

Defining Digital Literacy: A Case Study of Australian Universities

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The contemporary appearance of the term “digital literacy” on university websites suggests institutional interests on digital literacy that focus not only on the development of technology skills but also cognitive and attitudinal aspects in student development. This paper presents an exploration of institutional conceptions of digital literacy based on document analysis of university published information online. The investigation involved universities located in Australia as embedded case studies (n=42). Evidence suggests variations in defining this term and shows that universities have diverse goals as espoused in their corresponding definitions of digital literacy, from developing technical skills of using and understanding technology, to possessing a set of capabilities for living, learning and working in an increasingly digital world. For universities who enumerated a coherent account of digital literacy, the results indicate that their practices of promoting the development of digital literacy are entrenched in their espoused intent of graduate outcomes. The paper concludes with curricular and pedagogical implications in preparing and assisting students for the challenges of 21st century living, learning and working.

Keywords: Digital literacy; digital fluency; digital capability; higher education; case study.

Introduction and literature base

With the global world embracing the fourth industrial revolution, also known as the digital revolution, the world that we live in has been characterised by a culmination of technologies causing fundamental shifts in the way we live, work, play, earn and learn (Doucet et. al, 2019; Secker, 2017). The digital workforce has seen the need for the development of many competencies and these competencies encompass the proficiency and comfort of being able to achieve desired outcomes using technology (Colbert et. al, 2016). Such a workforce means that digital disruption in education is inevitable. The recent report on education by Organisation for Economic Cooperation and Development (OECD, 2019) calls for an ‘urgent’ action for education institutes to connect education to the trends shaping the world that we live in. Given this urgency, it is imperative for education institutions to have digital literacy skills as part of its overall goal and acknowledge the role it plays in student digital literacy skills development (Reedy & Parker, 2017). ‘Digital’ has been a term that higher education uses to commonly express the incorporation into learning resources, the use of new information and communications media (Goodfellow, 2011).

The term ‘digital literacy’ was popularised by Paul Gilster in his 1997 book where he coined this term as the “literacy for the digital age”, and described it as the ability to understand and use information in multiple formats, from different sources, and presented through computational means (Gilster, 1997, p. 1) Despite the appearance of this book, the term digital literacy did not gain widespread attention for at least another decade. More recently, this term is often misunderstood and used differently, at times interchangeably as digital fluency (Colbert et. Al, 2016), digital competency (Secker, 2017) or digital capabilities (JISC, 2014). The latter is the term used to describe the six capabilities that embody JISC’s digital capability framework and defined as the “capabilities which fit someone for living, learning and working in a digital society” (JISC, 2014). The term ‘digital fluency’ on the other hand is interchangeably used with ‘digital literacy’, to mean going beyond simple use of a few programs or basic technological applications as it extends to having a level of proficiency that allows the users to manipulate information, construct ideas, and use technology to achieve strategic goals.

Presently, most higher education institutions offer a space of learning on an assumed understanding that students are digital natives, or even digital literate (Pangrazio, 2019). Pangrazio (2019) stresses that while the students do have understandings of how to use technological devices effectively and efficiently for social purposes, in most cases, they have not engaged in learning in a digital environment using digital technologies. There is an

assumption that the notion of digital natives may seem to possess digital fluency, such assumption has created a gap when students graduate and enter the digital job market (Coldwell-Neilson, 2010). While digital natives have often been assumed to have a high level of digital fluency owing to their extensive engagement with technology in their lives, it is experience with technology, rather than generational membership, that best defines digital fluency or literacy (Colbert et.al, 2016). The interest of institutes of higher learning on digital literacy and related constructs is evident in the contemporary appearance of these terms on university websites that focus not only on the development of technology skills but also cognitive and attitudinal aspects in student development. Indeed, in the current higher education landscape, it appears that digital literacy involves more than the ability to use a digital device; it extends to a variety of cognitive, sociological and motor skills that the users need to function effectively in digital environments (Eshet et.al, 2004; Littlejohn, Beetham & McGill, 2012; Reedy & Parker, 2017). However, the term digital literacy has largely defied a concrete definition, despite the apparent currency of this term (Bawden, 2008; Secker, 2017).

