Defining Culturally Responsive Digital Education for Classrooms: Writing from Oceania to Build Indigenous Pacific Futures

52

Lester-Irabinna Rigney

Contents

Introduction 1032
Benefits of ICT and the Internet 1034
Liberating Digital Possibilities: Empowerment in Indigenous Oceania 1035
Digital Divide, Schooling, and Equity 1037
Defining Culturally Responsive Digital Schooling 1039
Conclusion 1043
References 1043

Abstract

Digital education, technology-rich schools, and smart classrooms particularly configured by cloud-computing and blended-learning programs are growing. Participation in education is a key factor affecting the life chances for Indigenous children of the Pacific, yet they have lower rates of participation than non-Indigenous people. Pacific twenty-first-century learning requires new culturally inclusive spaces that do not override Indigenous cultures but draw upon them as a learning foundation on which to build new digital learning. Research on technology and equity as a means of raising school achievement are becoming more attractive in education systems seeking to improve school processes and outcomes. Although international research in this area is extensive, covering about two decades, there are still gaps in its research base specifically on the concept of Culturally Responsive Digital Education for Indigenous peoples. While literature on culturally responsive schooling (CRS) for academic improvement of American Indian and Alaska Natives peoples has emerged, this literature is yet to theorize Indigenous online education and complimentary teacher

L.-I. Rigney (✉)
Centre for Research in Education, School of Education, Division of Education, Arts and Social Sciences, University of South Australia, Adelaide, SA, Australia
e-mail: Lester.Rigney@unisa.edu.au

E. A. McKinley, L. T. Smith (eds.), *Handbook of Indigenous Education*,
https://doi.org/10.1007/978-981-10-3899-0_44

pedagogy, especially in the Pacific. This chapter will define culturally responsive digital schooling (CRDS) for Indigenous peoples of the Pacific drawing from robust information communication technology (ICT) research, critical and CRS studies. This chapter first argues the need for CRDS that comprises of three interdependent dimensions of "*benefits*," "*decolonization,"* and "*cultural responsiveness*." Understanding these dimensions are necessary before purpose, effects, or impact of CRDS can be understood. Finally, the chapter defines CRDS and proposes a ten-point model as a cultural standard to support CRDS Indigenous schooling in the Pacific.

Keywords
Culturally responsive · Digital education · Aboriginal education

Introduction

Na marni purrutye marni "Defining Culturally Responsive Digital Education for Classrooms" pepe. Welcome to this chapter "Defining Culturally Responsive Digital Education for Classrooms." *Ngai narri Lester-Irabinna Kudnuitya Rigney.* My name is Lester-Irabinna (Warrior), Kudnuitya (name of third child if son) Rigney. *Ngai yaitya meyu Narungga, Kaurna, Ngarrindjeri, Buhhiyanaunungho*. I am a man from the Nations of the Narungga, Kaurna, and Ngarrindjeri. *Ngai Taihurtinna Nellie Raminyemmerin Yakkana Ivaritjiburha*. I am a descendant of Nellie Raminyemmerin who is the sister of Ivaritji. *Pangkarra ia, Kaurnako yerta warrabutto pepe.* This is Kaurna country (Adelaide Plains) where I write this chapter.

As is my cultural custom before speaking, it is important to locate myself in Kaurna language protocol that respects the laws of my Narungga, Kaurna, and Ngarrindjeri cultures. Speaking (in this case writing) in Kaurna language before entering into English dialogue acknowledges Kaurna land on which this chapter was written and makes transparent the position from which the author conceptualizes and argues for culturally responsive digital schooling.

Indigenous peoples in the Pacific do not want to be excluded from the economic and political opportunities shaped by technology. We want our governments, schools, and teachers in Oceania to skill our children in the benefits of e-commerce to improve our poverty. We want biotechnologies to protect our land and sea organisms. We need access to technologies to transform our status as oppressed colonial subjects. We recognize that modern information communication technology (ICT) and mobile phones have changed the world and its cultures. Now the foundation of all economic, social, and educational activity, these technologies have become important to society and are regarded as critical to improving quality of life (Radoll 2015). As digital technologies become ever more central to school and work, the disadvantages of not being connected increase. Many across the Pacific, including three million Australians, experience digital exclusion that deepens social, economic, and cultural inequalities. Despite unequal schooling and the widening of achievement gaps, Indigenous peoples of the Pacific are calling for schools to build

essential skills through the enormous resources of the Internet to engage how and when they want and wherever they live (Keegan et al. 2011; Radoll 2015; Rigney 2011a; Smith 2003).

Digital education and ever-increasing access to online learning promise to improve schooling processes and outcomes. Digital education, technology-rich schools, and smart classrooms particularly configured by cloud computing and blended learning programs are increasingly present in education systems. Participation in education is a key factor affecting the life chances for Indigenous children of the Pacific, yet they have lower rates of participation and/or success than non-Indigenous people. Pacific twenty-first century learning requires new culturally inclusive spaces that do not override Indigenous cultures but draw upon them as a source of learning foundation on which to build new digital learning.

Education reformers, researchers, and teachers view the use of ICTs in teaching and learning as a means to enhance teacher competency and thus deliver improvements in student outcomes within disadvantaged schools (Rizvi and Lingard 2009). Specific claims of digital education having power to improve Indigenous learning outcomes through building teacher and school capacities are in their infancy, with empirical studies supporting such claims not well established. Furthermore, although international research on technology and equity is extensive, there remain gaps in its research base, specifically on the concept of culturally responsive digital schooling (CRDS) for Indigenous peoples – especially in the Pacific (Warschauer et al. 2004).

