



Education

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Access to education can be seen as a key indicator of human development in the Arctic. Equally important is the content of education, including how well it fulfills local needs. This chapter does not attempt to make a circumpolar assessment of education, however. This is partly because there is very little circumpolar research in the field. Also, the varying circumstances across the Arctic make it necessary to proceed with caution when making comparisons between countries and regions and between rural and urban areas. Instead of assessing the field of education, the chapter explores some of these limitations. Using some selected examples, it also provides an initial discussion of three themes that can be further explored in future work. These include the balance between local and national control of education, the introduction of indigenous curricula in formalized schools, and circumpolar cooperation in higher education.

Introduction

What is education?

Education contributes to the development of human capital. It is most apparent in its institutional form as schools. Education is not a neutral enterprise. It is the promotion of skills, values, history, languages, and ways of thinking and behaving. In this chapter, it is discussed as a formalized process whereby nations perpetuate their values and beliefs from one generation to the next, including science, art, sport, and other facets of culture. Local and regional human capital needs are involved in the broader context of national needs and globalizing factors. Each of the circumpolar states has a vested interest in education. They do not all share equally, however, the same authority for education policies.

Education policy is driven by values and interests. It is therefore important to know if some take precedence in curriculum development over others, and why. This chapter reveals a host of influences shaping education, from development to reform, where the major constituencies influencing education policy include professional teachers and their associations (unions), parents and organized parents' groups, regional and local governments, economics and industries, and students.

In the circumpolar North, there is significant interaction between minorities and majorities, located across vast areas with small populations. Education is at times seen as an arena in which different social groups struggle for influence, often in subtle ways. Education should be an important indicator for human development in the circumpolar region. Those aspects of education that could be crafted to this purpose are not readily comparable between jurisdictions, however, whether at the state level or between states.

Educational systems

In this chapter, we are interested in knowing how education is organized into systems: from the interaction of individual students to the school house, from school boards to ministries of education. Comparative analysis is difficult as there are no pre-established models to follow. In our initial foray we have looked for developing trends. In light of several circumpolar educational initiatives, it is important that we develop a shared understanding of similarities in the changes of the educational systems and of the differences that set them apart.

To start, we acknowledge that northern values and skills are conveyed to northern students in a number of ways. We are also aware that the forces of globalization, for example satellite tel-

evision and the internet, are bringing the world to northern students, forever changing what we know as northern values and skills. We are equally aware that traditional cultural values and practices continue to persist, with adaptation inherent to the very nature of indigenous cultures. Furthermore, we have seen and can envision the changes coming to the North, including development pressures, in-migration, and diasporas in our Arctic environments.

Some aspects of what students learn during their primary and secondary school years, and even beyond to post-secondary education, is on the surface similar in all parts of the circumpolar North. In Narsaq, Greenland, students will acquire some of the same knowledge as those in Norilsk, Russia, even if there will be some obvious language and culture differences. Comparisons show similar systems of organization, school administration, and textbook subject matter, though the size of classes and economics of education vary a great deal. This holds true when comparing a number of schools in each of the larger urban communities. The graduates from these different schools will follow goals and objectives set within the social and historical context of where they live, as well as the economic and cultural specifics of their times.

A proportion of students will continue past primary school through secondary school graduation, and, in some cases, even beyond to technical colleges and post-secondary institutions. In parallel to the official education system, in particular for indigenous peoples, traditional learning also progresses through stages of education in both culture and language. In many jurisdictions where indigenous peoples form the majority, the formal content of education, the curriculum and language of instruction, and perhaps even the textbooks and other educational supports are based on their language and culture. Where indigenous peoples are in the minority, they are all too often marginalized.

Increased access

An emerging trend for circumpolar education is its increasing accessibility. Accessibility is about students being able to take classes and fulfill their potential, that is, it concerns their possibilities for attending school, both physically and culturally. The economics of education, if we were to employ a sustainable development paradigm, would show that educational systems are often supported through public funds,

although there are private schools that charge fees. Accessibility to post-secondary education varies greatly in the circumpolar North. In primary and secondary school, students enjoy a high degree of accessibility to physical structures, although cultural and linguistic barriers persist in some areas. In the past, some students were separated from their families to attend school, and for higher education this is still sometimes the case. Distance and institutional capacity were barriers to centralized education. Now there are schools in most communities, students can be “home schooled” in remote and rural locations, and increased connectivity allows students to take courses on the internet, for example the Bachelor of Circumpolar Studies offered by the University of the Arctic.

As institutions become more “accessible,” larger numbers of students will attend. This is not a documented trend, however, rather it is an assumption. In some parts of the Arctic, there will also be more students because populations are growing, see *Chapter 2. Arctic Demography* for details. So far, there has been little discussion of what these changes mean for the North in terms of challenges and opportunities.

Even though this increased accessibility of education is occurring in some places, it is not unique to the North. Rather, it is a reflection of changes that have occurred in urbanized areas around the world, where population growth, increased living standards, modernity, and technology have been transforming schools for the past fifty years.

Statistical comparisons: a cautionary note

Circumpolar education research would benefit from comparative measurements for a range of factors: recruitment and retention, graduation rates, student-teacher ratios, per capita funding, literacy rates, employment rates, and so on. It is with caution, however, that we seek the development of such measurements since within circumpolar nations, there are a number of national indicators that do not necessarily correspond to northern realities. Such research must include an understanding of the fact that northern education includes both formal and traditional systems, so that one is not given prominence at the expense of the other.

There are certain common characteristics in northern education: it is regionalized, it involves mostly small populations in remote communities and few urban centers, cultural diversity and

the erosion of small languages are the norm, and the level of educational investment varies as do the costs. Comparisons, however, have to take some major differences across the North into account also. For example, comparison of systems of post-secondary education would have to take into account the fact that Canada has no independent universities in the North unlike other Arctic Council member countries. In order to attain an undergraduate or graduate degree, the reality for most northern students is attending southern universities. Nevertheless, one of the territories in Canada, the Yukon, claims one of the most educated populations in Canada. One would thus need to survey where those people in the Yukon who reported having degrees came from to get a clear idea of educational capacity in northern Canada.

