Balancing Choices:

Opportunities in Science and Technology for Aboriginal People
April 1999, Winnipeg

Action Plan

Opportunities in Science and Technology for Aboriginal People:

. . . . . The Need for Action

The Department of Indian Affairs and Northern Development (DIAND) and Human Resources Development Canada (HRDC) hosted the conference *Balancing Choices: Opportunities in Science and Technology for Aboriginal People* in Winnipeg on April 8-9, 1999. Close to 250 representatives of government, First Nations and Inuit communities, youth, schools, and industry met to address the under-representation of Aboriginal people in science and technology-related education and careers, identifying issues and proposing solutions.

The conference adopted a broad perspective on science and technology, defining it to include the pure, natural and applied sciences as well math. It also encompassed traditional and modern science.

Delegates noted that, while there are many similarities between labour market outlooks in Aboriginal communities and neighbouring regional and sub-regional economies, there are frequently also significant differences between them which information on career outlooks prepared for Aboriginal youth must take into account. In forestry, for example, opportunities for Aboriginal employment are expected to increase despite an overall decline in this sector.

One of conference's key objectives was to develop an Action Plan of activities which governments, educational institutions, employers, parents and community members can undertake to increase Aboriginal participation in science and technology. Workshops and plenary sessions generated many recommendations. Taken together, they point to a need for action on four themes and seven sub-themes:

Theme 1:

Reach for excellence in science education

- Equip teachers to be skilled and enthusiastic in science, math, and technology
- Support strong curriculum development
- Support post-secondary students

Theme 2:

Ensure adequate funding for science and technology education

- Establish facilities and programs to expose students to science and technology in their home communities
- Support post-secondary and adult learning programs

The following table presents concrete activities which delegates proposed. This list is far from exhaustive: While it prescribes practical measures which can be undertaken today, it also illustrates the wide variety of activities which can expand opportunities in science and technology for Aboriginal people. This framework of priorities and themes offers many points of entry for organizations to propose initiatives of their own.

Theme 3:

Improve the flow of information

- Make the transition from school to work easier
- Continue this conference series

Theme 4:

Build Employment Partnerships in Science and Technology

Theme 1:

. . . . . Reach for excellence in science education

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
Sub-Theme: **Equip teachers to be skilled and enthusiastic in science, math, and technology**			
1. Support upgrading of math and science instruction techniques from K-12 with particular emphasis on high school.	Reallocate education funds within communities and under DIAND's Gathering Strength initiative to support professional development for teachers and to set higher pay for teachers with higher skills.	Chiefs; education authorities; DIAND	This point was raised in more than one discussion. Activities in this area also fall under provincial jurisdiction.

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
2. Inform teachers about the careers that are available and the skills students will need to succeed in them.	Research existing career planning and curriculum materials and assess the existing channels of communication between teachers and the creators of these materials, including the use of electronic media. Establish a national resource centre on Aboriginal participation in science and technology to promote and distribute these materials to schools.	DIAND; HRDC; First Nations; education authorities; provincial and territorial ministries of education; AFN Chiefs Committee on Education; industry and professional associations AFN Chiefs' Committee on Education; DIAND; Aboriginal organizations; Industry Canada	

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
3. Support virtual meeting places on the Internet to share ways of making science and technology relevant and exciting. Establish links to other sources of information, science-related projects, and other partners.		Aboriginal Youth Network; First Nations SchoolNet; Concordia University; AFN Chiefs Committee on Education; universities and colleges	Parents, role models, schools, universities and colleges, and governments can share their experiences and ideas on how to make science exciting, relevant, and fun. Use the Internet to hold "Internet Olympics," "Cyber-Science Fairs" and plan students exchanges between northern and southern communities.
4. Inform teachers about existing science camps which train teachers to design and deliver innovative science and technology learning activities.	Collect and disseminate information on these camps.	Regional teachers' associations; faculties of education; DIAND; education authorities; provincial and territorial ministries of education	

