Evaluation Report for the Teaching Radiography at a Distance Project

Final Draft

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1 Project Background

The Teaching Radiography at a Distance (TRD) project is a one-year content development project designed to create and use digital learning objects to support Basic Radiography education in First Nations communities and learning organizations. The project was officially launched in November 2007 and is due to end on November 28, 2008.

During the past year, Oshki-Pimache-O-Win Education and Training Institute in partnership with Cambrian College, the Basic Radiological Technician Program, and the Ojibway and Cree Cultural Centre, collaborated on the development of Basic Radiography digital learning objects and online courseware to help support the training of remote First Nations community members to become proficient Basic Radiological Technicians. Basic Radiological Technicians work under the direction of physicians and nurses in the provision of clinical radiography (x-ray) services to patients within their own home communities.

Learning objects are designed to support “visual learning” and “learning by doing” among First Nations learners. The project made use of eDome a high-tech, digital, multimedia specially designed facility developed at Cambrian College that facilitates the audio and video capturing of objects in a cinema-like production environment. The project utilized eDome to house a typical First Nations radiographic clinical setup complete with the mobile AMX-4 x-ray machine to capture and produce a series of learning objects of Aboriginal radiological technicians performing radiographic clinical procedures on Aboriginal patients. Learning objects were produced in English, Cree and Oji-Cree languages. The project also used Moodle, a virtual learning environment, to deliver and distribute learning objects and online courseware.

2 About this Evaluation

The overall goal of the evaluation is:

- To conduct an independent external evaluation of the project at its end phase and evaluate the effectiveness of the project in terms of its expected results and outcomes.

Specific objectives:

1. To describe and analyze how learning objects were created as well as make recommendations on improving the process.
2. To evaluate the quality, utility, and value of learning objects, online course modules, and infrastructures that support them.
3. To evaluate the success of the project in meeting its expected outcomes.

3a Project Goals

The TRD project addressed the need to promote and foster the development of Aboriginal e-learning for Aboriginal post-secondary education and training by demonstrating a multi-disciplinary collaborative approach between OSHKI, BRTP, OCCC and Cambrian College. The project focused on both process and product in delivering and sharing best practices, resources, and tools to support the creation, sharing and use of learning objects and online courseware.

The project focused on five overarching goals:

- To aid the diffusion, uptake and harmonization of e-learning among Aboriginal post-secondary education institutions in Ontario.
- To facilitate collaboration among Aboriginal and mainstream higher education institutions in the creation, sharing and use of quality digital educational/learning objects and collections.
- To facilitate the infusion of Aboriginal social, cultural and pedagogical needs and considerations in the design, development and delivery of e-learning for Aboriginal adult learners.
- To demonstrate and validate the use of open source software tools, systems and standards to support sustainable Aboriginal e-learning environments.
- To address the technical and infrastructural challenges to surmount in making e-learning accessible and widely available to Aboriginal learning organizations and their learners.

3b The Development Team

Name	Position and Organization	TRD Project Role
Gordon Kakegamic,	E-Learning Coordinator Oshki-Pimache-O-Win Education and Training Institute	Project manager, Moodle developer
Estelle Howard	Program & Student Services Coordinator Oshki-Pimache-O-Win Education and Training Institute	
Peggy Wassegijig	Finance & Administrative Officer Oshki-Pimache-O-Win Education and Training Institute	Administration
Rob Wesley	IT Technician Oshki-Pimache-O-Win Education and Training Institute	IT technical support
Dr. Dermot McLoughlin	Radiologist, MB, FRCP (C) Basic Radiological Technician Program (program manager)	
Janet Scherer	Radiologist, BA, M.R.T. (R), ACR. Basic Radiological Technician Program (curriculum developer, instructor)	
Liz McLeod	Radiologist, BRTP Instructor Basic Radiological Technician Program (curriculum developer, instructor)	
Robert Bentzen	Manager Online Teaching and Learning & eDome Cambrian College	
Joyce Helmer	Chair, Wabnode Institute Cambrian College	
Loretta Assinewai	Faculty, Wabnode Institute Cambrian College	
Jim Hollander	MEd, Curriculum Coordinator and Writer Ojibway and Cree Cultural Centre (Curriculum Coordinator)	
Anastasia Weesk	Ojibway and Cree Cultural Centre Cree Translator	Cree Translator
Angela Shisheesh	Ojibway and Cree Cultural Centre Cree Translator	Cree Translator
Kathy Beardy	Ojibway and Cree Cultural Centre , Oji-Cree Translator	Oji-Cree Translator
Bruce Beardy	Ojibway and Cree Cultural Centre Oji-Cree Translator	Oji-Cree Translator

