TECHNOLOGY & INDIGENOUS EDUCATION

ANNOTATED BIBLIOGRAPHY

2008

[ARTICLES & JOURNALS]
[WEB PAGES & BOOKS]

[ALL ANNOTATIONS]

Submitted to: Natasha Boskic
Manager Education Technology
E.P.L.T. Faculty of Education, UBC

Submitted by: Jocelyne Robinson
PhD student, CCFI Faculty of Education, UBC

Articles & Journals

Archibald, J. (1998). Creating power in the land of the eagle. *Canadian Journal of Native Education, 22*(1), 1-2.

This article by Dr. Jo-Ann Archibald echoes the article *Architecture as a Living Process* by Douglas Cardinal and extends it by applying Cardinal's theme of creating power in the land of the eagle for the Canadian Journal of Native Education. Dr. Archibald introduces a diverse set of authors who respond to the call for papers on this theme.

Alexander, J. C. (2001). Wiring the nation! Including First Nations! Aboriginal Canadians and federal e-government initiatives: Retrieved September 1, 2008, from http://findarticles.com/p/articles/mi_qa3683/is_200101/ai_n8939869/print?tag=artBody;col1

This article is written from the viewpoint of 2001 period as it pertains to the challenges to the development of innovative technological infrastructures for Aboriginal people in the digital age. The article is useful as a tool for exploring the early development of digital policy inclusions such as technological initiatives: School Net, Aboriginal Canada Portal on the Internet (www.aboriginalcanada.gc.ca) and others. It would be useful to compare the progress of these initiatives to date in an effort to view their value, utility, and relevance. The issues of Aboriginal Diversity, Coalition and partnerships are at the early stages and this may be useful in discussions as a comparison to the existing structures that have developed.

Assembly of First Nations. (2005). *First Nations education action plan.* Retrieved August 31, 2006, from http://www.afn.ca/cmslib/general/Education-Action%20Plan.pdf

This document presents an overview of the vision for the development and implementation of First Nations sustainable education based on the recognition of Aboriginal inherent rights under international law. The paper discusses important documents pertaining to the advocacy of the Assembly of First Nations on the 1972 document on Indian Control of Indian Education. The document describes the 2004 Auditor General's view on the gap between First Nations peoples living on reserve and the Canadian population as a whole. The statistics on Aboriginal population growth and the low graduation rates in comparison to Canadians in general are described. The article offers new directions in policy and jurisdictions as an action plan for Aboriginal education. Topics covered in the action plan are the implementation of First Nations' education systems and funding, information on research capacity, and coordination of

new approaches for sustainable First Nation's education. The fundamental issue discussed is the goal of transformative self-governance to meet current needs.

Barber, J., & Tuovinen, J. (2006). Creation mother - avatar-based indigenous multimedia intergenerational culture communication project. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006,* 2523-2529.

This document presents an overview of the visions projected for the development and implementation of First Nations' sustainable education, based on the recognition of inherent Aboriginal rights under international law. The paper discusses important documents pertaining to the advocacy by the Assembly of First Nations regarding the document of 1972 on Indian Control of Indian Education. The document describes the 2004 Auditor General's view on the gap between First Nations peoples living on reserve and the Canadian population as a whole. The statistics describing the Aboriginal population growth and the low graduation rates in comparison to Canadians in general are identified. The article offers new directions in policy and jurisdictions as an action plan for Aboriginal education. Topics covered in the action plan are the implementation of First Nations' education systems, funding, information on research capacity, and coordination of new approaches for sustainable First Nations' education. The focus is on the goal of transformative self-governance to meet current needs.

Baxter, M. (2008). Re-conceptualizing the linked courses model. *AACE Journal, 16*(2), 127-135.

Although this article by Mary Baxter at the University of Houston, TX does not allude to Aboriginal technology courses, it describes many strategies that may be transferred to any university wanting to implement a cross-disciplinary, linked set of courses. The notion of re-conceptualizing linked courses across curriculum shows how an Aboriginal program may be linked to history, art, science and language. The article describes the process and the participants involved in the three-semester pilot study. The aim of this study is to attain a rich media-based learning environment. The benefits appear to outweigh the challenges in implementing the linked course model. The use of PeopleSoftware was recommended for the registration of linked courses. The interweaving of history, art, technology etc. may create closer links to community and schools.

Boyle, T., Kennedy, D., Pearson, E., & Vogel, D. (2007). Learning design for nomadic digital natives. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2007,* 757-760.

This article outlines four talks that were focused on the key issues of mobile learning. The talks were initiated to generate discussion on the topic of mobile learning. Although the article is short, several important questions are posed. These are worth noting as they pertain to the future design of accessible, mobile, and flexible multimedia learning resources. How do we design effective learning experiences for mobile digital natives?

How will the designs fit with current formal educational learning experiences or issues of design continuity/discontinuity with web-based learning resources? One talk describes the future video pod casting and pod casting learning environments. Another talk examines the problem of connectivity and availability that may be more important than high bandwidth and high security. A suggestion is made to create local wireless hotspots for connectivity for students instead.

Buker, L., & Zandvliet, D. (2002). Infusing wireless technology into teacher education. *Proceedings of Society for Information Technology and Teacher Education International Conference 2002*, 2466-2470.

This study describes important contextual factors that affect good instruction in a computerized classroom. These are the What Is Happening in This Classroom (WIHIC) instrument and the Computerized Classroom Environment Checklist (CCEC). It includes Gardner's conceptual model for organizing the evaluation of information technology (p. 4) as it pertains to three overlapping spheres called ecosphere, technosphere and sociosphere with the person at the center of one shared area. Psychosocial, Physical, and Use of Information technologies overlap in an area named "satisfaction" as the shared outcome. Student "satisfaction" is taken as a major variable in this study. I am aware of how this paper serves as a good introduction to the use of a high context environment for learning about the interrelated factor affecting "good teaching" in a technologically infused environment.

Campbell, P. J., Oblinger, G. D., et al. (2007). *Top ten teaching and learning issues 2007, creating a culture of evidence tops the list of important issues, academic technology profession moves to an instruction 2.0 world. Retrieved September 1, 2008, from* http://net.educause.edu/ir/library/pdf/EQM0732.pdf

This article emphasizes the direction that education technologists are proposing to take in view of the Net generation and the Instruction 2.0 world. Of the ten issues listed, it was appropriate to place the greatest importance on establishing a culture of evidence. However, included in the list are the issues of selecting appropriate models of e-learning and addressing emerging ethical issues, protecting institutional data, professional development and support, the evolving role of academic technologist, culture of evidence, translating learning research, sharing content, and student expectations. If the list were in order of priority, it would be questionable. There is a well-developed focus on the issue of accountability as it relates to academic technologists and the measures by which one may improve students' learning. This article exposes some of the complexities attached to best practices in educational technology.

Campbell, M., Goold, A., & Goward, P. (2004). Using online technologies: Does culture matter? *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2004*, 2300-2307.

Although the title indicates that culture will be emphasised in online technologies, minimal attention is paid to any specific culture. Malcolm Campbell, Annegret Goold, and Pen Goward approach the topic of using online technologies through the analysis of a survey conducted by two online cohorts. The study consisted of an online survey and its analysis at the Deakin University, Australia, involving both international and local students. The critical questions were to find out how students use online technologies and resources, and their appropriateness. The importance of this article lies in the fact that it underscores the critical weakness of the survey questionnaire. How students enrolled in an Information Technology course might access a course is less relevant than what they consider important material to support their study. The use of the resource guide and the mode of online course delivery were emphasized, resulting in differences between the various student cohorts' preferences in using the study guide to enhance online learning. The international student cohort preferred teacher-driven classes with less text-based learning. In contrast, the local students preferred a self-directed approach. It is noted that the pre-orientation of students to the university may play a role in the way students engage in methods of combining online research. The benefit of this research is that it can lead to other questions that relate to the pre-orientation of students to university settings.

Cardinal, D. (1998). Architecture as a living process. *Canadian Journal of Native Education, 22*(1), 1-1.

In this article, the Métis architect Douglas Cardinal contributes to the current discussion on the challenges facing Aboriginal people in the information age. Cardinal describes his life as a student and artist in the academic world of science and technology and compares it with the wisdom of his elders in technology and science.

Comstock, S. (2007). Indigenous understandings of information literacy by high school student learners and librarians: A socio-technical approach. *Proceedings of Society for Information Technology and Teacher Education International Conference 2007,* 2977-2979.