Against this backdrop, the aim of the current research is to explore the meanings of digital literacy as ascribed by each university located in Australia, and to establish how such meanings influence the contemporary enactment of student development. Through a benchmarking exercise, a survey of each Australian university's website was undertaken to specifically locate the meaning of the term digital literacy. Investigator triangulation was carried out on data collected (Patton, 2005) and was conferred with published literature on digital literacy to validate insights generated in the findings.

Research design

This study is informed by qualitative research perspectives that utilise case study research and document analysis approaches to capture the phenomenon of digital literacy. Given the nature of the research problem—i.e., *How and in what ways do Australian universities engage in the development of digital literacy?*—embedded case study is considered appropriate for this investigation. Figure 1 outlines the research design which extrapolates the methodological fusion (Press, 2017) that embodies the current research. The fusion between case study design and document analysis approaches is aimed at generating rich data, in order to develop rich descriptions for understanding the bounded case (cf. Yin, 2017).

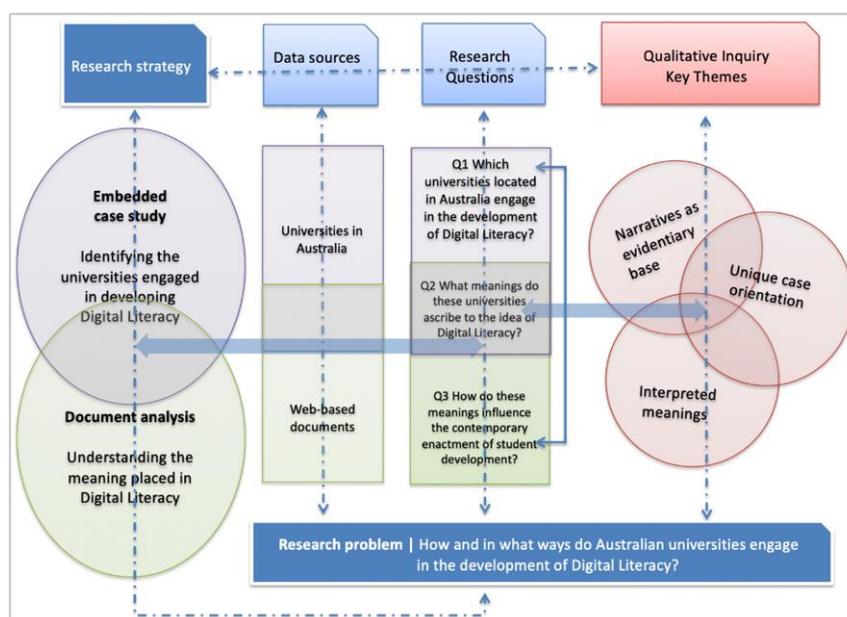


Figure 1: Methodological fusion* as a research strategy

The case in this research constitutes the Australian universities and within it are embedded cases—universities organised collectively in their State of origin. The embedded case study approach focused on the experiential knowledge of each university and close consideration of the influence of its social, political and other contexts (Stake, 2005; Yin, 2017).

*Please contact the first author for the methodological fusion template.

The aim of employing document analysis within a bounded system of the case—i.e., bounded by time and place—was to explore and examine in published documents views and orientations about digital literacy, directly expressed in such documents. The document analysis approach gave voice and meaning from universities in Australia around the idea of digital literacy. Data collection was carried out using published documents from respective universities' website. These are the official, ongoing records of the university's activities on digital literacy. Collected data were derived from print (e.g., PDF, Word) or web-based information. Data collected were stored and managed on Google Sheets to enable concurrent collaborative research work by the investigators. Bowen (2009) notes that document analysis is a social research method and, indeed, it enabled the current research team to triangulate and corroborate findings across data sets and facilitate evidence-based credibility in exploring the research questions noted in Figure 1 and elaborated on below.

Results and preliminary findings

The work of Huber and Shalabin (2018) surveyed the “digital literacy landscape for academic and professional staff in higher education” (p. 151) and identified the units responsible for the development of digital literacy. The current research, however, specifically explored how each university pursued digital literacy through their espoused meaning of digital literacy, their standpoints and conceptualisation related to student development.

