Barents Virtual University
– Plans, Problems and Possibilities.

Bridging the digital divide between Russian and Scandinavian communities in the Barents region.

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> *"Education will become the centre of the knowledge society,*
> *and the school its key institution."*
> *Peter Drucker*

Abstract

Several influential policy reports recently have argued that our societies are changing from industrial societies into 'information societies', in which the creation and dissemination of knowledge is of great importance. In October 2000 rectors and representatives of 19 higher educational establishments of Northwest Russia, Northern Norway, and America, signed a declaration on co-operation and development between higher educational establishments of the three countries.

This paper will address the possibilities, challenges and problems using Internet in the teaching and learning process, and in the planning, administration and management of international distance education of the Barents Euro-Arctic Region. First the paper addresses the present status concerning ICT infrastructure in the countries involved. Secondly, the paper reports on the results of a survey of web sites of higher education institutions in the region, and discusses the different educational needs in the countries. Finally, different organizing, financing and crediting models are analyzed. Internet-based courses are not just old wine in new bottles but a new system with interesting and unpredictable implications for students, faculty, and institutions.

1. Introduction

New computer and telecommunications technologies offer the possibility of global access to education. In turn this global access offers the possibility of a truly global classroom, unlimited by nationality. Teachers and students may be drawn from many countries and study the same course together at the same time. Through widening choice, the new interactive technologies may empower individual learners by providing an education that focuses on their needs.

Several influential policy reports recently have argued that our societies are changing from industrial societies into 'information societies', in which the creation and dissemination of knowledge is of great importance. They contend that, in order to combat social exclusion and to maintain competitiveness in a global economy, education must go beyond the framework of initial schooling in order to prepare and support citizens with social capital for life long learning. Accompanying this argument is the belief that information and communication technologies (ICT) may play an important role in reshaping education to respond to contemporary information needs.

There has always been a difference between nations. In this paper we use the term "*digital divide*" to refer to the gap between those who can effectively use new information and communication tools such as Internet, and those who cannot. The digital divide between nations has attracted a lot of attention, and has been put to the agenda of organisations such as the UN. There is no current consensus on the extent of the digital divide and whether the divide is growing or narrowing (NTIA, 1998).

In early October 2000 rectors and representatives of 7 higher educational establishments of North-west Russia, and 5 Colleges in Northern Norway, as well as 7 American colleges, signed a declaration on cooperation and development between higher educational establishments of the three countries. This trilateral conference in Petrozavodsk made a possible beginning of a new stage, although the American side seems to back out. In Mars 2002 the Barents Secretariat in Norway announced the *Archangel University Consortium* to be the winner of the tender for the Barents Virtual University Secretariat.

First, it will allow people to overcome the factor of distance and borders. Second, it enables

the student simultaneously to get information and instruction in different courses from various Universities. Third, it gives an equal opportunity to those who are deprived of it due to disabilities, engagement in industrial and private affairs, lack of time, isolation, poverty and social vulnerability. Fourth, it allows us to implement the principle of educational continuity. The student may study in one place, convenient for her/him according to an individual schedule, having a complete set of special materials for studies and an easy access to the teacher through a computer network in online and off-line modes.

The Institute for Academic Technology, University of North Carolina (1995) has provided a useful definition of distance education, or what they prefer to call "*distributed learning*" in USA:

> *"A distributed learning environment is a learner-centred approach to education, which integrates a number of technologies to enable opportunities for activities and interaction in both asynchronous and real-time modes. The model is based on blending a choice of appropriate technologies with aspects of campus-based delivery; open learning systems and distance education. The approach gives instructors the flexibility to customize learning environments to meet the needs of diverse student populations, while providing both high quality and cost-effective learning."*

We may distinguish between three types or levels of web-courses:

1. Courses using Internet as a voluntary supplement.
    The web is used to present extra references, but will not be necessary to attend the subject or do the exams. This is often how you start adapting a course for web.
2. Courses where Internet is a necessary resource.
    Here the students must have access to Internet to join the study. In addition one must join the local class on campus. In Norway we often use this combination model, because the students want to meet each other.
3. Courses where almost all studies are done via Internet. Books and videos are still used, but the rest of the activity is done online.