Comparisons in educational systems must also take into account infrastructure. In Alaska, for example, there are communities which are accessible only by air, and of those connected by road, some are only connected by winter road for four months of the year. Populations in the different communities vary, sometimes on the order of tens or hundreds. Can small communities have the same quality of education as large communities or can it even be better? Regional variations create complexity and urban and rural dichotomies exist not only for education but for other services as well. The circumpolar challenge is to have quality research on education from the primary to the post-secondary level.

Another gap in research concerns the differences between state-developed and indigenous educational systems, as well as between northern and southern approaches to these systems of education.

Our survey of the literature indicates more variations than similarities in the good “national” research on education. Regional-scale studies are not easily comparable and circumpolar studies are almost non-existent (1). This chapter has therefore relied heavily on case studies to illustrate some trends that should be more fully analyzed in future research. In addition to the aforementioned increased accessibility, one common theme is the striking of a balance between local, regional, and national authority over education. After that, we discuss cultural and linguistic plurality in circumpolar education, in particular reinvigorated indigenous curricula within formalized schools. Finally, we look at the emergence of a circumpolar network of post-secondary institutions.

Local control or national directives

Researchers have demonstrated student motivation and success increases when teachers make school subjects relevant (2). A significant issue is the balance between local and centralized curricula control. The degree of autonomy given to each school and the resources that go along with it vary a great deal, and there is no clear circumpolar trend on how different countries strike the balance between standardized curriculum and locally specific content. The following country examples illustrate the tensions and harmonies that now exist.

Russia

Changes taking place in Russian education mirror those taking place in Russian society, and include a modernization of secondary education. Since the 1990s, Russian education has become decentralized, and educational institutions are under regional authority with extensive rights (3). Other changes include democratization and acknowledgement of diversity. Students have more learning choices with new institutions emerging having greater curricular variety which has been tailored to meet regional and school differences. Tkachenko characterizes these changes as a break from the old authoritarian state view: “the school before was aiming at teaching all and everything in the same way. Compulsory education based on the single curriculum and system of required marks in 14 subjects listed in school-leaving certificate was universal from Kaliningrad to Vladivostok, from Turkmenia to Baltic. Uniformity and disregard of the interests, talents, inclinations of an individual suppressed and prevented individual development. ...To liberate school is in the first place to release it from the necessity to lie.” (4).

Russian schools now devote 75% of the curriculum to federally defined subject content, with the remaining 25% concerned with region and school specific content. These latter subjects provide opportunities for indigenous cultural revival, for example in the development of indigenous history courses. The schoolhouse is an element of social development in Russia. Therefore all Russian citizens, families, federal and regional authorities, local governments, pedagogic communities, academic, cultural, commercial and public institutions are becoming actively involved in educational policy (5).

Strategic priorities have been aimed towards

increasing accessibility, quality, and effectiveness of education. One of the indisputable achievements of the change in policy is the increase of accessibility for all children from an early age. Pre-school is compulsory for children starting at age 5. In 2003, 92 % of all 5-year olds attended these institutions, which can be compared to 70% of all children in 1997.

An emerging trend in the developing Russian education system is the increased accommodation of the needs and interests of students by creating educational plurality. Various programs have been introduced with specialized content. Administrative models are being modernized to support such diversity. A network of pre-school and general education institutions is developing. There are efforts to develop new textbooks, manuals and teaching aids, in particular for indigenous education institutions, to support ethnic and cultural aspects of core subjects.

The increased recognition of diversity can be illustrated by developments in the Sakha Republic (6). Here, educators are investing in multicultural awareness as a means of easing tensions in society and for training pupils to be critical thinkers. Efforts include creating conditions for cross-cultural relations between children of different ethnic groups studying at schools with different (Russian and indigenous) languages. A network of multicultural schools in the Republic implements the principle "from native threshold to the world of values common to all mankind." For example, the Khatystyr school in southern Yakutia has schoolchildren studying Russian, Evenki, and Sakha cultures. The study of foreign languages is integrated with the study of world culture. The teachers are involved in developing and implementing an interdisciplinary program of "Multilingualism, Comparative Typology of Languages, and Polycultural Education," and specialized courses on ethnic psychology, ethnicity and culture such as "The Routes of My People."

In 1997, a network of "Presidential" schools was established in order to encourage pedagogical initiatives. These are schools with excellent teaching staff with the school curricula characterized by new content and advanced teaching technologies. They function as scientific, methodological and resource centers for various districts of the Republic.

Due to the remoteness of schools in northern Russia, new information technologies and distance education are becoming increasingly attractive options. Not all northern schools are

uniformly well equipped with computers and software. In the Sakha Republic as of 2003, both village schools and town schools had one computer per 23 students, while in Russia as a whole the average was one computer per 500 students. Most comprehensive schools use local networks, and all secondary schools have internet access.

Sweden

An intensive process of change has taken place in the Swedish school system throughout the 1990s. Since July 1, 1991 the municipalities have been responsible for the schools. The Riksdag and the government exercise control by setting achievement objectives. The municipalities must send quality reports to the National Agency for Education. The Education Act and Curricula state that the school has an important role in communicating and firmly establishing the fundamental values of our society.

The national school system regulations regulate the Saami schools as well, but the municipal school plans do not apply to Saami schools, who instead develop their own plans. The Swedish National Agency for Education is responsible for educational inspection, national follow-up and evaluation, as well as reviewing curricula and grading criteria. "Sameskolförordningen" are the additional regulations for the Saami schools. Children one to six years of age have the possibility to join preschools for Saami children. Saami schools, in terms of compulsory schools, are developed for children six to twelve years of age. For upper secondary levels, the pupils have to take part in different forms of integrated education. Home language programs are offered for all levels, however. An agreement between the local education authority for Saami schools and the municipality is a requirement when offering integrated education in Saami.

Sweden thus has an institutionalized intercultural approach to teaching and learning today (7). In this intercultural perspective, the importance of a holistic educational approach is emphasized, including cooperation between home (first) languages and cultural backgrounds in order to cross cultural barriers.