This short article examines indigenous notions of information literacy by students and librarians. The author relates an example of the 2006 Educational Testing Services data that reflects low rates for information literacy in 800 high schools and 3,000 colleges. The author frames a new way of thinking of this problem by aptly suggesting that the question should not be "Are our students illiterate?" Rather, it should be "Is information literacy discourse itself in need of examination?" (p. 1)

Crawford, S., & Crawford, K. B. (1995). *Self-determination in the information age.* Retrieved September 1, 2008, from http://www.isoc.org/HMP/PAPER/230/html/paper.html

This article contains both an internal and external analysis of the role of self-determination of First Peoples and the transformation to the information age. The author cites Dan Pacheco on the technological education benefits of the "in Barrow, Alaska, the two-way interactive video system that serves remote communities that undergo extreme

weather conditions." On politics and power relations, the authors draw from David Ronfeldt's essay *Cyberocracy is Coming* to explore the potential for information facilitation. The author refers to the work of others such as Dr. Richard Griggs. Kurt Mills, Regis Debray and an array of websites are spread throughout the article, which ends in a short description of the limitations of accessibility for Third World countries. The fears of information colonization are taken up briefly as well as the future of partnership as the steps to solving remote accessibility problems. Debray offers a telling insight on the future shift in military informational empowerment that points to storage, managing, distributing and creating information, rather than the traditional physical and material empowerment (p. 7). One example of an international website is the "Fourth World" Documentation Project organized by the Center for World Indigenous Studies (CWIS) to provide important documents relating to social, political, strategic, historical, human rights and more. The researcher of Fourth World Nations states the meaning of "Fourth World" as nations forcefully incorporated into states that maintain a distinct political culture but are not internationally recognized (p. 3).

Daniels, D. (2008) *Canada's northern indigenous perspectives on distance learning.* Retrieved September 1, 2008, from http://vefir.unak.is/ICTConference/Daniels.pdf

This article provides an overview of the factors that affect distance learning in Northern Indigenous communities of the North West Territories. These factors include the people and the geography. The author cites a number of transitions between communication technologies owned by Ardicom. Half of the communities use relay technology to deliver data and half use fibre optics, copper, cable, and digital microwave technologies. This article describes the changes since the territorial digital communications network (DCN) Telesat and Industry Canada supplied satellite. The author expresses hope for a NWT development for broadband. Broadband for Rural and Northern Development Programs is mentioned as one of the leading tools for mobilizing education programming. The Aurora College is a site for college programs that blend the teleconferencing and satellite delivery options. An example is the Teacher Education Program that is offered through courses from instructors at the University of Saskatchewan. Aurora College offers a Bachelor of Circumpolar Studies through online technology. Language acquisition and culturally relevant materials are examined in this article, together with the resources that affect relevancy, and appropriate literacy materials such as audio files. Example: www.lessonsfromtheland.ca. The article stresses the importance of technological support for students and facilitators.

Din, R., & Abdul K. A. (2004). Promoting indigenous language development through computer mediated communication in an online learning environment: A hybrid approach. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004,* 5419-5424.

This article describes the Hybrid Learning System (HLS) that is an integrated teaching and learning system used at the University of Malaysia. The systems are based on Vygotsky social development theory, Kearsley's minimalist approach and Sweller's cognitive load theory. It was interesting to find that there are more than twenty ways to

integrate computer conferencing in the classroom. The article touches on the notion of democratizing education for diverse learners through Hybrid Learning Systems. The aim of the study was to observe diversity in personality (introvert vs. extrovert, and learning styles that are visual, audio, or kinetic). Results suggested that the hybrid learning style suited both introvert and extrovert personalities and learning styles. This may mean that a variety of learning tools can accommodate more student learning styles.

Donaldson, L. (1998). Writing the talking stick: Alphabetic literacy as colonial technology and postcolonial appropriation. *American Indian Quarterly, 22*(1-2), 46.

This article provides ancillary accounts of the ways the alphabet as a colonial technology has shaped the grand narrative of literacy. The talking stick as a metaphor for *pen* projects a form of resistance and empowerment as a counter to the atrocities of residential school periods. The author makes connections between the accounts from the book *Out of the Depths,* Isabelle Knockwood's memoirs of the nine years spent in Catholic residential school Subenacadie in Nova Scotia. Other stories illustrate the affect of European writing modes on oral societies. The article is an important acknowledgement and cautionary tale for a society introducing technological innovations to Aboriginal people. The knowledge of history is crucial for technological designers of pedagogy involving Aboriginals.

Downing, R. (2003). *Bridging Aboriginal digital and learning divides: Report on office of learning technologies support to Aboriginal communities.* Retrieved September 1, 2008
http://www.hrsdc.gc.ca/en/hip/lld/olt/Skills_Development/OLTResearch/bridging-aboriginal-divide_e.pdf

Although this article is written in 2002, it is useful because it describes the disparities, challenges, issues and outcomes that are still present with regard to accessibility for online services meeting community needs in Aboriginal communities. A number of funded initiatives are mentioned such as the following: The *Distributed E Learning Community for First Nation Science Education* at Concordia University is providing 17 web-based learning modules on science subjects. In addition, the program has an advisory committee consisting of Aboriginal elders, engineers and scientists who are role models for students. The Marieval Enterprise Centre, the Ku-ke-nah SMART First Nation, and the Keewatin Career Development Corporation provide information and communication technology training and access through their network of community sites in rural and remote places. The *Keewaytinook Okimakanak Centre for Expertise for Indigenous Learning Communities* is improving access to equitable and affordable broadband connectivity and all the applications that can be delivered over such a network. The *Centre for Indigenous Peoples' Nutrition and Environment at McGill University* is delivering an online course with interactive components on "Nutrition and Health for Contemporary Aboriginal Communities." The Council for the Advancement of Native Development Officers is providing certificated, online training in community economic development for 2,000 Aboriginal economic development students. The Upper Skeena Development Centre has opened a "Learning Shop" in the Village of Hazelton in

the Gitxan First Nations' territory to promote popular education and to encourage community development officers throughout Canada (pp. 17-18).

The goals are key words such as community partnership, sustainability, leadership and capacity building, lifelong learning and support and infrastructures. The article conveys the need to develop leadership programs for youth and best-practice strategies for developing public policy in government and education.

Durocher, M., & Armfield, S. (2002). Modelling and developing technology integration with pre-service indigenous teachers. *Proceedings of Society for Information Technology and Teacher Education International Conference 2002*, 346-350.

Although this article approaches the modelling and developing of technology for indigenous pre-service teachers in line with Piaget's theory of situated learning, there are important differences in this paper. Two pre-service education courses were combined. The technology in the classroom and the elementary school curriculum were explored. The paper discusses both student and teacher feedback. The web portfolio that students were asked to create provided interesting titles.

1. Splash Page, graphic introduction to web page.
2. Integrated Thematic Unit, demonstration of knowledge of developmental stages and more.
3. Educational Philosophy based on the three-week course.
4. Assistive Technology Page that summarized the research of the technology students used in their lesson plans.
5. Resource Page that contributed to a shared teaching environment.

The results suggested that time was a big stressor and the expectation was that the content of the two courses would be separate but instead they ran simultaneously. Scaffolding was not adequate but the integration of technology was thought to be beneficial for the future.

Duzer, J. V. (2003). Designing and delivering online education for the unique academic needs of Native American populations. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2003*, 3373-3380.

This article provides insights into pre-service, in-service and other staff administrators working in education and is of value to all Native Americans. This article recounts the development of the online course called History of Indian Education offered at the Humboldt State University's Indian & Educational Personnel program. The course was offered in an asynchronous format. The article draws on Palloff & Pratt (1999) as a reference to a student-centered learning model. Face-to-face instructional styles are compared to conventional non-native classrooms. Inuit, Cree, and Mohawk teachers reported their relation to the facilitator role. Student-student communication was an essential component in on-line learning because it makes sense in native communities that already use the collaborative approach in learning activities. Online learning is noted as a "cultural fit" because the reciprocation of discussions was more in line with the mentors, elders, traditional co-operation and reflection in a meaningful context. There is mention of the Salish Kutenai College as a leading tribal college that offers 130 online

courses. This review sought to find out if the online course style and content was culturally appropriate but the course was developed initially to provide access to a unique curriculum. The attention given to the course online feedback creates a valuable insight for course developer and designers. The course delivery style appears to be vital because it was a launching point that provided the confidence needed for students working online. The article also brings attention to the obstacles to enrolment.

Ehlers, U. (2007). A new pathway for e-learning: From distribution to collaboration and competence in E-learning. *AACE Journal, 16*(2), 187-202.

The author develops a case for the critique of e-learning in higher education in relation to the development of competence. Ehlers explains how research has changed since Russell's work on the comparison of e-learning, distance education, and traditional face-to-face education environments. The notion of collaborative learning and competence learning is emphasized. The focus is to rethink the e-learning as pedagogical innovation rather than technological innovation for e-learning.

First Nations Education Steering Committee. (2007). Building digital literacy in BC First Nations communities: Report on the current landscape and the way forward. Retrieved October 1, 2008, from http://www.fnschools.ca/files/Digital%20literacy%20report%20FINAL%20-%20no%20appendices.pdf

This report was created by the First Nations Education Steering Committee to examine the theory that digital literacy in combination with access to connected computers will result in community capacity building in First Nations communities. The report indicates community, industry and expert consultation notes a need to define digital literacy that is appropriate for First Nations people by understanding the demands of the communities. The report recommends using a holistic approach to create a digital learning program for BC First Nations communities that will meet their needs.

First Nations Education Steering Committee. *Teacher resource guide English 12 first peoples.* Retrieved August 1, 2008, from http://www.bced.gov.bc.ca/irp/efp12.pdf

The resource guide for this course has a large number of references to online resource sites containing documents such as First Peoples Provincial Exam practice test and examinable text for the course, policy statement for authentic voice and text use in the classroom, and recommended approaches to local protocol in Aboriginal communities.