What is perhaps most important in the early stages of adopting innovations is the role played

by leadership, such as administration and university principals. The first main question for our study is to what extent has the institution adopted plans and objectives that reflect a focus on new Internet learning strategies. Have the institutions in different forums stated an interest for working in this area?

The second main question of our study addressed this: Which ICT infrastructure (equipment, access to the Internet and the like) is available in the schools?

It is known from previous research that educational innovations usually do not succeed if teachers are not provided with the skills and knowledge needed to carry them out. Training teachers is a very expensive activity and hence often much neglected in large-scale innovations. Therefore it is important to pose this concern as the third main question: What staff development and support services exist with regard to ICT?

2 Method and Material

There are many obstacles to overcome in the process of working out such a paper. We must remember that the Barents Region covers a huge geographical area, and the number of educational institutions to survey is great. More than 5 million people who live in 4 countries in an area twice the size of France. The emergence of ICT in education has been so rapid that there exists a serious information gap regarding the actual infusion of technology into education. The International Association for the Evaluation of Educational Achievement (IEA) has contributed significantly to reducing this gap with its international study of Computers in Education (Pelgrum & Anderson, 1999), and this will be followed up in the years to come. The charts that follow draw upon the results of the data compiled by the IEA. Their minimum sample size of computer-using schools for each population is 200 (=effective sample size), and refers to the minimum number of responding schools. The instrument used in this survey is a school questionnaire consisting of one part for the principal of the school (covering aspects like school organization, school policies, readiness, and staff development with regard to ICT) and one part for a person who is most knowledgeable with regard to infrastructure and use of ICT in the school. The questionnaire is mailed to the sampled schools, requesting to return the completed version within two weeks. After this period a

procedure of reminding will start (mail and phone). The minimum acceptable response rate for inclusion in the international comparisons is 85%.

The data from IEA do not cover the university level. To add knowledge from this area we had to use data from other sources. The *Barents Secretariat* in Kirkenes and *Niels Brock International Business College* in Copenhagen have recently compiled a "*Need Analysis on Higher Education & Research in Northwest Russia*" (Johnsen & Larsen, 2001). More than 18 co-authors have contributed in this report, each representing their educational institution or their region's administration. Most of the information is collected on the institutional level by direct contact with the universities' representatives, and other official documents. A basic questionnaire was used for this purpose, but the questions were not pre-coded and must be considered to be quite open.

Finally, by using a more informal qualitative method, we have also collected information by browsing web pages, and mailing addresses given there. All the institutions involved have web-sites and domains presenting the different faculties etc. Egil Rønningstad, Terra prosjektutvikling in Tromsø, carried out this browsing and mailing in Russian in the spring of 2001. He has also to a limiting extent been checking with students. To obtain more than the "formal" answers from people in position, we contacted users of the equipment at the universities to receive their confirmation that they had real access to the international Internet.

By these different sources, we have an overview of the situation. The present paper is written from a western perspective with a main focus on Russia. This is the country where the challenges and possibilities are greatest. After collecting the main part of the information, we decided to focus mainly on these three Russian institutions: Petrozavodsk State University, Pomor State University, and Murmansk State Technical University. This is because Arkhangel State Technical University seems to have a more specialized focus, which not so easily would match the focus of the Norwegian Colleges. Arkhangel State Medical University are also focused on things a bit to the side of the Colleges, although they have done quite a deal in both international co-operation, and in telecommunications, through the "Telemedicine Development Project".

3 Results and Discussion

The main findings in the IEA-study are (Pelgrum & Anderson, 1999):

- Many schools in economically developed countries are getting access to the Internet. The use of this medium by students is still low.
- The density of computers for instruction is continuing to rise. Many countries have an average of one computer for every 10 students.
- The adequate training of teachers is still a major problem in most countries.
- There are indications that ICT facilitates changes in pedagogical practices.

3.1 Educational plans and needs.

What studies are needed in the different areas? On the Scandinavian side the situation is considered to be satisfying and close to an international "state of the art", but they are open to new ideas and co-operation. In Russia education has been considered more and more important among young people in the latest years, and there is at present a great need of educational capacity.

Archangel

In the educational policy of the Archangel region it is planed to go on developing the university Internet, and create a uniform informational and educational network for the region and the countries in the Barents region.