Until 1940, the Saami had special schools, "nomad schools," which often moved through the seasons, the idea being to not take children away from their culture and their normal daily life. In 1962, the Riksdag decided that the Saami people should have the possibility to choose

what kind of schooling system they wanted to join. In the national curricula, three different phases can be distinguished in the development of intercultural teaching and learning (8): In the first phase, the introductory phase during the 1960s–1970s, the perspective was more international, and only faint traces of intercultural perspectives could be found in the syllabi. In the second phase, the evaluative phase in the 1980s, multicultural perspectives were visible. The curriculum required schools to work with cultural backgrounds, and municipalities had to offer teaching and learning in the students' home language, even if all students also had to learn Swedish. The curriculum was not changed at this stage, but comments were sent out to the municipalities and schools. In the third phase, the reformulating phase during the 1990s, a new form of curriculum for the Swedish compulsory schools was developed with intercultural objectives. For example, the intercultural perspective is visible in the texts about ethical values, and in the objectives that all students are expected to achieve.

However, the curriculum says nothing about how to reach these objectives. Moreover, teachers, pupils, and researchers still claim that the curriculum materials are focusing on international rather than intercultural issues. A major problem is the lack of relevant knowledge at the local level. For example, there is a deficit of skilled teachers with knowledge of Saami language and culture (9). This discrepancy between political intentions, curriculum objectives, and students' views is an area for research.

Norway

During the 1990s, the Norwegian education system, from kindergarten up to the post-secondary level, was radically revised at a tempo never before experienced in the country. From 1987, Norway followed the national policy for education described in *Mønsterplanen 87*, a flexible curriculum that gave teachers some degree of latitude. Under this policy, the northernmost county of Norway, Finnmark, was declared a special educational region. This special regional designation was meant to motivate young people to attain full education so that the region would develop economically, culturally, and socially. The education reforms in the 1990s (Reform 97) brought the regional project in Finnmark to an end. For primary and lower secondary education, the reforms set a more detailed national curriculum in place.

In 1990, the Ministry of Education replaced most of the elected educational councils and committees with “ad hoc committees” on different educational issues. The Minister himself wrote the general part of the curriculum and a new strategy was introduced in which power and control in policy making became more important than ever before. Norwegian education policy changed from a corporate and democratic process, where different voices could be heard, to an authoritarian-oriented process, where the state tried to impose a hegemonic position (10).

Why was the education system reformed? An analysis of the basic documents on which the reform was based shows that the curriculum to a great extent is based on economics disguised as pedagogy (10). Policymakers stress the needs and interests of society defined at a macro level, especially with reference to economic growth and technological development. Local differences are marginalized. The education system is now building the stock of human capital and labor in order to make the state internationally economically competitive. This dimension is important, but nevertheless problematic as long as personal aspects of education are considered irrelevant. The tension between macro and micro is left unmediated. There is no discussion about the role of schools in the formation of student identity, how their self-esteem should be positively stimulated, or well-rounded personal development.

The economic orientation in the Norwegian reform project can be linked to global trends of education being increasingly integrated with other areas of social and economic policy (11). This trend is clearly visible in the second half of the 1980s (12) and has been well documented in OECD countries where education is often regarded as an instrument of change and renewal (13). A study of European Union educational policy indicates a primary consideration of education as an instrument for increasing competition and economic growth, whereas the idea of education as the provider of a well-rounded personal development is almost absent (14).

One of the most striking differences between Reform 97 and *Mønsterplanen 87* is that the latter allowed the teachers to plan their teaching within three-year time frames and gave them the opportunity to choose on which themes they would concentrate. The current curriculum defines year by year what should be taught.

Moreover, the previous plan allowed the students in lower secondary schools to choose at least some subjects in accordance with their personal interests and abilities. Today this possibility has been radically reduced.

To what extent has Reform 97 influenced pedagogic practice in the classroom? In a study of teachers' and students' experiences (15), 78 students from six different lower secondary schools in rural and urban districts in both northern and southern parts of Norway reported (16) various degrees of dissatisfaction. School subjects were thought of as being too "theoretically oriented" and students complained about the lack of personal relevance. Students reported being tired of school, even some of the cleverest girls stated that they did not know how to keep up with the demands. All students expressed the wish to have influence on what and how they were learning. As one girl said: "We need more freedom in school, it is just before we are handcuffed." (17). Students reported wanting a closer connection between school and local society and between school and working life. The experiences of the teachers correlate to the experiences of their pupils. For example, teachers feel obliged to teach what is presented for each subject year by year, even though they know that many students do not find the classes relevant.

An evaluation of Reform 97 from the perspective of differentiated teaching indicates that the reform has failed (18). This is a serious criticism. If schools cannot develop well-rounded students and the top-down strategy provides little opportunity for teachers' professionalism in the classroom, the gap will widen between what teachers believe is the right way of teaching and what they really do in the classrooms.

Canada

In northern Canada, the Western and Northern Canadian Protocol is the vehicle for curriculum framework development (19). Agreed upon standards apply to core courses as well as electives. Educational authority is the responsibility of territorial and provincial governments (20). Territorial education departments are run by elected ministers, and the thirteen Canadian education ministers oversee and regulate education in their respective jurisdictions. Universality in Canada enables students to move between jurisdictions if necessary (21).

Principals administratively manage schools and a superintendent supervises groups of schools geographically linked. School

boards/district, school trustees, and education ministers are elected. Departments of Education are large bureaucracies staffed following a strict hierarchical structure. Canada is unlike other Arctic Council countries in that there is no national education ministry. However, it could be argued that transfer payments using a per capita formula of funding, enable the federal government to exert enormous pressure on education policies and practices of the provincial and territorial ministries.

A newly emerging concept in northern Canada is parent advisory councils. These councils are being used in schools where circumstances provide an impetus for increasing community partnerships with school staff. The involvement of parents, in particular indigenous parents, is a growing movement aimed towards increasing the recruitment and retention of indigenous students and improving schools in northern Canada, where the majority of students in many communities are indigenous (22-23).

There is a growing trend in northern Canada to appreciate the differences of language, place, and the tensions experienced due to standardized curriculum. One expression of this trend is the development of student-centered classrooms and the revitalization of land-based education. The latter is discussed further in the next section.