3c Proposed Timeline (Pre-Development)

Task	Start Date	End Date	Key Deliverable(s)	Responsibility
1 Project Scope and Preparation				
1.1 Establish and initiate project plan	Oct/07	Oct/07	Project Plan including: Work Plan Budget Communication Plan Dissemination Plan Evaluation Plan IT/IM Plan including Service Level Agreement Risk Assessment	OSHKI G. Kakegamic
1.2 Conduct project kick-off meeting	Oct/07	Oct/07	Kick-off meeting and meeting minutes	OSHKI G. Kakegamic
1.3 Establish project website including tools and technology related to the project	Oct/07	Nov/07	Infrastructure, servers, and systems in place and operational	OSHKI G. Kakegamic R. Wesley
1.4 Review of team/staff development in understanding of concepts and methods and use of tools and technology	Oct/07	Nov/07	Demonstrations and training sessions delivered using synchronous/live tools	OSHKI G. Kakegamic
2. Design Review Process				
2.1 Review the target curriculum areas and establish online pedagogic and content aims and objectives for each curriculum area.	Nov/07	Dec/07	Meetings and meeting minutes Instructional Design Document & Prototype	OSHKI, BRTP, CC, OCCC G. Kakegamic J. Scherer L. McLeod L. Assinewai J. Hollander
3 Learning Objects Development				
3.1 Pre-Production: objectives defined, equipment, materials and personnel (subject expert, actors, extras) defined, rough script and storyboard created, production plans set, and alternative plans defined	Dec/07	Jan/08	Script and Storyboard	OSHKI, BRTP, CC, OCCC G. Kakegamic J. Scherer L. McLeod L. Assinewai J. Hollander R. Bentzen & eDome Team
3.2 Production: in studio recording sessions, off camera voice overs, graphics and still image capture/creation	Jan/08	Jan/08	Video, Audio, and Image Artefacts	OSHKI, BRTP, CC G. Kakegamic L. McLeod R. Bentzen & eDome Team
3.3 Post-Production: editing the content into final run time length, combining all other visual content (graphics, logos, still images), combining all other audio content (sound effects, voice over, music), creation of a master production	Jan/08	Mar/08	Learning Objects	CC R. Bentzen & eDome Team

