before digital literacy, but the affordances and constraints of digital technologies have remolded the concept to one that is less focused on traditional peer reviewed and published artefacts, requiring a specific subset of skills.

Teaching and embedding digital literacies

While some lipservice is paid to technology use in the graduate attributes of many university courses, it is important not to let the traditional notions of language and numeracy marginalise digital skills – particularly through the assumption that millennial students already have a full suite of them. With this in mind, the authors redesigned an existing core unit, *Communications & Digital Technology*, which was originally developed to introduce students to basic desktop programs (e.g. Word, PowerPoint) and visual communications to ensure that digital literacies were promoted as part of a larger focus on students' self-regulation. The focus of the unit was on generic skills that would help students to articulate assignments in written and visual formats. The unit is undertaken by all first year undergraduate and new incoming postgraduate students in the School of Communications & Arts (SCA) at Edith Cowan University. The vast majority of students are school leavers so could be characterised as Millennial. Based on the conceptual model of six digital literacy skills (see Table 1) by Eshet-Alkalai and Chaujut (2009), the authors embedded digital literacies in the unit by introducing:

- a specific module emphasising the core competencies of digital literacy (i.e. iterative knowledge acquisition and utilisation process); and
- a module-based teaching and learning structure to address the multiplicity of digital literacy (see Table 2).

Table 2: Module structure in *Communication & Digital Technology* unit in relation to conceptual model of digital literacy by Eshet-Alkalai (2004).

Digital literacy skills	Modules	Module descriptions
Information literacy Branching literacy Real-time thinking skill	Information Wrangler (IW)	This module introduces students to a digital literacy cycle, which enables them to identify, search, collect, evaluate, store, and apply information in their assignments.
Photovisual literacy Reproduction literacy Real-time thinking skill	Office Rocket (OR)	This module introduces students to advanced features that are relevant to academic publication skills (print and digital).
Photovisual literacy Reproduction literacy Real-time thinking skill	Presentation Guru (PG)	This module teaches students how to create engaging and meaningful presentations following three steps of: preparation, design, and delivery.
Photovisual literacy Branching literacy Real-time thinking skill	Web Master (WM)	This module provides students an opportunity to showcase their capabilities and achievements in the form of online portfolio (i.e. website).
Photovisual literacy Information literacy Branching literacy Socioemotional literacy Real-time thinking skill	Social Animal (SA)	This is an alternative online module that focuses on web-based publication without the requirement of technical skills of creating a website.

Information wrangler was a component of digital literacy in the unit, acting as an enabler for information literacy. This module requires students to produce an annotated bibliography that reviews three types of information sources including books, journal articles, and newspaper articles. While it focuses on traditional information channels that are considered credible (unlike Wikipedia or a personal news blog),

students are not restricted to hard copies of these sources; they are strongly encouraged to access online knowledge domains such as library websites, newspaper websites, and online databases. This provides a conceptual link to the language focus of existing literacy education and to reinforce those information sources that are privileged within it. This then acts as a springboard to a more diverse range of texts and sources. Based on an iterative digital information literacy cycle, the module teaches students to:

- identify key concepts in a research question or assignment topic;
- search and locate information;
- evaluate relevance, accuracy, and quality of the sources; and
- store and apply information ethically in their assignment.

Students are trained to analyse their chosen topic to extract key concepts leading to a focus area of research. This step is followed by Web searching techniques (e.g. Boolean searching, phrase searching, truncation), using a wide range of nonlinear knowledge domains to access information. In particular, evaluation, storage, and application of information are emphasised to further expand the information literacy skills to suit the context and purpose of the unit. The evaluation phase of the module covers ethical usage of information by discussing the concept of copyright and intellectual property, referencing, and plagiarism. Each semester, an expert in copyright and referencing delivers a guest lecture to reinforce the importance of using information in a wide range of assignment formats (e.g. artwork, posters, essays). Living in a digital era, information seems less valuable due to its intangibility and the ease with which it can be modified and repurposed. Reference management software called, EndNote, is introduced to teach students to manage and apply references for current and future assignments.

After a trial of Information Wrangler module over three semesters in 2010 and 2011, the authors learnt that students do not initially demonstrate high levels of information literacy despite their familiarity with technologies and online information searching (e.g. Google). Many students expressed positive feedback on search strategies and online databases where they can obtain credible academic publications.

Over time, additional content has been introduced to capture the multifaceted nature of digital literacy. A module-based teaching and learning structure was, developed to encapsulate the specific digital literacy outcomes to be achieved in the unit within a range of contexts. Another reason was to allow students to tailor their learning to their own needs; flexibility being a stated characteristic of millennial students (McMahon & Jung, 2011). The revised unit structure consists of five modules and students are required to complete three of the five considering their chosen major (see Table 1). Each module focuses on three or more digital literacy skills to ensure that students have opportunities to develop their skills across the suite of literacies.