Each of the northern territorial education systems is unique. Nunavut, the youngest government, is still in the formative stages of development of their education system, whereas in the Yukon, the most senior northern government, education is well developed and moving toward devolution to self-governing indigenous nations. While the realities of education across northern Canada vary considerably due to the cultural diversity, there are some commonalities. Teachers are often attracted from southern universities. The three northern colleges have, over the past twenty years, invested considerable resources in developing northern teachers. In many remote and rural communities, the first language of instruction is not English. However, in keeping with Canada's national bilingualism, French language instruction is available across the North, in particular in urban centers. Specialized curricula have been developed to reflect the unique cultural, historical, and economic differences across the North. The ability of each teacher and school to deliver quality education is sometimes constrained by remote-

ness and under-funding. As a counter-balance, rural and remote teachers and schools have access to a range of “northern” culture, language, and experiences on the land, which urban and southern education lacks. Access to online courses are an option for students in small and remote communities to pursue courses that would otherwise be impossible to offer because of small class size, multi-age classrooms, diversity of learner experiences, etc.

Theme summary

These four country cases focusing on the formalized educational systems of states and territories/provinces demonstrate a range of experiences. In sum, it seems that some Arctic countries follow the international trend of increased central control, whereas in other Arctic countries there has been an increasing recognition of the need for more local control. We are cognizant that additional specifics from other Arctic Council members would add to the discussion. A full assessment of education in the Arctic should include an exploration of the tension between local and central control across the Arctic and how it has affected the direction and quality of northern education.

Indigenous education

Traditional indigenous education existed before contact with outsiders and continues to exist as part of indigenous cultural practices, mixed economies, and traditional systems such as food systems (24). In a discussion on local control, an important consideration is how indigenous perspectives are permeating northern education, both as a starting point for school curricula and as part of more general policy. This section examines some such educational developments, illustrating with examples from the Athabaskan, Saami, and indigenous peoples of Russia.

Athabaskan

Northern Athabaskans attend schools in Alaska, the Yukon, and the Northwest Territories (NWT) of Canada (25). These schools can be characterized by their cultural content and language of instruction. In the past, the majority of students attended mainstream courses, with Americans and Canadians, taught in English. The history of residential schools, replete with neglect, marginalization, and assimilation, are a legacy of colonial education. This case acknowledges this

past, but we will not elaborate further on the associated issues that taint education for Athabaskans. In order to contextualize, the following argument will focus on Athabaskans in Canada, in particular in Denendeh (NWT).

In northern Canada schools can be found in communities that range in size from 200-16,000 people. In smaller communities, school grades are often combined to make greater use of limited resources. For example, a teacher in Tsiigehtchic (Denendeh - NWT), may teach math to a combined class of twenty-five Gwich'in students from grades 5, 6, and 7 (ages 10-13). They may learn the basics of mathematics in English just as they do in many other classrooms around the North. For many students, English is their second language. These students will spend the entire day in classrooms with family, friends, and all the children of the rural community. They will have a computer class at some point in the day and will have to contend with dial-up internet access until broadband is installed up the Mackenzie Valley.

In smaller isolated centers, students will receive local schooling in grades one to nine. Some students attend high schools in major urban centers, such as Inuvik. Increasingly students are graduating from high school (grade 12). The dropout rates are higher, on average, for indigenous students compared to other northern students, and also higher than among students in the south. There are a growing number of mature students returning to studies to achieve high school diplomas, either as single parents, or after spending time in the labor market. In communities connected by roads, high schools often combine students from a number of communities.

Education can be thought of in terms of local capacity (24). Indigenous communities may have very different expectations for schools than school administrators and teachers, which can undermine local capacity. It is essential that educational goals of the schools reflect those of the community. Schools prepare students with skills to be able to “live a good life.” Besides formalized schooling, traditional education systems persist to convey indigenous cultural and spiritual values. Traditional education systems, or the primary values at the heart of many traditional teachings, are increasingly playing a role in classrooms in northern Canada. Inuit students, for example, can learn biology by preparing a seal, and eating it as well as studying it. Student-centered education paradigms are of

critical importance. Individual and social identity varies a great deal, however, and there are adjustments needed to ensure that the social cohesion typical of many northern indigenous cultures is strengthened. More importantly, the cultures and languages of students are no longer forced to fit into English parameters.

The schoolhouse is not the main location for indigenous education. Rather indigenous peoples largely educate their children in their own languages, while embedded in families and communities, by cultural practices at various stages and under a host of influences that continue to evolve over time. The common view is that it takes an entire community to raise children, and now that there are schools and other influences such as satellite TV, the question becomes what possibilities still exist for the perpetuation of culture. What exactly will be the next generation's culture?

Indigenous peoples in Canada have largely experienced schools as tools for assimilation and acculturation. As discussed in *Chapter 3. Societies and Cultures: Change and Persistence*, there was a time when education was used to destroy indigenous culture. Much of the experiential learning of oral traditions, at the heart of indigenous educational practices, still however persists. Northern education capacity seeks to maximize the human potential here with education that is from here. How well we balance the need to import educational tools (educated people and curriculum) with the creation of education that reflects the north will be important to evaluate.

An important trend in this respect is the development of indigenous curricula within the school system. Primary schools have offered indigenous students curricula that strengthen their knowledge about their own cultures. For example, Inuit communities in the Northwest Territories follow Inuuqatigiit, which is a culture-based school curriculum (26). Similarly, in Dene communities, subjects are being complemented with Dene Kede, which is a curriculum produced by Dene Elders and teachers from each of the five Dene regions. While Dene Kede may have been developed for all students to grade nine, we raise it here to illustrate the importance of culturally relevant curriculum, in particular for indigenous students. Dene Kede will not be discussed for its value in cross-cultural education but we recognize this value.

Teachers are expected to use Dene Kede curriculum as a guide in the creation of community-relevant course content. Each teacher has to

interpret the expectations in terms of what is specific to his or her community, and use the language(s), material resources, and people of the community to bring the curriculum to life. The extent to which the curriculum is used in a school depends on the desires and needs of the community. Where one school may use the curriculum as a Dene-based perspective within which to organize teaching of all other subjects, another school may use it only in second language classrooms or as an elective. These curricula for indigenous students in high school (grades 10-12) are alternatives to the Province of Alberta's curriculum (with the exception being the three-credit Northern Studies course). Neither is mandatory for Canadian students outside of Dene schools; however the curriculum is intended for all.