Which universities engage in the development of digital literacy?

Universities in Australia were organised according to their State of origin. Where in some cases universities are located in multiple States, they were listed based on the location of their main campus. Table 1 outlines the number of universities investigated in this research and the types of documents found in public domain. A disclaimer that it is possible the information sought was only accessible in the universities' intranet and therefore not accessible for the purpose of this research. Moreover, the researchers made no attempt to directly contact specific universities, with the exception of obtaining a draft copy of the framework from one university in Queensland.

Table 1: Number of Universities per State

State of Origin	Number of Universities	Direct Definitions of digital literacy	Organisational Document	Curriculum document	Other document
Australian Capital Territory	2	0	0	1	1
New South Wales	11	5	5	5	10
Northern Territory	1	0	0	0	0
Queensland	8	4	6	7	2
Victoria	9	3	4	6	5
South Australia	5	2	3	1	3
Tasmania	1	0	0	0	1
Western Australia	5	2	4	0	5
Total	42	16	22	20	27

For a list of Australian universities go to the link below, which this research has adopted and used for triangulation: <https://www.studyinaustralia.gov.au/english/australian-education/universities-and-higher-education/list-of-australian-universities>

The groupings per State showed a snapshot of opportunities for the development of digital literacies and how they relate to other opportunities in neighbouring universities. Previous research (e.g., Huber & Shalabin, 2018) investigated the mention of digital literacy based on university affiliation, e.g., Group of 8 Universities, Regional Universities, Australian Technology Network, etc. One of the benefits of the State-based groupings is that themes can be easily detected, such as when the majority of universities in certain States actively engaged with the idea of digital literacy while very few in other States did so for all intents and purposes. See Attachments 1a and 1b.

The result showed that not all universities in Australia have published information on digital literacy and related constructs, such as digital learning, digital capabilities, digital competencies and digital fluency, among others. Documents encapsulating a whole-of-university strategic plan or framework were categorised as *organisational document*. The search also yielded curriculum information on digital literacy that formed part of course offerings (units of study) and was categorised as *curriculum document*. Information found on digital literacy not falling under the two previous categories was categorised as *other document*, such as student training materials, staff workshops, conference papers, etc. For the purpose of this paper, the organisational documents will be the predominant focus of the analysis in revealing specific definitions of digital literacy found in these documents.

What meanings do these universities ascribe to the idea of digital literacy?

Bounded by time and place, the case study universities' activities on digital literacies, or lack thereof, were captured from published documents in public domains and illustrated in Attachment 1a and Attachment 1b. Of the 42 universities surveyed, 16 universities presented a direct definition of digital literacy, communicating a vision for student development and, in doing so, some enumerating relationships with other literacies or capabilities, for example:

Digital literacy is a broad spectrum of capabilities such as using technologies and systems to engage and connect with others; access, organise, and present information; manage risk and online identity. Being able to adapt to using new technologies easily and knowing which tool is best suited to a task are skills which will equip students for the rapidly changing digital work environment [Edith Cowan University].

Digital literacies are those capabilities which fit an individual for living, learning and working in a digital society (cited JISC, 2014) [Adelaide University]

The investigation showed that the work of JISC in the UK on Digital Capabilities guided the development of many Australian universities' digital literacy initiatives, including Edith Cowan, and universities in Queensland such as James Cook University, Griffith University, University of Queensland and University of Southern Queensland, among others. The themes emerging from these universities' digital literacy commitment relate to enabling students to develop critical skills and knowledge as they experience tools, technologies and ways of knowing, thinking and valuing the increasingly digital environments. On this note, some of the educational goals espoused include developing cognitive skills, practice and dispositional aspects of student development and these reflect the definition of digital literacy for these universities, for example:

The capabilities which fit someone for living, learning and working in a digital society (cited JISC, 2014) [James Cook University].

Digital literacy is a set of skills, knowledge and attitudes that require constant attention and development through our lives and across all aspects of our lives... requires individuals to be adaptable and committed to ongoing personal and professional development [University of Southern Queensland].