Freeman, K., & Moore, J. (2007). Testing a new talking stick: An indigenous community organization and a Canadian university try desktop videoconferencing in partnership. *Proceedings of Society for Information Technology and Teacher Education International Conference 2007,* 2351-2356.

Janet Kelly of Texas Christian University, Janet Kelly of Oglala Lakota College and Jonathan Gratch of the University of North Texas are authors of this case study. It

includes a descriptive study called the Native American Attitude and Preference Survey given to 20 high school students on the Native American reservation in South Dakota. The work touches on the inquiry of home-technology access, internet, email and gaming, with a broader focus on learning styles. The article cites the problems of globalization in a networked world and the influence of technology. Students were asked the following questions: How do Native American high school students perceive technology? How do their responses to technology use compare to suburban and urban high school students? How do Native American students in this study say they learn best? Has technology made a difference in the way they learn? Students were given 37 questions. The article provides a breakdown of the data that of Caucasians and non-Hispanic students, 66.3% had computer and internet access at home compared to 48% of Hispanic students. It was noted that Native Americans and non-Native American teens most often use messaging technology. Teens use computers more than TV in all ethnicities. It was not a surprise that the study suggested Native American students preferred group work because cultural connectedness requires group activity.

Halverson, G., & Thornburg, L. (2006). Adult basic education for Aboriginal learners: The distance delivery continuum. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006*, 552-555.

This article describes the ways that Negahneewin College operates within the Confederation College in Thunder Bay, Ontario, Canada. The college offers campus classroom and satellite synchronous classrooms services. There are 73 First Nations communities in the catchments area; 40% are youth. This model is learner-centered and uses a broad range of online/distance learning resources. Some of the ways that this college prepares students for on- and off-reserve education equivalencies may be of special interest in course design.

Hayes, M., & Allen, B. (2003). *Web-based modules designed to address learning bottlenecks in introductory anatomy and physiology courses.* Retrieved September 1, 2008, from http://imej.wfu.edu/articles/2003/1/02/printver.asp

A faculty at Douglas College has designed a unit module to visualize concepts of Human Anatomy and Physiology. The article refers to the Flash animations and QuickTime movies as a learning tool that replaces the existing audiotape tools to illustrate central concepts; however, the links did not function when I tried them.

Hermes, M. (2000). The scientific method, Nintendo, and eagle feathers: Rethinking the meaning of "culture-based" curriculum at an Ojibwa tribal school. *International Journal of Qualitative Studies in Education (QSE), 13*(4), 387.

This piece asks questions such as: How do we teach non-tribal teachers to teach their children? How can a school frame curriculum in an Ojibwa epistemology without representing Ojibwa as a static culture? How can research support the recovery of indigenous cultures in schooling in a way that pushes the educational researcher beyond sorting out cultural differences as reasons for failures? (p. 389). Another point was made

concerning the perceptions people have about academic rigour and culture-based education being synonymous. Culture is often seen as secondary to academics. The author relates some examples of the scientific method and the traditional way to gather data in stories. Another key term is "moral authority" rather than teacher authority. The author sums up the notion of teaching or trying to insert culture into the classroom. Teaching about culture is different from making students feel their culture is alive in their classrooms (p. 396). Culture-based curriculum is not new, but success in developing curriculum is lacking in theoretical development.

Hermes, M., & Roach, K. H. (2003). Supporting indigenous culture through local creation of multimedia CD-ROM curriculum. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2003*, 3326-3329.

This short article on the CD ROM project echoes many of the concerns in the literature on the importance of availability of technology to create locally controlled multimedia materials. Some of the positive goals are:
1. To create a model for working across differences.
2. Using technology to promote self-esteem by using local aboriginal content.
3. To use of multimedia representation to break stereotypes.
4. Interactive multimedia to instruct and for individual activities.

Hewling, A. (2005). Understanding culture in the virtual classroom: Students expectations of an education environment, and what they experienced once online. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2005*, 2593-2595.

This brief article correlates some issues that arise from expectations that a group of master's students brought to the online classroom environment. The study involved content analysis of class forums and discussion as well as interviews to investigate the process of being an online learner. The article examines the context for online learning relationships and culture because it contrasts student expectations with their experience of online learning. The students' assumptions about flexibility, traditional learning methods and computer-media skills are described as having a strong role in the delivery of the online experiences. Although the students expected flexibility to mean that they could work on their own terms, the course schedule was still governed by a linear mode of delivery. Collaborative expectations were seen as an effort to negotiate. The students' assumptions about the computer skills they brought to the online classroom are discussed. The article views the online learning environment as a site for cultural production in its own right.

Holloway, S., & Valentine, L. G. (2002). Cyberkids? Exploring children's identities and social networks in on-line and off-line worlds, *92*(2).

This article examines the use of cyberspace by younger generations in terms of how children's "real" or "off-line" worlds are incorporated into their "virtual" or "on-line" worlds and vice versa. The article uses empirical evidence to suggest that the modern

Western world requires people to become members of cyberspace in order to avoid social exclusion. Furthermore, children's virtual activities are actually integrated into their real worlds; therefore, in order to understand how to instruct children better, it is important to gain insight into the way in which their integrated on-line and off-line social worlds are formed.

Kavanagh, B., Posstl, B. & Mathew, M. (2005). *First Nations school measures project.* Retrieved September 1, 2008, from http://www.fnesc.ca/Attachments/FNSA/School%20Measures%20&%20Data/FNSA %20School%20Measures%20&%20Data%20Collection%20Project%20- Results%20of%20the%2004-05%20Pilot%20Project.pdf

This article summarizes a pilot project run by the First Nations Schools Association, a non-profit society created on behalf of First Nations schools in British Columbia. The project was designed to integrate high quality and culturally appropriate curriculum into First Nations schools in BC. One major goal was incorporating First Nations language and culture into the programs to increase students' security, knowledge of self, community and family involvement, positive notions of being First Nations, and numeric and literacy skills. Surveys were taken to measure student progress and track the program and school effectiveness.

Kelly, J., Gratch, J., & Thunder, J. A. W. (2008). Case study: Technology use among Native American high school students. *Proceedings of Society for Information Technology and Teacher Education International Conference 2008,* 1008-1012.

Janet Kelly of Texas Christian University, JoAnne White Thunder of Oglala Lakota College and Jonathan Gratch of the University of North Texas are authors of this case study. It includes a descriptive study called the Native American Attitude and Preference Survey given to 20 high school students on the Native American reservation in South Dakota. The work touches on the inquiry of home technology use and access [internet, email, gaming] with a broader focus on learning styles. The article cites the problems of globalization in a networked world and the influence of technology. Students were asked the following questions: How do Native American high school students perceive technology? How do their responses to technology use compare to suburban and urban high school students? How do Native American students in this study say they learn best? Has technology made a difference in the way they learn? Students were given 37 questions to answer. The article provides a breakdown of the data that 66.3% of Caucasians and non-Hispanic students had computer and internet access at home compared to 48% Hispanic students. It was also noted that Native Americans and non-Native American teens most often use messaging technology. Teens use computers more than TV in all ethnicities. It was not a surprise that the study suggested that Native American students preferred group work because cultural connectedness requires group activity.

Kim, P., Olaciregui, C., & Miranda, T. (2007). Can mobile technology become a viable literacy education option for underserved illiterate indigenous children in Latin

America? *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2007,* 1056-1065.

In Latin America and elsewhere, there is a need to create innovative interventions to counter the literary gap between Indigenous students and on Indigenous students as technology continues to grow with globalization and technological advances. The author cites Joseph and Uther (2006) on the notion that no formal theory of mobile language learning has been developed to date. The potential for mobile technology is discussed as a tool that may offer methods of surmounting the literary disparities among Latin American students in the digital age. The article points to situation and culture design considerations such as "frequent engagement opportunities," citing Beaudin et al. (2006) on the idea of "chipping away at a large task once motivated." The development of a mobile learning model must be in relation to the practical problems of the location and situation. Learning technologies need to include the political, cultural, and environmental diversity in their design as well as awareness of the effect of technology, whether intentional or not.

Langman, J., & Fies, C. (2007). Technology-mediated science inquiry: Moving from everyday to classroom science, moving from native language to English. *Proceedings of Society for Information Technology and Teacher Education International Conference 2007,* 3434-3436.

It is a fair comment to say that schools do not always acknowledge students' language proficiency and prior academic knowledge. The authors recognize the limits of the CRS research tools because they were relatively untested when this article was written. The article starts a discussion on the possible benefits of using technology as a tool for improving science enquiry with English Second Language students. The classes were video-taped and students were given digital recorders and paired in groups. The students were given questionnaires in their native language and only in English. The aim was to test the dynamics of science literacy when technology was present in the class. I would caution that this situated-learning experience might introduce assumptions because of the censorship required when performing data collection. Mobile and wireless technology provides new possibilities because of the storage capability and the adaptability to place. The author notes that students who live on farms often move according to the demands of the harvest and mobility is important.

Lickers, H. F., et al. (2007). Lessons in learning: The cultural divide in science education for aboriginal learners. *Journal of Applied Research on Learning,* Retrieved August 31, 2008.