Pomor State University (www.pomorsu.ru) has suggested preparing international Web-courses like this:

- History and practice of regional co-operation in the North.
- Bjarmland-archaeology and history
- Site for teachers of Russian and Norwegian languages.
- Religion & Church in Barents region
- History and Culture of Russian North.
- Political management on a regional level

- Social work in the North

- Educational systems in Barents region

- Comparative law

- International tourism, international economic relations

- Journalism

The institution lists its educational needs like this: Business administration, theory and practice of small and medium business, international management, regional marketing, international tourism and hotel business, and on modern information technologies in distant education.

Archangel has some persons involved in developing web-based courses, and they have defined a project with the title: *Development of distant education in the Barents Region. Barents Virtual University.*

Archangel State Technical University also wants to go on with programs in retraining of engineers, businessmen and bank employees. They also want to develop curricula for teaching programs in oil and gas technologies and management.

Murmansk

Murmansk State Technical University (http://eng.mstu.edu.ru/) has as one of its goals in education policy to create a uniform information net in the sphere of higher education and research in the Barents Region.

Murmansk STU proposes things like: Web-forum for ecological education, for fish-market, for youth enterprise development, and for a Master Course program in social work for teachers (together with The Regional University of Bodø)

Murmansk STU seems to have a very good database of papers and courses at its website. For instance a course in programming java and a paper on project management was found on their site. Also links to English language academic resources on the web.

They are partners of *The University of the Arctic*, a group for working out the program

"Bachelor of Circumpolar Study". The partner's role consists in information assistance and providing materials from foreign sources, and participation in training program.

In Murmansk State Teachers' Training Institute an academic course in ecology is introduced into the faculties. In cooperation with the University of Groningen (the Netherlands) an educational manual has been worked out and published.

Murmansk also has plans for a centre for distant education, and on its basis to form conditions for effective and long-time co-operation between educational establishments in the Murmansk region and Northern Norway in the sphere of science and education according to the principle of an "Intellectual corridor".

Petrozavodsk

Petrozavodsk State University (www.karelia.ru/psu/index_e.html)

An Internet Centre at PetrSU was created in 1997, sponsored by Soros Foundation and the Russian Government. The regional Centre for Modern Informational Technology Development (RCMITD) is in operation, and provides students and professors with Internet access and e-mail services.

PetrSU can achieve international standards in education and can issue internationally recognised diplomas. They are active in the creation of a Barents Virtual University and look forward to an international co-operation network in higher education integrating the universities of the European Northwest, with the introduction of distant education and virtual training programs.

PetrSU is also interested in international collaboration, ready to take part in realisation of joint projects like: Geo-informational systems (GIS technologies), Folk culture of the Russian North, and Vegetable Kingdom of Karelia

3.2 ICT infrastructure and access.

The number of computers available in schools was, for instance, relatively high in Canada,

Finland, and Norway. This contrasted quite sharply with Russia where the numbers are still low.
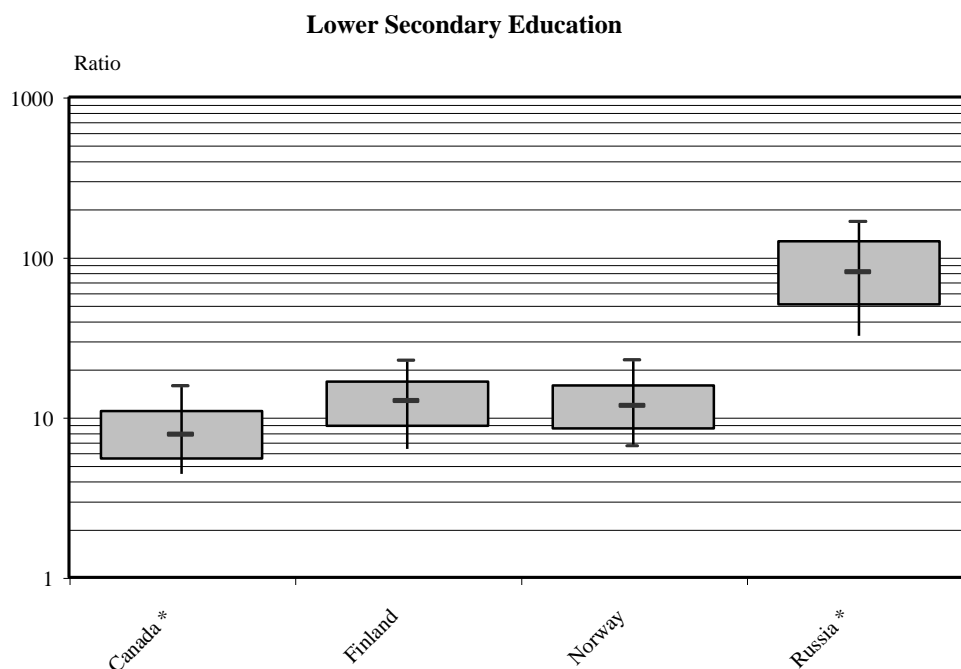