3.4 Authoring: creation of master DVD (interim storage), conversion into streaming video formats, including links and picons (picture icons), packaging, labeling for final product delivery	Mar/08	Mar/08	Master DVD	CC R. Bentzen & eDome Team
4 Learning Object Repository Development				
4.1 Build and populate the learning object repository	Feb/08	Mar/08	Learning Object Repository Learning Objects available through Creative Commons License	OSHKI G. Kakegamic
5 Online Courseware Development				
5.1 Develop online course modules	Apr/08	Sep/08	Basic Radiological Technician Course Modules	OSHKI G. Kakegamic
6 Evaluation				
6.1 Evaluate mid-project outcomes as per Evaluation Plan	Mar/08	Mar/08	Best practice guides	KORI B. Walmark & Team
6.2 Evaluate final project outcomes as Per Evaluation Plan	Sep/08	Sep/08	Best practice guides	KORI B. Walmark & Team
7 Delivery				
7.1 Sharing of the content	Sep/08	Ongoing	Content published and available through GNU General Public License	OSHKI G. Kakegamic
7.2 Maintenance of the content	Oct/07	Ongoing	Content updates	OSHKI, BRTP G. Kakegamic J. Scherer
8 Dissemination				
8.1 Implement dissemination activities as per Dissemination Plan	Oct/07	Sep/08	Dissemination products including project website updates	OSHKI G. Kakegamic
9 Project Management				
9.1 Implement communication activities as per Communication Plan	Oct/07	Sep/08	Communications	OSHKI G. Kakegamic
9.2 Develop activity reports and conduct project meetings	Oct/07	Sep/08	Activity reports Project meetings and meeting minutes	OSHKI G. Kakegamic
9.3 Develop and submit Mid-Project Report	Mar/08	Mar/08	Mid-Project Report	OSHKI G. Kakegamic
9.4 Develop and submit Final Project Report	Sep/08	Sep/08	Final Project Report	OSHKI G. Kakegamic
Project Milestones				
1-Mid-project: Submission of the Mid-Project Report to Inukshuk.				March 31, 2008
2-End of project: submission of the Final Project Report to Inukshuk.				September 30, 2008

4a The Actual Timeline

The development of TRD Project was scheduled to begin on October 7, 2007 (see Proposed Timeline above). The project got off to a late start. The first meeting took place in the latter part of January 2008 at the eDome facility at Cambrian College, Thunder Bay. In addition, for technical and logistical reasons outlined in section 4B, the proposed timeline underwent a number of modifications. The following table compares the proposed and actual timelines:

Task	Proposed Timeline	Actual Timeline
Project Scope and Preparation (as outlined in sections 1 and 2 of the Proposed Timeline): • Initiate project plan • Kick-off meeting • Project website • Team review of concepts, methods and tools • Establish aims and objectives for curriculum areas	Oct 2007 - Nov 2007	Jan 2008 - April 2008
Learning Object Development (as outlined in section 3 of the Proposed Timeline): • Pre-production, • Production, • Post-production • Authoring	Dec 2007 - Mar 2008	July 2008 – Jan 2009

4b Challenges and Obstacles

- Team members were geographically dispersed across Ontario and each had professional work commitments outside of the TRD Project. Video shooting at the eDome facility was conducted during summer months, when dorm rooms were made available, due to lack of funds for travel and accommodations.
- The project was supposed to make greater use of videoconferencing and online collaboration tools to conduct project meetings (and circumvent travel expenses), but this did not happen. Videoconferencing requires advanced notice to book facility and equipment, not a problem for OSHKI, but a problem for others in larger institutions. Team members also require face-to-face training in the use of online tools. After the video shoot, there were periods when some individuals were not part of the knowledge loop.
- Some team members faced a steep learning curve in the process of learning and understanding project-related concepts, techniques, methods and facilities.
- The first batch of Positioning Videos was produced with English narration. To accommodate the expected discrepancies between the length of the English, Cree and Ojicree voiceovers, each Positioning Video contained 50% extra footage that could be cropped accordingly in studio to synch the video timeline with the other language voiceovers. When it came time to lay down the Ojicree voiceover, however, it was discovered that the length of the track was twice as long as the track for the English voice over. It remains unclear if this discrepancy is due to the differences in the languages (ie. the Ojicree script was twice as long as the English script) or the speed/pace of the narration. Consequently,

the Ojicree Positioning Videos took considerably longer to produce.

