UNIVERSITY OF THE ARCTIC

ICT in Arctic Higher Education Priorities

Recommendations and proposed actions

Background

The Arctic Council (www.arctic-council.org) is hosting an Arctic ICT Conference in Iceland, on October 20-21, 2003. The organizers approached the University of the Arctic (UArctic) to develop a background paper on the status of ICT in the Arctic. There are three focus areas for the conference: infrastructure, education, and telemedicine.

The University of the Arctic addresses ICT in higher education in our Arctic Learning Environment (ALE) program. The ALE program focuses on finding ways to allow northerners to overcome distance to learn in the North, including finding new and innovative means to overcome cultural barriers and physical distance. The program also seeks to identify relevant and new approaches to learning processes, especially pedagogy and information technologies that support the delivery of content across the great distances of the region.

Preparations for the ICT workshop in Iceland focused on a very basic question: *what, if anything, is special about ICT in higher education in the Arctic?*

The first step was a workshop on "Bridging the Digital Divide: Sharing Best Practices for Developing ICT in the Rural Areas of the North and South", which demonstrated clearly that populations in remote areas worldwide share many problems related to ICT and higher education. The report from this workshop is available as a separate publication to the workshop participants.

To further document the situation and share experiences, the University of the Arctic is preparing a comprehensive book on ICT in higher education in the Arctic. The book will contain fifteen academic papers; including status information on ICT use in Northern Higher Education institutions, an overview of ICT-based learning strategies in the Arctic countries, and documentation on the various approaches to ICT-based education. The book will be finished by the end of the year, and early drafts of the papers will be available at the ICT conference in Akureyri.

The editorial team of the book gathered at the University of Highlands and Islands' campus in Stornoway for a first discussion of the papers in the book and to initiate the work on a reflections and outlook section to the book. As a part of this work, the editorial team developed the following recommendations on ICT in higher education in the Arctic. We hope these recommendations will stimulate discussion at the ICT conference in Iceland.

Higher Education Recommendations

1. Enhanced Information and Communication Technology

(The purpose of this recommendation is identical to the Telemedicine recommendation no.1)

To effectively deliver education to learners throughout the Arctic Information and Communication Technology should be in place. If systems are in place, affordable, and reliable, they will be utilized to deliver high quality education to the Arctic. Joint solutions

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are necessary to implement the affordable ICT services necessary to support education, medicine, governance, and business opportunities for northerners.

Possible follow up:
Progress in infrastructure requires action outside the education and research community. Collective experience has shown that:

- The cost of access to infrastructure in urban and rural areas must be equal.
- There are existing examples of national programs and regulations that could inspire practical solutions for other parts of the Arctic.
- Arctic infrastructure must support a mix of technologies, from e-mail courses, to web based, video, and broadband solutions to suit the various interactions that take place.
- Support for Arctic languages should exist in multilingual technologies, including translation software.
- Distance education and research projects should continue as front-line projects to motivate and display regional ICT infrastructure development. Collaborating in this way would greatly benefit the progress of distance education in the north, and provide resources for future advancement.
- A mechanism to share knowledge on solutions to affordable ICT solutions in Arctic areas is necessary for future progress.

2. Develop relevant pedagogies for Arctic ICT based learning

To effectively deliver content across the great distances of the region, it is necessary to develop relevant and new approaches to learning processes that overcome cultural barriers and physical distance. Pedagogies and information technologies must be identified that support these goals.

Possible follow up:

- Identify the needs of the northern learner and the UArctic members, review evaluations of existing programs, and determine a way to learn from indigenous and non-indigenous northerners about learning preferences.
- Facilitate the generation (construction) of knowledge, specifically how to involve the learners/students.
- Provide a mechanism (develop a technology?) for the sharing of experiences including examples of best practices and a series of UArctic seminars on learning processes and ICT with an Arctic focus.
- To support the most underserved regions in the Arctic, it is important to develop new concepts for ICT supported learning where users are less dependent on high bandwidth Internet connections.
- The great similarities between northern periphery and reality in developing countries are a good basis for new types of cooperation.

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3. Education and Training

Human connections inside and outside higher education institutions and organisations are the main driving force for the successful use of ICT in higher education. Communication between students and tutors, students and other students, tutors and other tutors must be supported. Training tailored to the unique education methodologies and information and communication technologies issues in Arctic regions is an important aspect in the use of ICT in northern education, and has applications on regional and cross-regional levels.

