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Developing Online Master's Programs for Teacher-Librarians: A Focus on 21st Century Digital Learning Environments

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Abstract

A multi-disciplinary degree program in education and information studies can uniquely facilitate educators to develop or enhance their capacity to be responsive to the demands of a digitally connected world. Charles Sturt University's new Master of Education (Knowledge Networks and Digital Innovation) aims to develop agile leaders in new cultures of digital formal and informal learning, with expertise in navigating diverse information pathways, creative learning environments, and socially connected global networks. By examining key features and influences of global connectedness, information organization, communication and participatory cultures of learning, students are provided with the opportunity to reflect on their professional practice in a networked learning community, to improve learning and teaching in digital environments.

Keywords: participatory, online learning, information, knowledge networks, pedagogy

Expanding the influence of the information professions

The leadership challenge placed before teacher librarians in rich multi-modal environments is both exciting and challenging, encompassing as it does all aspects of literacy, information literacy, technology, and professional development in collaborative partnerships with students and teachers (Fontichiaro, 2010; Howard, 2010; Killeen, 2009). In the Australian context, the scope of this challenge was highlighted in the Australian Government Standing Committee on Education and Employment inquiry into school libraries and teacher librarians in Australian schools, published in the report entitled *School libraries and teacher librarians in 21st century Australia (2011)*.

This inquiry provided educators in Australia with a substantial review that indicated the vital need to continue the conversation about what a teacher librarian is, does, and can do into the future. (*Inquiry Report*, 6.17). This conversation (i.e. research activities and professional development opportunities) provided a framework for moving forward into the future, for individuals, groups and organizations to be better placed to continue advocacy on behalf of the profession.

For practitioners working in and involved with teacher librarianship, this report has been of significant importance in highlighting the evolving context and changing needs encompassed in providing quality library and information services in our schools. Through this report, practitioners have also been challenged to look further into the field of school libraries and school librarianship, and the factors influencing the post graduate professional needs of teacher librarianship in that context.

The report highlighted the vital role that information professionals in the field of teacher librarianship play in the preparation of our children and youth in 21st century learning contexts. Students use technology to research online, anytime, anywhere, and because of this students in primary and secondary schools need

to be nurtured in ways to learn *how to learn* from the multiplicity of resources at their disposal, using the best information organization and critical thinking strategies that that we can show them. We need to build a strong digital culture of enquiry at the heart of each of our schools (O'Connell, 2012).

As Gordon, (2010, p. 79) explains, a culture of inquiry emerges as teachers become learners, and learners are self- and peer-taught, and everyone becomes a researcher. We know that the development of critical thinking is a key learning objective in education, as it entails the ability to make reasoned evaluative judgements when making sense of information sources that contain different and/or conflicting findings, perspectives and interpretations of a given topic of phenomenon.(Ford, 2008 p. 59). The use of critical thinking has become particularly important in the digital age as relatively quick access to a wide range of information means that the user needs the ability to critically evaluate the validity and value of information accessed. Being taught to think critically and evaluate processes and emerging ideas are important if students are to actively participate in a digitally enhanced world rather than being limited to being consumers of knowledge (Starkey, 2011).

The evidence is that technologies and social media platforms are driving an unprecedented reorganisation of the learning environment in and beyond schools and tertiary environments. These disruptive shifts are already reshaping the workforce landscape and the skills required (Davies et al, 2011), establishing [lifelong](#) and [life-wide](#) learning as the central paradigm for the future (Redecker et al, p.10). Our work as educators has to centre on helping to meet future learning needs by creating a sustainable learning ecology that is shaped by the ubiquity of information, globally responsive pedagogical practices, and driven by collaboration and informal learning in multiple access points and through multiple mediums.

Teacher librarians can be leaders and agents of change in the new information ecology within which library and information services are positioned within a school.

Students in the Master of Education (Teacher Librarianship) program at Charles Sturt University soon discover the breadth of these leadership opportunities, particularly new forms of online information curation, digital citizenship, social media, Web 3.0, tools such as QR codes, and the power of personal learning networks. However, a program/course review undertaken in 2012 provided the impetus to review the current and future needs of current students, past graduates, and the potential areas to introduce information science and education informatics into the broader professional post-graduate landscape within the education sector.