Photovisual and reproduction literacies, which are not covered in the traditional concept of literacy, are particularly important skills for our students. The School of Communications & Arts is a large school, which offers a diverse range of courses with a primary goal of developing interdisciplinary creative professionals across a range of contemporary communication fields (e.g. Interactive Media, Graphic design, Spatial & Interior Design, and Film & Video). These two literacies are covered in four modules and demonstrated in the form of report, presentation, web design, and online publication. By using popular desktop, authoring, and design software (i.e. Word, PowerPoint, Dreamweaver, and WordPress), students are introduced to creation and manipulation of visual/graphic and multimedia elements in their assignments. Each module assignment requires students to research their chosen topic using both print and online resources to obtain visual and textual information. Students must evaluate the information they obtained in terms of its relevance, currency, and quality.

As a first year level unit, the focus of module activities is on exploration, analysis, manipulation, and application of pre-existing materials to complete their assignments. Nevertheless, this does not undermine the importance of students' ability to create authentic and meaningful work. The common component of all modules is real-time thinking which encourages students to exercise metacognitive knowledge involving critical thinking and reasoning skills. These skills are demonstrated by students rationalising their design decisions and explaining the process of their assignments. In doing so, students:

- select appropriate resources for the assignment;
- determine an appropriate steps to be taken to complete the assignment;
- monitor their learning progress;
- critically evaluate their learning progress in a reflective manner; and
- self-assess and rate their work.

With the ease at which information can be accessed through online sources, it is tempting for students to simply click-and-download and paste an image or digital text into an assignment. The convenience of using

information eliminates the physical interaction with materials and how they are applied. Digital literacy is not just about using the tools but ensuring learners are critical and creative users of new media. Therefore, the metacognitive learning process described in above list encourages students to be aware of their own learning processes and develop self-regulated learning.

By extending the real-time thinking to socioemotional literacy, students are required to conduct peer assessments of fellow students' assignments published on online blogs to evaluate and provide constructive feedback. The peer review process promotes collaboration in students, which is a core characteristic of digital literacy and preference of millennial students (Zemke et al., 2000).

Informal findings (e.g. lecturer's observation and conversations with students) and UTEI surveys (Unit and Teaching Evaluation Instrument) have suggested that the unit helped students to better equip them to undertake university learning regardless of major they have chosen. Students also indicated that the unit provided practical skills they could see using in their future career:

"the ability to create a website was a really good skill for me to learn as I wish to go into the music industry, where you have to self advertise" (ECU UTEI Survey, 2011).

There is no doubt that embedding the critical aspects of digital literacy enhanced the challenge within the unit but it was one that students embraced. Over the two years in which the unit was redeveloped, it witnessed an improvement in overall satisfaction – 13% mean in 2009 UTEI score compared to 35% in 2011 UTEI score.

Conclusions

To argue that literacy is a key enabler for success in both education and life is a truism but one worth reiterating in the light of a renewed focus on language and numeracy within universities. The issue with this focus on the most obvious literacies of reading, writing and arithmetic is that that it positions the literacy debate on a trampled playing field of political ideology and popular sentiment. The goal of ensuring literacy is a laudable one, but one that needs to be framed by and understanding of its status as a contextual outcome of a deeper set of self-regulatory skills. By reducing the scope to traditional literacies there is a danger of producing graduates that have functional applied skills but a lack of underpinning generic ones, or equally as bad, an inability to practice self-regulatory skills within and across domains. It is therefore imperative that digital literacy is valued equally in the pantheon of literacy disciplines.

The aim is not to privilege one form of literacy over the other but to ensure that learners are equipped to develop and apply their skills as their chosen disciplines evolve. Language itself is a tool that has evolved over millennia and digital literacy is essentially just another evolution in communication that embraces contemporary epistemologies such as the social construction of knowledge and the broadening of textual forms to a diversity of media. What makes digital literacy unique is that it appears to be treated as something of an assumed skill, and one that does not require formal education.

Communications and Digital Technology is one example of formalising digital literacy within an educational setting. It success appears to be in the way it has embraced the notion of literacy as metacognitive and self-regulatory skills that cross the boundaries of social, organisational, language and numerical abilities. Just as language is not just about conjugating verbs, the use of digital technologies goes beyond clicking the right button to make something happen. In an ideal world, the technology of digital literacy will become the most trivial aspect of it but for that to happen it needs to become a ubiquitous part of learning and not just the focus of an individual unit. While it is encouraging to see digital tools like blogs and wikis become more integrated into teaching practices, the authors suspect that many educators still view it as a production tool, rather than a fundamental shift in pedagogy towards having students construct knowledge in participatory ways and engage in reflective iterative practice. If universities are serious about having teachers 'plan for, contextualise and embed evidence-based actions and strategies to advance these skills' (ECU, 2011), then the rhetoric needs to go beyond a focus on the three Rs to an understanding of the multifaceted nature of literacy and the significant role that digital literacy has to play within this broader literacy conversation.

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