The Environmental Assessment Process – learning nexus: a Manitoba case study

Patricia Fitzpatrick, PhD
Natural Resources Institute, University of Manitoba

Abstract: This research explores opportunities for learning arising from a recent Manitoba EA. The Wuskwatim generation station and transmission lines projects involve the construction of a low head dam and three 230 kV transmission line segments. The EA process included multiple opportunities for public participation, including scoping meetings and 32 days of hearings. Primary data collection relied on participant observation, semi-structured interviews with EA participants, and a review of documentation generated during the EA.

Assessment participants identified a range of learning outcomes, which revealed a number of strengths and weaknesses associated with the EA. Four of these aspects necessitate consideration for EAs. Information must be managed to allow for access, without overwhelming participants. Procedural uncertainty negatively impacts communicative learning outcomes. Access to financial resources by participants is necessary, but not sufficient for ensuring access to alternative perspectives. These findings suggest that although the EA of the Wuskwatim projects was able to better engage the public, additional procedural changes would strengthen the review process and positively impact the learning outcomes of participants.

Keywords: Manitoba, environmental assessment, hearings, transformative learning

Introduction

This research explores the linkages among environmental assessment (EA), public participation, and learning. EA is a policy tool utilized by governments to consider the environmental, social and economic sustainability of projects (Connelly and Smith, 1999). As such, EA has historically required some level of public participation (Wood, 1995; Petts, 1999; Sinclair and Fitzpatrick, 2002; Sinclair and Diduck, 2005).
The utility of public participation in EA decision making is well established in assessment literature (Susskind and Cruikshank, 1987). Public participation ensures that the project reflects the public interest, in both purpose and design (Forester, 1989; Shepard and Bowler, 1997); creates a venue for conflict resolution between participants (Diduck, 1999; Mitchell, 2002); creates a forum for the submission and inclusion of local knowledge in the EA decision (Usher, 2000); provides for a more comprehensive consideration of factors on which decisions are based (Webler et al., 1995); creates an opportunity for citizens to become actively involved with governance (Akkerman et al., 2004); and, allows for learning (Sinclair and Diduck, 2001; Diduck and Mitchell, 2003; Fitzpatrick and Sinclair, 2003).

Of interest to this study are these last two points: active citizenship, and learning. Scholars from a range of disciplines are interested in how to strengthen activities centred on civic engagement (see for example Habermas, 1984, 1987; Innes, 1996; Healey, 1997; Dryzek, 2000; Sinclair and Doelle, 2003; Gastil, 2004). Learning plays an important role in these activities, as democracy relies on an informed citizenship, willing and able to contribute to the systems that govern them (Habermas, 1999; Lange, 2004). In creating opportunities for public deliberation, participants are exposed to different perspectives, and as a result, learn (Young, 1996; Barabas, 2004). Thus learning is necessary for, and an outcome of, public participation in democratic exercises.

Although learning is important to EA (Diduck and Sinclair, 1997; Fitzpatrick and Sinclair, 2003), it is rarely identified as an objective of process design. Thus while, as will be discussed below, participants consider learning to be important to EA, it has not traditionally been central to the underlying objectives of the process.

This research explores the relationship between EA and learning by examining the EA of the Wuskwatim Generation Station and Transmission Line projects (Wuskwatim projects). In understanding participant learning, consideration is given to both the learning outcomes, and the experiences that contributed to these outcomes.

The paper begins with a review of literature surrounding transformative learning, which guides the analysis of learning opportunities. An introduction of research methods, and the specific case study under review, follows. Results first explore the learning outcomes of EA participants, followed by a discussion of the EA experiences that helped shape these outcomes. The article concludes with a discussion of the significance of research findings.
Transformative Learning

Transformative learning is a framework of adult learning and education with roots in the theory of communicative action (Habermas, 1984, 1987) and critical pedagogy (Freire, 1973). In drawing from these theories, transformative learning examines how adult interaction can promote cognitive development and social change. When adults are engaged in social processes, they are introduced to alternative perspectives. As they come to critically engage with these perspectives, learning may ensue. The overarching goal of transformative learning is to “help adults realize their potential for becoming more liberated, socially responsible, and autonomous learners,”(Mezirow and Associates, 2000, 30).

Three aspects are central to transformative learning: experience, critical reflection, and adult development (Merriam and Caffarella, 1999). Prior experience is the foundation of one’s existing perspective; current and new experience allows for the introduction of ideas which may affect one’s perspective. These experiences serve as the basis for critical reflection. Critical reflection about the process, the content, and one’s own assumptions may result in adult development, or learning.

Learning has multiple dimensions. Instrumental learning involves the acquisition of new knowledge and skills, designed to control or manipulate the environment. Instrumental learning “involves predictions about observable events, physical or social, which can prove correct or incorrect,” (Mezirow, 1991, 73). Although instrumental learning outcomes are necessary, they are insufficient for transformative learning, which promotes change. Communicative learning is directed at “understanding what others mean and to make ourselves understood as we attempt to share ideas,” (Mezirow, 1991, 75). Communicative learning centres on changing one’s approaches to situations or points of view.

If a learner is confronted with a major contradiction to an established perspective, a perspective transformation may ensue. A perspective transformation,

...is the process of becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand and feel about our world; changing these structures of habitual expectation to make a more inclusive, discriminating, and integrative perspective; and finally, making choices or otherwise acting upon these new understandings (Mezirow, 1991, 167).
This transformation is facilitated through a sequence of activities that begins with a disorienting dilemma, and includes different activities such as critical self reflection, planning a revised course of action and making a decision to act on that course of action. Through perspective transformation, learners become critically aware of how their assumptions constrain their life, and make changes so as to develop and implement a more holistic perspective.

Transformative learning provides a way of understanding learning reflective of the goal of active citizenship, deemed important to public participation. Furthermore, as this framework puts a premium on experience as the context for learning, and interaction as a means of exposure to alternative perspectives, its application to deliberative processes is fitting (Mezirow, 2003). Indeed, transformative learning has been applied to EA by a small but growing number of scholars (Sinclair and Diduck, 2001; Diduck and Mitchell, 2003).

Despite the potential for more deliberative participation, questions have been raised about the ability of this framework to address learning in a cross cultural setting. Issues surround transformative learning’s reliance on rational processes, particularly critical reflection, to foster change (Merriam and Caffarella, 1999). A small but growing subset of the literature is working to consider how transformative learning may apply in a cross-cultural setting, including research that examines how culture shapes the learning agenda and curricula of adult learners (Merriam and Mohamad, 2000), discusses the design and impact of a university course based on traditional knowledge (Feinstein, 2004) and documents the challenges experienced by Indigenous learners (Shilling, 2002). More in depth analysis of how culture affects impacts transformative learning processes and outcomes is needed. The focus of this study, however, is to explore how learning outcomes were shaped by EA experience.