As part of the industry-wide consultation process with key stakeholders (principals, teacher librarians, librarians, system leaders, teachers, and education

consultants) a strongly emerging theme was the need for **a new credentialed advanced degree program for previous graduates of teacher librarianship courses, as well as for other graduates of education programs.** Such a degree program was seen as a positive response to the clearly identified professional development priorities related to 21st century school environments. For instance, of 300 survey respondents, 78% indicated a clear preference in undertaking such an advanced degree program, as opposed to professional development through non-academic non-credentialed options.

More importantly, a **new multi-disciplinary degree program in education and information studies could also provide advanced learning options for other education practitioners** who are seeking a *substantial post-graduate foundation in connecting information knowledge networks and digital innovation in the P-12 education*, and tertiary environments, where the information discipline aspect is foundational to improved education pedagogical practices in digital environments. This could provide a unique opportunity for the School of Information Studies to utilize information science expertise to influence the post-graduate formation of practitioners interested in knowledge networks, e-learning, and digital innovation.

Knowledge Networks and Digital Innovation

Students need guidance from teachers with expertise in navigating diverse information pathways within their personal and creative learning environments, socially connected networks, and globally enriched contexts. The range of literature and information options from books to all manner of media objects, sources and devices means that students need to know how to juxtapose quality text, sound, media and social connections appropriately and in real time; and how to filter, then mix and match what they see, hear and exchange in order to build personal knowledge and understanding of the curriculum.

Educators are challenged by this 21st century participatory culture and information ecology. There is a need to provide a substantial postgraduate advanced program of study in the information discipline knowledge fields that are being impacted by these interactive media-rich environments encompassing:

- Literature and literacy experiences in digital environments, including children's and young adult literature, e-book systems, management and development
- Information organisation in digital environments, including new media tools and content curation with the aid of mobile devices, online platforms and cloud based storage services
- Digital information environments, information retrieval concepts and advanced search strategies
- Concepts and practices for curriculum integration of social media tools, services and platforms

- Comprehensive knowledge of local and international developments in relevant areas of information media practices, with an emphasis on information fluency, guided inquiry, critical inquiry and analysis, as well as design thinking
- Digital citizenship essentials in an evolving digital culture, including legal and ethical behaviour and open learning approaches
- ICT integration and innovation, demonstrating a technology infusion with mobile learning, tablets and devices for information rich learning experiences
- Big Data and information flow, including Web 3.0 and the concepts of the semantic web
- Creative and intellectual leadership in global environment.

Educators who adapt to the literature, information and digital needs of their students not only continue to build a reading culture in the school, but provide the divergence and convergence in media needed to provide the materials and opportunities for motivation, curriculum differentiation, collaboration and the connections necessary to enhance 21st century learning.

Thus a new degree program commenced in 2014, and is delivered fully online by distance education, lead by the Courses Director and Teacher Librarian discipline team in the School of Information Studies, drawing on specialist adjunct staff associated with the School. The degree program Master of Education (Knowledge Networks and Digital Innovation)

<http://www.csu.edu.au/digital> requires completion of sixty-four (64) points comprising two (2) core subjects and six (6) elective subjects. The program is grounded in cross-disciplinary studies in information science and education, allowing students to gain an advanced and integrated understanding of a body of knowledge in the emerging developments in digital innovation in the information science discipline, and the online knowledge networks, processes and interactions for innovative education practice.

The learning framework for the program is established in the keystone subject ***Concepts and Practices in a Digital Age***, where a body of knowledge is introduced that includes a review of recent developments which are influencing learning and teaching in an increasingly digitally-connected world. Through questioning, review and reconstruction of understanding, the subject frames the challenges of learning in digital environments and sets the context for innovation and change in professional practice. The subject is designed to encourage professional learning through authentic tasks and activities; opportunities for collaboration with peers; readings that are thought-provoking; study suggestions which encourage inquiry, reflection and analysis; and engagement with a curriculum unit/strategy to demonstrate application of new knowledge and understanding for learning and teaching practice.