This chapter is informed by three vast literature sets: critical theory; ICT studies; and culturally responsive schooling (CRS). It argues that although the plethora of writing about technology and equity schooling reviewed here is insightful, it has dealt little with Indigenous digital education, teachers work, and the need for online empowerment. Blind spots include a definition of CRDS from an Indigenous Pacific perspective and the theorization of the CRDS concept or construct that privileges Indigenous values, interests, aspirations, and epistemologies (Carlson 2013; Donovan 2007; Keegan et al. 2011; Rigney 2011a; Radoll 2015). This research gap possibly explains why there is no agreed universal definition of CRDS or a model of cultural standard that supports it in schools. This also raises another gap in the research in the lack of theorization on the causality or effects of CRDS on improving Indigenous performance outcomes. Therefore, there is a clear need for more social and empirical theorization to explore the claims made about the effects of online education on student improvement.

Educator Mark Warschauer (2003) stressed that research about new technologies and social inclusion has focused on the oversimplified notion of a "digital divide" that can be overcome by providing equipment to the poor, and must shift to explore how teachers can improve student's ability to use technologies for greater societal participation. Warschauer (2003) rightly argues that such ability to access, adapt, and create knowledge using ICT is critical to social inclusion. This chapter seeks to extend the notion of "digital divide" in education beyond exploration of the gaps in ICT access, and toward conceptualizing the effective integration of ICTs into Pacific schools in ways which increase Indigenous people's online ability to engage in meaningful social practices. Beyond the intermediary effects of culturally responsive

digital schooling (CRDS) on Indigenous learning outcomes, there is also a need to look beyond the classroom to the desire and purpose of CRDS from Indigenous perspectives based on three interdependent dimensions: "benefits," "decolonization," and "cultural affirmation." This chapter proposes that these three intimately related dimensions provide important context to understanding Indigenous theorization of CRDS and that understanding these dimensions is necessary before purpose, effects, or impacts of CRDS can be understood.

Literature that has emerged from the United States on culturally responsive schooling (CRS) for academic improvement of American Indian and Alaska Native youth (Castagno and Brayboy 2008) has as its common characteristic and strength a theorization of education that is informed by Indigenous first peoples' epistemologies ontologies and cosmologies. Yet it lacks theorization of Indigenous online education and complimentary teacher pedagogy especially in the Pacific, an absence which leaves a major research gap in the CRS literature. This chapter will define culturally responsive digital schooling (CRDS) for Indigenous peoples of the Pacific drawn from robust ICT studies, critical social science, and CRS studies. Drawing heavily on the CRS literature, the chapter defines the construct of culturally responsive digital schooling as an epistemological construct. In other words, the effects of cultural responsive digital schooling on student outcomes are affected or moderated by school context and Indigenous epistemological views of how knowledge is constructed and transmitted.

Finally, the chapter outlines the purpose of culturally responsive digital schooling from an Indigenous Pacific/Oceania perspective and discusses its characteristics for future schooling of Indigenous children. Currently, there is no definition of CRDS and we as Indigenous peoples of the Pacific are constrained in our capacity to determine future formations of our digital world act to produce. The primary aim of this chapter is to propose a ten point CRDS model as a cultural standard to transform the way we educate teachers and Indigenous students in Pacific schools. Presenting this theoretical model on CRDS provides a framework based on Indigenous epistemologies to build Indigenous First Nations Oceanian futures. As more interest and investment of resources are directed to technology in schools for improvement, there is an urgent need to develop a research agenda on this kind of CRDS model as a cultural standard capable of supporting the claims of digital improvement in Indigenous education.

Benefits of ICT and the Internet

Converging technologies that exemplify information and communication technologies (ICT) include powerful new tools of the Internet and Web 2.0-capable devices such as computers, tablets, mobile phones, and social media. Although ICT is often considered an extended synonym for information technology (IT), its scope is broader. The Internet is a driver of change. It has mobilized many human endeavors, produced globalized information exchanges, and developed new emerging e-commerce to move goods and services. Studying globalized schooling Rizvi and Lingard (2009: 153) conclude that "educational opportunities are shaped by access to technology."

Digital literacy skills born from school connect individuals to benefits of the Information Revolution. ICT careers include banking, health-care, software technicians, IT support, and multimedia to name a few. Wagner (2008) argues that the new world of work will require schools to develop skills in problem solving, collaboration, adaptability, entrepreneurialism, communication, analytics, and imagination. The Internet is widely used in school for teaching, news, entertainment, and keeping touch with parents, students, and staff.

Outside of schools, political, economic, and institutional applications have been central to the Internet's history. The United States organization *Partnership for twenty-first Century Skills* indicates that a "growing number of multinational corporations" require as prerequisite skills "abilities to network with people across boundaries from different cultures and languages" (Wagner 2008: 25). Wagner supports the idea that digital entrepreneurialism requires schools to build student core competencies in global awareness of diverse cultures to thrive in the changing nature of collaboration in today's workforce.

Many tribal communities and Indigenous educational leaders, as well as a number of Indigenous scholars in the Pacific, advocate for the benefits of ICT. Keegan et al. (2011) highlight the importance of web-based Maori language dictionaries, resources, and lessons (e.g., Ngai Tahu) for successful Maori language and cultural revitalization. In Australia, Leavy (2014) outlines best practice in ICT to preserve and maintain Aboriginal virtual heritage. Donovan (2007) and Radoll (2006, 2010) consider how teachers can use the connection between Aboriginal Pedagogy and ICT to engage Aboriginals students in an Aboriginal way. Rigney's (2011a, b, c) and Rigney et al. (2013) studies confirm the need for CRDS to promote greater social inclusion and the need to draw on 20,000 years of relevant cultural epistemes.