- The process of translating English scripts into Cree and Ojicree syllabic scripts for each learning object was found to be a challenging task because there was no vocabulary for basic radiography terms and items such as 'pigg-o-stat'. Transcriptionists had to be creative in describing such objects which must be made understandable to First Nation practitioners and patients fluent in their Native language. This took considerable time and effort. The time and effort required to conduct language translation was generally underestimated. Consequently, the Ojibway translation was dropped from the project.
- The absence of some quality assurance measures from the development process impacted on the project. These QA issues were directly related to language transcription and narration/editing. The scripts were not consistent at first, and there was much writing being done during production or directly after.
- Quality assurance on the files revealed that the Cree translations for 16 of the 88 videos had missing components. Further Cree translation and narration was required, which resulted in further delay.
- There was some delay in passing the information about the compression format (for playback) to the video-editing crew. Two formats, Flash and WMV, were eventually selected, which effectively doubled the time that the editing crew required to compress the files.
- The post-production activities encountered time overruns due to the high volume of video and audio production work. 75 positions x 3 languages x 2 video formats = 450 learning objects.
- During the project production, one of the subject experts was also in the process of revising the TRD radiography manual.

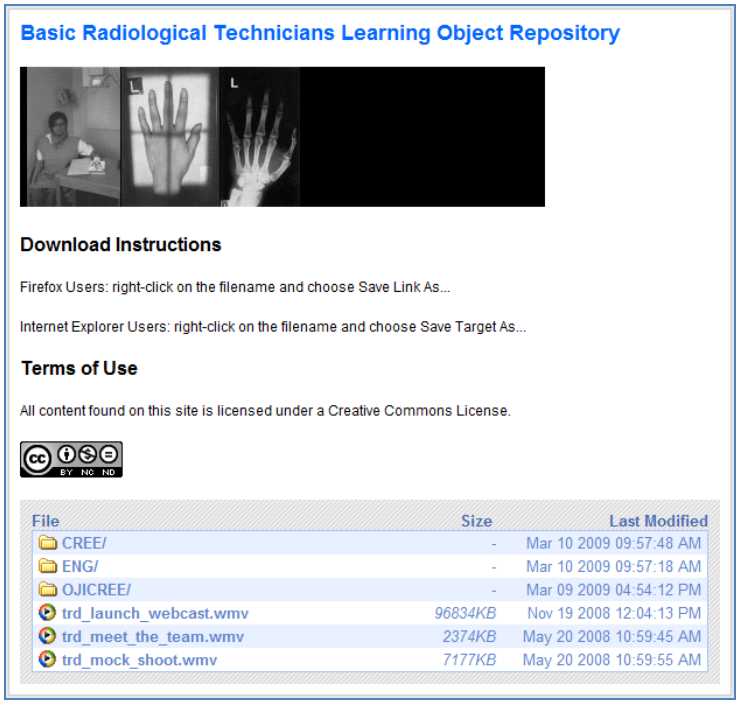
4c The Final Product

The TRD Project produced a series of "Positioning Videos" in three languages: English, Cree and Oji-Cree.

Screenshot of a Positioning Video

The Positioning Videos are located in a dedicated repository at this address: http://www.oshki.ca/public/brt/videos/index.php

Screenshot of TRD Learning Objects Repostiroty



These Positioning Videos were also used to create "Positioning **Manual**" webpages.

http://www.oshki.ca/public/brt/Hand_Lateral.html

POSITIONING MANUAL — Basic Radiological Technicians

HAND

P.A.	F.F.D. 40"	1/2 SMALL CASSETTE / IMAGE PLATE
OBLIQUE	F.F.D. 40"	1/2 SMALL CASSETTE / IMAGE PLATE
LATERAL	F.F.D. 40"	SEPARATE SMALL FILM
CASSETTE:	P.A. & Oblique - Crosswise / landscape, Lateral - Lengthwise / portrait	
PROTECTION:	Full apron and thyroid collar	

LATERAL

*** USE A SEPARATE SMALL CASSETTE / IMAGE PLATE FOR THIS VIEW**

PROTECTION:	Full apron and thyroid collar.
POSITION:	Hand on side, little finger down. Fingers fanned apart. Knuckle of index finger superimposed on knuckle of little finger.
CENTRE:	At base of index finger (where finger joins the hand).
INSTRUCTIONS:	HOLD STILL