Digital literacy is the set of integrated abilities encompassing the reflective use of information, understanding how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning [University of Queensland].

Across the border in New South Wales, the notion of digital literacy encompasses being literate as a digital citizen to navigate successfully the multi-dimensional digital environments. This requires a new concept of literacy and involves not only the ability to use the new technologies but also a whole set of social practices, for example:

Digital literacy means having the skills you need to live, learn, and work in a society where communication and access to information is increasingly through digital technologies like internet platforms, social media, and mobile devices [Western Sydney University].

Digital literacy means students have the knowledge and skills to safely access, question, evaluate and create using technology. Digital literacy is one part of being digital citizen; a person who is responsible for how they use technology to interact with the world [Macquarie University].

For a number of universities across Australia, the development of digital literacy is embedded in a set of Graduate Qualities or Graduate Attributes or Graduate Learning Outcomes or similar student development initiatives, such that the digital literacy development sits alongside other intended graduate capabilities with interrelated elements, for example:

Digital literacy provides students with the skills they need to navigate our ever-changing world. Introducing Digital Literacies as a Graduate Learning Outcome ensures that the University is creating graduates who are flexible and adaptable users and creators of information [Charles Sturt University].

The Digital Literacy Framework sets out digital literacies as a set of interrelated elements. These include: data literacy; media literacy; communication and collaboration; digital identity; scholarship; innovation and creativity; information literacy; and IT Proficiency [La Trobe University].

The Real World Learning 2020 Vision states that graduates will employ digital literacies and use technology strategically to leverage information and to collaborate [Queensland University of Technology]

Digital literacy is related to the graduate attribute, *Apply Technology*. It is the ability to use, navigate and understand technology, hardware and software... [University of the Sunshine Coast]

On that last note, it is worthy to mention that a good number of Australian universities have taken the position to state specifically that digital literacies are not confined to mastery of information and communication technology tools but also involve competencies and understanding to be critical in the elaboration and construction of knowledge. Thus, one of the espoused goals of digital literacy is to develop digitally literate individuals who possess analytic and critical skills alongside the ability to use and create technologies. Indeed, for some, digital literacy is defined as connected to lifelong learning, for example:

Digital literacy is the ability to locate, evaluate, choose, use and create technologies effectively, critically, and safely for lifelong learning [James Cook University].

The definitions and meanings of digital literacy as presented here may have shown a confusion caused by diverse terminologies, meanings and mutually conflicting definitions. Similarly, such confusions and contradictory definitions are evident in the literature (Bawden, 2009). However, what is essential to recognise is the importance of these definitions to practice – how the development of digital literacy is enacted in student development. Moreover, the nurturing and maturity of literacy for the digital age is critical in that understanding, meaning and context should all be fundamental to the concept of such literacy (Selwyn & Facer, 2013).

How do these meanings influence the contemporary enactment of student development?

A university needs to provide enhanced and engaged learning, teaching and research experiences that promote agility of its staff and students, to be confident in their engagement with technological innovations because digital literacy “is a prerequisite in our open and global educational environment” (ACODE, 2014, p. 1). Viewed in this way, the meanings universities ascribe to the definition of digital literacy are likely to influence practices of promoting the development of digital literacy as entrenched in their espoused intent of graduate outcomes and the development of professional identity, for example.

An explicit focus on scholarly and digital literacy is integral to the University’s aim of producing world class scholars and graduates ready for the digital world [University of Melbourne].

The commitment of producing world class scholars and graduates for this university appears to be a key influence in enacting student development. In empowering individuals to navigate the digital world, stakeholders need to put emphasis on developing the literacies and capabilities and lesser emphasis on the rich media, tempting as it may. This is certainly evident in the data sets that emerged in the current research, for example:

Fundamentally, it focuses more on literacies rather than media and involves finding, using and disseminating information in a digital world [Deakin University]

To develop skills for learning, researching and working in a digital society [University of Western Australia]

On this note, the Australasian Council on Open, Distance and eLearning (ACODE, 2014) advises that universities need to operate effectively and critically in the constantly evolving environment and to advance digital literacy through leadership, readiness, clarity and credibility, organisational culture and belief in the purpose, among others. Engaging in these ideas reflectively and strategically is imperative in enacting student development, specifically for developing digitally aware, responsible and literate citizens. This calls for a digitally literate organisation. As JISC (2014) nicely put it “A digitally literate organisation is better equipped to address a range of challenges so building capacity for strategic thinking and leadership around digital literacy at all levels is critical for organisational change in this area”.