Lower Secondary Education

Figure 1. Box plots of student:computer ratios in computer-using schools in lower secondary education. Boxes range from 25% lowest to 50% highest value; the horizontal line in the boxes represents the median; tiles show values for 10% and 90% of the cases. Because of the huge differences between countries, these box plots are presented on a logarithmic scale (Pelgrum & Anderson, 1999).

A student:computer ratio in itself does not, of course, contain much information about the potential functionality of the equipment. Nowadays, especially when one wants to fully exploit the possibilities of the web, the availability of multimedia computers is important.

3.3 Staff development

What type of changes will happen in our educational systems? Internet will in our experience till now, generate a change *from teaching towards learning* for the students. The students will be more responsible for their own learning process. We cannot be too sure of what kind of changes this new technology will generate in the years coming, but we can se the following trends:

- **Changes in the learning process**: From passive consumer's position to a more active learning
- **Interdisciplinary work will be more important**: Subjects, pedagogics and ICT play together
- **The target groups of students will be more diverse**
- **A broader international focus**

It is impossible to predict the future development's direction. Our planning will have to be very flexible. So far, Internet has not reduced the use of paper. When the students get their lectures delivered on Internet, they often print it out before they study it in detail. The result is the same, but the distribution is often easier than the classical methods used in distance education.

Experiences from the USA, in fact, show that it is easier to start using new teaching tools in primary and secondary schools than in universities and colleges. However, Internet also has got many problematical areas; such as, its enormous amount of unstructured information, its lack of context, and no quality control - some of its content is even unethical and criminal.
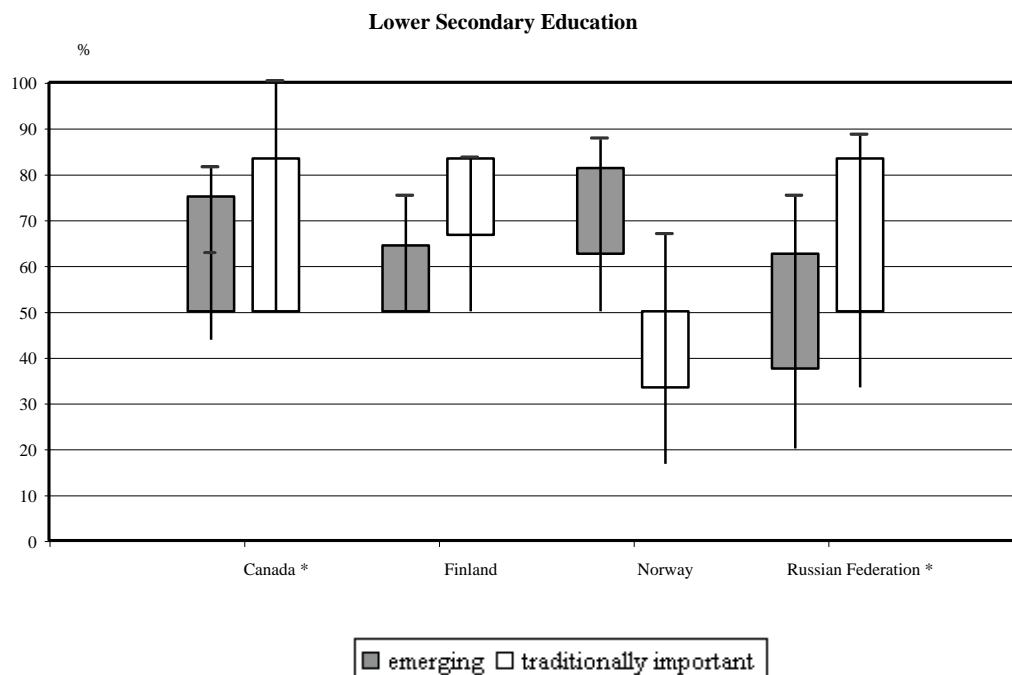