Possible follow up:

- Universities throughout the Arctic should use the University of the Arctic structure to support staff networking and training. This collaboration will secure program development on a cross-regional level, put local programs into a circumpolar context, and encourage partnership on joint or over-lapping projects.
- Networking amongst institutions should include cooperation in e-mentoring, tutoring, assessing, and developing high quality learning material.
- The network should develop concrete solutions for sharing training techniques, manuals, and best practices related specialized distance education for remote areas.
- Circumpolar training programs should be delivered on regional levels (e.g. the BVU for the Barents region). This will provide distant professionals with an opportunity to become familiar with other distance education projects in their region, and encourage further collaborative efforts.
- There is a need for regional and circumpolar cooperation to train locally recruited personnel at learning centres throughout the Arctic. The focus should be on higher education pedagogy, research, and adaptation to new technology. These training programs will also provide opportunities to let persons with local knowledge and delivery experience take part in the development of relevant delivery models for ICT supported education and training.
- Student mobility, course transferability, and pedagogic approaches will greatly benefit from shared or harmonized solutions for administrative activities, libraries, learning management and credit management solutions.
- Higher education institutions in the Arctic would benefit from sharing Information and Learning Technology (ILT) Strategies. The ILT strategy declares how technology is used in teaching and learning in the institution and across the partnership and builds on the preferred pedagogic model and the wanted instructional outcomes.

4. Ownership

As Arctic residents learn about the possibilities for expanded access to higher education, they may desire to select services from a variety of sources, both within and outside the Arctic. Standardized mass education programs utilising education delivery means may not be the most appropriate or desired. Indigenous and other northern people may prefer education solutions provided by institutions with a cultural background similar to their own. As local

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and regional ownership is necessary to sustain local education institutions, the future may also bring threats to locally adapted ICT-based learning support systems.

Possible follow up:

- Local level: Communities should take an active role in the development and marketing of their own learning centres. Working on a joint community learning strategy and widening access ensures that the curriculum is relevant to its stakeholders and that the local population benefits from the educational provision. It also facilitates recognition of the qualifications and employability of graduates in the local job market albeit that graduate jobs may need to be created in the area.
- Regional level: Joint education centres should be created where several small communities are located close together. The centres would ensure regular use of the equipment and be able to provide sufficient training for the staff located there. This approach will serve remote and under-served communities at a lower cost.
- Cross-regional: Active use of UArctic's Arctic Learning Environment program as a tool to develop increase knowledge of adapted ICT based education initiatives throughout the Arctic.
- Outside of the University sector: Policy makers, ICT providers, and other experts would benefit from learning more about Arctic education challenges and opportunities. Local, regional, and national administrators need knowledge and ownership to make informed decisions and create action plans for Arctic ICT in education and government. The Arctic Council will be a good forum to share such information on an overarching level.
- UN: The University of the Arctic should ensure that northern education become a part of the UNESCO agenda.
- Business sector: The Arctic may form opportunities for competition between companies to develop different ICT infrastructure, and adapted learning support systems made specially for remote regions.
- Development sector: Experiences from northern periphery should be utilised when assisting with education solutions for peripheries in developing countries.

5. Fierpmadat, advanced education network in the Arctic

One, out of several possible paths, is to stimulate development in advanced ICT-based education in the circumpolar north. A joint circumpolar "Fierpmadat[1]" – a broadband network connecting northern communities to each other and to the south. Initially, each country could endeavour to connect one or more communities by extending their southern networks northward, thus utilizing the southern backbone networks to effect intra- and international north-to-north connectivity. Later this should be expanded by direct link over the pole.

[1] Fierpmadat, Saami word for network. The word has its roots in ancient words for fishing net.

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Possible follow up:

- Creation of a Northern Network Knowledge Repository: A system for benchmarking and tracking all factors relevant to network deployment in the Arctic.
- Participation in workshops or other tools to share economic models for broadband services among northern communities: These meetings would focus on cost avoidance resulting from network services, creation of new value, skills retention, sustainability of skilled human resources, and synergy with regional development policies.
- Establishment of an Arctic Technical Advisory Committee: Building on already advanced northern education institutions, and additional multidisciplinary and northern community representation from each of the circumpolar member states to define the applications and technical requirements for the establishment of the "Sierpmadat".

6. Cooperation with other Arctic Programs

Arctic programs should make use of the ICT-based education and training capabilities developed by University of the Arctic member institutions. Many programs of the Arctic Council as well as the projects in the sciences community have concrete training and capacity building needs. The network of northern higher education institutions is a perfect instrument to implement many such initiatives. The cost of developing good pedagogical and technological frameworks will then be utilised to a maximum mutual benefit.

Possible follow up:

- The University of the Arctic Open Learning Program and Arctic Learning Environment must have the capacity and overview to advertise new initiatives to the relevant groups of northern education institutions.
- A small incubation fund with sufficient resources to bring concrete ideas into full project proposals for funding should be developed by University of the Arctic.
- University of the Arctic should ensure collaboration also outside the University sector, in particular the Arctic Council working groups, the Arctic telemedicine and health sector, and regional Arctic cooperation initiatives (i.e. Barents etc.).
- The Arctic Council Sustainable Development Program is the natural choice for responsibility to following up within Arctic Council.

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