POSITIONING IMAGES:

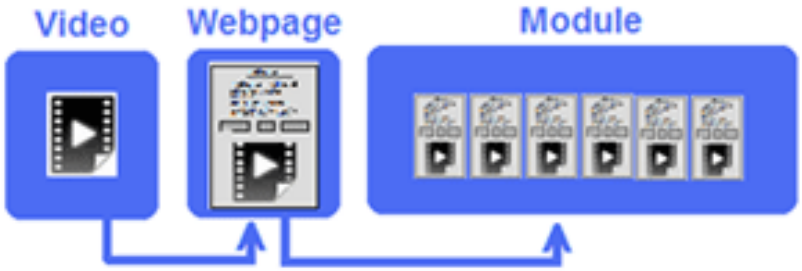

POSITIONING VIDEOS:

Play Hand Lateral: English | Cree | Oji-Cree

Other Video Formats:

Play Windows Media Video (right-click to download): English | Cree | Oji-Cree

The Positioning Manual webpages were grouped into several "Modules" - each module focuses on a particular area of the body.



These modules are located under the "Unit 9" section of the Basic Radiological Technician course (http://moodle.oshki.ca/course/view.php?id=57).

5a The Main Goals of the TRD Project

The TRD Project had 5 main goals. These goals are highlighted in yellow below. Team members were asked to comment on the project's effectiveness in meeting each of these goals.

Goal 1. To aid the diffusion, uptake and harmonization of e-learning among Aboriginal post-secondary education institutions in Ontario.

- The project and its results are disseminated on the project website (http://blog.oshki.ca/trd) and all outputs are accessible to Aboriginal post-secondary education institutions in Ontario; however, no formal face-to-face dissemination activities were directly aimed at such institutions over the duration of the project. OSHKI applied and was accepted to disseminate the project and its results at the planned national MoodleMoot conference at Toronto's York University back in August 2008; however, the conference was unfortunately cancelled.
- OSHKI will continue to disseminate project results as opportunities arise. OSHKI's newly revamped web site will serve as an important vehicle for sharing and disseminating the Institute's e-learning initiatives, best practices, tools and platforms among Aboriginal post-secondary education institutions in Ontario.

Goal 2: To facilitate collaboration among Aboriginal and mainstream higher education institutions in the creation, sharing and use of quality digital educational/learning objects and collections.

- The project demonstrated a successful collaboration between OSHKI and Cambrian College. OSHKI was able to engage and collaborate with Cambrian College's Wabnode Institute, eDome, and Medical Radiation Technology program. The MRT was invaluable in providing support for all the x-ray equipment and materials required for the eDome production. Both the BRT and MRT programs will benefit from the creation, sharing and use of the learning objects.
- There is a further need for Aboriginal and mainstream higher education institutions to come together and build capacity for Aboriginal e-learning. This project was an important first step.

Goal 3: To facilitate the infusion of Aboriginal social, cultural and pedagogical needs and considerations in the design, development and delivery of e-learning for Aboriginal adult learners.

- The learning objects were designed, developed and delivered in a culturally relevant context for First Nations students to learn basic radiography. The learning objects were designed to support the oral and visual learning styles favoured by First Nation learners. Each learning object was scripted in English and translated into Cree and Oji-Cree syllabics by the Ojibway and Cree Cultural Centre. Each learning object was then captured in a typical First Nation clinical x-ray environment complete with a First Nation Basic Radiological Technician performing x-ray procedures on First Nation patients. Each learning object was then narrated by English, Cree, and Oji-Cee speaking narrators.
- OSHKI is planning to propose a partnership for a localization project to localize Moodle into Ojibway, Cree, and Oji-Cree languages. The results of this project will further enhance the delivery of the BRT learning objects and online courseware by adapting and translating the learning content in the learner's first language.

Goal 4: To demonstrate and validate the use of open source software tools, systems and standards to support sustainable Aboriginal e-learning environments.