The focus of this article is on the cultural difference in science and technology for Aboriginal learners. Aboriginal identity, worldview, and mother tongue are aspects that conflict with Western science. The author cites Aikenhead who refers to the Kickapoo students who study off-reserve because their worldviews conflict with Western scientific modes of learning. Aboriginal students think holistically about the world whereas Western ways are competitive, de-contextualized, rational, and exploitive. One statement

13

exemplifies the problems facing Aboriginal students when learning science and technology in a Western worldview. Students find themselves having to make one of three choices: (1) adopt science worldview and abandon Aboriginal values and ways of knowing; (2) acquire sufficient knowledge of the material to learn the concepts to get a passing grade, thus keeping your identity intact; (3) refuse to learn anything and accept the consequences of failure. One example of the under-representation factor is provided, noting that in 2002, there was not one single Aboriginal PhD level Fisheries biologist in British Columbia.

Malatest & Associates Ltd. (2004). *Aboriginal peoples and post-secondary education: What educators have learned.* Retrieved September 1, 2008, from http://www.millenniumscholarships.ca/images/Publications/aboriginal_en.pdf

This report would be a useful resource in drawing comparisons between new reports to examine what has worked in particular areas of post-secondary education. The report provides information on the historical, social, geographic, demographic, cultural, individual barriers to Aboriginal post-secondary success, including financing from government and private funding. The article covers strategies for access programs, community delivery, partnerships, curriculum development, initiatives in science and health fields, support for students and alternative assessment strategies.

Menzies, C., xiiem, Q., Archibald, J., & Smith, G. (2004). Editorial: Transformational sites of indigenous education. *Canadian Journal of Native Education, 28*(1/2), 1 - p1, p2.

This article provides the fundamental aims that need to be considered in any Indigenous course design. The notion of transformation in education is described in terms of changing the status quo through education that recognizes the importance of self-determination. Questions cited in the article include: What counts as transformation? How to get it? Transformation is for whom and by whom? To whom is the researcher accountable? The article touches upon policy development and resource sharing, both of which affect any on-line course design. The article refers to the Forest for the Future Project and a website. One of these articles notes the consideration for classroom teachers and curriculum designers Veronica Ignas, Edosdi (Judy Thompson), and Paul Orlowski. The importance of interrogating or taking account of our work is revealed in a number of ways by several people in this article, for example, critical and political understanding are needed, rather than just strategies.

Merkley, D., Schmidt, D., Dirksen, C., & Fuhler, C. (2006). Enhancing parent-teacher communication using technology: A reading-improvement clinic example with beginning teachers. *Contemporary Issues in Technology and Teacher Education, 6*(1), 11-42.

This article conveys an innovative approach to how technology can be used to create effective communication with parents on literacy growth for their child. A university student enrolled in a university-based tutoring program called Reading Improvement

Clinic enhanced the communication process with parents using a WebCT program. The university students were assigned a child to tutor; however, the teacher asked if a student would like to volunteer to use the WebCT environment for communicating with the parent. The article provides examples of the files such as audio and video titles. Since Web CT is password oriented, it became a possibility. The parent appreciated the up-to-date versions of their child's progress. The forum consisted of parent, tutor, and instructor access for the sharing of child reading artifacts and comprehension strategies and goals. The author points out some of the disadvantages but indicates that the positive advantages outweigh the negative ones.

Nikolejsin, D. (Chief Information Officer BCNet). (2007). *Bridging the digital divide, cliff assignment, BCNet conference presentation.* Retrieved October 9, 2008, from http://209.85.173.104/search?q=cache:iQVMnywVsV4J:www.bc.net/2007-conference/Presentations/DNikolelejsin.ppt+briding+the+digital+divide+bcnet+Dave+nikolejsin+2007&hl=en&ct=clnk&cd=1

This is a PowerPoint presentation on how to bridge the digital divide by using technology to educate, inform, make literate, employ and build the capacity of British Columbia's First Nations population.

The funds were contingent upon federal matching, which at the time appeared imminent. A change in government at the federal level delayed this, and we continue to work with the federal government to find cost-sharing opportunities, given that many of their service-delivery plans hinge on connectivity being available in First Nations communities.

Parker, A. (1999). Interaction in distance education: The critical conversation. *AACE Journal, 1*(12), 13-17.

This article provides a meticulous examination of what defines "interaction" in a distance-education context. The article is not specific to Aboriginal people but the technological aspects are worth considering. Worth noting is the view that interactions among students and between student and instructor are places where technology must empower students to construct and reconstruct knowledge as a result of the interaction. The article focuses on four interaction processes: (a) a justification for interaction in a pedagogical process; (b) a definition of interaction as a learning process; and (c) the methodologies for integrating interaction into distance education. The balance of self-direction and the integration of the instructor as taking the role of "provocateur" rather than "academician" fit well with ideas on active learning (terms provocateur and academician, p. 16).

Pascual, P. C. (2005). Educational techno-ethics: As a means to an end. *AACE Journal, 13*(1), 73-90.

The term "techno-ethics" in the title indicates the focus of the article. The author states that technology (and how it is used) needs to be analyzed in an ethical sense for many

environments. The article alludes to the term "competence" as it applies to the areas of educational technology. Being composed of different methods such as audio-visual, technological resources, production, assessment, the "ethical" aspect is ignored. This article branches out from the findings of two projects: "Seminar on Techno-ethics for Future Teachers" and "Observation Laboratory on Techno-ethics for Adults." A short excerpt found on page 82 provides a glimpse of a techno-ethic discourse, as follows:

> Learning with new technologies sometimes forces a confrontation between and among culture-students culture, personal religious values, the discourse of technology and teaching cultures, to name four .... Perhaps what is needed is continuing meta-conversation about the nature and value of technology in various domains. There are arguments presented regarding ethics and values and the terms used to describe them are worth noting. Examples: Moral point of view, idea role taking, moral insight and others. (p. 82)

Peterson, P., & Showalter, S. (2003). Utilizing technology to disseminate Native American culturally diverse special education lessons and training. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2003*, 3355-3358.

This article describes a large and far-reaching demonstration project that includes the major aspects of five federal grant projects. The program acronyms are: RISE, DREAMS, BRIDGE, BEST, LEAP. These programs and their websites, combined as a sharing resource of culturally relevant materials, offer insights into the ways local knowledge can be disseminated to accommodate Indigenous populations facing teacher shortages, poverty, and the disparities that accompany these factors. The article describes each program context and motivation behind the website development. It describes the distant-education technology that was used for the web-based courses. Interactive Group Software was used to maintain the human factor. There is a firm belief that students are more successful when they are well grounded in researching open sources on the World Wide Web. Another technology used is the Interactive Instructional Television System. Teacher training is closely linked with the university supervisor who is aware of the grant program initiatives. Most interesting is the fact that the materials were developed by Indigenous students for Indigenous instructors and students.

Rasheed, F. (2007). Factors impeding implementation of web-based distance learning. *AACE Journal, 15*(3), 315-338.

This article explores some of the barriers in the implementation of distance learning delivered electronically. The author provides a view of terms to define distance learning that is worth comparing to others. The author applies these definitions to the demographics of distance-learning students, promises of web-based distance education, problems of web-based distance learning, student barriers, and faculty barriers and course quality concerns. The article reveals the complexity of distance-learning environments.

Resta, P., Montano, M. D., & Christal, M. (2003). Web-based virtual museum projects: Strategies for revitalizing Native American curriculum and cultures. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2003,* 1968-1970.

This short article describes (a) how the Four Directions web-based project was developed; and (b) the directions it has taken beyond the initial project goal. The article takes up the issues of Native American self-determination and repatriation through three central topics: Culturally Responsive Teaching, Cultural Revitalization and Cultural Collaboration. The project model concept to create virtual museums in partnership with the Native American schools and communities indicates positive moves toward repatriation and self-determination, digital repatriation, and future protocols concerning authentic knowledge access. The article offers two website links that pertain to the development and ongoing immersion of the National Museum of Native American Indians, the University of Austin, and 11 schools.
http://www.conexus.si.edu/VRTour
http://www.4directions.org/
The important features of this project are that it employs a system of curriculum scaffolding between community, schools and museums.

Resta, P., Roy, L., Christal, M., & Montaño, M. K. (2002). Revitalizing Native American cultures through virtual museum projects. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2002,* 2563-2564.

This article describes the six-year Four Directions project that was funded by the U.S. Department of Education Challenge Grant. The aim was to develop technology-supported curriculum for culturally responsive teaching. The partnership included 19 K-12 tribal Native American schools, four universities and two museums. During the first two years of the project, three of the Four Directions schools sent teams of students, teachers, and community members to create an immersive Virtual Museum. The use of quick time virtual reality media was used.

Riedling, A. M. (1999). Distance education: The technology – what you need to know to succeed, an overview. *AACE Journal, 1*(11), 8-13.

This article illustrates some of the important aspects of engaging in distance-education learning. The author recognizes that technology is a factor in the blurring of the boundaries between the traditional classrooms and distance-education environments. The evolution of the tools used in distance education and how they are changing the quality of distance education is touched on. The article contains a list of limitations in the use of satellite and a list for the use of the superhighway or internet. The useful aspect of this article is its brief summary of the networking advantages of distance-education technology.

Rogers, P. C., Graham R. C., & Mayes, T. C. (2007). *Cultural competence and instructional design: Exploration research into the delivery of online instruction cross-culturally.* Retrieved September 1, 2008, from SpringerLink.