**Methods**

Research was conducted using a case study approach, relying on multiple methods to collect data. I attended nineteen days of hearings between March 1 and April 15, 2004. During this time, participation observation allowed me to meet and engage in dialogue with participants.

---

1 A disorienting dilemma generates consciousness. Examples of disorienting dilemmas can be epochal such as a natural disaster or a loss of a loved one, or more gradual and graduated in nature, “more of a journey and less of a decision at one point in time,” (McDonald et al., 1999, 11).
outside a one-to-one interview setting, observe human interaction, including vocal intonation and body language, not recorded in transcripts, and develop a preliminary understanding of the assessment environment. Second, documentation generated through the EA, including the impact statement, written question and answer exchanges about the impact statement, called Interrogatories (IRs), and over 7,000 pages of hearing transcripts, were reviewed. As part of this process, three public registries located in Winnipeg were consulted: the provincial public registry located in the main branch of Manitoba Conservation (123 Main Street), the public records related to the Clean Environment Commission (305-155 Carlton Street) and the federal public registry located in the regional headquarters of the Department of Fisheries and Oceans (501 University Crescent).

Third, semi-structured interviews were conducted with 16 assessment participants, representing the Clean Environment Commission (CEC), federal and provincial government departments, and organizations engaged in the EA. Interviews, lasting between 30 and 120 minutes, were tape recorded and transcribed. Interviews addressed a range of topics in understanding learning by participants, including questions about how people were involved in the EA, what they expected to learn through the process, what they learned through participation, and what qualities of the process facilitated this learning.

Data analysis used a grounded approach, relying on Nvivo, qualitative analysis software, to organize themes (Qsr, 1999-2002). To ensure validity, draft findings were sent to research participants for review. In soliciting comments, participants were asked to consider if the material reflected their experience with the assessment process.

Case Study

The EA of the Wuskwatim projects was selected as the case study. If approved, the Wuskwatim projects involve the construction of a low head, modified run of the river dam producing 200 megawatts of electricity, and three 230 kV transmission line segments, totaling 247 km (see Figure 1). Power generated at Wuskwatim will be available for export until 2020, when it is projected that Manitoba’s firm energy demand will require energy generated at Wuskwatim.

Manitoba Hydro, a provincial crown corporation, is the project proponent. Manitoba Hydro is responsible for providing reliable and economic energy to the citizens of the province (Manitoba Hydro and Nisichawayasihk Cree Nation, 2003). Nisichawayasihk Cree Nation (NCN), a First Nations community situated in northern Manitoba, is the co-
Figure 1: The proposed Wuskwatim generating station is located southwest of Thompson, Manitoba.
proponent. NCN’s interest in the projects stems from the siting of generating station, in NCN’s traditional territory and resource management area. In 2001, the community approved an agreement in principle to work with Manitoba Hydro to develop the Wuskwatim projects. Subject to final referendum following regulatory approval, NCN has the option of purchasing a 33 1/3 % ownership of the generating station. Therefore, the community (through Chief and Council) acted as a co-proponent of the projects during the EA.

The Wuskwatim projects triggered reviews by three separate bodies:

- the Public Utilities Board (Manitoba) was charged with reviewing the justification, need for and alternatives to the projects,
- the Department of Conservation facilitated an EA under the terms of the Manitoba Environment Act, SM 1987-88, c. 26 of Manitoba. The generation station triggered a class three assessment, and the transmission lines triggered a class two assessment. As part of this review process, the Clean Environment Commission (CEC) was directed to gather public comment on the assessment guidelines, and later hold public hearings about the impact statement, and
- the Department of Fisheries and Oceans and Transport Canada conducted a comprehensive study of the generation station under the terms of the Canadian Environmental Assessment Act 1992, c. 37, (hereafter CEAA) stemming from the projects’ need for fisheries authorization, which involves permission for modifying fish habitat, and its geographic location (within a navigable water).

To avoid a duplication of efforts, regulators harmonized the three review processes. Thus rather than being subject to multiple assessments, the projects underwent one EA. A timeline of the key activities surrounding the EA of the Wuskwatim projects is provided in Table 1. Public participation in the EA was encouraged through opportunities to:

- provide written and verbal submissions regarding the scope of the assessment,
- submit written comments related to the conformity of the impact statement to the guidelines,
- apply for money to help finance participation,
- participate in Interrogatories (IRs),
make verbal presentations, supported by written material, during 32 days of hearings, and;
submit written comments about the draft comprehensive study report.

This research focused on the provincial EA of the projects, initiated in December 2001 when the proponents submitted applications for the projects, until September 2004, when the CEC issued its report. Forty-two organizations, as identified in Table 2, and numerous individuals were
**Table 2:** Organizations involved in the hearings (Clean Environment Commission, 2004). Participants were actively involved in the EA through a numbers of activities, including the scoping sessions, IR exchanges and hearings. Presenters spoke only during the formal hearing proceedings.

<table>
<thead>
<tr>
<th>PARTICIPANTS</th>
<th>PRESENTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boreal Forest Network</td>
<td>Assembly of Manitoba Chiefs Secretariat Inc</td>
</tr>
<tr>
<td>Community Association of South Indian Lake (*) and the Centre for Indigenous Environmental Resources</td>
<td>Building and Construction Trades Council</td>
</tr>
<tr>
<td>Consumers’ Association of Canada/Manitoba Society of Seniors (*) and the Public Interest Law Centre</td>
<td>City of Thompson</td>
</tr>
<tr>
<td>Displaced Residents of South Indian Lake</td>
<td>Fox Lake Cree Nation</td>
</tr>
<tr>
<td>Manitoba Conservation</td>
<td>Granville Lake</td>
</tr>
<tr>
<td>Manitoba Future Forest Alliance</td>
<td>Ineo Thompson</td>
</tr>
<tr>
<td>Manitoba Hydro</td>
<td>International Brotherhood of Electrical Workers</td>
</tr>
<tr>
<td>Manitoba Industrial Power Users Group</td>
<td>Keewatin Community College</td>
</tr>
<tr>
<td>Manitoba Métis Federation (*)</td>
<td>Manitoba Justice</td>
</tr>
<tr>
<td>Manitoba Wildlands / Canadian Nature Federation (*)</td>
<td>Manitoba Keewatinook Ininew Okimowin</td>
</tr>
<tr>
<td>Mosakahiken Cree Nation (*)</td>
<td>Manitoba Water Stewardship</td>
</tr>
<tr>
<td>NCN</td>
<td>NCN Youth Members</td>
</tr>
<tr>
<td>Opaskwayak Cree Nation (*)</td>
<td>Norman Regional Development Corporation</td>
</tr>
<tr>
<td>O-Pinon-Na-Piwin-Cree Nation</td>
<td>Northern Association of Community Councils</td>
</tr>
<tr>
<td>Pimicikamak Cree Nation (*)</td>
<td>Operating Engineers of Manitoba</td>
</tr>
<tr>
<td>Provincial Council of Women of Manitoba</td>
<td>Sagkeeng First Nation</td>
</tr>
<tr>
<td>Pukatawagon Fishermen’s Association (*)</td>
<td>Southern Chiefs Organization</td>
</tr>
<tr>
<td>Tataskweyak Cree Nation</td>
<td>Swampy Cree Tribal Council</td>
</tr>
<tr>
<td>Time to Respect Earth’s Ecosystems/Resource Conservation Manitoba (*)</td>
<td>Thompson Chamber of Commerce</td>
</tr>
<tr>
<td>Trap Line No. 18 (*)</td>
<td>Winnipeg and Manitoba Chambers of Commerce</td>
</tr>
<tr>
<td>York Factory First Nation (*)</td>
<td></td>
</tr>
</tbody>
</table>