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
Sub-Theme: **Support strong curriculum development**			
5. Combine instruction in the traditional and the applied sciences by developing Aboriginal culturally integrated curricula.	Design culturally integrated curricula.	Community education authorities, with funding from partners in science and technology-related industries and with the participation of parents, Elders, industry and professional associations, Natural Resources Canada, Environment Canada, and the Canadian Environmental Assessment Agency.	
	Maintain and increase funding for Aboriginal culturally-integrated curricula by reallocating funding within community education budgets.	First Nations and Inuit education authorities	

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
6. Ensure that curricula equip students with the skills to succeed in this highly competitive sector.	School board officials should consult experts in faculties of education, science, engineering and provincial and territorial governments about the adequacy of curricula. Distribute the Conference Board of Canada's "Employability Skills Profile" to all Aboriginal students.	The AFN Chiefs Committee on Education should facilitate the consultation. HRDC or DIAND and provincial and territorial ministries of education.	

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
Sub-Theme: **Support post-secondary students**			
7. Upgrade the services provided at the community level to facilitate success in post-secondary education	Improve guidance counselling to students on program choices prior to attendance at post-secondary institutions Improve support programs for post-secondary students to develop the skills needed to succeed Familiarize community education coordinators with the pressures and benefits associated with university and college life.	First Nations; Regional First Nation education bodies Universities and colleges	Aboriginal students often do not have the benefit of a family history in post-secondary education.

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
8. Redesign career counselling to include family members as well as students.		Community post-secondary education coordinators; school guidance counsellors; friendship centres; Aboriginal women's organizations	
9. Encourage universities and colleges to establish more post-secondary access programs and actively recruit Aboriginal students.		Universities and colleges; provincial and territorial governments; Aboriginal educational institutions	

Theme 2:

. . . . . Provide adequate funding for science and technology education

Theme 2: Provide adequate funding for science and technology education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
Sub-Theme: **Establish facilities and programs to expose students to science and technology in their home communities**			
11. Review the practice of funding First Nations elementary and secondary educational facilities based on student populations.	Compare federal, provincial and territorial funding criteria.	DIAND; AFN Chiefs' Committee on Education	Students should not have to leave home to be exposed to science and technology. By reserving funding for certain facilities to schools with a minimum number of students, government policies limit the options for science and technology education available in smaller communities. Community schools should have facilities which at least match those available in neighbouring communities.

Theme 2: Provide adequate funding for science and technology education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
12. Improve Internet access in remote communities.	Increase funding for hardware and connectivity. Train teachers in the use of the Internet	Industry Canada's SchoolNet and Community Access Program; First Nations and Inuit communities; telecommunications companies; Internet services providers; computer industry First Nations and Inuit communities	
13. Establish community, national, and international science fair competitions for Aboriginal students and establish linkages to non-Aboriginal science fair tournaments.	Identify a coordinating agency. Commit funding.	Canadian Aboriginal Science & Engineering Association (CASEA); Canadian Aboriginal Science and Technology Society (CASTS); National Research Council; other Aboriginal organizations; industry associations Industry Canada; DIAND	

Theme 2: Provide adequate funding for science and technology education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
Sub-Theme: **Support post-secondary and adult learning programs**			
14. Increase funding for post-secondary education to make it available to all eligible students.	Complete the review of the post-secondary education program.	DIAND; First Nations; Chiefs' Committee on Education	
15. Increase the number of students who receive life skills and course selection counselling.	Establish life skills and course selection counselling for Aboriginal students. Communicate the available programs better to Aboriginal communities.	Universities and colleges Universities and colleges, Aboriginal communities	

Theme 2: Provide adequate funding for science and technology education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
16. Commit core funding for Aboriginal education institutions to offer skills upgrading and post-secondary student support.		Aboriginal education institutions; DIAND; HRDC; provincial and territorial governments; government agencies responsible for adult education	
17. Revise the funding criteria for adult learning programs to encourage more science and technology programs.		HRDC; Aboriginal education institutions; First Nations	