This study moves the focus toward cultural competence and instructional design for online instructions as a cross-cultural exploration. The authors explore the experience of 12 professionals' (six female, six male) lived experiences related to their cultural differences and the effect of these difference on their practice. The description of several educational technologies in cross-cultural markets is insightful. The article notes that there is a growing interest in the interaction between culture and educational technology. The authors pose the question: Who are they and what do they bring with them? The research draws on ground theory for the study. The gist of the findings rests on the question: Are online instructional designers aware of the differences between themselves and the cultural group for whom they are designing instruction? The answer is yes, but with limited awareness. According to the author, a useful handbook devotes a whole section to online learning: The Handbook of Distance Education by Moore & Anderson, 2003.

Rowow, L. V. (2007). *Technology in education: Equity and theory are key.* Retrieved September 1, 2008, from http://www.springerlink.com/content/119978/?p=a315fa716c81426eb78de7c743b0a5e8&pi=0

This article by La Vergne Rosow describes some of her teaching experiences using a variety of technologies including computers. Rosow argued that equity and theory are important factors in providing empowerment to students' writing, reading and assessments. Rosow said that Beta testing of software is necessary to ensure the bugs are taken care of. The article describes the ways Rosow encountered education technological inequities during her teaching career. A chronological view of the ways technology can be used to improve student/teacher success is presented. The suggestion is that if students know why and how a system works, they are more likely to value the system for their own use. Therefore, equity and theory are the key to technology education.

Royal, T., Wetere, R., Malina Wright, V., & Hanohano, P. (2003). WINHEC: Advancing IT of A new sort – indigenous technology. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2003,* 3359-3359.

This organization is worth noting because it offers global leadership on Indigenous issues. The authors advance the collective spirit of synergy, self and cultural determination, and other topics. There is a special focus on Indigenous technology and innovative telecommunications.

Ruskin, A. (2005). Digital learning resources: Enriching the appreciation of Aboriginal Canadian literature for undergraduate students. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2005*, 1333-1335.

This article demonstrates the innovative ways in which student courses can be enriched by the inclusion of a linked format for digital media. This paper is a preliminary presentation of an investigation into the research on digital learning. First-year Aboriginal students were selected to test a prototype for a course. The goal was to develop a learning resource that provides access to materials on cultural and historical context for the study of works by Aboriginal authors. The resource material is designed to help in the transition to one of eight other faculties at the university. The English 114 Aboriginal Literature and Culture course is a full year with three different instructors and three sections. The linked digital aspect allows for quick adaptation and change of resources. The author notes the potential for influence in the fields of education, visual communication design and Aboriginal literature.

Rutledge, D., Duran, J., & Carroll Miranda, J. (2007). Three years of the New Mexico laptop learning initiative (NMLLI): Stumbling toward innovation. *AACE Journal, 15*(4), 339-366.

This project relates the trend in education toward economic development. The three-year study of the New Mexico Laptop Learning Initiative (NMLLI) indicated that the teachers reported more creative customized, collaborative lessons and that students are more interested in their work. Teachers expressed the need for technology training to improve their skills. The recommendations for organized workshops and additional professional development were in line with other research studies. Establishing an appropriate policy for laptop use was a benefit in this article. An interesting question was raised in the article: Should emphasis be on technology skills or test material? The Teacher Accountability Reporting System (STARS) is a New Mexico Legislative Education Committee, 2006. This pilot project was a partnership between Governor Bill Richardson and the New Mexico legislature, New Mexico public education departments, students and their families, Regional Education Technology Assistance program, New Mexico State University and hardware and software providers, Dell and Microsoft. The attention to qualifying economic effects and global competitiveness was pronounced in this article.

Skeele, R., & Stefankiewicz, G. (2002). Blackbox in the sandbox: The decision to use technology with young children with annotated bibliography of internet resources for teachers of young children. *AACE Journal, 10*(2), 79-95.

This article involves the use of technology as an important apart of early childhood education; including the beneficial and harmful effects. The article suggests that in the modern technological revolution, computer integration in the classroom can be convenient in helping children reach new levels of development. However, it runs the risk of shaping an anti-social learning environment. The article contains an annotated bibliography of early childhood internet resources.

Society for the Advancement of Excellence in Education. (2005). *Proceedings of a national policy roundtable; moving forward in Aboriginal education. Concordia University.* 18-18. Retrieved October 9, 2008. http://books.google.com/books?hl=en&id=iIvgDmnWWwAC&dq=Society+for+the +Advancement+of+Excellence+in+Education.+(2005&printsec=frontcover&source =web&ots=uRqRICem0p&sig=oIZg_YL3ptbCAB6Sm68Th29ZVkU&sa=X&oi=bo ok_result&resnum=1&ct=result

This website offers a preview of the book that describes many important issues discussed in the round-table conference called Moving Forward in Aboriginal Education that was produced by the Society for the Advancement of Excellence in Education in 2005. The article cites a comprehensive list of major issues that need to be discussed in Aboriginal education. At the top of the list is the view that school must view the community as a source of knowledge and trust. An acknowledgement of Elders and an open-door policy is mentioned, amongst other things.

Sotelo, Q., & Berruecos, J. (2004). Window to my community: Teaching intercultural issues in indigenous, Mestizo (Matzo?) and multicultural schools. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004,* 5476-5478.

This short article was developed in partnership with the General Coordination for Bilingual Intercultural Education in Mexico 2001. The focus is on establishing support material for elementary schools that is inter-culturality sensitive to the 62 ethnic groups of Mexico. The project recognizes the educational, cultural and economical asymmetries that exist as educational challenges to social and developmental policies. The changes envisioned by the project are important factors in the 62 videos that are being created for the three scenarios of indigenous, Matzo and multicultural schools: one is reform in elementary education and two is the production of new materials that promote inter-culturality teaching through 62 video packages with complementary activities. The critical benefit in this project relates to how the videos were produced by local community members and students. This provides culturally specific education as well as the sharing of a broader spectrum of other cultures across the three scenarios. Another important aspect with regard to the materials produced is that they are created with a consideration of the economical asymmetries in the technological outputs available. Put into many formats, the videos would be useful tools for student research.

Subramony, D. (2006). Key patterns and issues relating to the attempts by native Inupiat K-12 students at a technology-rich school district in the Alaskan arctic to culturally appropriate western information technologies. *Proceedings of Society for Information Technology and Teacher Education International Conference 2006,* 1818-1825.

This ethnographic case study explores the key patterns and issues pertaining to culturally appropriate Western information technologies and their effect on Inupiat K12 students living in a technologically rich school district. The author's purpose is to offer insights on

a global scale. The author notes the proficiency of the students' using various technologies during library observation. An excerpt is thought-provoking:

> While most traditional discussions of the digital divide have tended to initially focus on the most obvious issue, namely equitable access to technology tools, it has quickly become apparent to critical scholars that equitable technological proficiency is, if anything, eve more crucial. Tapscott (2000, p. 127) noted, "The issue is not just access to new technologies, but rather ... availability to services, technology fluency, motivation, and opportunities to learn."

Taylor, J. (2007). Indigenous internet representation among the Nordic Sami. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2007*, 1071-1083.

This article brings into focus the stereotypes that are created of the Sami people on the internet. This feature is common to other Indigenous groups. The author makes a good point in asking who will write the next Indigenous handbook on cyberactivism.

"Thibaut, C. (1996). *Cybersphere 9: Philosophy, Baudrillard on the new technologies: An interview with Claude Thibaut.* Retrieved October 4, 2008 from http://www.egs.edu/faculty/baudrillard/baudrillard-baudrillard-on-the-new-technologies.html

This one-page article is an interview by Claude Thibault with Jean Baudrillard. Baudrillard poses a number of questions and possibilities regarding new technologies as they pertain to pedagogy.

Thompson, S., May, T., Caleb, D., & MacPhail, M. (2008). *House of Commons calls for declaration of human rights.* Retrieved April 15, 2008, from http://www.vivelecanada.ca/article/235929873-house-of-commons-calls-for-implementation-of-declaration

This article notes the importance part of history pertaining to the rights of Indigenous peoples. Awareness of fundamental issues and rights provides a useful background when designing Aboriginal courses. The declaration serves as a guide for the notions of reconciliation.

Thorbes, C. (2005, March 10). High tech saves ancient language. *Simon Fraser University Media and Public Relations, 32*(5). Retrieved October 6, 2008 from http://www.sfu.ca/mediapr/sfu_news/archives/sfunews03100501.html

This article describes a research project that was slated to finish in 2007. The language-revitalization program is called the E-Masters Apprentice Program. It brought apprentices and Elder mentors together in face-to-face online learning environments. The use of different technologies such as web-based writing and teaching tools, and audio/video web

communication techniques will test the effectiveness of computer World Wide Web technology as pedagogical tools.

Verlinda, L., & Thompson, V. (1999). Beyond tipis and tomahawks: Using internet images to combat Native American stereotypes. *Proceedings of Society for Information Technology and Teacher Education International Conference 1999,* 337-342.