(*) identifies participants who received funding
engaged in the CEC review of the Wuskwatim generating station and transmission lines projects.

Although representatives of First Nations were actively involved in the EA, this research was not designed to address learning in a cross-cultural context, and there were insufficient data to comment on nuances of learning specific to Aboriginal worldviews (see for example McGregor, 1999; Simpson, 1999; Simpson, 2000a, b). However, the breadth of the EA, including the large number of participants, representing a range of interests, and multiple opportunities for participation, made the Wuskwatim projects a rich case for exploring learning.

Learning Outcomes

All participants acknowledged that there is a relationship between learning and EA. As summarized by one participant,

[Learning] is the essence of EA. EA is to inform decision making, and you only get informed decision making through what you learned. And the process provides for scientific learning in respect to that particular project[s], and decisions to be taken based on the EA. So absolutely, it is integral to it, it is what it is about (Interview 20).

As illustrated in Table 3, a variety of instrumental and communicative learning outcomes were identified by participants as having occurred through the EA process. All research participants experienced instrumental learning – the acquisition of new skills or information. Results span two categories of outcomes: legal, administrative, and political procedures; and biophysical, social and economic knowledge.

The most common category of instrumental learning related to legal, administrative, and political procedures. This type of learning is important to a project-specific EA; because it is essential to know how to become engaged, participants must be familiar with how the process functions and the mechanisms through which they can be engaged in the review. Knowledge of procedures can also transfer to other venues, including future CEC hearings and other opportunities for public involvement in democratic decision-making, including hearings convened by the Public Utility Board or the National Energy Board.

Two participants identified legal, administrative, and political learning as both an objective and outcome of participation. Because this was the
### Instrumental Learning

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Quotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal, administrative and political procedures</td>
<td>EA process (Interviews 14, 15, 17, 18, 19, 21, 25, 28, 30) – “I mean this is the first generating station, so if another came up within a reasonable amount of time when we still had a lot of the experience around from this one, I think then we could probably design a better review, in terms of making it more expeditious” (Interview 19).</td>
<td></td>
</tr>
<tr>
<td>First Nations consultation</td>
<td>“In terms of section 35 consultation, we learned a lot about what that might be. It is ill defined in the country. We try something, to do as well as we could, given the circumstance, but we certainly learned. We learned a lot about that” (Interview 20).</td>
<td></td>
</tr>
<tr>
<td>Reaffirmation of understanding of process and social dynamics</td>
<td>(Interviews 19, 26) – “I wasn’t surprised at very much actually, Because once I knew the direction things were heading, I was thinking “Oh, oh, we are going to run into grief.” And in most cases that is exactly the way it worked, including the interrogatory process...And I base that strictly on past experience. Why would it be any different this time?” (Interview 19).</td>
<td></td>
</tr>
<tr>
<td>Biophysical, social and economic knowledge</td>
<td>Project components (Interviews 16, 23) – “Well I think that we learned everything about the dam. That was a huge learning curve, we went from knowing nothing to knowing so much” (Interview 16).</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>“And on a technical level, we learned information about the North. In fact we are learning about caribou right now, because people’s level of understanding, level of appreciation [about this valued ecosystem component] was elevated” (Interview 20).</td>
<td></td>
</tr>
<tr>
<td>Environmental impacts</td>
<td>(Interviews 21, 23) – “[E]dge effects, for example, is something I had not really understood...I had enough working knowledge, but the hearings were tremendously helpful in terms of that” (Interview 23).</td>
<td></td>
</tr>
<tr>
<td>Cumulative impacts</td>
<td>(Interviews 21, 28) – “I mean I got a whole lesson in cumulative impacts assessment, and the whole issue of ... what’s the word... when you have got to much and when you decide that. And baseline coverage” (Interview 21).</td>
<td></td>
</tr>
<tr>
<td>Dynamics of northern development</td>
<td>(Interviews 17, 22, 24, 29) – “I gained a whole new perspective with respect to Aboriginal people, their issues, their concerns, their passions. And frankly, I quite appreciated it. I thought it was a very important part of the hearing, and a learning for us all” (Interview 22).</td>
<td></td>
</tr>
<tr>
<td>Need for and alternatives to</td>
<td>(Interviews 22, 30) – “[One important contribution involved] looking at a different transmission line routing that one of the Commissioners brought to the forum and asked Hydro to address that, the advantages and disadvantages of doing that. So actually through the EA another sort of position or alternative was put on the table” (Interview 22).</td>
<td></td>
</tr>
<tr>
<td>Demand management</td>
<td>(Interviews 22, 27) – “[A second contribution was] all the discussion and work that Hydro had done on their demand management and portfolio management alternatives. This [discussion was] based mainly on the good work that one of the funded participants. I think they were positive things that might not have been brought to the fore if we hadn’t had a hearing, or maybe more importantly if we hadn’t had funded participants to participate in the hearings” (Interview 22).</td>
<td></td>
</tr>
<tr>
<td>Manitoba Hydro</td>
<td>(Interviews 15, 27) - “[I prepared, in part, by learning about] Manitoba Hydro and how they functioned, what their development intentions were going to be, what the lines of communication and decisions were between Hydro and inside the Manitoba government” (Interview 15).</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td>– (Interview 28)</td>
<td></td>
</tr>
</tbody>
</table>
first of a series of generating stations to complete an EA in Manitoba, these organizations became involved in the review, in part to contribute to anticipated learning about how to hold hearings. These participants envisioned that the hearings would be a learning experience for all, and wanted to contribute their knowledge of these processes to strengthen the overall EA process. This perspective has resonance with literature related to public involvement in environmental management decisions. One principle of participation documented by Webler and Seth (2000) is the iterative nature of participatory processes. People engaged in public deliberation believe that each process has implications for future processes, and thus considerations should be given to the conditions necessary for future deliberative processes.
Biophysical, social, and economic knowledge are related to the project design and valued ecosystem components (Table 3). Examples of this knowledge include a new understanding of dam construction, caribou, demand management programs, the proponents, and edge effects. This type of learning is essential for understanding the complex issues related to the specific projects under review. Knowledge is acquired through experience; as participants are engaged in the review, they gain an understanding of the technical details surrounding the development. Biophysical, social, and economic knowledge is transferable to other activities. For example, familiarity with northern communities is useful when approaching other developments in the same geographic region as the Wuskwatim projects.