Figure 2. Box plots of indicators concerning the emerging and traditionally important pedagogical practice paradigm for lower secondary education. Boxes range from 25% lowest to 50% highest value; the horizontal line in the boxes represents the median; tiles show values for 10% and 90% of the cases. (Pelgrum & Anderson, 1999).

There will be a great need for carrying out seminars on modern pedagogic in distant education.

3.4 Organisation: Some relevant models of educational corporation

The term 'Virtual university' is difficult to define, but in can be organised on different levels and in different models.

Free exchange model

On the individual level it is possible to do co-operation on education and courses. As soon as the open network is there, the professors and lecturers can exchange support, material and lectures with each other across the borders. No extra money is needed for this, but normally the professors must meet with their colleagues in real life before they are inspired to build a human network and friendship. In some courses there could be a positive input receiving some lectures from a colleagues in one country, and as exchange giving some lectures back.

There even exist many clever professors who live outside their home country. Some of them might even give teaching to students in their motherland free, if they were challenged?

Organised exchange model

In Scandinavia we have an organised exchange between countries of pedagogical computer software. This is conducted by a special ICT-group under the Nordic Council of Ministers. It is simply done in the way that each county puts one good pedagogical program into a common pot, and all the others can use, adapt and translate it as they like in their educational system. In this way we have been able to enrich the ICT-repertoire in our schools.

Parallel and portable education

The education system is often marked by rigidity of curriculum. The institutions must take a fresh look at portability of the curriculum and transferability of credits across institutional and national borders. The Northern International University (NIU) in Magadan in North-East of Russia has implemented the importance of participating in various programs, and as result, the students of NIU constantly take part in exchange programs of different kinds. A new form of

education is the so called *parallel education* - the students of NIU are able to get bachelor degrees at NIU in Magadan as well as at the University of Alaska. NIU also provides courses of Russian as a Second Language for foreign students from the USA, Canada, China, Vietnam, and Brazil.

Community Colleges for International Development (CCID) in USA is a non-profit consortium of two-year colleges whose primary mission is international development, especially in vocational/technical education and training, non-formal education and workforce development. During the past quarter century, CCID has undertaken development activities on every continent, in well over 100 different countries. They have worked on plans to present their web-based courses online to the Barents region. The mission of CCID is to provide opportunities for building global relationships that strengthen educational programs, and promote economic development.

Most American universities, some states, and at least one Canadian province have processes and procedures governing the transfer of students. Up to fifty percent of all students studying in the U.S. Higher Education system are enrolled in one of over 1,200 community colleges. The process of transfer is often referred to as articulation.

Virtual universities

The *University of the Arctic* (UArctic) is an international nongovernmental organization dedicated to higher education in and about the Circumpolar North. UArctic is a decentralized university without walls that mounts programs of higher education and research, builds local and regional educational capacity, and stimulates cooperation among participating institutions. It has members from many of the universities in circumpolar north, and has mostly organized work in PhD-studies and on research level. But UArctic is now working on plans for a new undergraduate program, the Bachelor of Circumpolar Studies (University of the Arctic, 2000). This program is equal to four years (120 US credits) of full-time studies, where the two first years are elective from existing curricula, and the last two are international arctic studies. The *University of the Arctic* will build on, but not duplicate, the academic and professional experience in the circumpolar community.