This foundation subject establishes connected learning within new information environments created by the social and technological changes of the digital age. By focusing on connectivity, communication, collaboration and convergence, the subject addresses the challenges, opportunities and emerging possibilities for learning and teaching in information-rich participatory environments. Trends in

knowledge construction, participation and social networks are explored, including information futures and digital convergence. The subject introduces education informatics and the scholarship of digital teaching, and models connected learning through group discourse and collaborative inquiry in digital environments, including the reflective and participatory experiences employed throughout the course.

A comprehensive examination of ideas about digital literacy is undertaken, providing a strong examination of the interconnections between various terms that are in vogue. Drawing from the information science discipline, Bawden (2008) provides the key facets of digital literacy upon which the program is built:

- “knowledge assembly,” building a “reliable information hoard” from diverse sources
- retrieval skills, plus “critical thinking” for making informed judgements about retrieved information, with wariness about the validity and completeness of internet sources
- reading and understanding non-sequential and dynamic material
- awareness of the value of traditional tools in conjunction with networked media
- awareness of “people networks” as sources of advice and help
- using filters and agents to manage incoming information
- being comfortable with publishing and communicating information as well as accessing it

Bawden and Robinson (2012) is also used to introduce the factors involved in information behaviour, and how they relate to one another, to depict the stages and processes of information seeking and use, and sometimes to illustrate a person’s thought processes and changing cognitive state as they deal with information. Information behaviour cannot be considered in isolation; we need to explicitly understand the wider context.

Within the context of connected learning, students also engage with the critical fields of research that can inform the work of educators. Connected learning encompasses information behaviour and processes with technology and digital environments; is explained and facilitated through a range of theories and/or models; includes evolving taxonomies of learning outcomes; and is fired by critical and computational thinking.

The complexities of knowledge networks in digital environments has highlighted the importance of the emerging sub-discipline of education known as **education informatics** - the application of technology to discovering and communicating education information. Information technology is key to knowledge diffusion, but understanding and developing human interaction, human behaviour, and information use and exchange are also essential. Definitions of informatics usually encompass the crossing of disciplines, thus education informatics is basically a **combination of the disciplines of education, technology, and information science**. Just how these domains intersect and interrelate is still

cause of much debate across the disciplines, however the work of Nigel Ford (2008) underpins the focus throughout the degree program.

The first cohort of students have been drawn from Australian and international educators, who are currently Principals and Vice Principals in schools; teachers and teacher librarians; e-learning leaders in schools and higher education; educational designers in higher education; program leaders in education organizations; and technology integrators in schools higher education.

The degree program is delivered through a purposed-designed participatory platform <http://digital.csu.edu.au> that connects to the university learning management system. It also makes use of online tools within and beyond the program, as part of the participatory learning experiences for knowledge networking and digital innovation. In addition, the program has embedded within each subject a reflective and reflexive journaling process undertaken at the newly established **CSU Thinkspace** <http://thinkspace.csu.edu.au>. A reflective journal is an opportunity for students to demonstrate **functioning knowledge** in the context of the intended learning outcomes for the subject or program.

*“In professional programmes in particular, it is useful if students keep a reflective journal, in which they record any incidents or thoughts that help **them reflect on the content of the course or programme**. Such reflection is basic to proper professional functioning. The reflective journal is especially useful for assessing ILOs (intended learning outcomes) in relating to the application of content knowledge, professional judgment and reflection on past decisions and problem solving with a view to improving them.” (Biggs and Tang, 2011)*

Rationale

The cliché for our education era is that ‘there’s an app for that’, yet this slogan belies the intricacies and complexities of human communication and the learning and teaching environments in which we engage with our students – the global citizens of our future world. Literacy and information fluency in digital environments is our contemporary challenge, and the ‘app generation’ is an expression of the power of networks, and the pertinence of technology in the knowledge interactions of learning and teaching.

Most educators understand that digital convergence has begun to have a significant influence on teaching, learning and literacy, resulting in a need for all teachers to revisit and revitalize their understanding of the core influences that shape the pedagogical interactions in classrooms and beyond.