Communicative learning addresses how one approaches situations or points of view. Examples of communicative learning associated with participation in the EA of the Wuskwatim projects addressed four broad categories: (1) insight into one’s own interest, (2) insight into the interests of others, (3) communication strategies and methods, and (4) social mobilization. These types of outcomes were experienced less frequently, and by slightly fewer individuals (twelve participants).

Outcomes related to one’s own interest focused on the EA process. The first three outcomes address participants’ EA performance; the reasons for becoming involved in the EA, steps necessary for being engaged, and opportunities to improve performance. These outcomes build on the legal, administrative, and political outcomes associated with instrumental learning as described above. Rather than focus on specific skill or information about how to be involved, however, the communicative outcomes addressed how to be better engaged in the review. Outcomes included strengthening linkages between an organization’s mandate, and the EA, and ways to strengthen these linkages. The fourth outcome also addresses this concept; in identifying what is broadly termed “organizational effectiveness”, participants learning outcomes reinforce the theoretical utility of public participation described above. By seeing how their contribution impacted the EA, empowerment ensued.

Outcomes associated with insight into the interest of others reflected the social natural of the learning environment. Participants were exposed to different relationship (between governments, between organizations) and different perspectives (different ways of knowing, and the emotional significance of the issue). These learning outcomes indicate the types of relationships fostered through the EA, which Innes and Booher (2004) suggest is an important aspect of participatory processes. Outcomes further reveal assessment strengths and weaknesses related to EA procedure and access to alternative perspectives, as discussed below.
Communication strategies and methods, again, addressed how participants are engaged in the EA. However, this outcome also adds the dimension of other groups, as outcomes were focused on how to assist other groups to become involved in the process.

Social mobilization outcomes addressed the role of the EA in the arena of resource management. The case study illustrated or in some cases reaffirmed the difficulties associated with project specific application of dialogue; while project specific EA is important, participants recognized a need for civic engagement in the overarching norms that facilitate resource management. As one example, participants expressed a desire to strengthen the environmental planning regime, and enact, develop and reinvigorate institutions that foster learning. As a second example, three participants advocated the need for a strategic approach to energy issues. Rather than addressing the environmental impacts associated with the individual developments proposed by Manitoba Hydro, participants expressed the desire for a comprehensive energy plan, and an EA of that plan.

That is inevitably what happens, that these things are done project by project, and taken in isolation, which is what those who stand to benefit from the developments want to see happen. Each project then becomes subjected to a series of rather narrow technical criteria, and it leaves off the table the larger questions (Interview 27).

Connected to this need for an energy plan is a desire for learning related to Manitobans’ use of energy sources. Linked to testimony and evidence surrounding demand management initiatives, steps have been taken on a number of fronts (such as Public Utility Board hearings) to challenge existing perceptions regarding individual power consumption. Absent from this effort is a venue to further efforts directed at promoting sustainable development (Interview 29). Participants are seeking institutional changes in governance systems to advance environmental (in this context energy-based) thinking outside of a project specific EA. This is consistent with literature that supports strategic EA (see for example Gibson (2001)).

Finally, two participants identified learning outcomes that may contribute to perspective transformations. Building on the communicative theme “organizational interest in EA”, these participants noted that they became involved in the review not because of an interest in the EA, but rather because of the project context - the project description and/or the process used to review the proposal. The potential ecological impacts of
the projects did not motivate their participation. However, as a result of
the EA, these participants came to believe that potential ecological impacts
of development were and are inextricably linked with their areas of interest.
These interests “all run together. By the end, we were all saying that.”
Drawing on this change in perspective, the participants suggested they
had a newfound interest in EA. Thus these participants came to change
the way they understood their specific areas of interest and may ultimately
result in participation in future EA processes. If this learning outcome is
manifest in future action by the two participants, a perspective
transformation will occur.

EA Experience

Learning processes, as conceptualized through transformative
learning, are firmly situated in the experiences of participants. As such,
learning outcomes are shaped by the learning process, in this case the EA.
In understanding the learning outcomes of participants, it is possible to
identify various strengths and weaknesses of the assessment process. In
other words, learning outcomes provide a lens for understanding the
effectiveness of the EA process, both in terms of promoting learning, and
creating opportunities for active citizenship (Sinclair and Diduck, 2001;
Diduck and Mitchell, 2003). Drawing from the learning outcomes identified
by participants of the Wuskwatim projects, four aspects of the EA
necessitate consideration in future EA processes. These themes, grounded
in the data include: access to information, information management,
procedural certainty, and alternative perspectives.

Access to information:

Access to information is a critical aspect of a participatory process
(Hanna, 2000; Sinclair and Diduck, 2005). As described above, the public
must be informed in order to effectively participate in participatory
processes. Access (or lack of access) at the most fundamental level impacts
instrumental learning outcomes, which are necessary for communicative
and transformative learning.

One of the most important tools for sharing information with the
public is a registry. A public registry is a centralized repository system of
information to facilitate orderly and timely access to information related to
an EA. As noted above, public registries for the Wuskwatim projects were
kept by the province of Manitoba, the Department of Fisheries and Oceans,
and the CEC. Each body has different definitions of material that must be
included in that record, so each registry includes different material. For
example, federally, the public registry includes all records produced, collected or submitted in relation to the EA (subject to issues surrounding privacy) including public comments, and documents prepared by the government (see s.55 of the *CEAA*). Therefore, this record includes copies of the correspondence associated with the EA, including letters and emails. Provincially, correspondence is not required but is placed on the public record at the discretion of the Director of Environment Approvals (see s. 17 of *The Environment Act*, SM 1987-88, c. 26). Although the provincial public registry included some correspondence related to the Wuskwatim projects, in comparison to the federal record, the provincial registry was lacking.