Carlson (2013) examines the rapid rise of social media among Aboriginal Australians and how it is used to communicate self-representation to other online communities. Podber's (2014) research suggests that the interrelationship of oral tradition and technology has revolutionary potential for social change. Similarly, the Tangentyere Council and Central Land Council (2007) outline mobile phone use among low-income Aboriginal people and how remote Australia seeks to utilize technologies for empowerment. From this research, it is understood that challenges and opportunities for Indigenous education in the twenty-first century abound and are potentially accompanied by benefits across welfare reform, heritage protection, health care, and workforce growth. Indeed, these public policy and schooling contexts and goals must be intentionally considered and pursued for ICTs' potential to "leap frog" economic and social disadvantage is to be realized (Davison et al. 2000).

Liberating Digital Possibilities: Empowerment in Indigenous Oceania

The author of this chapter argues that Indigenous Pacific futures are tied to Indigenous digital entrepreneurialism propagated by innovative schools. Indigenous digital entrepreneurialism is defined here as digital emancipation and empowerment through schooling to nurture Indigenous entrepreneurs who will create online

systems, enterprises, and platforms for Indigenous futures that are new and optimistic. Teachers in modern classrooms engaging young people to build the Indigenous Pacific of the future need to be giving pedagogical tools to honour students' entrepreneurialism. But discourses of entrepreneurialism are rarely used about the Indigenous Pacific.

In Oceania, colonial-inspired derogatory views of Indigenous cultures pervade. For the reader to understand why we in Indigenous Oceania believe that information technology has become fundamental to equity policies, they must first understand that Oceania's Indigenous "digital divide" is inextricably linked to Pacific colonialism by distant European Empires. Equally important for the reader to understand is what we mean by decolonization. For us a decolonized Pacific is one that is secured firmly to an Internet future that is affordable, socially just, liberating, profitable, and a means to mobilize Indigenous Oceania for our self-determination. The goal of decolonization carries the dreams and aspirations of the colonized peoples of the Pacific. An important question is why?

Bevacqua (2010: 80) writes "that amongst the I6 remaining official colonies in the world left today (as recognized by the United Nations) I4 of them are islands in the Pacific, Atlantic or Caribbean." Bevacqua highlights that 2010 ends the "second decade of UN attempts" to eradicate colonialism and notes that this "is failing miserably" (2010: 80). Early European interactions with Indigenous cultures often constructed us as lazy, heathen savages, constructions that have had prolonged and sustained negative impacts on people's views of us and even our own Indigenous views of ourselves.

European Imperial voyages and migrations through the Indigenous Pacific over the past hundreds of years confined Indigenous mobility to fictitious imperial borders, shaped our schools and determined whose knowledge is valid and whose is excluded (Rigney 2006; Connell 2007). Prevailing colonial views of the modern Indigenous Pacific include the language of disadvantage, isolation, and welfare dependency (Moreton-Robinson 2000; Larkin 2014; Arbon 2008). The Pacific was seen as joke, the cause of dangerous isolation, a place where you dump your convict undesirables, and waste land to test nuclear weapons.

The claim that the Indigenous Pacific had no history or literacy stems from Western representations of Pre-colonial Oceania (Smith 1999; Thaman 1988, 1993; Bishop et al. 2007). European colonial expansion replaced Indigenous knowledges and schools with European versions (Moreton-Robinson et al. 2012). As Heugh (2015) points out the emergence of scientific rationalism, nation-state ideologies in the seventeenth and eighteenth centuries, followed by mass education in the nineteenth century, resulted in the marginalization and silencing of minority communities and an invisibilization of their languages, knowledges, and cultures across Europe. This process coinciding with European colonization has been replicated across Africa, the Americas, much of Asia, and the Pacific.

Tongan scholar Epeli Hau'ofa, a prominent thinker in disrupting colonial narratives and Pacific Islander Studies, claims that colonization and its imaginary borders interrupted trading that was otherwise unimpeded across large seas from Australia, United States, Canada, Polynesia, and Micronesia (Hau'ofa 1994). These trade

winds routes promoted interconnection and communication that was practiced by ancestors and is still reinforced today. Languages and cultures in the Pacific interlinked and were woven into epistemology, ontology, and cosmology. Hau'ofa's (1994) seminal essay "Our Sea of Islands" charts a grand regional vision to profoundly reimagine the Pacific to promote Indigenous interests beyond such colonial inscriptions.

His vision includes the decolonization of the Pacific and the rejection of pervasive hegemonic notions of "smallness, isolation and dependency" born from ways others see the Pacific (Hau'ofa1994: 148). Instead he calls for the re-establishment of order through restoration of Indigenous Pacific collaboration that binds cultures for a common identity to build new and sustainable futures for self-determination. Hau'ofa's view is that we are the minority of the Pacific, but we continue to remain the Majority. For Hau'ofa, the modern project of decolonization must draw on past cultural innovation legacies in order to thrive in the ocean while using technologies to build new economies.

This chapter proposes the need for digital entrepreneurialism in schools that mobilize the Indigenous Pacific collective for transformative action toward fulfilling Hau'ofa's vision. Liberating digital possibilities optimistically seeks empowered change from smallness, isolation, and dependency. Hau'ofa's renewed reformation of Indigenous Pacific identity through technology is not a call to return to pre-European pasts resistant to modernization. Instead, he pursues futurist collaboration with those who are willing to decolonize. Digital revolution for the kind of Indigenous entrepreneurialism argued here delivers power to Indigenous Pacific to control their own futures.

Like Hau'ofa, other Indigenous scholars and thinkers seek counter-narratives to settler-versions of schools that embrace digital inclusion and empowerment. Oceania bounds together numerous writers including: Aboriginal Australians; New Zealand Maori; Indigenous Hawai'ians; First Nation US west coast mainlanders; First Nation west coast Canadian; and Indigenous peoples from the vast "Sea of Islands" across the Pacific (Fredericks et al. 2014; Moreton-Robinson 2000; Smith 1999; Arbon 2008; Martin 2008). These alternative discourses argue that schooling must be culturally responsive to revitalizing and empowering Indigenous communities. Technology and schooling must enable Indigenous First Peoples to de-link from post-colonial habitus toward pluri-versal views of a collective political and economic future.