Theme 3:

. . . . . Improve the flow of information

Theme 3: Improve the flow of information			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
Sub-Theme: **Make the transition from school to work easier**			
18. Distribute job forecasting information more widely to help students identify employment opportunities in science and technology at the end of post-secondary programs.	Improve communication between the sources and users of labour market information.	HRDC Aboriginal Relations Office and Aboriginal Human Resource Development Council, in consultation with DIAND; private sector employers; Aboriginal organizations; Aboriginal businesses; industrial sector organizations	
19. Support career counsellors through training and exchanges of information and experiences.		First Nations; education authorities	

Theme 3: Improve the flow of information			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
20. Increase efforts to encourage employers to actively recruit for Aboriginal workers at universities and colleges.	Industry and government facilitate increased numbers of placements in cooperative and intern education programs Encourage use of DIAND's Aboriginal Workforce Participation Initiative *Employer Tool Kit*	DIAND; HRDC; Industry Canada; private and public sector employers; universities and colleges	We should work to improve communication between the private sector and individuals in order to ease the transition from post-secondary education to employment.
21. Increase the use of the Internet to identify employment opportunities and promote different careers.	Increase Aboriginal people's awareness of Internet employment-related resources.	Aboriginal Human Resource Development Council; employers in science and technology-related industries	
22. Share information on existing government programs.	Improve information-sharing between government departments and between governments and the Aboriginal public.	Government of Canada; provincial and territorial governments; universities and colleges	In some cases, programs already exist to address concerns raised by conference delegates.

Theme 3: Improve the flow of information			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
Sub-Theme: **Continue this conference series**			
23. Hold another conference.	Possible elements to include in a future conference: • Address the under-representation of Aboriginal women in the workforce • Include spirituality as an aspect of learning • More members of communities must attend, including parents and students	DIAND/HRDC; Aboriginal Human Resource Development Council; Industry Canada	*The two conferences have been valuable; another is essential.* – Dennis Macknak

Theme 3: Improve the flow of information			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
24. Support the conference series with ongoing activities.	Reinforce conference themes in interactions with partners.	Conference participants; Aboriginal Human Resource Development Council; National Aboriginal Economic Development Board	
	Expand and distribute the package of career profiles in science and technology	DIAND	
	Distribute Job Search Tool Kit for Aboriginal Youth	DIAND	
	Produce and distribute 10-and 20-minute bilingual versions of the Balancing Choices video	DIAND	

Theme 3: Improve the flow of information			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
25. Distribute the *Balancing Choices Action Plan* .	Distribute to conference delegates and invitees, chambers of commerce, regional education authorities, and the Council of Ministers of Education Canada (CMEC).	DIAND	
26. Convene a conference for parents.		Assembly of First Nations	The AFN has held conferences for Elders and youth in the past. First Nations, Inuit, and Metis parents and grandparents could share techniques that support children in their career interests. They could also learn traditional knowledge that schools did not teach in the past. Similar points were raised in more than one discussion.

Theme 4:

..... Build Employment Partnerships in Science and Technology

Theme 4: Build Employment Partnerships in Science and Technology			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
27. Offer more students work experience in science and technology.	Increase support for high school cooperative education and work placement programs in science and technology.	DIAND; education authorities; Aboriginal education institutions; science and technology-related businesses (especially Aboriginal businesses)	These programs provide valuable experience even when they provide only temporary employment opportunities.

Theme 4: Build Employment Partnerships in Science and Technology			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
28. Encourage more partnerships with business.	Approach businesses to propose partnerships which • provide schools with computers and science labs • sponsor mobile science camps in remote communities • participate in stay-in-school programs • sponsor selected students over the long term as potential employees • establish job shadowing and mentoring programs • establish visiting professionals programs; and • offer career fairs in science and technology.	First Nations and Inuit education institutions; communities; parents; teachers; science and technology-related businesses; Aboriginal Human Resources Development Council; National Aboriginal Economic Development Board; industry associations	"This is good for business."