- The project made extensive use of free and open source software as follows:
  - Mozilla Firefox (http://www.mozilla.com/en-US/firefox/) was used to browse and test web pages.
  - Kompozer (http://kompozer.net/) was used to author and code web pages.
  - FlowPlayer (http://flowplayer.org/) was used to embed video streams into web pages.
  - Apache HTTP Server (http://httpd.apache.org/), MySQL (http://www.mysql.com/), and PHP (http://www.php.net/) was used as a web development and web hosting platform.
  - FileZilla (http://filezilla-project.org/) was used to manage the transfer of files using FTP.
  - WordPress (http://wordpress.org/) was used to deliver the project website/blog.
  - Moodle (http://moodle.org/) was used to deliver the BRT learning objects and online course modules and content.
  - Directory Listing (http://www.evoluted.net/community/code/directorylisting.php) was used to create an online repository for the learning objects.
- The BRT learning objects are released to the public under a Creative Commons License.
- Commercial software included Adobe Creative Suite 3 which was used for multimedia production (imaging and video) at OSHKI. Proprietary standards included Flash Video (.flv) and Windows Media Video (.wmv).

Goal 5: To address the technical and infrastructural challenges to surmount in making e-learning accessible and widely available to Aboriginal learning organizations and their learners.

- The technical infrastructure required for carrying out such a project was successfully put in place at OSHKI, but the installation and deployment process was not well documented in a manner that other Aboriginal learning organizations could reproduce. Positioning videos were stored on a web server and used the progressive download method to stream videos which may have not been the optimal choice for some learners in remote First Nations. In the future, a dedicated streaming server/appliance will be used to stream videos over the Internet to remote First Nations learners.
- The project would not have been possible without the regional Kuh-Ke-Nah Network (K-Net) in First Nations and local MeetMe Network in Thunder Bay.

5b	Recommendations to improve the development process:

1. **Ensure that all team members have a good understanding of the entire process before commencing any type of development work.**

    - Suggestion: During the "kickoff" meeting, team members were provided with an overview of the key tools and methods that were to be used in the project (such as the eDome equipment and the Moodle online environment), but would have benefited from a series of workshops to share and exchange skills, knowledge and competencies required by the project. As the Gordon Kakagamin, Project Manager, commented:

        "… e-learning is like a two sided coin, on one side is technology and the other side is pedagogy. Likewise you have two camps on the project team, on one side of the fence are the technologists, programmers, technicians, etc. and the other side are the subject matter experts, curriculum developers, instructors, etc. Add to the mixture are cultural ingredients such as native language actors and narrators. I think the greatest challenge in delivering a content development project like this is ensuring the two camps understand each other in terms of both technology and pedagogy. We can achieve greater understanding if both camps have the opportunity to learn from one another upfront through face-to-face hands-on seminars and workshops."

2. **Centralize all communication and information related to the project.**

    - Suggestion: Create a project website with a URL that is meaningful and easy to remember (ex. www.TRD-Project.ca) and use it as the hub for all aspects of the project, including project management, public information, repository, etc. Use the project management system, which would be password protected, to centralize all communication, maintain updated timelines and task-lists, post mock-ups, etc. Utilizing an online "project headquarters" in this manner would ensure that all members remain in the knowledge loop, which is especially important when members are located in different communities.

3. **Document the development process in a manner that others could review, digest and learn.**

    - Suggestion: During the first team meeting, conduct a "Tracking the Development Process" workshop. Stress the importance of "documenting the journey" (so that others may follow) and ensure that all team members are provided with a blog within the project management system. During the workshop, review the functionality of blogging system and use a blog mock-up to communicate expectations for the blogging entries (member's role, tasks, best practices, challenges, etc). Make sure to document pre-development tasks as well (i.e. funding considerations, team selection, etc.)