Once a hearing is announced, all material submitted to the CEC is put on the public record. However, this record, maintained by the CEC, is separate from the provincial (and federal) public registry; evidence submitted to the CEC is only placed on the provincial public registry at the discretion of the Director. The provincial public registry related to the Wuskwatim projects includes little evidence presented at the hearings; consequently, it was necessary to consult all three locations to find all documents on the public record.

At the provincial level, the public registry is available in 14 locations; however, the Department of Conservation only manages the site located at the Main Street Library in Winnipeg. While the Department forwards material to every depository, records are added at the discretion of each site manager. This results in potential inconsistencies in the public record, depending upon which site was visited (also discussed by Sinclair *et al.*, 2002). Additional concerns relate to access to registry sites; assessment participants have noted that certain depots have restrictive hours and lack cost effective equipment necessary for keeping up to date with material related to the EA. Thus the province has clearly made steps to provide access to information; however, access is inconsistent and restrictive depending upon the point of entry.

Past research recommended the use of an electronic public registry to address these issues (Sinclair, Diduck, & Fitzpatrick, 2002). To this end, an online public registry was developed for the EA of the Wuskwatim projects by the provincial government (*http://www.gov.mb.ca/conservation/envapprovals/registries/wuskwatim/*). Although this is a positive step in improving public access to information, it is important to note that the electronic site did not replicate the data available at the Main Street Library location. Only a small subset of information was available electronically; for example, unlike at the physical site, the online registry did not include the proponent’s EIS (or links to the document available on Manitoba Hydro’s website), government technical reports, correspondence related
to the EA, or the final CEC decision report. In this case, then, participants relying on the electronic public registry were not able to access all public information related to the EA.

Remedy to issues of access to information lies with the development of one central registry system, based on the broadest interpretation of what should be on the public record (in this case the federal definition). In addition to providing copies to various locales, all material should be posted electronically, as partly implemented by the Department of Conservation for the Wuskwatim projects.

**Information Management:**

Beyond issues of access to information, information management is a persistent concern of EA participants. To learn, participants must have access to a body of material that is accurate and complete (Mezirow, 1991). Furthermore, data should be available in forms that meet participants’ needs (Shor, 1993; Hanna, 2000; Fitzpatrick and Sinclair, 2003). As illustrated by the data, information management also impacts the range, depth and tone of learning outcomes associated with participation in EA. Thus information management is essential to learning.

EAs generate a wealth of written documentation and information management is a long standing concern associated with EA (Hanna, 2000; Diduck and Mitchell, 2003). Sinclair and Diduck (2005, 64) observe, “the overly technical language and general lack of readability of EISs and other EA documents … tend to impede broad and active participation.” Conversely, plain language documents are insufficient for developing sophisticated technical opinions about the case study. Thus it is a delicate balance to provide comprehensive access to EA information, in a format that eases readability for non-specialists.

Issues surrounding information management were evident in the case study. Proponents often observed that the data generated through the review spanned over ten linear feet. As noted by one, the assumption that all participants were able to review all material related to the EA was unrealistic (Interview 30). However, participants (including Interview 30), also expressed concerns with being able to access the technical information required to develop arguments on a specific EA component.

With respect to public accessibility, participants advocated the use of third party summaries. Reflecting recommendations by Fitzpatrick and Sinclair (2003), these summaries would be available at different points in the EA (e.g., prior to hearings, and as addendums to the daily hearing transcripts), as a means summarizing key aspects surrounding the EA for the general public, and highlighting specific areas of interest for specialists.
Technical documentation requires a different strategy. One potential approach is the use of technical sessions prior to the hearings. Utilized in the EA of the Snap Lake Diamonds project in the Northwest Territories, technical sessions bring all the experts together to deliberate specific EA issues prior to the hearings (e.g., “fish” and “wildlife”). Experts then work to resolve outstanding issues (including data deficiencies, and interpretation of data results), so as to narrow down the list of issues to be deliberated in the public hearings. Minutes (or transcripts) of these sessions are placed on the public record. Thus access to technical information can be balanced with readable, general summaries of the potential environmental impacts.

In the EA of the Wuskwatim projects, information management was further challenged by the Interrogatories (IRs), a new step in the CEC review process. The purpose of this process was to clarify and strengthen information provided in the impact statement and supplementary material. Questions posed by the CEC and participants were forwarded to the proponent (and other participant organizations, excluding government). Four rounds of IRs were issued, resulting in over 500 questions. While some participants felt that IRs were successful in clarifying information provided by proponents, others had concerns about this part of the process. Issues, as they relate to information management include concerns that IRs:

- resulted in duplication of efforts when questions were addressed in existing documentation,
- created scattered trails of documentation surrounding a particular issues, and;
- required additional resources to review and critique the new body of information.

Issues surrounding the IR process were evident as participants discussed learning outcomes associated with legal, administrative, and political procedures. Although the tones varied, most participants expressed some opinion about the IR process. Examples of negative, and positive comments follow.

_The other thing I learned was that I am not sure that the IR process is an appropriate process for EIA_ (Interview 14).

_[One thing I found useful was]... the written exchange prior to the actual hearing. Because you can try to_
narrow down points, and get an actual response (Interview 29).

Suggestions for improving the efficiency of the IR process include:

- issue only one round of IRs,
- integrate IR responses in a final version of the impact statement, available electronically, and;
- vet IRs through the CEC or its staff, so as to ensure questions are not duplicated by different participants.

Concerns related to IRs embody the basic issues surrounding information management in EA - there is a mass of information that does not quite reflect the needs of participants. As such, access to information becomes limited, despite the quantity of material surrounding the hearing. Thus, as noted by numerous researchers, efforts must be made to strengthen the readability of EA documentation to facilitate participation and encourage learning (Sinclair and Diduck, 2001; Diduck and Mitchell, 2003).

**Procedural Uncertainty:**

As noted above, the Wuskwatim projects were subject to a harmonized EA, meaning that the projects were subject to one assessment that addressed the needs of multiple review processes. The resultant process therefore addressed the provincial and federal EA legislation (as negotiated under the Canada – Manitoba Agreement on Environmental Assessment Cooperation (2000)) and the *Public Utilities Board Act*, RSM 1987, c. P280. Unfortunately, representatives of federal government departments did not attend the CEC public hearings. Representatives of government, the CEC and non-governmental organizations suggested that procedural uncertainty resulted. One participant observed:

*the Canada Manitoba Agreement on environmental assessment cooperation is not the easiest agreement to follow* (Interview 14).