Often the culture-based curriculum is taught by a teaching assistant, who is also a community member. Increasingly often, these are people who have received degrees from one of the northern-based colleges or from a southern teaching university. Teachers who present these courses in their native language are at times challenged by combined classes with students at varying levels of comprehension with their own language, or students who speak different languages. Teachers are also often responsible for administrative duties and other education-related work in their communities.

There is a trend towards the development of a northern studies curricula in centers such as Yellowknife and in some southern schools, in particular universities. More efforts are needed, however, to produce a generation of Canadians knowledgeable about indigenous cultures and languages (27). The development of northern studies oriented programs in southern universities may usurp much of the resources and energy needed, if the development of northern post-secondary education is to advance. Small and highly diverse populations combined with the high costs of education will continue to be factors that retard the establishment of northern universities in Canada.

The availability of teachers has been a major challenge in northern Canada, especially teachers with knowledge about local cultures and languages. Most teachers go north with no indigenous language training, with very little understanding of the history and ecology of the community they fly into. Not that these teachers necessarily do a poor job; many are young and energetic and others are experienced teachers

who remain in these communities for many years, often becoming important members of the community. All too often, however, teachers leave when their contracts expire, taking both the institutional memory and educational capacity of a seasoned teacher with them. Often teachers come into schools with no specialized training and with the only possible language of instruction English. Intuitively we know that if the language of instruction is not that used by the students, small indigenous languages are in jeopardy. This is particularly acute as students advance through their higher learning (28). There is no Canadian official native language policy. Such matters are instead left to local or regional authorities, who often lack adequate resources. Indigenous languages are often taught in schools by local community members many of whom nowadays have college or university education, if not teaching certificates. The Nunavut government has set a hiring quota for Inuit, which may reverse the need for immigration of southern Canadian teachers.

Indigenous schools in Russia

In Russia, indigenous schools for many years worked in the interests of the unitary schools, and several generations of people were brought up isolated from native traditions. Most indigenous languages were displaced from social and everyday life. In 1992, the Ministry of Education had to admit that Russia had no indigenous schools, only fragments (29). However, processes that began with *Perestroika* favored the renewal of indigenous languages. The number of languages being taught rose from 66 in 1990-91 to 83 in 1992-1993. Educators began to look for new content that would include indigenous cultural elements. Russian authorities started to move from a common unitary system to a new system of indigenous schools based on indigenous culture taught in native languages. Since 1990, this process has developed both as a top-down policy and from bottom-up initiatives led by local populations.

The indigenous schools sought to meet three important goals: first, promotion of indigenous culture and indigenous identity among new generations of ethnic groups, every child having a right to education in his or her native language, and on the basis of his or her own culture; second, openness to other cultures; and third, that these schools should meet the needs and requirements of modern development and international educational standards.

Indigenous languages in Russia

In the mid-1980s, a typical Russian classroom would be made up of 19% of indigenous students with the language of instruction in Russian. Of the indigenous students, 19% of the total, 10% attended ordinary Russian schools while the other 9% studied at indigenous schools. Forty-four indigenous languages were taught while 120 ethnicities live in Russia. Twenty-six languages were studied as academic subjects. Eleven languages were used during the first three years of study. Four ethnic groups used their languages for instruction in both junior and senior levels of schools.

In 1991-92, new curricula for indigenous schools were introduced. Subjects were divided into federal core courses (e.g. mathematics, computer science, physics, astronomy, chemistry), those of regional concern (e.g. regional studies, biology, geography, history, society, the market economy, languages, fine arts, music, Russian and world culture), and those of local concern (e.g. indigenous culture, physical and labor education). The number of hours for regional and local subjects varied depending on subject areas and education level being analyzed (30).

Indigenous cultures programs and other methodological materials were published for both indigenous and Russian schools. Moreover, regional and local components for programs and textbooks were developed for all school subjects, for example dictionaries with Sakha terminology in geography and biology.

Indigenous languages are being used more widely. For example, 36 % of Yakut pre-school students were educated in Yakut in 1993 but 50% in 2002, by which time 86 % of all Yakut schoolchildren were learning in their native tongue. Minority indigenous languages were taught in only 13 schools from 9 districts in 1989, and a decade later there were 31 schools from 15 districts. By 2002, 44% of Even children, 25 % of Evenks, 70% of Yukagirs, and 82% of Chukchi were educated in their native languages. Twenty-two communities have opened Sunday schools where indigenous languages, culture and traditions are taught.

The organization of state education and training for children among the numerically small peoples of the North presents special challenges. For example, many live a nomadic life while the present system of education is based on large settled communities. Also, the lan-

guage and ethno-cultural situations of the numerically small peoples of the North have been characterized by loss of language, culture and identity. Alternatives are developing, however. For example, in Verkhoyansk, a new model for schooling was worked out to match the traditional nomadic way of life. The classroom year ends on May 1 and traditional cultural education with the family and community begins. Language learning is based on communication with relatives, ecology is learnt in nature. Cultural transmission is based on interaction with different people and participating in traditional economies (trading, reindeer herding, hunting and gathering, crafts, etc.). Education is inseparable from the life and practices of northern indigenous communities. Nomadic schools emulate traditional cultural practices, education placed in the context of life in the “open air.” The individual curricula take into account the special, unique aspects of the life patterns and traditional economies of the peoples. This educational model promotes indigenous languages in family, and domestic activities, and connects parents and children through cultural practice. There are six nomadic schools: four Evenk schools in the Anabar, Aldan, and Olenyok districts and two Even schools in the Kobayasky and Srednekolumsky districts.

Saami

In recent years there have been major changes in the policies governing Saami education, leading to creation of Saami schools. However, a closer look at policy implementation shows some challenges to creating indigenous curricula.

