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International collaboration for education of future Arctic experts (0267)

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Research Domain: Learning, Teaching and Assessment

The Arctic becomes the territory for industrial development, due to limited natural resources elsewhere on Earth that may be easier for exploitation. Harsh natural conditions and fragility create many challenges and education of Arctic specialist is an important issue.

The University Centre in Svalbard (UNIS, Norway) is the world's northernmost institution for higher education and research, located at 78 ° N in Longyearbyen on Spitsbergen Island. UNIS was established in 1993 in a place where students are able to feel and learn real Arctic conditions, and where the nature of Svalbard could be used as the classroom and laboratory for exercises, experiments and field work. A strong focus on safety training and good logistical services ensures the success of such experiences.

UNIS offers many courses on Bachelor-, MSc - and PhD-level in the Arctic oriented field of Biology, Geology, Geophysics and Technology. All the courses are research based with 40-60 % of study time devoted to field and laboratorial work, taking advantage of UNIS' location in the Arctic and the highly developed infrastructure. Students are given the opportunity to participate in cutting-edge research and to work with modern equipment and assimilate contemporary techniques.

Half of the students at UNIS is Norwegian and half is international from all over the world. The largest amount of students usually represents Scandinavian countries, Germany, Great Britain, Netherlands, Russia. But even students from Australia, New Zealand, Latin America and South East Asia find their way to Svalbard. The teachers are nearly 45 UNIS professors and about 170 guest lecturers from famous institutions, who specialize in Arctic issues.

There are several collaboration programs initiated by the Norwegian government to support studies and research in the Arctic. The Fellowship programme for studies in the High North, funded by the Norwegian Ministry of Foreign Affairs, gives selected students from partner institutions in Russia, Canada and the US the chance to come to UNIS and attend the courses. The funds allocated to UNIS for the next 3 academic years sums up to 2,5 millions (NOK). The scholarship consists of a monthly grant covering food, accommodation, and other basic needs. In addition, they receive a travel grant to support the travel far north. Students all live together in student dormitories, and that way, they also learn the culture, languages and habits of different nationalities.

The "North 2 North" Mobility Program combines the efforts of Circumpolar countries in the frame of University of the Arctic. The University of the Arctic is a cooperative network of universities, colleges, and other organizations committed to higher education and research in the North. UNIS is a member

for the University of the Arctic, and support selected incoming Russian students from other member institutions within the mobility program.

The project "Safety of Maritime operation and sustainable industrial development in the Arctic" (SMIDA) is sponsored by the Norwegian Centre for International Cooperation in Education (SIU). The project is hosted by the Arctic Technology Department at UNIS, and has received funding of 4 million NOK over the period 2012-2015.

The main goal of this Norwegian-Russian collaboration project is the increasing of basic knowledge required for sustainable development of Arctic offshore and coastal Technology. Regions of offshore and coastal development in the Barents and Kara Seas are in focus. The project has an educational and a scientific part. It is aimed to exchange MSc/PhD students, to develop communication between academic and administrative staff, to synchronize the teaching procedures in both countries and to organize joint field and laboratorial works in Svalbard and in the Russian Arctic.

The fields of research and study are hydrology of Arctic seas; physical and mechanical properties of ice and frozen ground; coastal erosion and permafrost stability, environmental impact of industrial activity in High North; physical environmental actions on coastal structures; ice loads on offshore structures/ships and effects on marine operations; instrumentation development for advance field and laboratory measurements.

The Norwegian partners of the project are UNIS (responsible institution) and Norwegian University of Science and Technology. The Russian partners are Moscow University of Physics and Technology (main partner institution), St.-Petersburg State Polytechnic University, Moscow State University, State Marine Technical University (St.-Petersburg).

Norwegian-Russian collaboration in the academic field of Arctic Technology goes 15 years back, and more than 50 students from leading Russian institutes have been involved and got invaluable Arctic experience. They now work in companies and in research institutions.

The main activities of the SMIDA project are:

- teaching and exchange of MSc and PhD students;
- research cruises with student groups on research vessels in the Barents Sea and in the Russian Arctic;
- field works on land fast ice and industrial areas in Spitsbergen, in coastal zones of the Russian Arctic;
- modeling, numerical simulation and software development;
- creation of information environment and geographical information system.

SMIDA works in close cooperation with other scientific and industrial projects that allows to multiply efforts, use common resources and expansive equipment.

Project participants regularly make presentations on international conferences on Port, Offshore and Ocean Engineering in Arctic Conditions. Much attention is paid to establish and support project web-pages on web-sites at UNIS (English version) and at MIPT (Russian version). An important

task is to develop the environment for electronic communication and operative data exchange among the participants, together with information base on the subject of Arctic Technology in the form of web-site. Such information space accumulates knowledge on the topic (library, citation lists, links to useful web-site, news section) and the results obtained in the frame of the projects, and could be used for digital education for the students preparing to study at UNIS. Web pages have been created in September 2012 and are currently up-dated.

Along the project field work and teaching; unique research equipment is created and tested, new techniques and methods are developed, and original results on physical and mechanical properties of sea ice, ice load on construction are obtained. Research and field based study in real Arctic condition is very important for developing expertise and for educating future high latitudes experts.