Digital Divide, Schooling, and Equity

Are Indigenous students of the Pacific ready for a technology-rich world? According to Rizvi and Lingard (2009) in a "knowledge economy, education opportunities are shaped by access to technologies." They outline the digital divide as: "unequal internet access" between industrialized and developing societies; the "social divide" between information rich and poor; and a "democratic divide" between those who can use the Internet and those who cannot (Rizvi and Lingard 2009: 154). Thomson

and de Bortoli's (2007) analysis of OECD 2003 PISA education tests concludes that while all Australian and New Zealand students have access to a computer at school, and most also have computer access at home, fewer Aboriginal and Maori students have access at home. They conclude that students with access to a computer at home frequently achieved at a higher level in mathematics than those students with no such access. OECD member countries continue to invest in ICT to build productive workplaces and as such there is an increasing demand for schools to adapt curriculum to produce technologically literate students (OECD 2012b).

The 2001 and 2006 New Zealand census indicated Maori use of ICTs continues to be low and that a digital divide existed with 25% of Maori households having access to the Internet compared with 45% of other New Zealand households (Keane 2012; Statistics New Zealand 2001). Of the two biggest island nations in the Pacific, OECD (2012a) studies reveal that Maori and Aboriginal Australian households are the least connected due to low income and high cost of technology. The Australian Index of Digital Inclusion (Thomas et al. 2017: 16) highlighted that the gap between Indigenous Australian and non-Indigenous Australian's digital inclusion cannot be explain by low socioeconomic status alone and that "there are important distinctions in how Indigenous Australians access the internet" and as such, even as their "technology adoption increases [. . .] aspects of digital exclusion may persist" for Aboriginal Australians. This creates what Wolff and MacKinnon (2002) call an "information underclass." Where Indigenous peoples of the Pacific experience higher connectivity at school than at home, schools become crucial sites for effective use of gained knowledge to enact Indigenous digital empowerment and entrepreneurialism. To reduce the "digital divide" and the "information underclass" requires, among other priorities, the development of culturally responsive digital schooling while transforming curriculum and teacher pedagogy.

Research on technology and equity has mainly centered on unequal physical access to computers and the Internet, through lenses of race, income, and education (Warschauer et al. 2004). With the intensification of ICT use over the past decade, technology is now considered important to addressing education inequality. Warschauer et al. (2004: 563) conclude that new technologies are a double-edged sword that has the potential to either alleviate or exacerbate existing inequalities. If ICT is distributed equally and is designed and deployed in well-considered ways, it can contribute to societal inclusion, while unequal access and/or colonial configurations at home and school will widen the digital divide and social exclusion. The Internet and its societal transformations present enormous opportunities and challenges for schools (Selwyn and Facer 2007; Fink and Kenny 2003; Wolff and MacKinnon 2002).

Pacific schools are located within a geographical and political region that has the most heterogeneous levels of ICT development globally (International Telecommunication Union 2016), with international aid for ICT development reducing since the mid 1990s on the presumption of the private sector playing an increasing role in the provision of ICT infrastructure (OECD 2005). Although Australia, New Zealand, and some Pacific Island Nations have made considerable advances to bridge the digital divide, rural villages and Indigenous communities remain the most

underserved sections of society (Organisation for Economic Co-operation and Development 2012a, b).

Indigenous peoples of the Pacific seek more than being consumers of technology but want to be producers, managers, and creators. Digital inclusion that only considers issue of access is not enough. This chapter defines Indigenous digital inclusion as: equal Indigenous ICT access that empowers Indigenous peoples and increases skills and capacities to exercise their fundamental rights and freedoms as first peoples in the Pacific. In the spirit of our ancestors we seek digital self-determination, digital empowerment, digital entrepreneurialism, digital equity, and digital excellence. An effective technology pathway to full empowerment and participation in a digital society is via schools. But a central question is how?

Defining Culturally Responsive Digital Schooling

In seeking to define digital education agenda for the Indigenous Pacific the emerging literature on culturally responsive schooling (CRS) offers valuable insights. Relevant themes include: Indigenous culture based curricula (Demmert and Towner 2003), culturally and epistemologically responsive pedagogy (Ladson-Billings 1995; Villegas and Lucas 2002; Castagno and Brayboy 2008; Klump and McNeir 2005), cultural classrooms (Delpit 1995); American Indian pedagogies (Cajete 2001; Grande 2004; Swisher and Deyhle 1989); Multilingualism and multi-literacies (Dick et al. 1994; McCarty and Watahomigie 2004); Alaskan pedagogy (Swisher and Deyhle 1989; Alaska Native Knowledge Network 1998); and New Zealand Kaupapa Maori (Bishop et al. 2007; Smith 2003, 1991). In Australia and other Pacific areas, this issue has been articulated in a number of key policy texts (Rigney 2011b, c; Taufe'ulungaki 2002; Nabobo 2006; Teaero 2003; Thaman 1988).

This body of research illuminates the important roles curriculum and pedagogy play in improving achievement gaps. The CRS literature suggests they can play even more powerful roles for Indigenous youth if they are enacted within the context of decolonization, Indigenous epistemology, ontology, and cosmology. In previous work on Indigenous Australian epistemologies within the CRS domain, the author argued for three integrated principles that include: knowledges that brings emancipation from the unjust Aboriginal human condition; knowledges that uphold the integrity of Indigenous languages, beliefs, and values; and knowledges that privileges Indigenous voices (Rigney 2006). The key point relevant to CRDS emerging from this work on epistemology is the centrality of Indigenous worlds, ways of knowing, speaking, seeing, and being to all forms of curricula, pedagogy, and teacher–student relationships (Rigney 2001, 2002, 2006).