Discussion, recommendations and conclusion

“The truth is that there is no one agreed definition of digital literacy” (Brown, 2018, p. 52). But in many respects, the underlying definition remains pointed to JISC’s espoused definition, that is “Digital literacies are those capabilities which fit an individual for living, learning and working in a digital society” (2014, p. 1).

Equally important to note here is that digital literacy is clearly an essential aspect for successfully living, learning, working and even how people think in today’s increasingly digitalized society. Digital forms of communication and information are transforming what it means to co-exist with the ever changing digital landscapes and the opportunities they present. Indeed, the current study has shown that at least 16 universities in Australia are listening and responding to new societal and technological developments, putting in place mechanisms to prepare graduates for the digital world. However, there is no denying the digital literacies movement is complex. While the term ‘digital literacy’ is widely used in curriculum and strategy, research indicates that universities still do not have a clear understanding of the types of digital literacy skills that would enable students to be job ready and how “students are enabled to build digital competencies” (Coldwell-Neilson, 2017, p. 85). Digital literacy also challenges “relationships between staff and students” as their expectations and understanding of digital skills are not always aligned (Coldwell- Neilson, 2010, p. 1).

Developing functional digital skills for life, work and wider societal participation, while challenging, provides a platform for the “transformative goal of promoting critical digital mindsets capable of reimagining and reshaping our inequitable, socially unjust and unsustainable societies” (Brown, 2018, p. 54). At this point, it is useful to reflect upon some generally agreed upon components of digital literacy (Bawden, 2008; Bawden & Robinson, 2009, pp. 54-56). These provide a framework of sort for understanding and enacting student development that bridges the digital divide.

1. Underpinnings
 - Literacy per se
 - Computer / ICT literacy
2. Background knowledge
 - The world of information
 - Nature of information resources
3. Central competencies
 - Reading and understanding digital and non-digital formats
 - Creating communicating digital information
 - Evaluation of information
 - Knowledge assembly
 - Information literacy
 - Media literacy
4. Attitudes and perspectives
 - Independent learning
 - Moral / social literacy

It is evident in the current research that many universities in Australia attempt to bridge the digital divide and tackling such divide is not just about focusing on technological tools, but universities need to address the many components of digital literacy, as shown above. It is linked to the development of new forms of critical digital literacies, acquired through student active involvement in the increasingly digital world in which we live, work, play, earn and learn (Bawden, 2008; Doucet et. al, 2019; Secker, 2017). On this basis, it is imperative that

universities have a strategic vision and operational plans that encapsulate the development of literacies within core systems and processes to build capacity and capability.

We recommend consideration of critical questions for universities in helping articulate a vision for digital literacy:

- How does our institutional mission recognise the importance of digital capability?
- What learner or graduate attributes do we make it our mission to develop, promote and support in our learners?
- What part do digital technologies play in the learning experience at our institution?
- How are learners involved in decisions about ICT?
- How are we helping learners to thrive in a networked social context, where boundaries of many kinds are crossed?
- Do we actively address learners' expectations about the digital environment and forms of digital learning in which they will be engaged? (JISC, 2014)

These questions have curricular and pedagogical implications that ultimately impact on educational practices. Certainly, digital literacy in courses and units of study ought to consider how technologies get embedded into educational practices and not be narrowed down to a question of skills in handling the technology (Bawden & Robinson, 2009). The embedding impacts on the mechanism for influencing educational practices. There will be a better understanding, therefore, of the changes in the practices of developing digital literacy that the technologies may bring about (Bawden, 2008; Knobel, 2008). As it is, the terms digital literacy and 21st century skills have become synonymous in recent times. It is worth considering, then, the idea of "literacy for the 21st century"; what this looks like for different people, what kinds of digital literacies that need to be developed over time and how stakeholders might engage in digital literacy development.