This article offers some insights for some of the ways Native American stereotypes can be combated through visual literary diversity-awareness and critical thinking. The article provides some examples of native stereotyping but then moves into solutions that include using a database of appropriate images. The SURWEB project is described as a data base designed to provide authentic, student-centered, locally created resources to enhance education opportunities for all of Utah's elementary, secondary, and Navajo people. One interesting concept was the media-basket feature, which allows students and teachers to construct their own slide shows using the images from the SURWEB data base. Media baskets turned into media shows shared on the World Wide Web. Another useful technique for creating anti-bias curriculum was called webbing. The article describes this technique and provides a sample lesson plan from the SURWEB database.

Vigo, K., & Arnold, J. (2004). Indigenous inclusion in curriculum: Creating cultural opportunities in multimedia learning resources. A case study. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004,* 5488-5494.

This article describes how a group on Indigenous and non-Indigenous academics designed a set of criteria for curriculum that entailed Indigenous knowledge inclusion in the multimedia learning resources. This article offers a glimpse of the Curriculum Development and Delivery and Criteria Checklist for Research into Indigenous Matters: Research Protocols. The checklist describes the practical ways to raise consciousness and make policy recommendations, among other useful consultation factors.

Voerman, A., & Philip, R. (2005). Walking together: LAMS, learning and experience for Indigenous students. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2005,* 1350-1358.

This article by Angela Voerman and Robyn Philip based at the Macquarie University of Australia provides a practical and innovative view of the gaps and issues that arise from an exploration of Indigenous students' everyday lived culture and the culture of university learning, using a web-based learning management system (LAMS). The aim of Macquarie University is to review online and offline course structure, philosophy, support, and course delivery in an effort to recertify to a degree-granting program starting in 2006. The challenge of scaffolding students to become independent learners who participate in a collaborative environment through dialogue appears to rest on creating e-learning spaces that are interactive, thus recognizing the social nature of learning environments. The argument of this article is that the LAMS web-based authoring system

(in comparison to the Content Management Systems) is more conducive for creating collaborative online activities. The argument is that LAMS is designed to accommodate teacher/learner sequence activities with more flexibility and input by learner/teacher to input and existing course content. This seems to allow space for local content and would dependent on collaborative efforts via the monitoring system, for student progress. Student prior learning, student safety and security, as well as student development of new knowledge in Indigenous courses depend in part on the ability of students to work independently both in the intensive on-campus block sessions and the home distance periods of the course.

Wilson, S. T. (2007). *Turtles all the way: Simulacra and resistance to simulacra in indigenous teachers' discussion of indigenous children' literature.* Retrieved September 1, 2008, from http://www.springerlink.com/content/95500m0k46771203/fulltext.pdf

This is an excellent discussion on appropriate Indigenous curriculum. The author makes a connection between the notions of resistance to the simulacra in Indigenous teachers' discussions of children literature. The author reinforces the notions that we are made of stories and teachers are storied people. The article view is that children's stories are contested spaces due to the persistence of the simulacra in Indigenous stories. An excerpt clearly explains this connection to the simulacra. Margot struggled with W.P. Kinsella, who along with Thomas King, was one of her favourite adult "Indigenous" contemporary authors. She likened Kinsella's ironic wit to King's and was intimately acquainted with Kinsella's writing except for the fact that he was not Indigenous. Her mistake can be attributed to a confusion that Kinsella himself deliberately cultivated in his fiction, fashioning his stories of reserve life as if it were based on an intimate knowledge of "Indigenous" stories. This confusion is one that Baudrillard (1983) identifies as central to the role that the simulacrum plays in society. When Indigenous mainstream literature becomes conflated with stories written by Indigenous authors, the danger is that the connection of resistance with Indigeneity is threatened (LaRoque, 1996).

Wiseman, D., & Jetté, C. M. P. (1999). Teaching technology through tradition: Native access to engineering at Concordia University. *Proceedings of 1999,* 1467-1469.

The Native Access to Engineering Program at Concordia, Quebec, presents a useful commentary on the under-representation of Aboriginal students in science and technology. This favours the enhancement initiatives of teaching technology through the World Wide Web. Example: School Net and the Community Access Program. The article notes that Aboriginal communities are "developing" and "disparities" are growing. The result is that infrastructural, engineering and technical needs will be at a deficit. One of the most exciting initiatives in this article is that of the "distance-learning" objectives of the project. The interactive blend of curriculum materials, Aboriginal community knowledge that includes a visual interface of the WWW with engineering mentors and teachers may enhance curiosity and new ways of seeking knowledge. The project provides interactive communication to a broad spectrum of First Nations communities focused on science, engineering and leadership, and tradition.

A positive factor is the Canadian government's commitment to national connectedness that results in the connectivity of 631 reserves in Canada (http://www.nativeaccess.com) The website has excellent resources for students and teachers.

Zittle, F. (2004). Enhancing Native American mathematics learning: The use of Smartboard-generated virtual manipulatives for conceptual understanding. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004,* 5512-5515.

The TechShare project is a distance-education initiative of the Navajo Education Technology Consortium that includes a partnership between 13 school districts with 10 individual schools. Two groups of Navajo students were involved in a math Smartboard program test. Their aim was to combat the negative effects of isolation, mobility and scarce resources on Navajo students' academic achievement distributions of standard based multimedia online lessons. The Star Schools program created 260 multimedia lessons to improve student learning. Important lessons can be gleaned from the author's attention to some of the causes for student failure such as irrelevant curriculum, inappropriate testing, and passive teaching methods. Active student learning and experiential learning were deemed important factors in the success of students in the math Smartboard analysis.

Zittle, F., & Zittle, R. (2004). Injecting or integrating technology in the classroom: The interaction effects of teacher technological expertise and technology integration training on Native American student learning. *Proceedings of Society for Information Technology and Teacher Education International Conference 2004,* 2794-2798.

This article examines the concept of providing technological training for teachers in order to enhance student achievement. The article concludes that as teachers' technological expertise increases in a particular field, so will the student performance in that context.

Zittle, R., Zittle, F., Lesher, K., Largie, E. B., Fischer, D., Short, M., et al. (2004). The effects of web based multimedia lessons on Native American learning. *Proceedings of Society for Information Technology and Teacher Education International Conference 2004,* 764-772.

This research was sponsored by the Navajo Education Technology Consortium that is a partnership of 13 school districts and 10 individual schools. This article describes statistical data pertaining to the disparities of Native children in education; however, the main value of the article is that it points to research findings indicating that education technologies are improving education assessments for Navajo students using SHAREtech lessons plans and tools. Student population, software design, educator role, and level of access to technology are factors in the effectiveness of education technology.

Web Pages

[Annotated]

Aboriginal Canada Portal. (2008) *Aboriginal canada portal universities and colleges education.* Retrieved September 1, 2008, from http://www.aboriginalcanada.gc.ca/acp/site.nsf/en/ao28010.html

This is a partnership between government departments and the Aboriginal community to provide online resources, contacts, information and government programs and services in Canada sorted by topic, region and audience.

Aboriginal cultures and traditions, storytelling, (2008) *Industry Canada and Aboriginal youth network project.* Retrieved October 9, 2008, from http://cado.ayn.ca/index.asp

This is a database of First Nation, Inuit and Métis stories collected in an effort to preserve Aboriginal cultural identity via technology.

Alaska Native Knowledge Network. (2007) *Alaska native knowledge network resources for compiling and exchanging information related to Alaska Native knowledge systems and ways of knowing.* Retrieved August 31, 2008 from http://www.ankn.uaf.edu/

This is an online knowledge base designed to assist Native peoples, educators, government agencies and the general public gain access to the Alaskan Native knowledge acquired over the past millennia; it includes insights into Native pathways to education, Alaska Native Cultural resources, Indigenous knowledge systems and the Indigenous education world.

BC Ministry of Education. (2008) *Aboriginal education enhancement agreement.* Retrieved October 9, 2008, from http://www.bced.gov.bc.ca/abed/agreements/criteria.htm

Details of the Aboriginal Education Enhancement Agreements between the school district, all local Aboriginal communities and the Ministry of Education in British Columbia collaborating to set goals aimed at improving the achievements of Aboriginal students.

BCNet. (2008) *BC.net, the backbone of research, education and innovation.* Retrieved October 9, 2008, from http://www.bc.net/news_events_publications/press_releases.htm

This is news, press releases and publications compiled by BCNet, a not-for-profit organization funded by BC's universities, colleges, provincial and federal government, in an effort to encourage research, education and innovative networking between BC's research and educational institutions.

Emily Carr University of Art and Design. (2008) *Emily Carr University online learning,*
    Retrieved September 1, 2008, .http://courses.eciad.ca/

This is an example of the institutional inclusion of Aboriginal-related curriculum.

Evelyn Conley. (2006) *Indigenous education institute.* Retrieved August 31, 2008, from
    http://www.indigenouseducation.org/

This article describes an initiative to preserve and maintain Indigenous traditional
knowledge and to apply it to astronomy and other scientific areas of practice in an effort
to promote the global networking and interrelatedness of Indigenous communities. It
contains an external resource list linking to web pages of various science and technology
organizations.

External Programs and Learning Technologies. (2008). *External programs and learning
    technologies.* Retrieved October 9, 2008, from
    http://www.eplt.educ.ubc.ca/ep_contact.html

A directory of staff members serving on the team for the External Programs and Learning
Technologies sector at the University of British Columbia.