The conclusion reached was that any education system digital or otherwise that attempts to disrupt or dislodge Indigenous languages, cultures, and epistemes from Pacific schools weakens their cultural fluency repertoire needed to bridge other languages of power (Rigney 2002). This view concurs with Battiste (2002) that not all ascribe to the same Indigenous epistemology and that it is diverse in definition. She defines epistemology as "Indigenous knowledges and technologies"

that "sustained their cultures" and "passed to generations" (Battiste 2002: 2). This diversity is seen within two important examples of culturally responsive schooling that inform the digital entrepreneurialism framework proposed in this chapter.

One of the many alternative versions of culturally responsive pedagogy, Gloria Ladson-Billings (1995) work is focused primarily on improving learning outcomes for African-American children. Her version of culturally responsive pedagogy "rests on three criteria or propositions: students must experience academic success; students must develop and/or maintain cultural competence; and students must develop a critical consciousness through which they challenge the status quo of the current social order" (Ladson-Billings 1995: 160). Villegas and Lucas (2002) propose that to increase classroom cultural and linguistic diversity good teaching must have six characteristics: is socioculturally conscious; has affirming views of students from diverse backgrounds; is capable of bringing about educational change that will make schools more responsive to all students; is capable of promoting learners' knowledge construction; knows about the lives of his or her students; and uses his or her knowledge about students' lives to design instruction that builds on what they already know while stretching them beyond the familiar (Villegas and Lucas 2002).

Although the work of Ladson-Billings (1995) and Villegas and Lucas (2002) is relevant for building culturally responsive digital schooling, the author argues for two important points of departure. Firstly, online environments now allow Indigenous children to create their learning, beyond that which is designed by adults, using their cultural funds of knowledge, languages, and epistemologies. The social nature of technology and digital platforms provide the teacher with new opportunities for student self-expression, information gathering about students own cultures, and to create cross-cultural collaborative learning throughout the Pacific. This is the underlying technological basis of the society those in the Pacific now inhabit. Secondly, in ways not imagined by Ladson-Billings, Villegas, and Lucas, using digital classrooms makes achievable the development of local online Indigenous content related to the Pacific context in which parents, local elders, and community stakeholders can be encouraged to participate. Such activities simultaneously expand the languages available on the Internet by prioritizing local Indigenous vocabularies and literacies that predate colonialism in the Pacific by thousands of years.

Given these new and ever-emerging digital possibilities, CRDS must contribute to changes in the dominant educational paradigm in relation to the nature of what it means to know, the role of the teacher in the learning process, and the relationship between the teacher and student. In digital classrooms, the teacher is no longer sole expert or the center of all wisdom, a position that has predominated in the profession for decades. Rather the role of teacher is far more complex as mentor and leader while providing learning experiences for students to achieve creative and personal interdependence through web technologies.

In New Zealand, principles of culturally responsive pedagogy from Kaupapa Maori education scholars reinforce this necessary shift in teacher role as all knower. Kaupapa Maori education sees: power as shared between teacher and student; culture as counting; Maori being Maori as priority; learning as interactive and dialogic; connectedness as fundamental to relations; and a common vision of

excellence for Maori in education (Bishop et al. 2007: 15). Similarly, the Alaskan Native Knowledge Network Culturally Responsive Teacher Standards include: teaching philosophy encompassing multiple worldviews; teacher competency in learning, theory, and practice knowing how students learn; teaching for diversity; content related to local community; instruction and assessment building on student's cultures; learning environments using local sites; family and community involvement as partners; and continuous professional development (Alaska Native Knowledge Network 1998). When grafting this work onto modern technological developments and digital-learning contexts, it is important to note that such pedagogies do not dismiss the specialist knowledge of the teacher, nor their pedagogical expertise and authority. Rather, they compelling see inherent reciprocity in the relationship between teacher and learner for empowerment. The current generation of Web technologies provide opportunity for the nature of such relationships to nurture personal interdependence for students to pursue their own agency.

The field of Indigenous Studies research in Australia also has valuable insights for virtual learning environments that are categorized into four main areas: Indigenous funds of knowledge and epistemologies (Buckskin et al. 2010; Rigney 2006, 2011a,b; Ma Rhea 2015; Perso 2012); community engagement, improving teacher pedagogy, and high student expectation (Ma Rhea et al. 2012; Sarra 2007; Craven et al. 2005); Anti-racism and social justice education (Hattam et al. 2009; Comber 2016); and students at risk strategies (Krakouer 2015; Freebody and Freiberg 2012; Aveling 2012). Although digital literacy is touched upon by a number of these scholars, it is rarely a central theme. What is common in this literature is that teachers' attitude to students and their understanding of students' cultures have shown to improve academic performance. In other words, success requires teachers' knowledge of local cultures, community involvement, and schools that are culturally responsive to, and compatible with, the community environments that surround them.

Synthesizing these CRS research findings makes evident the need for inclusive digital environments for successful learning to adopt a strengths-based approach that privileges Indigenous epistemologies and ways of knowing. The message is clear: any technology-based learning or good culturally responsive digital schooling system should have three purposes:

1. Provide all Indigenous students who want to learn with access to technology
2. Empower all Indigenous students to empower others
3. Connect e-learning to ways that take into account the sovereign status, self-determination, and digital entrepreneurial goals of Indigenous First Nations communities

The ramifications of digital schooling for Indigenous youth are complex. This includes the inherent right of tribal groups peoples to determine the digital nature of schooling for their youth and how best to benefit from technologies and digital platforms now available in the Pacific. At present, there is no Indigenous definition of culturally responsive digital schooling, nor are there articulated conceptual frameworks for greater digital inclusion. Unfortunately, the theory and practice of

culturally responsive digital education in Australia is insufficiently developed, has had no significant peer-evaluated reviews, and currently has only a few productive advocates (e.g., Rigney 2011a, 2013, 2014; Radoll 2010, 2015; Yunkaporta and McGinty 2009). To propel the Indigenous of the Pacific to be ICT-savvy nations there is a need to define digital inclusion and conceptual frameworks for culturally responsive digital schooling.