This is where information literacy models come into their own as mechanisms to scaffold information as a knowledge flow, nurturing information fluency and the

capacity for critical thinking and cognitive engagement with old and new media. Computer and mobile device technology environments, social media, and ready forms of online communication drive our newly emerging knowledge ecosystems – and these have been significantly changing in the last 10 years! When Skype was first released in 2003, the global face-to-face contact transformed the opportunity to communicate and collaborate in ‘real time’. Now Apple’s Face-time, Skype in the Classroom, and Google Hangouts (to name just a few tools) guarantee synchronous engagement, alongside collaborative text platforms such as Google docs.

In other words, the mechanisms for the acquisition of new knowledge has become a deeper process of individual and collaborative learning activities, problem solving and artefact development – through an integration of face-to-face and online interactions within a community, involving absorption, integration and systemisation of the information received by the receiver in their own pre-existing cognitive structure, which are the result of personal experience, and earlier knowledge transactions (Trentin, 2011 p. 159).

For teachers and teacher librarians, domain knowledge involves information and also:

- knowledge of information resources such as publications, databases, search tools, web resources, etc.
- understanding of the community of learners, enthusiasts and professionals in that area
- tools needed to browse, explore and discover needed information
- methods for storing, managing, retrieving and sharing
- creating artefacts that demonstrate understanding of concepts and material

We have, without a doubt, had an extraordinary decade of change. In our fast-paced world, the priority of any educator is to fast-track professional learning about, and understanding of, knowledge networks and digital innovation. Our school students have not known a world without technology, and our newest students have always been in a world with hand-held and mobile devices. But as any educator knows, having a device, and communicating with a device is not ‘the be all and end all’ of learning. So the role of educators today is to extend their professional capabilities of discipline or domain expertise by embracing knowledge flow within the power of their personal and professional networks – thus developing the capacity to be agile learners themselves ready to nurture the emergent needs of the students in their care.

In the Master of Education (Knowledge Networks and Digital Innovation) we have undertaken to meet the challenges of learning in a connected world, and helping our post-graduate students (who will in fact already be outstanding

teaching practitioners) develop the capacity to be responsive to the challenges that this connected world brings.

In examining the concepts and practices for a digital age, we are engaged with as many of the recent developments that are influencing learning and teaching in an increasingly digitally connected world. By examining key features and influences of global connectedness, information organization, communication and participatory cultures of learning, students are provided with the opportunity to reflect on their professional practice in a networked learning community, and engage in robust dialogue to develop an authentic understanding of concepts and practices for learning and teaching in digital environments.

But more than simply learning about online tools, spaces and activities in a participatory culture, learning about knowledge networking requires an examination of what ways the new online tools and techniques for handling information significantly change knowledge; how different knowledge interactions transform learning; and why these transformed activities are meaningfully different and justly describe as 'better' than those they displace. This goes beyond the use of technology to the use of information and knowledge in networked environments to articulate the real transformative potential of connected learning. The changing character of information and the social, participatory nature of knowledge construction in connected environments has created a new participatory culture and information ecology that we cannot ignore.

Thomas and Seely Brown (2011), who explored this new culture of learning in our world of constant change, explained how much the Internet has changed the way we think about both technology and information. In this new culture of learning, the Internet has become a participatory medium, giving rise to an environment that is constantly being changed and reshaped by the participation, changing the flow of news, effecting tacit as well as explicit knowledge, and embedding a new culture of learning. They argue that traditional approaches to learning are no longer capable of coping with this constantly changing world. Teachers no longer need to scramble to provide the latest up-to-date information to students because the students themselves are able to take an active role in helping to create and mould it, particularly in areas of social information.

To support and nurture learning in these evolving environments is a challenge, and why using digital mediums to communicate, collaborate, and curate in the management and dissemination of information is important. Academic and professional development programs should be designed to enhance personal professional networks and personal learning conversations.