Another noted:

*Another thing we learned was the CEC process – and the Wuskwatim hearings in particular - were in fact not under, or part of, the cooperative EA agreement between Canada and Manitoba* (Interview 15).
This sentiment was reaffirmed by a quotation from the final report of the CEC (Clean Environment Commission 2004, pp. 7-8).

The Commission agrees that the cooperative assessment process in Manitoba is not easily understood and found little evidence of its practical application during the review of the Wuskwatim Projects. The Commission realized little benefit from the cooperative approach that was apparently undertaken in connection with this review.

It is important to clarify that the Canada – Manitoba Agreement on Environmental Assessment Cooperation requires that the two levels of governments (federal and provincial) coordinate the steps involved in the review (e.g., scoping), not participate in each other’s EA. Although the provincial legislation deemed public hearings were necessary, the federal process did not; as such, the federal government chose not to participate in the provincial hearings. Nonetheless, this decision was not clearly communicated to EA participants, who identified unmet expectations, and expressed disenchantment with the review process due to this lack of federal participation. Furthermore, despite provisions for common time schedules and decision points, the federal draft comprehensive study was released 14 months after the CEC report. Thus the harmonized process designed to create a clear, one-window approach to project specific EA resulted in increased project complexity and uncertainty.

This procedural complexity and uncertainty was manifest in instrumental learning outcomes related to legal, administrative and political procedures (EA process) and communicative learning outcomes related to both the insight into one’s own interest (strengthening the process) and insight into the interest of others (interaction between government). And, like access to information and information management, this procedural uncertainty impacted the range, and tones of learning outcomes.

The proposed revisions to the Canada-Manitoba Agreement on Environmental Assessment Cooperation (2005) do little to address this issue. Although new provisions for conflict resolution mechanisms could, in future, be used to encourage participation, they relate specifically to conflict between the two signatories, not conflict amongst all participants. Nor have any modifications been made to sections regarding how EA processes will be harmonized. The absence of federal government officials during provincial hearings relating to a harmonized EA could be replicated in future assessments. Unfortunately, resolution of this issue lies at the political level. Until the two levels of government effectively cooperate to
deliver a one-window approach to EA, the principles of the Canada – Manitoba Agreement on Environmental Assessment Cooperation (2000/2005) will not be addressed, and process complexity and uncertainty will continue.

**Alternative perspectives:**

As discussed above, learning requires access to alternative perspectives. This is best achieved through broad, active participation in the hearings. The range of organizations involved in the assessment, as identified above, suggests that participants could have been exposed to diverse perspectives. However, an analysis of the recruitment, mandate and composition of each organization is necessary before comments on the representativeness of participants can be discussed (Davies and Blackstock, 2005).

Of greater interest to research participants was the access to alternative perspectives expressed during the hearings. Although public participation was encouraged, the range and scope of issues debated throughout the EA was a concern. Key deficiencies related to the role of government and the public.

In the first instance, a lack of government involvement in the hearings created an environment where participants and the CEC were solely responsible for challenging the proponent’s evidence. In some EA hearings, including those established under the federal CEAA, and the Mackenzie Resource Management Act, 1998 c.25, government assumes the role of an adversary, in that it believes its role is to challenge and test assessment evidence. In this way, various governments rigorously test the proponent’s information in the public forum, thereby providing one or more alternative perspectives to the environmental impact statement. For the EA of the Wuskwatim projects, government did not assume this function. The federal and provincial governments completed a technical analysis of the impact statement through their technical advisory committee prior to the hearings. While meeting notes were posted on the public registry, technical advisory committee meetings were closed to the participants, except for the proponent and its consultants.

When it came time for the hearings, government took a hands-off approach to the review. As discussed above, the federal government did not attend the hearings. The provincial government attended the hearings, and gave testimony on two separate occasions. However, it was not active in cross-examining the proponent through this process. As noted in correspondence to the CEC prior to the hearing, this was a deliberate strategy:
As you are aware, in order to protect the validity of the CEC independent review, provincial decision-makers cannot take an active role in the hearing process or comment in any substantive way on issues that will ultimately be the subject of their licensing decisions (L. Strachan, personal communication, February 27, 2004).

By completing their analysis prior to the hearings, in closed discussions, the onus of challenging evidence rests solely on the CEC (who contracted external expertise) and public participants. While this role may preserve the independence of the CEC, it also detracts from efforts to ensure alternative perspectives were explored during the hearings.

Given the involvement of government departments in other EA hearings, it appears that “independence” can be interpreted in a different manner. In these processes, the Minister of the Environment, acts on behalf of the Crown, while government officials attend and participate in assessment hearings. Unfortunately for EA participants, resolution of this issue again lies at the political level.

Participant funding is one mechanism to ensure that alternative perspectives are explored throughout the EA. Indeed, access to financial resources is an important theme in assessment literature (Palerm, 2000; Diduck and Mitchell, 2003). As summarized by Sinclair & Diduck (2005), funding increases the capacity of recipient organizations to engage in the assessment by allowing for hiring of independent technical expertise to aid in the review, and increasing the ability of organizations to prepare for and be active in the different steps of the assessment (e.g., scoping, hearings, etc.). Providing financial assistance allows for increased public participation in the assessment process.

A study of past CEC hearing participants conducted in 2001 recommended that provisions for participant funding established in provincial legislation be implemented (Sinclair et al., 2002). The CEC awarded $876,438 to 11 groups involved in the EA of the Wuskwatim projects, making this the largest financial award for participation in an EA up to this point in time in Canada. Table 4 breaks down funding awards by organization.

Participant funding increases the capacity of organizations to develop arguments, thus providing for access to alternative perspectives. Thus participant funding was used to strength the EA process, in each of the aspects noted above. As summarized by one participant:
all the discussion and work that Hydro had done on their demand side management and portfolio management alternatives issue based on mainly the good work that one of the funded participants brought to the table in that regard. I think they were positive things that might not have been brought to the force if we hadn’t had a hearing, or maybe more importantly if we hadn’t had funded participants to participate in the hearings (Interview 22).

Despite the noted benefits, participants observed that the funding program had shortcomings, specifically related to how money was used by different organizations. Participant funding can be used for a variety of activities related to an EA (as specified in individual funding applications). Funded participants used three approaches to debating the EIS. The first approach involved developing new, independent, research on specific issues to counter the proponent’s data. Other organizations presented a critique of the EIS evidence based on existing knowledge. The third approach was to provide a general commentary on assessment issues.