The basic (13 year) education curriculum for Saami in the Norwegian public national system follows guidelines that adjust the national system and create a foundation for Saami schools. A core objective was to improve school practices regarding indigenous, minority, and multicultural perspectives. This represents a change of educational policy in that Saami values are supposed to serve as the foundation for education. This shift has its basis in Norway's ratification of the United Nations International Labour Organization Convention 169, which recognizes indigenous peoples' will to control their own institutions, way of life, economic development, as well as their formation of identity, language, and religion (see *Chapter 6. Legal Systems*). These principles are in the Saami curriculum guidelines (SCG97) as its legal basis.

The responsibility for the Saami schools rests with the local municipality. Compulsory use of the guidelines is limited to six municipalities where Saami legal status equals that of Norwegians. Outside this area, the use of the guidelines is voluntary. Education based on these guidelines is referred to as “the Saami school” and the pupils studying under these guidelines are referred to as “Saami pupils”, regardless of ethnic heritage. The Ministry of Education is responsible for the overall development of the Saami school, while the Saami Parliament of Norway has a limited role as co-partner in developing some of the school subject guidelines. At the municipal level, the schools have a responsibility to work consciously to develop a learning environment based on Saami culture and community.

The Reform 97 discussed earlier in this chapter covers also the Saami school and SCG97. SCG97 is not peripheral to the national curriculum but is an independent alternative. It spells out the general guidelines (grades 1 through 13) and goals for Saami education. These include Saami syllabi for a certain number of subjects, a separate time plan for instruction hours, indigenous and minority perspectives, and a view of Saami schools from a multicultural perspective.

SCG97 claims to be pivotal, with Saami values and traditional knowledge introduced in the Saami schools and transmitted to the next generation (31). The policy states that local Saami culture has its place in the schools and that course content should reflect local culture. The teacher is responsible for emphasizing and expanding pupils' knowledge of and participation in traditional culture, ecology, and economy.

Some of the SCG97 subject syllabi use Saami Traditional Knowledge. This knowledge is characterized by its connectedness with nature and is particularly well suited to learning in science and ecology. Core cultural values are introduced to strengthen and preserve students' identities. Social sciences do not make explicit use of the term Saami Traditional Knowledge. However, history, geography, and social sciences all use it as a basis, from traditional social organization to solving contemporary challenges.

The greatest challenge for schools and communities is the interface between cultures where Saami knowledge has been largely marginalized by the Norwegian school system in the past (32-33). Saami Traditional Knowledge must be

understood in a broad social and ecological context and directly applied to educational content (34). Initiatives to date have seldom had a comprehensive approach integrating philosophy, nature, and spirituality. Schools tend to focus on practical work and skills (34).

An evaluation of SCG97 (35) indicates that schools and teachers are making changes according to the guidelines, but that some aspects take more time to change than others. One challenge is to guide pupils to work independently (if it is culturally relevant to do this is another question) (36). Computer and information-technology use outside the classroom is low.

Saami language in schools

Training in Saami was formally introduced to the basic educational curriculum in 1967. School regulations have since expanded, allocating increased hours of instruction, to the point where Saami-speaking students have a right to instruction in Saami regardless of geography. SCG97 places the burden of responsibility on schools to work systematically with the Saami language as a subject. There is also a bilingual program (37), whose goal is for students to be functionally bilingual. In an evaluation of the SCG97 (33), 64% of the total population of the communities involved were Saami speakers (38). 66% of the pupils received instruction *in* Saami language, but only 35% receiving instruction *through* Saami language (39). 47% of the teachers were Saami speakers. However, the general lack of statistical information about Saami makes evaluation difficult, in particular the degree of instruction through Saami language. Saami educational reform needs significantly more support in all areas to achieve an acceptable level (40-42).

Education will not change until the Saami produce more textbooks and other curriculum materials (in particular, computer technology) and connect them to the community outside the school (43-44). Teachers must be encouraged to use traditional teaching methods and Saami epistemology. In our research we found that teachers did not give direct answers to some questions. Indirectly, however, it is clear they have started thinking about the significance of Saami culture and ethnicity and its influence on education (45), as well as how this influences their teaching practices. They try to identify the connections between their practice, their cultural background, and their environ-

ment. They compare their practice with theory (46) and find a convergence with traditional child rearing (36).

Theme summary

From having previously been a part of colonial oppression, education in formal schools systems is being redefined in a couple of areas with a recognition of indigenous cultures and languages. This includes creating indigenous curricula, using, in some cases, traditional indigenous knowledge. We close this section of Russian, Saami and Athabaskan case examples knowing that we are lacking Inuit, Gwich'in and Aleutian examples. Much more research is needed to better understand the advances in indigenous education in all countries, its opportunities and barriers.

Higher education

Institutional capacity as well as northern students' access to post-secondary education varies considerably across the Arctic. This section illustrates this diversity with a few examples. We conclude with discussion of an emerging trend of increased circumpolar collaboration among universities.

North America

In North America, the University of Alaska is based in Fairbanks and Anchorage, with urban campuses in the smaller communities. In northern Canada there are no universities, but there are colleges and research institutes (in Yukon, Northwest Territories, and Nunavut) based in northern cities, with regional community classrooms in rural and remote communities. At the territorial campuses, there is a limit to the range and types of courses, programs, and degrees available. Students in northern Canada cannot attain a Bachelor of Arts or Science degree unless they leave the North or unless they take courses from southern universities, purchased by their northern colleges and taught by sessional instructors (mostly without doctorates) (47).

Many northerners, particularly in rural communities, have been served by distance education. For example, University of Alaska (Fairbanks) services each of the regions within Alaska through regional campuses and distance delivery: video conferencing, telephone, and web-based teaching. The University's Board of Governors sets the curriculum.

Similarly, in northern Canada the curriculum is set by the college and delivered at regional campuses and satellite classrooms in most of the medium-to-large communities. In the Northwest Territories, for example, Aurora College contracts with Athabasca University in Alberta and other southern universities for courses taught at all three of their major college campuses (Fort Smith, Yellowknife and Inuvik). Students can be linked by phone or are able to access web-based courses through the college.

The increasing opportunities for college and university education via satellite campuses, mail correspondence, tele-conferencing, and web-based delivery, in particular where broadband is available, are not, however, the main path of delivery as most northern students still make the trip south at the end of August to attend post-secondary institutions. The southern urban universities offer students undergraduate degrees in sciences and the arts/humanities and colleges offer diplomas in a wider range of subject areas.