So called "Virtual Universities" are often created on the basis of a model used by the Norwegian *Network University* (NVU) where many of the institutions in the south of Norway are members:
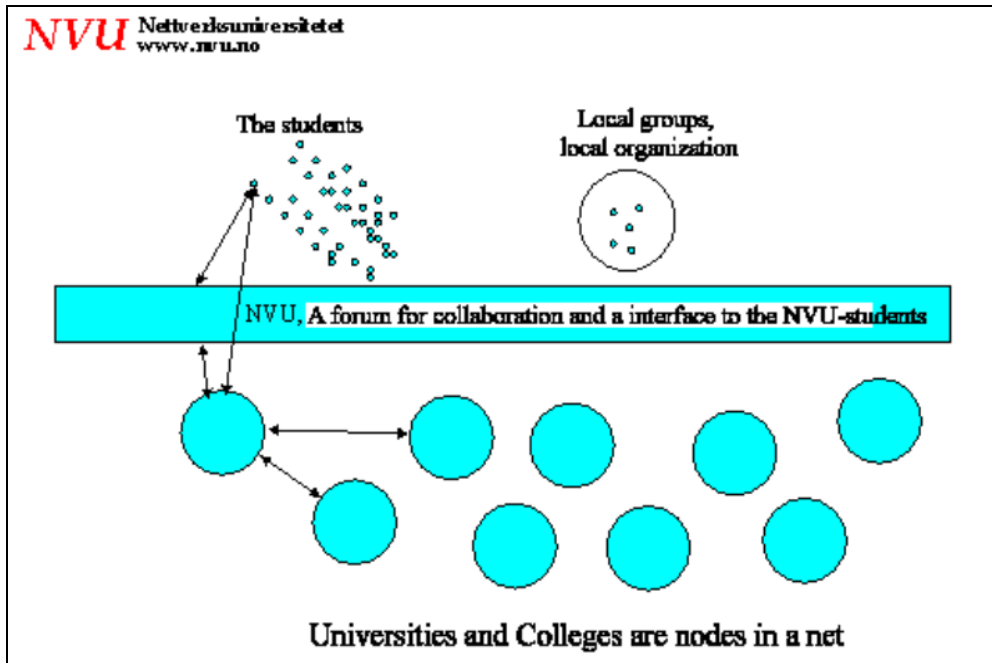

Figure 3: Organisation of the Network University in Norway.

Today the NVU is a partnership of universities and university colleges collaborating to provide higher education over the Internet. The partnership is open to all 4 Norwegian universities and 32 university colleges. The present membership includes 9 out of the 36 institutions and has 150 credit courses on the web. Courses range from 3 to 15 US-credits.

NVU students come in two categories: *On-campus* students at member institutions, who take on-line courses as part of their degree programs, and *off-campus* students who either take individual courses as part of their continuing education program. The off-campus student enrolment in NVU courses totals approximately 1500 in 1999-2000, corresponding to approximately 550 full-time students. Student fees at present amount to 80 US-dollars per US-credit.

In order to meet the objectives in NVU, it was considered essential to develop a homogenous organisation which

- markets and distributes online courses provided by the member institutions
- facilitates student registration and local exams
- is flexible with regard to the validation of courses provided by other member institutions
- builds competence on ICT in education through collaboration and exchange of expertise.

The students are channelled to the member institution(s) responsible for the course(s) he/she has registered for. Since the member institutions remain responsible for teaching and testing, each student has to be accepted by each institution responsible for a course, and the NVU technically speaking thus remains a university without students of its own.

The division of labour between the NVU secretariat and the member institutions is now being debated in the organisation. The smaller institutions seem to favour a strong central organisation, whereas particularly the universities, which are significantly bigger than the university colleges, are anxious not to have their autonomy infringed upon.

Traditionally, Norwegian academic institutions have been reluctant to let students sit for off-campus exams. This tradition is being profoundly challenged by the NVU. In principle an exam in any NVU course can be taken at any college or high school in the country.

Steps are now being taken to streamline the system to reduce costs. A network of authorised exam schools will be established in densely populated areas. Students who live more than 1,5 hours away form one of the authorised sites, will be allowed to sit at his local school. Students living abroad take exams at churches, on oil platforms, in embassies etc. The NVU intends to avoid building a bureaucratic and expensive organisation. The board, formally consisting of one representative from each of the five founding institutions, is the highest body of the NVU. Most of the institutions which joined the NVU at a later stage, make use of their opportunity to send representatives to the board meetings, formally as observers.