To conclude, the research presented here forms part of a two-phase study, which aims to address specific questions that enabled us to contribute to the discourse of educational importance, that is to enhance knowledge and practice of digital literacy. We believe that digital literacy in higher education is a fertile ground for research and development, in particular in pursuing the ever-illusory meaning of this phenomenon. We intend to pursue the next phase of our investigation, to give voice to people and their understanding of digital literacy, how this plays out in practice, and the opportunities they present as well as obstacles. The goal is to gather empirical data to illustrate a definition of digital literacy, derived from experiences of study participants and as enacted within the walls of universities in Australia.

Finally, the limitations of this study are acknowledged. Attempts were made to locate documents on digital literacy but limited to those that are publicly available. As noted elsewhere in this paper, it is likely that relevant information may be present within universities' intranet and/or internal documents. This will be further investigated in Phase 2 of our research.

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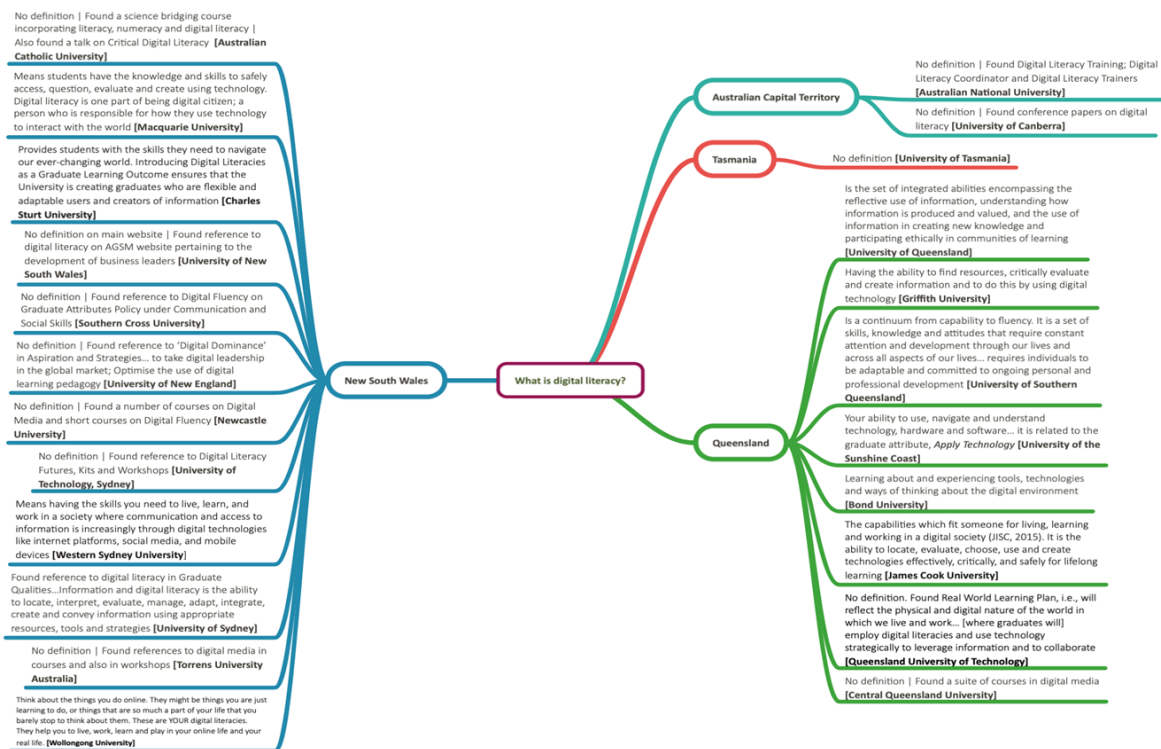
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Attachment 1a Australian Universities' Definition of Digital Literacy



Attachment 1b Australian Universities' Definition of Digital Literacy