The Nordic countries

In some of the Nordic countries, universities are seen as motors for regional development. In the northern parts of Iceland, Norway, Sweden, and Finland, university institutional development has stimulated accessible education and quality research since the early 1970s. Universities have become expressions of regional development policy and require infrastructure ranging from increased communication technology, teaching hospitals, specialized research institutes, libraries, to such supports as student housing and other services. Many states have invested in increasing the general level of education. The establishment of the University of Tromsø is our first illustration of this theme, followed by a look at Swedish and Finnish initiatives.

The University of Tromsø was established in 1968 by a parliamentary decree, and officially opened in 1972. Until then, people in northern Norway needed to go south for higher education. Consequently, northern Norway had a lower rate of well-educated people compared to other parts of the country. There were three main reasons behind the decision to establish a university in northern Norway: concern about regional imbalances in socio-economic development, the belief that the best way to overcome shortages of qualified manpower in the region was to train local young people (who

would be more likely to remain in the region after graduation), and a determination to promote research and technical and cultural services relevant to the region (48). The University of Tromsø has been described as “a symbol and, it was hoped, an effective instrument of the government’s policy of promoting the economic, social and cultural development of the north.” (49). At the time, the Norwegian government linked social, economic, and cultural development with education.

In 1966 the Swedish government decided to establish higher academic education in technology in Luleå, and in 1971 Luleå University of Technology was opened. The impetus came from a need for qualified competence in the mining, steel, and hydropower industries. Poor educational possibilities in the North were pointed to as one of the most important reasons for weak development in Norrbotten (50). In particular, the lack of vocational, technical, and commercial professional training was a problem.

Effects of higher education in the region have been visible in many ways. The number of students enrolled in undergraduate programs in Sweden in general and in the North in particular continued rising during the period 2002/2003 (57). The high number of new enrollments means that Sweden is now close to attaining the goal of half of each age cohort including those in northern regions beginning studies in institutes of higher education. The social sciences, including economics and law, are the educational fields that attract most applicants. When taken together with the field of health, medical and social care, they account for more than half of the total number of applications. The third largest area comprises programs in technology and teacher training. A teacher training college was already established in Luleå in 1907.

The highest participation in higher education can be found among women, who make up 60% of the students. The location of this university in Luleå has resulted in broader recruitment in terms of social background. Life-long learning offered by the higher education institutions has also been of importance in the region. Distance education has been of importance for people living in the rural areas, and the number of distance students has been rising rapidly, increasing opportunities for staying in the area and influencing its development. The number of companies working with high technology has

increased, as well as the number of skilled people. The university studies that are and have been offered are of great importance for the survival of the region. For rural areas, an important developmental factor has been in teacher-education programs to support high quality teaching in the compulsory schools.

Post-graduate studies have increased during 2002/2003, with considerably more women than men. The number of PhDs has more than doubled since 1993. The trends are the same in all of Sweden. Social background still influences the transfer to postgraduate studies. In northern Sweden, great efforts have been made by Sametinget in supporting PhD studies and also in funding research programs.

The youngest university in Finland is the University of Lapland in Rovaniemi, which was established in 1979. The aim of its educational program has been to contribute to the development of occupations and culture in northern Finland and to further international cooperation between universities and research institutes in the northern regions. There are more than 4000 full-time students. Faculties cover art and design, social sciences, education, law, and business and tourism. The research strength at the University of Lapland lies in northern issues, in particular in research into welfare, minorities, international relations, international jurisprudence, and applied environmental research.

In some of the western Nordic countries, universities have been in place for a much longer period than in the Fennoscandian North. For example, the University of Iceland was founded in 1911. During its first year of operation 45 stu-

dents were enrolled and today it provides education for approximately 8,000 students, studying in eleven faculties. The University of Akureyri in northern Iceland was established in 1987. The University of Greenland offers courses taught in both Danish and Greenlandic. As of 2003, the university has approximately 100 students and 13 academic staff members. The university has four departments (Administration, Cultural and Social History, Greenlander Literature, and Theology). The University of the Faroe Islands was founded in 1965. The university carries out research and provides post-secondary education. It has three departments and about 90 students.

Russia

In post-Soviet Russia, there has been a trend towards more regional differentiation not least in higher education. All regions want to have their own university or universities and there is a strong academic drift by upgrading former colleges, for example, teacher training colleges, technical colleges, etc., to pedagogical universities, technical universities and so on. As an illustration, in Murmansk and in Arkhangelsk there were no universities before perestroika. Today there are several in both cities, and in addition to the state universities there are also private institutions of higher education. The students' fields of interest have also changed: business administration, economics, management, and law are favorites, while the number of applicants to faculties of natural science is decreasing. The possibility of getting higher education close to home in the Russian North varies however. In the northwest there are several universities, whereas educational possibilities are sparser in the less populated northern Siberia and in the Far East.

Circumpolar initiatives

A significant development in northern higher education is the thinking in terms of circumpolarity, and the increased interest in the use of information and communication technology and open learning networks (52-53). This is reflected in the University of the Arctic and the Northern Research Forum. Their efforts to raise awareness of natural and cultural circumstance of the Arctic and promoting dialogue among members of the research community and a wide range of other stakeholders in the Arctic have been applauded by the Arctic education ministers. (54).

Saami University College

The Saami University College was established in Guovdageaidnu in 1989 as a result of Saami movement's campaign and is based on the needs of Saami society for higher education and research. The main three elements of the scientific basis are language and language development, sustainable development and biodiversity, and Saami teaching and understanding. The College has national responsibility for Saami teacher-training, journalist-training, and higher education. It is funded by the Norwegian Ministry of Education and serves all Saami students in Saami area of Norway, Sweden, Finland, and Russia. Most of the instructing is given in Saami language. Both students and staff are bi- or multilingual (51).

The University of the Arctic is a cooperative network of universities, colleges, and other organizations committed to higher education and research in the North. Its members share resources, facilities, and expertise to build post-secondary education programs that are relevant and accessible to northern students. The overall goal of the University of the Arctic is to create a strong, sustainable circumpolar region by empowering northerners and northern communities through education and shared knowledge. It was officially launched in 2001 and now, three years later, has 71 member institutions and organizations.