In this chapter, the author defines culturally responsive digital schooling as:

> Schooling that uses dialogical and participatory teacher pedagogies, which authentically connect learning of subject-specific knowledge to the lifeworlds, epistemological experiences, and languages of Indigenous students, for both improving learning outcomes and addressing social inclusion challenges.

This definition recognizes that ICT-access alone, whether in schools or Indigenous homes, is not the solution to Indigenous poverty or inequality in the Pacific. Rather, being digitally literate, a necessary precursor to being able to efficiently contribute to and access benefits from digitally transformed economies and societies, requires enabling school environments accompanied by inclusive ICT infrastructure and policies. For this definition of culturally responsive digital schooling to be realized, it will be necessary for professional learning in which teachers and educators engage to redefine schooling and pedagogy to meet the requirements of twenty-first century Indigenous learners. Teaching in the Pacific will have to undergo pedagogical changes that match the evolution of digital delivery technologies. School and pedagogies continuously evolve. Digital tools, implemented in culturally responsive ways, can help to facilitate, further, and perhaps even improve the outcomes and processes of existing pedagogies.

Thus, culturally responsive digital schooling and its new pedagogies seek to engage diverse learners and connect students to learning communities, knowledge, and experiences beyond the classroom to empower and improve their lives. To underpin these aims, the author proposes ten standards for culturally responsive digital schooling:

1. Ensures teacher qualifications in ICT teaching and student e-learning
2. Provides students and community access to technology to build skills to participate in online environments and economies
3. Engages parents, local elders, and community as partners to develop local Indigenous digital content
4. Provides e-learning that builds on students' cultural epistemologies, ontologies, and cosmologies
5. Advocates a strengths-based approach to Indigenous e-learning by recognizing the skills, funds of knowledge, and world views students bring with them to school
6. Emphasizes web-based financial, social, and individual cyber safety
7. Cultivates twenty-first century workforce skills of problem solving, adaptability, communication, and analytics

8. Expands languages available on Internet by prioritizing local Indigenous languages and cultures
9. Engages three digital learning purposes: (a) Provide all Indigenous students who want to learn with access to technology, (b) Empower all Indigenous students to empower others, and (c) Connect e-learning to ways that take into account the sovereign status, self-determination, and digital entrepreneurial goals of Indigenous First Nations communities and
10. Reconnects traditional Indigenous engagement and communication across the Pacific and builds core competencies in global awareness of other diverse cultures

Indigenous children of Oceania live in a multitasking, multifaceted, technology-driven, diverse, rapidly changing world. Pacific twenty-first century digital learning and information technology requires new spaces that are culturally safe, coherent, and consistent with Indigenous interests and values. They require learning spaces that do not override Indigenous epistemes and cultures but instead draw upon them as a source of learning foundation on which to build new digital learning structures. They need schooling that connects school, home, country, and community learning in successful ways. Further conceptualization, and enacted programs and evaluations of culturally responsive digital schooling as defined here, framed by the ten principles outlined, are now imperative to bridging the digital disconnect in the Pacific and sustaining and transforming Indigenous Pacific futures.

Conclusion

This chapter has outlined a meaningful purpose and definition of "cultural responsive digital schooling" that moves beyond settler-versions to empower Indigenous communities and Pacific futures. Any program to reduce the Indigenous digital divide must involve teachers, schools, and Indigenous communities as partners. How do we prepare Indigenous students of the Pacific for technology-rich worlds, while retaining and sustaining their languages and cultures that are central to their self-determination? Given the fast uptake of Web-based technologies globally we must develop strategies for educators to meet both of these imperatives. Schools are part of the solution to generate digital innovation and sustain socioeconomic well-being of all children including ours in the Pacific.

References

Alaska Native Knowledge Network (1998) Alaska standards for culturally responsive schools. Retrieved 22 Nov 2016, from http://www.ankn.uaf.edu/publications/standards.html

Arbon V (2008) Arlathirnda ngurkarnda ityirnda: being-knowing-doing: de-colonising indigenous tertiary education. Post Pressed, Teneriffe

Aveling N (2012) Indigenous studies: a matter of social justice: a matter of urgency. Diaspora Indig Minority Educ 6(2):99–114