Theme 4: Build Employment Partnerships in Science and Technology			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
29. Expose more Aboriginal youth to Aboriginal role models in science and technology	Develop and maintain a list of young Aboriginal professionals who are willing to speak to students in their home communities. Support role models and mentors with opportunities to share techniques. Provide role models and mentors with funding to travel between communities.	Aboriginal leaders; AFN Chiefs' Committee on Education; businesses; governments; Canadian Aboriginal Science & Engineering Association (CASEA); Canadian Aboriginal Science and Technology Society (CASTS); National Research Council	This point was raised in more than one discussion.

Theme 4: Build Employment Partnerships in Science and Technology			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
30. Encourage existing role models programs to include Aboriginal people who have succeeded in science and technology careers.	Approach the administrators of the National Role Models Program, Alberta Future Leaders Program, and National Aboriginal Achievement Awards. Create a video of role models and their achievements.	Aboriginal Human Resource Development Council; National Aboriginal Achievement Foundation	The Alberta Future Leaders Program hires university students in specific disciplines to tour communities as speakers and role models.
31. Ask construction and engineering firms and other professionals operating in Aboriginal communities to make career presentations to students in grades 7 through 12.	Share best practices.	First Nations and Inuit communities; Public Works and Government Services Canada	

Appendix A:

. . . . . Other Recommendations

A. Begin teaching science and technology intensively at the elementary school level.

B. Make training programs flexible to accommodate family demands and traditional activities.

C. Fund community activities for youth such as sports.

D. Community leaders and parents can help to dispel stereotypes about forestry work.

E. Increase the number of innovative on-campus recruitment programs by business.

F. Commit funding for a network of positions in treaty organizations and band offices for specialists in science and technology issues. Contacts of this kind exist for medical issues.

G. Strengthen the role of traditional knowledge in sustainable development practices.

H. Balance traditional knowledge and industry knowledge in forestry management and broaden the role that First Nations play.

I. Through respectful approaches, capture the science and health knowledge of Elders through electronic means.

Appendix B:

List of Workshops and Plenary Sessions

Workshops - April 8, 1999

1. Building math and science networks for teachers
2. Incorporating Aboriginal culture into math and science curricula
3. Providing equipment and facilities for success
4. Creating excitement in STEM careers
5. Exploring new horizons and guidance counselling
6. Taking responsibility for excellence in math and science education

Workshops - April 9, 1999

7. Creating educational partnerships
8. Ensuring appropriate programming in science and technology in post-secondary programs for Aboriginal people
9. Meeting the skills needs of Aboriginal business
10. Communicating the skills needs of industrial sectors
11. Supporting student success in post-secondary science and technology
12. Identifying skills requirements for managing land and natural resources

Plenary Sessions - April 8, 1999

Visioning: It's April 8, 2019, what changes have we witnessed?

Panel 1: The Community and the School: Supporting Career Choices

Panel 2: Indigenous Knowledge Systems: A Foundation for Careers in Science and Technology

Plenary Sessions - April 9, 1999

Panel 3: Learning and Employment: Career Skills and Access to Education

Theme 1: Reach for excellence in science education			
Proposed activity	**Follow-up**	**Responsibilities and partners**	**Comments from delegates**
10. Support the initiative by Saskatchewan Indian Federated College to identify and test characteristics of successful post-secondary access programs.		Aboriginal education institutions	*Identify how students can be made comfortable and successful in universities and colleges. Once the actions can be identified, Canadian universities and colleges need to learn "how to do it": Students should be able to go to the institution of their choice. Eber Hampton has initiated some studies; let's get some projects going now and support these in preparation for the next conference. Continuity is essential.* – Dennis Macknak