Identifying New Horizons

Three of our other exciting new subjects for the Master of Education (Knowledge Networks & Digital Innovation) demonstrate how the degree program aims to encompass the most important areas of understanding in knowledge network needs and digital innovation:

Literature in Digital Environments:

Opportunities for creative learning with, and co-creation of, literature and literacy experiences in digital environments is a foundational element of innovation in learning. By exploring digital creation modalities, and the media tools such as e readers, tablet devices, interactive programs and information specific applications for fiction and information sources, it is possible to build new learning pathways and craft new knowledge interactions. The focus on creative environments, such as rich interactive information and story engagement through iPad applications; flexible environments of online graphic interfaces; and digital storytelling or interactive multimedia stories; provides unique and rich challenges in pedagogy, and complex issues in organisation and management in designing learning experiences that are responsive to diverse learner needs.

Knowing how to build these interactive learning pathways is an emerging and essential component of digital innovation in connected learning environments.

Designing Spaces for Learning :

Numerous changes are occurring in the teaching and learning process, including rapid changes in technology and digital learning strategies. Effective practices are emerging around these very new technologies and digital environments, resulting in discussions of how “space” design and utilisation can adapt and drive quality learning and teaching environments and experiences. Ideally, design principles should include a description of the learning activities in which students and teachers will participate. However, designing a vibrant learning space can be a daunting proposition. Design principles require a close understanding of the relationships between learning principles and design principles to shape the use of space. Institutions can create learning spaces that will transform their ability to teach current and future students by identifying the institutional context; specifying learning principles meaningful to the context; defining the learning activities that support these principles; and building the design principles founded on a critical reading of the literature and evidence-based practices that inform potential developments.

Knowledge and understanding of the principles and processes of designing spaces for learning has become an essential component in determining how best to build, update, and modify learning spaces to meet the rapidly changing needs in education.

Information Flow and Advanced Search :

While the digital revolution is impacting everyone that works with information, the very nature of that abundance and accessibility requires a knowledge of the information structures and information seeking strategies that impact on efficient information discovery. By providing an overview of the most important developments taking place in the production, distribution, storage and consumption of information students will be able to critically evaluate the information flow that is becoming embedded in work and social lives. Now more than ever, working in education requires a deeper knowledge and understanding of the information environment, the developments in Web 3.0 and the semantic web, and the capacities of big data to provide opportunities for data mining and information analysis. This continual evolution of the internet as a vehicle for information flow requires searchers, and researchers, who are able to respond to the nuances of information environments, and deploy advanced cognitive and technical skills for managing and searching for information.

With this knowledge educators will be able to improve research skills, examine new and emerging theoretical and practical developments, and make informed decisions that will improve professional practice and the design of learning and teaching activities for ongoing digital innovation.

The Future

Learning in a digital age requires practitioners who understand education imperatives in local and global settings, and who can demonstrate an agile response to novel technologies that may catalyze learning. Both technical and pedagogical innovation should be hallmarks of the best learning environments we can create, and which incorporate a wide variety of pedagogical approaches, learning tools, methods and practices to support students' diverse learning modes.

The information profession, and the expertise of teacher librarianship provides insight and unique opportunities through educational informatics to provide post-graduate professional learners the opportunities they need for curriculum knowledge and development within a global, digital commons. The participants in the new degree program have the opportunity to work, network and learn together, in order to learn from leaders in the field, and become thought leaders in the professional practices of teaching and teacher librarianship in visible and connected ways.

Comments after 14 weeks study in the new degree program

"If nothing else, INF530 has convinced me even more of the need for all teachers to become digitally literate, connected educators".

“While accessing the subject knowledge networks, I have experienced the participatory culture that is at the foundation of 21st century learning. My views and understandings of an educational professional in digital environments have been matured by these studies and the social interactions that have taken place around this learning journey.”

“As a new leader, in a new position, I have found this subject to be incredibly beneficial and so pertinent to teachers and students in today are changing educational landscape.”

“I have loved connecting with the cohort, it’s been amazing. People have said to me “isn’t online study very impersonal and isolating” but I couldn’t disagree more. I feel infinitely more connected with my classmates than I ever did while studying in the traditional way over twenty years ago.”

“Thank you Judy, and thank you to all the other students. What a fabulous beginning, I’m very excited about what is to come”.

Visit the degree profile at <<http://www.csu.edu.au/digital>>

*Keep up-to-date with news and developments at the Facebook page
<<https://www.facebook.com/KnowledgeNetworksDigitalInnovation>>*

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Biographical note

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