Battiste M (2002) Indigenous knowledge and pedagogy in first nations education: a literature review with recommendations. Indian and Northern Affairs, Ottawa
Bevacqua M (2010) Their/Our sea of islands: Epeli Hau‘ofa & Frantz Fannon. LiNQ 37:82–90
Bishop R, Berryman M, Cavanagh T, Teddy L (2007) Te Kōtahitanga Phase 3: Whānaungatanga: establishing a culturally responsive pedagogy of relations in mainstream secondary school classrooms. The Ministry of Education, Wellington
Buckskin P, Hughes P, Price K, Rigney L-I, Sarra C, Adams I, Hayward C (2010) Review of Australian directions in indigenous education, 2005–2008 for MCEECDYA. MCEECDYA reference group on indigenous education, Department of Education and Training, Government of Western Australia
Cajete G (2001) Indigenous education and ecology: perspectives of an American Indian educator. In: Grim J (ed) Indigenous traditions and ecology: the interbeing of cosmology and community. Harvard University Press, Cambridge, MA, pp 619–638
Carlson B (2013) The ‘new frontier’: emergent indigenous identities and social media. In: Harris M, Nakata M, Carlson B (eds) The politics of identity: emerging indigeneity. University of Technology Sydney E-Press, Sydney, pp 147–168
Castagno A, Brayboy B (2008) Culturally responsive schooling for indigenous youth. A review of the literature. Rev Educ Res 78(4):941–993
Comber B (2016) Literacy, place, and pedagogies of possibility. Routledge, London
Connell R (2007) Southern theory. The global dynamics of knowledge in social science. Polity Press, Cambridge
Craven RG, Halse C, Marsh HW, Mooney J, Wilson-Miller J (2005) Teaching the teachers aboriginal studies: recent successful strategies, vols 1 & 2. Department of Education, Science and Training, Commonwealth of Australia, Canberra
Davison R, Vogel D, Harris R, Jones N (2000) Technology leapfrogging in developing countries. Electron J Inf Syst Dev Ctries 1:1–10
Delpit L (1995) Other people’s children: cultural conflict in the classroom. The New Press, New York
Demmert W, Towner J (2003) A review of the research literature on the influences of culturally based education on the academic performance of Native American students. Northwest Regional Educational Lab, Portland
Dick G, Estell D, McCarty T (1994) Saad Kaakih Bee’enootiilji Na’alkaa: restructuring the teaching of language and literacy in a Navajo community school. J Am Indian Educ 33 (3):31–46
Donovan M (2007) Can information communication technological tools be used to suit aboriginal learning pedagogies, information technology and indigenous people. IGI Global, Hershey, pp 93–104. [B1]
Fink C, Kenny CJ (2003) W(h)ither the digital divide? Info 5(6):15–24
Fredericks B, Maynor P, White N, English F, Ehrich C (2014) Living with the legacy of conquest and culture: social justice leadership in education and the indigenous peoples of Australia and America. In: Bogotch I, Shields CM (eds) International handbook of educational leadership & social (in)justice. Springer international handbooks of education, vol 29. Springer, Dordrecht, pp 751–780
Freebody P, Freiberg J (2012) Ethnomethodological research in education and the social sciences: studying ‘the business, identities and cultures’ of classrooms. In: Markauskaite L, Freebody P, Irwin J (eds) Methodological choice and design: scholarship, policy and practice in social and educational research. Springer, Heidelberg
Grande S (2004) Red pedagogy: Native American social and political thought. Rowman & Littlefield, Lanham
Hattam R, Zipin L, Brennan M, Comber B (2009) Researching for social justice: contextual, conceptual and methodological challenges. Discourse Stud Cult Polit Educ 30(3):303–316
Hau‘ofa E (1994) Our sea of Islands. Contemp Pac 6:148–161

Heugh K (2015) South Africa: three periods of bilingual or multilingual education. In: Mehisto P, Genesee F (eds) Building bilingual education systems: forces, mechanisms and counterweights. Cambridge University Press, Cambridge, pp 243–262
International Telecommunication Union (2016) Measuring the information society report 2016. United Nations, Geneva
Keane B (2012) Mātauranga hangarau – Information technology – access to technology. Retrieved from http://www.TeAra.govt.nz/en/matauranga-hangarau-information-technology/page-1
Keegan P, Keegan T, Laws M (2011) Online Maori resources and Maori initiatives for teaching and learning: current activities, successes and future directions. MAI Rev 1:1–13
Klump J, McNeir G (2005) Culturally responsive practices for student success: a regional sampler. Retrieved 17 Oct 2006 from www.nwrel.org/request/2005June/textonly.html
Krakouer J (2015) Literature review relating to the current context and discourse on indigenous cultural awareness in the teaching space: critical pedagogies and improving indigenous learning outcomes through cultural responsiveness. ACER, Melbourne
Ladson-Billings G (1995) Toward a theory of culturally relevant pedagogy. Am Educ Res J 32 (3):465–491
Larkin S (2014) Race matters: indigenous employment in the Australian public service. PhD thesis, Queensland University of Technology
Leavy BA (2014) Australian aboriginal virtual heritage. Masters by Research by Publication, Queensland University of Technology
Ma Rhea Z (2015) Leading and managing indigenous education in the postcolonial world. Routledge, New York
Ma Rhea Z, Anderson P, Atkinson B (2012) Improving teaching in Aboriginal and Torres Strait Islander education: Australian professional standards for teachers. Australian Institute for Teaching and School Leadership, Melbourne
Martin K (2008) Please knock before you enter: Aboriginal regulation of outsiders and the implications for researchers. Post Pressed, Teneriffe
McCarty T, Watahomigie L (2004) Language and literacy in American Indian and Alaska Native communities. In: Pérez B (ed) Sociocultural contexts of language and literacy. Lawrence Erlbaum, Mahwah, pp 79–110
Moreton-Robinson A (2000) Talkin' up to the White Women: indigenous women and feminism. University of Queensland Press, St. Lucia
Moreton-Robinson A, Singh D, Kolopenuk J, Robinson A (2012) Learning the lessons?: pre-service teacher preparation for teaching aboriginal and Torres Strait Islander students. Australian Institute for Teaching and School Leadership, Melbourne
Nabobo-Baba (2006) Knowing and learning: an indigenous Fijian approach. IPS/USP, Suva
Organisation for Economic Co-operation and Development (OECD) (2005) Financing ICTs for development – efforts of DAC members: report to the UN task force on financial mechanisms for ICT for development. OECD Publications, Paris
Organisation for Economic Co-operation and Development (OECD) (2012a) OECD broadband statistics update. Retrieved 4 Feb 2013 from http://www.oecd.org/internet/broadband-statistics-update.htm
Organisation for Economic Co-operation and Development (OECD) (2012b) OECD Internet economy outlook 2012. OECD, Paris
Perso TF (2012) Cultural responsiveness and school education: with particular focus on Australia's first peoples: a review & synthesis of the literature. Menzies School of Health Research, Centre for Child Development and Education, Darwin
Podber J (2014) Community dialogues: aboriginal Australians, oral tradition, and community radio. Int Commun Stud XXIII(1):141–150
Radoll P (2006) Information and communication technology. In: Hunter B (ed) Assessing the evidence on indigenous socioeconomic outcomes: a focus on the 2002 NATSISS, vol 26. ANU E–Press, Canberra, pp 197–212