4. **Looks for ways to involve a few members of the intended audience.**

    - Suggestion: First Nation community-based X-Ray Technicians are few, as are Aboriginal Radiography students. Reaching out to this relatively small group would help promote a greater sense of ownership. Finding ways to include "on the ground" footage that depicts the role of the X-Ray Technicians, for example, would not only add educational value to the video series, but would also help to highlight and celebrate the radiography work that's being done at the community level. This type of grassroots involvement could be done in many ways. For example, X-

RayTechnicians from two or three First Nation communities could be commissioned to record a short video segment about their work. This footage could then be edited into a short video that can be used as a preamble to the learning objects.

5. **Ensure that all team members have a common understanding of the terminology that is being used.**

    - Suggestion: Avoid ambiguous terms whenever possible. There was some confusion about the meaning of the term "learning objects" and whether this was a catch-all phrase that included the Positioning Videos, Positioning Webpages and Positioning Modules.

5c Closing Comments

The quality of the Positioning Videos is excellent, thanks in large part to Cambrian College's eDome facility and its skilled camera operators and multimedia developers. These videos are excellent resources that speak directory to the skills and knowledge required in the study and practice of radiography. They can be delivered stand-alone or embedded into web pages (using Flash Video and Windows Media Video formats) to support other First Nation and non First Nation x-ray and diagnostic imaging education programs.

The utility of this resource for First Nation community-based X-Ray Technicians, however, is limited due to fact that Internet access is limited or non-existent in the rooms that house the radiography equipment. As a member of the development team states, "The fact that our students work full time and this an extra duty they take on makes their time and access to the internet a problem at work, even if there is a computer for them to use – which there often isn't… if there is more access to nursing stations and if these people are given some protected time then they could be very useful". While the issue of Internet access in the nursing stations is beyond the scope of this project, creating a website for First Nations X-Ray Technicians, where such resources could be housed, could help make these learning objects more accessible in general. The project could also have greater impact if it could be made part of a larger First Nations telemedicine initiative.

The overall value of these learning objects is high, especially within the domain of Aboriginal Education. The development of these videos demonstrates how Aboriginal people to can create high quality culturally-relevant learning materials. The inclusion of the Cree and Ojicree languages, not only make these resources more accessible to First Nations people, but also validates the importance of preserving native languages. Outside of the Radiography field, these videos also serve as excellent examples of the type of instructional videos that can be produced for online instruction. The Aboriginal languages used in each video will help support BRT-specific Aboriginal language vocabularies and dialogues.

The course modules (Positioning Webpages) are concise and use a clean format that is easy to read. The use of photos, along with the Positioning Videos, also supports the visual learning style that is generally favoured by Aboriginal learners. The actual modules are not accessible outside of the Oshki Moodle site, however, and are only accessible by people who have access to the BRT Moodle course. To remedy this situation, the modules could be added to the existing repository. In addition, the BRT course (or a stripped down version of it) could be backed up and also included in the repository; this would allow schools and

organizations to easily "*restore"* the course within their local Moodle site. These modules provide a great example of how the Positioning Videos could be incorporated into new or existing webpages.

As with all forms of media in our society, the dominance of Western culture in the new "digital age" is so prevalent that it is rarely questioned. Even in First Nations educational programs, schools and institutions across Canada, multimedia-based learning objects are dominated by English Language and Western culture. Apart from the study of Native languages and "Native Studies", Aboriginal learners rarely see themselves reflected in the content that is used for instruction. The TRD Project produced multimedia learning objects that reflect the identity of Cree and Ojicree learners. This project brought together educators, translators and an expert video production crew to produce learning objects in a quality that is rarely seen in non-proprietary circles anywhere. By making extensive use of free and open-source software to publish the learning objects, this project also demonstrates how educators can go about incorporating media-rich content, such as TRD learning objects, into a format that is relevant to their local needs. Overall, the production quality and value of the TRD Project learning objects is high; the example it sets for other Aboriginal schools and organizations is invaluable.