New foundations
The University Courses on Svalbard (UNIS) is a private foundation established by the Norwegian government and owned by Norway's four universities. The objective of the

foundation is to offer university-level courses and to perform research relevant to Svalbard's geographical location in the high arctic. The courses are intended to complement the teaching given by the mainland universities, and they form part of standard courses of study that lead to examinations and degrees at intermediate, advanced and doctoral level.

The study programs has an international profile, and only half of the students are Norwegian. The instruction is in English. There is no tuition fee. Normally the Norwegian students will get their diploma from the University they come from, and foreign students will get it from the University in Tromsø.

3.5 Problems

Higher education in Russia and in the West faces different problems. But there are some basic problems to be faced in this type of co-operation (some are reported in Nygaard 2001, p. 47):

- There is a low level of foreign language skills among the Russian teachers and students.

- The technical level of facilities is different. There is a gap in availability of computers and equipment, and a lack of financing for faculty development in Russia.

- There are great differences in crediting and financing of higher education. In North America the student fee is increasing. In Norway and Russia it normally is free to study at the university, but distance education costs money in Norway. Russian students will normally not pay for a web-course. But Russian institutions can prepare and sell courses to another university.

- Certification of courses is also different, and there is absence of international requirements and standards for professional training in the sphere of higher education. The education system is marked by rigidity of curriculum, and the institutions must work on portability of the curriculum and transferability of credits across national borders. Transfer from one institution to another may be a complicated process. As

such, it is institution-to-institution, program-to-program, and faculty-to-faculty.

This process of articulation varies between and among colleges and universities and also varies according to the program of study. Some colleges and universities are beginning to recognize the value of developing guaranteed admission processes with selected universities. Guaranteed admission involves having a written agreement with selected universities that ensures students entering the college/university direct access to the university if specific academic standards are met. This guaranteed admission process is very attractive to local as well as international students.

Education and co-operation in the North is also marked by having participants of different cultural backgrounds. Trans-cultural education is a challenge, but a common climate and history is a unifying cultural factor in the Barents region. The culture in the Barents Euro-Arctic Region is unique. Refined by wildlife, cold, storms and in the absence of sunlight. This could be a common identity and *success factor* for students in a Virtual Barents University.

There is still little consensus in societies about what e-learning and the new pedagogical models should encompass. There are notions that students should be trained to learn more autonomously and to get access to and digest information more independently than has been the case so far. However, what this means for the educational process is still rather unclear. The planning of new programs has to be flexible and step-by-step.

4 Conclusions

This survey has given some interesting information about the cross-border situation in the Barents region, although we still lack some important information. The selection of informants in this paper is not done according to strict scientific selection where the selected informants are presumed to present the whole strata. This study can therefore only give some indicative tendencies of the Barents situation and co-operation.

The density of computers is very different in the Barents region, but is continuing to rise. Many countries have an average of one computer for every 5-10 students. In the private homes the density is often greater.

The cultural backgrounds are very different, but a common Barents identity can be found in a close relation to nature, climate, and the common history.

The adequate training of teachers is still a major problem in most countries. There are indications that ICT facilitates changes in pedagogical practices.

In a trilateral and multilateral co-operation in higher education in the Barents region, it is important to implement the principles of continuity, equality and creativity, - irrespective of place of residence, citizenship, and physical abilities.

Most of the Scandinavian institutions are running national web-supported courses today, some of them only in small scale. We consider Petrozavodsk State University, Pomor State University, and Murmansk State Technical University to be ready to prepare, implement and test out web-based courses in international higher education. Petrozavodsk State University is perhaps the university in Russian Barents region to be most ready using their resources to the benefit of society.

But we also noticed that the Murmansk State Technical University seems to utilise their web-pages to offer the students various information and papers, more than we found on the other web-sites.

International online teaching is not an enterprise that should be undertaken lightly if a high quality and successful project is to be launched. It needs strong institutional support, partnership between institutions, thoughtful market research and adaptability to local needs. Major administrative and bureaucratic obstacles will need to be overcome, but a Virtual Barents University can be realized under different organisation models. Above all, it needs many dedicated and hardworking teams, with very strong motivation to succeed.

Nevertheless, if these conditions can be met, delivering national and international studies online in the Barents region can be a most satisfying experience for students and teachers alike.

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