In some cases, this funding contributed to the development of “new” research material related to key components of the impact statement. For example, the record clearly illustrates evidence of independent investigations that include consideration of,

- flow regimes on Missi Falls water structure,
- the edge effect as it relates to proposed transmission corridors,
- alternatives to the advancement of Wuskwatim based on demand management programs, and,

### Table 4: Funding awarded through the participant assistant program.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumers Association of Canada/ Manitoba Society of Seniors</td>
<td>$190,000</td>
</tr>
<tr>
<td>Pimicikamak Cree Nation</td>
<td>$160,000</td>
</tr>
<tr>
<td>Time to Respect Earth’s Ecosystems/ Resource Conservation Manitoba</td>
<td>$145,000</td>
</tr>
<tr>
<td>Manitoba Wildlands - Canadian Nature Federation</td>
<td>$115,000</td>
</tr>
<tr>
<td>Manitoba Métis Federation</td>
<td>$80,050</td>
</tr>
<tr>
<td>Opaskwawayak Cree Nation</td>
<td>$60,000</td>
</tr>
<tr>
<td>Community Association of South Indian Lake</td>
<td>$60,000</td>
</tr>
<tr>
<td>Mosakahiken Cree Nation</td>
<td>$20,450</td>
</tr>
<tr>
<td>Pukatawagon Fisherman’s Association</td>
<td>$20,450</td>
</tr>
<tr>
<td>Trapline #18</td>
<td>$20,000</td>
</tr>
<tr>
<td>York Factory First Nation</td>
<td>$5,488</td>
</tr>
</tbody>
</table>
use of a portfolio approach for evaluating resource options related to the economic impact of a project.

A review of the public record identified only one research report widely available – a study commissioned by Time to Respect Earth’s Ecosystems/Resource Conservation Manitoba (Torrie et al., 2004).

The second approach to EA data involved cross examining the proponent. This process allows participants to question and challenge assessment data and conclusions. This was the most significant way that evidence was tested by members of the public; cross examination of the proponent was conducted on all or part of 21 of the total 32 hearing days.

The third approach to examining the EIS involved a general commentary on specific research issues. This strategy was employed by two general groups – presenters in expressing opinions about the projects, and EA participants. While this strategy, often used in informal hearings, is important for recording the opinions of the general public, when integrated into a formal hearing setting, general presentations are less effective for affecting change. It is important to ensure a broad range of presenters have access to the public review of a project; as such, part of the process must include opportunities for informal presentations. However, when faced with formal hearings, participant organizations could reconsider decisions to employ this strategy as a means of testing the proponent’s evidence. In the words of one participant:

_I usually see the public’s role, [to] the extent that they can, to critique the information they have been given and to identify gaps. And what I saw them mostly doing was educating the panel as to the issues out there. And that is valid sometimes, if the panel doesn’t have any clue about a topic you are bringing up because it has been completely overlooked and you need to educate them. But I saw it as a real weakness in the presentation of the interveners that didn’t actually say, “This paragraph dealing with wind, we disagree with it.”...They gave a treatise on wind, for example, and said, “Wind is this, wind is that.” I think that it meant that the panel essentially disregarded their information because that panel can only really use information that deals with the documents they have – the assessment. Even though some of it was very interesting, I don’t think it was focused on what they needed it to focus on. Although this process may have been an_
effective tool for educating assessment participants, it was less effective and did not contribute to a larger body of alternative perspectives (Interview 30).

As articulated by participants, the first approach was the most successful for both presenting compelling evidence in the public hearing, and promoting learning.

The Wuskwatim projects marked the third time the provincial government allocated participant funding under the Environment Act, SM 1987-88, c. 26. As such, there is insufficient data to recommend changes to the overarching provincial program. However, participants identified a number of remedies to strengthen the program results, which would also serve to enhance the potential of EA to promote learning. Two examples include the development of a short course on how to be an effective intervener in the hearings, which would include a component about how to manage resources allocated for participation, as well as additional direction on how to manage participant funding and/or make it through the process (Interviews 15, 16, 21, 23).

While a significant amount of money was provided to the participants of the Wuskwatim projects, findings suggest that access to financial resources is necessary, but not sufficient for effective engagement in EA. Busenburg (2000), for example, observes that, beyond access to money, successful participation is contingent on support from other organizations. Access to alternative perspectives is another aspect that contributes to successful participation, and learning (Diduck and Mitchell, 2003).

The EA of the Wuskwatim projects took steps to encourage alternative perspectives through the allocation of participant funding to EA participants and the use of expertise by the CEC; participation by government in the public review, and a more balanced emphasis on new research by the public would improve this aspect of the EA, and perhaps lend itself to more communicative and transformative learning outcomes by EA participants.

Conclusion

Participants of the Wuskwatim projects experienced a range of instrumental and communicative learning outcomes associated with the EA. This finding supports a growing body of literature that establishes an EA-learning nexus (Sinclair and Diduck, 2001; Diduck and Mitchell, 2003; Fitzpatrick and Sinclair, 2003; Diduck et al., 2005) Unlike other research, including the Manitoba-based Maple Leaf EA discussed by Diduck and
Mitchell (2003), preliminary findings of this case suggest that perspective learning outcomes may have been experienced by two participants. These participants changed their basic assumptions about the relationship between the environment and the economy, which has led them to consider participating in future EAs. Although evidence of this type of learning are promising, they were limited in nature, which suggests that like the Maple Leaf EA, procedural enhancements are necessary.

Exploring the context of the learning outcomes revealed a number of strengths and weaknesses associated with EA. Access to information, as noted by Diduck and Mitchell (2003), and Webler and Tuler (2000), among others, is essential for fair participation and facilitating learning among participants. While EA documentation was available through public registries, the use of one, harmonized, electronically available public registry system would greatly facilitate public access. Likewise, efforts must be taken to provide concise, general summaries of assessment documentation, while still ensuring experts have access to the technical details required to evaluate the project.

The role of government in the EA is less widely debated principle in the EA and learning literature. In the Wuskwatim EA, the absence of the federal government during the provincial hearings resulted in procedural uncertainty and additional assessment complexity. Combined with a generally inactive provincial presence at the hearing, alternative perspectives were limited to those provided through CEC expertise and funded participants. When the approaches undertaken by some funded participants were unsuccessful, access to alternative perspectives was again compromised, impacting learning outcomes. Recommendations for procedural changes could help strengthen public participation and learning in future EAs.