Radoll P (2010) Stone chips to silicon chips: a grounded theory of information and communication technology adoption in Australian Indigenous households-rural, urban and remote. PhD thesis, Australian National University, Canberra

Radoll P (2015) Information and communication technologies in the classroom: implications and considerations. In: Price K (ed) Aboriginal and Torres Strait Islander education: an introduction for the teaching profession. Cambridge University Press, pp 121–136

Rigney L-I (2001) A first perspective of indigenous Australian participation in science: framing indigenous research towards indigenous Australian intellectual sovereignty. Kaurna Higher Education J (7):1–13

Rigney L-I (2002) Indigenous education and treaty: building indigenous management capacity. Balayi Cult Law Colonial 4:73–82

Rigney L-I (2006) Indigenist research and Aboriginal Australia. In: Goduka NI, Kunnie J (eds) Indigenous people's wisdoms and power: affirming our knowledges through narrative. Ashgate Publishing, London, pp 32–50

Rigney L-I (2011a) Indigenous education and tomorrow's classroom: three questions, three answers. In: Purdie N, Milgate G, Bell HR (eds) Two way teaching and learning: toward culturally reflective and relevant education. Australian Council for Education Research Press, Camberwell, pp 35–48

Rigney L-I (2011b) Action for Aboriginal social inclusion. In: Bottrell D, Goodwin S (eds) Schools, communities and social inclusion. Palgrave Macmillan, South Yarra, pp 38–49

Rigney L-I (2011c) Can the settler state settle with whom it colonises? Reasons for hope and priorities for action. In: Brigg M, Maddison S (eds) Unsettling the settler state: creativity and resistance in indigenous settler-state governance. The Federation Press, Annandale, pp 206–211

Rigney L-I, Falkner K, Radoll P, Wilmore M (2013) Digital inclusion and Aboriginal and Torres Strait Islander Peoples: a discussion paper. Telstra Foundation

Rigney L-I (2014) Digital inclusion and Aboriginal futures: three questions. In: Tesitra foundation. (ed), Making the correction in essays on digital excellence. Vivid Publishing, Western Australia, pp 25–35

Rizvi F, Lingard B (2009) Globalizing education policy. Routledge, London/New York

Sarra C (2007) Young, black and deadly: strategies for improving outcomes for Indigenous students. In: Keeffe M, Carrington S (eds) Schools and diversity, 2nd edn. Pearson Education Australia, Frenchs Forest, pp 74–89

Selwyn N, Facer K (2007) Beyond the digital divide: rethinking digital inclusion for the 21st century. FutureLab, Bristol

Smith GH (1991) Reform & Maori educational crisis: a grand illusion. Monograph 3, The University of Auckland

Smith LT (1999) Decolonizing methodologies: research and Indigenous Peoples. Zed Books, New York

Smith GH (2003) Indigenous struggle for the transformation of education and schooling. Alaskan Federation of Natives Convention

Statistics New Zealand (2001) The digital divide. Retrieved 4 June 2013 from http://www.stats.govt.nz/browse_for_stats/industry_sectors/information_technology_and_communications/digital-divide/chapter-1-household-access.aspx

Swisher K, Deyhle D (1989) The styles of learning are different, but the teaching is just the same: suggestions for teachers of American Indian youth. J American Indian Educ (special issue):1–14

Tangentyere Council, Central Land Council (2007) Ingerrekenhe Antirrkweme: mobile phone use among low income aboriginal people: a central Australian snapshot. Tangentyere Council and the Central Land Council, Alice Springs

Taufe'ulungaki F (2002) Pacific education at the crossroads: are there alternatives? In: Pene F, Taufe'ulungaki A, Benson C (eds) Tree of opportunity: re-thinking Pacific education. IOE/USP, Suva, pp 5–21

Teaero T (2003) Indigenous education in Kiribati. In: Thaman K (ed) Educational ideas from Oceania. UNESCO Chair/IOE, USP, Suva, pp 106–111

Thaman KH (1988) Ako and Faiako: cultural values, educational ideas and teachers' role perceptions in Tonga. PhD thesis, USP, Fiji
Thaman KH (1993) Culture and the curriculum in the South Pacific. Comp Educ 29(3):249–260
Thomas J, Barraket J, Wilson C, Ewing S, MacDonald T, Tucker J, Rennie E (2017) Measuring Australia's digital divide: the Australian digital inclusion index 2017, RMIT University, Melbourne, for Telstra
Thomson S, de Bortoli L (2007) PISA 2003 Australia: ICT use and familiarity at school and home. ACER research monograph no 62. ACER, Melbourne
Villegas AM, Lucas T (2002) Educating culturally responsive teachers: a coherent approach. Suny Press, Albany
Wagner T (2008) The global achievement gap: why even our best schools don't teach the new survival skills our children need – and what we can do about it. Basic Books, New York
Warschauer M (2003) Technology and social inclusion: rethinking the digital divide. MIT Press, Cambridge, MA
Warschauer M, Knobel M, Stone L (2004) Technology and equity in schooling: deconstructing the digital divide. Educ Policy 18(4):562–588
Wolff L, MacKinnon S (2002) What is the digital divide? TechKnowLogia 6:7–10. Retrieved 11 May 2016 from http://www.techknowlogia.org/TKL_active_pages2/CurrentArticles/main.asp?IssueNumber=17&FileType=PDF&ArticleID=410
Yunkaporta T, McGinty S (2009) Reclaiming aboriginal knowledge at the cultural interface. Aust Educ Res 36(2):55–72