The Northern Research Forum has as one of its main objectives to enlist the participation of university students in discussions on northern issues, problems and opportunities. In particular, they serve as rapporteurs at open meetings, where they also take part in policy relevant discussions among the more senior members of the research community and a wide range of other northern stakeholders. The majority of students associated with or enrolled at University of the Arctic member institutions are also attracted to the Northern Research Forum. While it is affiliated with the University of the Arctic, the Northern Research Forum has its own, independent governance structure. (See also *Chapter 12. Circumpolar International Relations and Geopolitics*).

The University of the Arctic and the Northern Research Forum function as spaces for institutional processes to further the political and environmental work of the Arctic Council. In the past there were various initiatives that brought together specific educational/scientific communities (e.g. the International Polar Year). None of these initiatives, however, created a popular base of support or permanent institutions. The University of the Arctic offers the promise of post-secondary education based on information communication technology, "a university without walls," as well as mobility programs to facilitate northern student and faculty exchanges.

A particular feature of the University of the Arctic is the inclusion of indigenous peoples in its governance structure. For example, the Arctic Athabaskan Council, the Russian Association of Indigenous Peoples of the North (RAIPON), and Gwich'in Council International are member institutions of the Council of the University of the Arctic, and the Inuit Circumpolar Conference, Saami Council, and

others have worked at various levels to help develop the university. Moreover, there is an Indigenous Issues Standing Committee that was established to promote indigenous input to programs and projects and which has identified a need to coordinate northern indigenous views in the development of the University of the Arctic (55). The Indigenous Issues Standing Committee, like the University itself, is relatively new and is struggling to establish itself as a coordination mechanism. The goal of the committee is to assist indigenous educational capacity in the university and to increase northerners' activities on indigenous issues.

Many indigenous organizations see the potential of the University of the Arctic as an institution in which they may positively influence northern research and education. The opportunity to shape and develop the curriculum exists, as well as possibilities for the inclusion of traditional knowledge holders in teaching. This possibility would embody a major shift from professional academic atmosphere to a more open classroom, which respects different styles and norms of knowing and teaching. The inclusion of traditional knowledge holders on the roster of "Arctic Professors" and "experts", as well as recognizing the expertise of traditional knowledge holders with honorary PhDs, is the goal of members of the committee.

There have been and continue to be a host of organizations and institutions that enhance or play a role in higher education in the circumpolar North, for example the International Arctic Science Committee (IASC) and the International Arctic Social Sciences Association (IASSA). There are institutions, precursors of the Arctic Council, which share a concern for improved education in the North, such as the Conference and Standing Committee of Parliamentarians of the Arctic Region and the Canadian Polar Commission. Event-oriented initiatives, such as the International Polar Year (IPY) and the International Committee on Arctic Research Planning (ICARP), have also devoted attention to education and research issues. A plethora of funding agencies has specific mandates to increase research and post-secondary education in the circumpolar North. Future research could analyze the linkages, and lack thereof, of these initiatives, especially how they coordinate and focus post-secondary education opportunities in the North.

Theme summary

Access to higher education has increased in the Arctic over the past 30 years, with new universities being established in northern regions, various initiatives for circumpolar cooperation, and increased use of distance education. This access is still very uneven, however, and in many parts of the Arctic there are few or no opportunities for post-secondary education within the region (e.g. in parts of Canada, Siberia, and the Russian Far East). With the burgeoning of circumpolar initiatives in higher education and research, there is a need to look further into how they link, or could link, to each other.

Conclusions and gaps in knowledge

In this chapter we have identified and discussed three themes that resonate in schools around the circumpolar North. We have shown that indigenous and minority cultures are a major consideration when discussing education, as these peoples are adding to the reform of education. Education, as we have shown, can also continue to contribute to standardization and cultural loss. One cause for this may be the process of “difference blindness” that has led to the loss of many rare languages and important elements of indigenous cultures. Education can also be a significant tool for renewal and we have shown that education is performing a significant role in northern revival and development.

Education statistics are not readily available for the circumpolar North. In some jurisdictions these numbers are collected; however, they are not collected the same way in each of the jurisdictions of the circumpolar North. We believe it is very important to know the total number of possible students by grade category, total numbers of students enrolled, and the total numbers of students graduating at different levels in the education system. It would be useful if we had a breakdown of these numbers by indigenous and non-indigenous populations as well as by gender. Such statistics could be used to establish a baseline for evaluation of circumpolar educational trends.

Further statistics that would be instructive to future assessments of education in the Arctic would be: distances students have to travel to school each day by grade; faculty educational levels and place of origin; years of

teaching/school; teacher-student classroom ratios; support to schools; costs to deliver programs, etc. Income levels, employment levels, types of employment and other such indicators also need to be developed and used to understand education. But these measures must be tempered, as they tend to ignore and negate traditional economies and cultural practices. Control of one’s own destiny, cultural continuity, and contact with nature are elements that could be measured by indigenous languages spoken in schools. We need to look at school instruction using cultural practices, as well as activities outside formal school settings. There needs to be more research to determine what these tempering measures might be and if they can be used on a circumpolar basis. Too often generalization produces results that mean very little, so there has to be special consideration for the local when searching for pan-Arctic indicators. Also, comparisons across jurisdictions will be meaningless if we do not account for variations within each country.

Finally, another research area is the question of northerners as producers of knowledge. At present, there are no statistics for the publication of northern books or books about the North. All areas of knowledge production must be considered.

Chapter summary

The trends for education discussed in this chapter demonstrate that the most critical concerns are for control, relevance, and access to education. The three concerns are directly impacted by the acknowledgement of distributed knowledge and the need to adapt education services to fit local needs and conditions. They are set against a legacy where western values have been given priority in the view of knowledge over indigenous ways of knowing. The shift from viewing knowledge as a standardized commodity to seeing it as a distributed resource has led to pressures for decentralization of control and decision making, local adaptations of curriculum, and increased use of technology to access knowledge from any place at any time (i.e. University of the Arctic).

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