These results support the use of transformative learning as a framework for understanding both the learning associated with participation in EA, and the experiences that contribute to those outcomes. The critical role of experience in framing these outcomes means that understanding participant learning illumines procedural strengths and weaknesses associated with participation in the EA. As illustrated, the four aspects which necessitate consideration in future processes persist throughout EA and public involvement literature. This research documents that the implications of procedural weaknesses extend beyond their role as barriers to participation; the process has repercussions for both encouraging participation and promoting learning.

Manitoba is making efforts to modify the EA process to meet the needs of participants. Thus the case study can also be considered in a temporal context. Prior to the EA, steps were taken to strengthen
opportunities for public involvement that have repercussions for learning, including the inclusion of public scoping sessions, the initial effort to provide an online public registry, and provision of participant funding. The success of these is illustrated by the number of individuals and organizations involved in the review, and the range of learning outcomes associated with participation in the EA. However, more effort is needed to create a participatory process where information is easily accessible, in a suitable format, that addresses a range of alternative perspectives. Procedural changes suggested by participants, described above address the role of government in the EA, and the need for more direction for participant funding to encourage new evidence. By increasing access to alternative perspectives through the EA process, participants will be exposed to a wider variety of approaches to situations, which may impact how they think about the world, and act within it.

Acknowledgements

I would like to acknowledge Dr. A. John Sinclair and Dr. Bruce Mitchell, who supervised this research. I am thankful to the two anonymous reviewers, who provided valuable insight with respect to presenting my research findings. Finally, I am grateful to participants of the EAs of the Wuskwatim projects the Snap Lake project, who, after spending countless hours on the assessments, took time to share their knowledge and experiences with me. Funding for this research was provided by the Social Sciences and Humanities Research Council of Canada.

References

AKKERMANN, T., HAJER, M., and GRIN, J. 2004 ‘The interactive state: Democratisation from above?’ Political Studies 52, 82-95
BARABAS, J. 2004 ‘How deliberation affects policy opinions’ American Political Science Review 98, 687-701
BUSENBERG, G.J. 2000 ‘Resources, political support, and citizen participation in environmental policy: A reexamination of conventional wisdom’ Society and Natural Resources 13, 579-587
DAVIES, B.B., and BLACKSTOCK, K. 2005 ‘Recruitment’, ‘composition’, and ‘mandate’ issues in deliberative processes: Should we focus on arguments
rather than individuals?’ *Environment and Planning C: Government and Policy* 23, 599-615


DIDUCK, A.P., MOYER, J., and BRISCOE, E. 2005 ‘A social learning analysis of recent flood management initiatives in the Red River basin, Canada’ in *Sustaining our futures: Reflections on environment, economy and society*. eds. D. Shrubsole and N. Watson, (Waterloo, ON, Canada: Department of Geography Publication Series, University of Waterloo) 127-164


DRYZEK, J. 2000 ‘On the prospects for democratic deliberation: Values analysis applied to Australian politics’ *Political Psychology* 21, 241

FEINSTEIN, B.C. 2004 ‘Learning and transformation in the context of Hawaiian traditional ecological knowledge’ *Adult Education Quarterly* 54, 105-120


GASTIL, J. 2004 ‘Adult civic education through the national issues forums: Developing democratic habits and dispositions through public deliberation’ *Adult Education Quarterly* 54, 308-328

GIBSON, R.B. 2001 ‘The major deficiencies remain: A review of the provisions and limitations of Bill C-19, an act to amend the *Canadian Environmental Assessment Act*’ *Journal of Environmental Law and Practice* 11, 83-103


HEALEY, P. 1997 *Collaborative planning: Shaping places in fragmented societies* (Vancouver, Canada: University of British Columbia Press)


LANGE, E.A. 2004 ‘Transformative and restorative learning: A vital dialectic for sustainable societies’ Adult Education Quarterly 54, 121-139
MANITOBA HYDRO, and NISICHAWAYASIHK CREE NATION 2003 Wuskwatim generation and transmission projects: Environmental impact statement. In (Manitoba Hydro & Nisichawayasihk Cree Nation, Winnipeg, MB, Canada)
MCGREGOR, D. 1999 Indigenous Knowledge in Canada: Shifting paradigms and the influence of First Nations. In Sustainable Forest Management Network Conference Science and Practice: sustaining the boreal forest. (Edmonton, AB)
MERRIAM, S.B., and CAFFARELLA, R.S. 1999 Learning in adulthood: A comprehensive guide (San Francisco: Jossey-Bass)
MERRIAM, S.B., and MOHAMAD, M. 2000 ‘How cultural values shape learning in older adulthood: The case of Malaysia’ Adult Education Quarterly 51, 45-63
MEZIROW, J. 2003 ‘Transformative Learning as Discourse’ Journal Of Transformative Education 1, 58-63
MEZIROW, J.D. 1991 Transformative dimensions of adult learning (San Francisco: Jossey-Bass)
MEZIROW, J.D., and ASSOCIATES, eds. 2000 Learning as transformation: Critical perspectives on a theory in progress. (San Francisco: Jossey-Bass)
of Zoology, Native Studies and Anthropology. (University of Manitoba, Winnipeg)

SIMPSON, L. 2000a ‘Anishinaabe ways of knowing’ in Aboriginal health, identity and resources. eds. J. Oakes, R. Riewe, S. Koolage, L. Simpson, and N. Schuster, (Winnipeg: Department of Native Studies and Zoology, Faculty of Graduate Studies, University of Manitoba) 165-185

SIMPSON, L. 2000b ‘Indigenous knowledge and western science: Towards new relationships for change’ in Aboriginal health, identity and resources. eds. J. Oakes, R. Riewe, S. Koolage, L. Simpson, and N. Schuster, (Winnipeg, MB, Canada: Department of Native Studies and Zoology, Faculty of Graduate Studies, University of Manitoba) 186-195


SUSSKIND, L., and CRUIKSHANK, J. 1987 Breaking the impasse: Consensual approaches to resolving public disputes (New York: Basic Books)

TORRIE, R.D., TORRIE SMITH ASSOCIATES, and TIME TO RESPECT EARTH’S ECOSYSTEMS RESOURCE CONSERVATION MANITOBA 2004 Alternatives to the advance of the Wuskwatim generation station: Substantive filing. In (Time to Respect Earth’s Ecosystems & Resource Conservation Manitoba, Winnipeg, MB, CA) pp. 22

USHER, P.J. 2000 ‘Traditional ecological knowledge in environmental assessment and management’ Arctic 53, 183-193


WEBLER, T., and TULER, S. 2000 ‘Fairness and competence in citizen participation: Theoretical reflections from a case study’ Administration and Society 32, 566-595