First Nations Center National Aboriginal Health Organization. (2005). *Sacred ways of
    life, traditional knowledge.* Retrieved September 1, 2008, from
    http://www.naho.ca/firstnations/english/documents/FNC-
    TraditionalKnowledgeToolkit-Eng.pdf

This is information compiled by the First Nations Centre National Aboriginal Health
Organization in 2005 describing traditional knowledge, comparing Western and First
Nations ways of life, and identifying tools for maintaining traditional knowledge.

First Nations Education Steering Committee. (2008) *First Nations' schoolnet.* Retrieved
    October 9, 2008, from http://www.fnschools.ca/elibrary

This is an online library provided for the use of all First Nations' schools assisting
educators with resources and instruction manuals that can be integrated into their
curriculum.

First Nations Education Steering Committee. (2008). *Teacher resource guide English 12
    first peoples.* Retrieved August 1, 2008, from
    http://www.bced.gov.bc.ca/irp/efp12.pdf

These are resources for English 12 educators in British Columbia to teach English 12
First Peoples curriculum.

First Voice. (2000). *Language legacies celebrating indigenous cultures.* Retrieved
    August 31, 2008, from http://www.firstvoices.com/

Archive of First Nations' languages across Canada.

Gillies, J. (2005). *Is Aboriginal knowledge science?* Retrieved September 1, 2008, from http://communications.uvic.ca/edge/aboriginal-science.html

This is an article discussing the valuing and integration of traditional Indigenous knowledge into BC's science classrooms.

Hayes, M., & Allen, B. (2003). *Web-based modules designed to address learning bottlenecks in introductory anatomy and physiology courses.* Retrieved September 1, 2008, from http://imej.wfu.edu/articles/2003/1/02/printver.asp

This is an example of using web-based instructional materials and modules to teach the complex topics of anatomy and physiology at the students' speed and receive assistance on temporary roadblocks.

Indian and Northern Affairs Canada. (2008). *INAC GeoPortal.* Retrieved September 1, 2008, from http://geoportail-geoportal.ainc-inac.gc.ca/geonavigateur-geobrowser/public/GeoPortalBrowser.jsp?1220299657561

This is an interactive map of the INAC's regional offices and Indian reserves in Canada. Aboriginal students often share maps of their nations; therefore, an interactive map such as this may be useful.

Indigenous peoples and globalization program. (2006). Retrieved September 1, 2008, from http://www.ifg.org/programs/indig.htm

This is a forum for scholars, economists, activists and researchers to analyse the cultural, social, political and environmental effects of globalization. It contains discussions on how globalization endangers the survival of sustainable societies such as the Indigenous people.

International Indigenous ICT Task Force (IITF). (2008). *International indigenous ICT task force (IITF).* Retrieved August 31, 2008, from http://iictf.blogspot.com/

This site is a portal to promote the connectivity and development of Indigenous information and technology and communication.

Liu, K., & Lin, B. (2008) *Government of Canada strengthens UBC wireless research.* Retrieved September 1, 2008, from http://www.wed.gc.ca/77_10476_ENG_ASP.asp

This archive of news releases and articles promotes discussion on development, diversification and innovativeness in Western Canada's economy, economic policy, program and project development and implementation. The June 27 2008 article discusses the Government of Canada's investment in leading-edge technology for the

University of British Columbia to foster collaborative research between academia and industry.

Lone Eagle Consulting. (2006) *Community internet empowerment resources for Alaskan native villages.* Retrieved August 31, 2008, from http://lone-eagles.com/alaskan-resources.htm

This is a series of links to informational websites that promote technology to enhance Indigenous learning space on the internet.

Manitoba First Nations Education Resource Centre. (2008). *Technology web links.* Retrieved October 9, 2008, from http://www.mfnerc.org/index.php?option=com_weblinks&catid=56&Itemid=90

These are online links to educational technological resources for Manitoba First Nations schools and individuals to promote community development.

Marshal, S. (Ed.).(2008). *International journal of education and development using information and communication technology.* Retrieved August 31, 2008, from http://ijedict.dec.uwi.edu/viewissue.php

This is a journal of international articles with a theme that involves the use of information and communication technology to educate and develop Indigenous communities.

McHugh, J. (2005) *Synching up with the IKId: Connecting to the twenty-first century student.* Retrieved August 31, 2008, from http://www.edutopia.org/tech-integration

This library of resources discusses the use of technology integration into curriculum to enhance the learning experience; including real examples.

Moore, M. (2003) *The digital divide, aboriginal women and IT opportunity.* Retrieved October 9, 2008, from http://www.ayn.ca/ViewNews.aspx?id=266

This article discusses the use of systems of integrated wireless and satellite technology to create connections and receive education in First Nations' communities, resulting in global awareness and empowerment of First Nations' people.

National Congress of American Indian. (2008). *Indiantech.org.* Retrieved August 31, 2008, from http://www.indiantech.org/

This site illustrates an American effort to create Internet connectivity between Indigenous peoples that matches the telecommunications and information technology infrastructure and capabilities enjoyed by the rest of North America. It provides archival information in the areas of access, content, economic development, education, sovereignty, funding links and legislation and regulations.

National Indian Telecommunications Institute. (2003). *The beginnings* Retrieved October 9, 2008, from http://www.niti.org/html/contact_niti.html

This is a Native-run website with a mission to use technology to promote Native American, Native Hawaiian and Alaskan Native advancement in the areas of education, economic development, language and cultural preservation, tribal-policy issues and self-determination. It provides online initiatives such as a virtual museum creation workshop, a copyright-free photo collection for educational use, a language preservation initiative with paper and digital dictionaries, cultural curriculum models, and an archive of the organization's past workshops and presentations.

Native Access Engineering Program. (2008). *Native access to engineering program.* Retrieved August 31, 2008, from http://www.nativeaccess.com/

This is a website implemented by the Faculty of Science at Concordia University to encourage the profession of engineering for Aboriginal students in Canada. Ongoing projects involve a guide for teachers and students of the engineering opportunities available in Canada, curriculum materials for the high school level in math and science relevant to First Nations' students and professional development opportunities of interactive workshops for math and science teachers.

Nikolejsin, D. (2007) *Bridging the digital divide, cliff assignment, BCNet conference presentation.* Retrieved August 31, 2008, from http://209.85.173.104/search?q=cache:iQVMnywVsV4J:www.bc.net/2007-conference/Presentations/DNikolelejsin.ppt+briding+the+digital+divide+bcnet+Dave+nikolejsin+2007&hl=en&ct=clnk&cd=1

This set of presentation notes focuses on bridging the digital divide and increasing the technology use, literacy and connectivity of Indigenous people.

Obannon, C. (2008). *Twiddla very cool team whiteboard.* Retrieved September 1, 2008, from http://edtechtrek.blogspot.com/search?updated-max=2008-05-01T08%3A20%3A00-04%3A00&max-results=3

This is a blog archive with discussions on the power of using educational technology to create community innovative strategies to improve learning opportunities.

Press release, (2007*) First Nations education received royal assent in BC legislature.* Retrieved August 31, 2008, from http://www.bced.gov.bc.ca/abed/fnesc_nr_jurisdiction.pdf

A press release about the implementation of the First Nations Education Act in 2007, which provides provincial governmental recognition of the jurisdiction of First Nations people over kindergarten to Kindergarten to grade twelve education on reserves, providing an opportunity to begin incorporating more language and First Nations culture into the curriculum.

Report on The Royal Commission on Aboriginal Peoples.(1996) *Gathering strength.*
Retrieved September 1, 2008, from http://www.ainc-inac.gc.ca/ch/rcap/sg/ska5b_e.html

An Aboriginal perspective on the new directions that should be taken in social policy making in terms of the family, health and healing, housing, education, arts and heritage.

Royal Commission on Aboriginal Peoples. (1996). *Looking forward looking back.*
Retrieved September 1, 2008, from http://www.ainc-inac.gc.ca/ch/rcap/rpt/lk_e.html

An Aboriginal perspective on the history of First Nations' peoples and their relationship with Europeans in terms of treaty making, displacement and assimilation, residential schools, relocation of Aboriginal communities, the Indian Act, and Veterans. Furthermore, there are suggestions on how to rebuild and create foundations for a new relationship between Aboriginal people and the Government of Canada.

Royal Commission on Aboriginal Peoples. *Perspectives and realities.* (1996) Retrieved September 1, 2008, from http://www.ainc-inac.gc.ca/ch/rcap/rpt/per_e.html

The site explains the perspectives of Aboriginal women, elders', youth, Métis people, northern and urban populations.

Royal Commission on Aboriginal Peoples. (1996) *Renewal: A twenty-year commitment.*
Retrieved September 1, 2008, from http://www.ainc-inac.gc.ca/ch/rcap/rpt/rnwl_e.html

An Aboriginal perspective and suggestions on how to lay new foundations for a renewed relationship with the Government of Canada, the avocation of public education and awareness to create understanding between Aboriginal and non-Aboriginal cultures, approaches to improve economic disparities and constitutional amendments.

Sinclair, J. (2003) *Statement, globalization and indigenous peoples.* Retrieved August 31 2008, from http://www.ainc-inac.gc.ca/nr/spch/unwg/glob_e.html

Sinclair describes globalization as a driving force in technological evolution and its potential to provide connectivity as a coping mechanism for Indigenous people by bridging the digital divide and using communications to give Aboriginal people a voice in global society.

Tage, Cho. (2007). Yukon's Internet Community. *Council of Yukon First Nations' portal directory.* Retrieved September 1, 2008, from http://www.theyukon.ca/cdps/cditem.cfm?nid=63

An information source for Yukon individuals and communities to connect and promote culture and economic development.

Text of Prime Minister Harper's apology. (2008). Retrieved September 1, 2008, from
  http://www.fns.bc.ca/pdf/TextofApology.pdf

This is Prime Minister Steven Harper's public apology to Aboriginal peoples in Canada
for the damaging effects of residential schools.

Truth and reconciliation commission Indian residential schools mandate.(2008)
  Retrieved October 9, 2008, from http://www.trc-cvr.ca/indexen.html

An informational website implemented as part of the Indian Residential Schools
Settlement Agreement reached in September 2007 to provide opportunity for former
students and anyone affected by residential schools to share their experiences with an
independent body headed by Justice Harry LaForme in order to create an accurate
historical record of the policies and operations of the residential schools.

Twist, K. (2003). *A nation online, but where are the Native Americans?* Retrieved
  October 9, 2008 from http://www.niti.org/html/niti_history

A Native-run website with a mission to use technology to promote Native American,
Native Hawaiian and Alaskan Native advancement in the areas of education, economic
development, language and cultural preservation, tribal policy issues and self-
determination. It provides online initiatives such as a virtual museum creation workshop,
a copyright free photo collection for educational use, a language preservation initiative
with paper and digital dictionaries, cultural curriculum models, and an archive of the
organization's past workshops and presentations.

UBC Library Resource. (2008). *Indigenous librarianship, digital divide.* Retrieved
  September 1, 2008, from http://www.library.ubc.ca/xwi7xwa/fn_lib.htm#digit

Links provided by the University of British Columbia Indigenous Library concerning the
topic of The Digital Divide; an example of using technology and internet space to
advance indigenous knowledge and learning.

Vive. (2008) *Joint statement of House of Commons call for implementation of UN
  declaration on the rights of indigenous peoples.* Retrieved August 31, 2008, from
  http://www.vivelecanada.ca/article/235929873-house-of-commons-calls-for-
  implementation-of-declaration

This is a news release describing the Canadian Parliament's decision to endorse the
United Nations Declaration on the Rights of Indigenous Peoples. The Declaration
advocates for Indigenous peoples' right to self-dignity and determination and indicates
that the endorsement will promote access of First Nations people to resources that will
bring about the human rights in the Declaration.

Voyageur, J. C. (2001). *Ready, willing, and able, prospects for distant learning inCanada's First Nations communities.* Retrieved October 8, 2008, from http://www.jofde.ca/index.php/jde/article/view/174/131

This article discusses the use of distance education and technological access (computers, internet, e-mail, voicemail, computer networking, satellite systems, teleconferencing etc.) to enhance educational opportunities in remote First Nations' communities.

White, T. (2006). *Technology-enhanced learning support for Aboriginal institutions.* Retrieved August 31, 2008, from http://www.gov.sk.ca/news?newsId=408244c5-ebad-4a56-b21b-6074f09b43f7

Online resources supplied by the Government of Saskatchewan including an article about how Aboriginal institutions can apply technology to enhance post-secondary educational opportunities to ensure that youth in remote Aboriginal communities have access to skill-building and education.

Working Group on Indigenous Populations. (2007). *Working group on indigenous populations.* Retrieved September 1, 2008, from http://www2.ohchr.org/english/issues/indigenous/groups/groups-01.htm

This site is about the United Nations working committee's resources and discussions on how to promote the rights of Indigenous people.

Books

[Annotated]

Battiste, M. (Ed.). (2000). *Reclaiming indigenous voice and vision.* Vancouver, BC: UBC Press.

The formatting of the book chapters in different doors is special and echoes the practice of Indigenous knowledge as a sense of place and identity. The door is associated with home. Home is where we identify ourselves. The book is designed with this format for a strategic reason. Cultural restoration is an important impetus for writing this book. As the changes in education pass, it is important to remember the first generation of scholars who struggled for Indigenous voice and vision. This book shows the practical ways in which this strategic effort was carried out.

Battiste, M., & Henderson, Y. J. (2000). Protecting indigenous knowledge and heritage. (pp. 49) Saskatoon, SK, Canada, Purich.

This book offers a thoughtful perspective on the ways Indigenous people are expressing the importance of protecting Indigenous knowledge. There is a strong sense of legal awareness because several sections refer to legal documents. In an age when stories are being melded with new media technologies, it may become a foundational piece of literature.

Baudrillard, J. (1997). *Fragments.* London: Verso.

In the information age, Baudrillard is well known for his concept of the "simulacra." Philosophical phrases compel the most intriguing fragments of thought.

Cole, M., Steiner, J. V., Scribner, S., & Souberman, E. (Eds.). (1978). *L.S. Vygotsky, mind in society.* Massachusetts, London: Harvard University Press.

Vygotsky is well known for his work in developmental psychology. His analytical work on the "zone of proximal development" and notions of scaffolding are often discussed in education, particularly the strong sense of mentorship. With the advancement of technology, mentorship will be an important factor.

Deloria, V. J. (1999). In Deloria B., Foehner K., & Scinta S. (Eds.), *Spirit of reason, the Vine Deloria Jr. reader.* Golden, CO: Fulcrum.

It includes a chapter on traditional technologies but the book as a whole provides useful insights into Indigenous philosophy, reason and spirit. Traditional education in its relation to the modern world is taken up with reassurance and wisdom.

Dickason, P. O. (1997). Canada's First Nations. (p. 20). Toronto, ON: Oxford University Press.

This book provides a well-documented set of major Aboriginal historical events. The chapters address some of the early colonial history. The book moves into contemporary events. The First Peoples are covered across Canada.

Freire, P. (2007). *Pedagogy of the oppressed*. New York: Continuum International.

Many references can be drawn when thinking of technology and education. The notion that we must problem-pose in education is a good example. Problem posing to change the status quo is paramount when considering the cultural and literary technological divide for Indigenous peoples.

Kape'ahiokalani Padeken Ah Nee-Benham, Maenette, & Cooper E. J. (Eds.). (2000). *Indigenous educational models for contemporary practice*. London: Lawrence Erlbaum.

This book offers a glimpse of some Indigenous education models that may be of interest in view of curriculum design.

Kuokkanen, R. (2007). *Reshaping the university, responsibilities, indigenous epistemes, and the logic of the gift*. UBC Press Vancouver, British Columbia: UBC Press.

This book is essential if one considers the university efforts toward inclusiveness. The author offers a critique of Western academic practices in education, stressing a need for understanding the Indigenous worldview and an inclusive approach to curriculum in education settings. The author provides an extensive body of Indigenous philosophical insights that are useful in education discourse.

Narby, J. (1998). The cosmic serpent, DNA and the origins of knowledge. (pp. 160). New York: Jeremy P. Tarcher/Penguin Putnam.

The author proposes that Indigenous people have a unique perspective in their relationship with nature that offers a positive lead for the future. In spite of the rich descriptive accounts of the author's visits to Indigenous communities, there is not much written about how the Indigenous people are coping with new technology.

Rushkoff, D. (1996). *Playing the future*. New York: Riverhead Books.

This book offers some thoughtful commentary on the diverse set of media technologies used by youth. In this respect, the author portrays technology in a positive light.

Smith, L. T. (2006). *Decolonizing methodologies, research and indigenous peoples*. Dunedin: Zen Books, University of Otago Press.

In terms of Indigenous scholarly text, this book is globally renowned. It would be difficult to imagine talking about Indigenous issues without mentioning this work. The book has stood the test of time and continues to stretch the boundaries between Indigenous knowledge and contemporary Indigenous theory directions. Indigenous people are asking whose knowledge and for whom? This book attacks a variety of fundamental questions and issues that stem from the depths of Indigenous conversation about self-determination.

Smith, C. B. (2000). Indigenous cultures in an interconnected world (pp.1-24). Globalization and indigenous peoples: Threat or empowerment? (pp. 24). Vancouver, Canada, UBC Press: Publisher.

This book is like spending time with the wisdom of many Elders throughout the world. The title of the book is apt because it reflects the reality of Indigenous networks that are opening up all over the world. The book follows a symposium that included people from sixteen countries. This book exemplifies the collaborative efforts that can be made between cultures. Chapter 4 is titled Cyberspace Smoke Signals: New Technologies and Native American Ethnicity.

Smith, L. T. (2006). *Decolonizing methodologies, research and indigenous peoples*. Dunedin: University of Otago Press.

This book provides background knowledge that pertains to Indigenous methodologies, theories, worldviews and in some places touches on the subject of technology and Indigenous research.

Smith, T. L. (2008). Introduction: A caveat. In K. Denzin, Y. S. Lincoln, & L. T. Smith (Eds.), *Handbook of critical and indigenous methodologies* (pp. 85). University of Illinois, Urbana-Champaign, Texas A&M University, University of Waikato, Hamilton, New Zealand: Sage.

This book is a collection of writing relating to new Indigenous critical theorists' perspectives and their links to emerging research methodologies.