# Mathematics and Language in New Brunswick and the High North: An International Partnership

**Joseph Dicks, Karla Culligan, Hilja Huru, and Anita Movik Simensen**

When Karla Culligan and Anita Movik Simensen attended the international Psychology of Mathematics Education (PME) conference in Vancouver in July 2014, they did not expect that it would lead to an international collaboration between UiT The Arctic University of Norway (Alta campus) and the Second Language Research Institute of Canada ($L_2$RIC) in the Faculty of Education at the University of New Brunswick (UNB). However, that is precisely what happened.

After her presentation (Culligan, 2014) on the critical role of language in the teaching and learning of mathematics, Karla, a doctoral student at UNB, Fredericton, was approached by Anita, a doctoral student from Norway, who found Karla's work to be highly relevant to an emerging project that involved language immersion and mathematics education for minority and Indigenous languages in that country. This led to several conversations and then, in 2015, to a formal partnership between UiT and $L_2$RIC supported by a research grant from the High North Programme valued at NOK 300,000 (approx. 50,000 CAD).

In the fall of 2016, four project participants from Norway arrived in Fredericton, New Brunswick to begin a 10-day visit and exploration of how languages are learned through content (Cenoz &

Ruiz de Zarobe, 2015) and the connection between schooling and Indigenous language and culture (Hornberger, 2008). The visitors from Norway were Dr. Hilja Huru, then Associate Professor of mathematics in the Department of Teacher Education and project director at UiT (now Professor in the Faculty of Education and International Studies at Oslo University College of Applied Sciences); Anita Movik Simensen, doctoral student and Instructor at UiT and project coordinator; Anna Kaisa Räisänen, doctoral student at the University of Helsinki and language teacher at the Kven Institute; and Linda Kukula, an undergraduate student in teacher education at the University of Agder Linda Kukula. The Canadian project partners were Karla Culligan, Research Associate, and Joseph Dicks, Director and Professor, both at L2RIC in the Faculty of Education at UNB.

*Left to right: Anita Simensen, Hilja Huru, Linda Kukulu, Anna-Kaisa Räisänen, Karla Culligan, Joseph Dicks, at the Faculty of Education, UNB,*

The Norwegian visitors were able to observe French immersion students learning mathematics at the elementary level at Park Street School and at the middle school level at Bliss Carmen School in Fredericton, New Brunswick. They also engaged with teachers and administrators at both schools and came away with an appreciation of how quickly and effectively non-native speakers were able to gain competency in both their second language and the

subject area of mathematics. These researchers and students were particularly interested in mathematics and felt that the importance attributed to this subject in the curriculum in Norway (not unlike in Canada) would make it an ideal subject area to include in an Indigenous language immersion program.


*Visiting Park Street Elementary School in Fredericton, New Brunswick*

An interesting detail regarding French immersion in New Brunswick during the time of the Norwegian visit was that there was no Kindergarten or Grade 1 entry. Classes in French immersion only began at Grade 3. Since the visitors to Canada were interested in working with younger learners back in Norway, they were particularly keen on observing an early French immersion program. Consequently, as part of their experience, we drove to Prince Edward Island where they were able to observe in Kindergarten and primary level classes at Springpark Elementary School in Charlottetown. Another valuable part of the trip was a dinner meeting with provincial French language representatives René Hurtubise, Director of French Programs, and Diana Tutty, French Math and Science Program Leader (K – 6).

*Anita Simensen, Anna-Kaisa Räisänen, Hilja Huru, Linda Kukulu, at the Confederation Bridge, spanning New Brunswick and Prince Edward Island*

In addition to the French immersion language program experiences, we also spent time with David Perley and Imelda Perley of the Mi'kmaq-Wolastoqey Centre (MWC) at UNB. Conversations with the Director of the MWC and the university Elder-in-Residence provided invaluable insights into the importance of culturally relevant and respectful curricular materials and programming. While the French immersion visits were impressive and provided the visitors with a framework for the implementation of their program, the Indigenous language and culture connection resonated with them to an even greater degree. This related to the nature of their own immersion program planning, which involved both the Sami and Kven Indigenous languages in Norway's high north. We also met with Dr. David Wagner, Professor of mathematics in the Faculty of Education at UNB, to discuss issues related to language and mathematics. As a doctoral student, Ms. Simensen was also invited to participate in the Doctoral Seminar at UNB's Faculty of Education.

*Kindergarten French immersion mathematics classroom, Springpark Elementary School, Charlottetown, Prince Edward Island, Canada*

*With Elder-in-Residence Imelda Perley of the Mi'kmaq-Wolastoqey Centre (MWC) at UNB, Fredericton, New Brunswick, Canada*

*David Wagner and Anita Movik Simensen, Fredericton, New Brunswick, Canada*

As part of the project, a return trip to Norway in February, 2017 allowed Joseph Dicks and Karla Culligan to explore and learn about Indigenous language education in Norway, to provide some guidance to educators working in immersion in minority language contexts there, and to participate in a Research Seminar on "Multilingualism in Education in the High North" at UiT The Arctic University of Norway, in Alta. Dr. Dicks presented a paper entitled *Talking About Mathematics: Linguistic Repertoires of French Immersion Students* and Ms. Culligan presented a paper entitled *Using Classroom-Based Research to Explore Mathematics and Language Learning in Secondary Immersion*. Dr. Huru, Ms. Simensen, and Ms. Räisänen presented their talk entitled *Culturally Based Mathematics Tasks: A Framework for Designing Tasks from Kven Traditional Knowledge* and Ms. Räisänen also presented on the topic of *Language Educational Rights–Kven Language in Porsanger*. Other papers presented included topics such as

challenges with translation (Sami-English), and language practices in Sami kindergarten. This was an extremely rich exchange on issues related to foreign and Indigenous language education.

*Karla Culligan presenting her paper at the Research Seminar: "Multilingualism in Education in the High North" at UiT, Alta, Norway*

*Joseph Dicks and Karla Culligan, UiT, Alta Campus in Alta, Norway*

The Norwegian visit took place over a 6-day period and involved visits not only to UiT in Alta but also to a daycare in Lakselv as well as Lakselv Elementary School. The daycare visit was particularly informative as it was in a small community and focused on the teaching of Kven using a language nest model.

Language nests are an immersion-based approach that originated in New Zealand as a part of the Māori language revitalization. These programs often take place in daycare-like settings as they are designed for children from birth to about five years. The concept of the "nest" refers to a safe environment for young children to interact with fluent speakers of the language.

These fluent speakers are often Elders but may include other speakers of the language (http://www.fpcc.ca/files/PDF/Language/Language_Nest/FPCC_LanguageNestHandbook_EmailVersion2.pdf). It was particularly interesting to see this in action in an area where there are no commercially prepared curricular materials and where language instruction is offered largely by volunteers.


*Visit to Kven Language Nest School, Lakselv, Norway*

*Anna-Kaisa Räisänen leading a Kven language activity, language nest classroom, Lakselv, Norway*

The Kven language has a particular status in Norway. Officially Sami and Kven are minority languages in Norway protected under international law (the European Charter of Minority Languages). However, the Sami language has a higher level of protection under the charter and has additional and stronger

protection under national law (The Sami Act, 1987; Corson, 1995).

Sami and Norwegian have equal status in Norway and, in the "Sami language administrative district", Sami has a status similar to French and English as official languages in New Brunswick where judicial proceedings must be available in Sami, health services must be provided in Sami, and elementary and secondary school curricula must be offered through Sami.

The particular elementary school we visited is situated in Lakselv, in the district of Porsanger, which is a Sami district. However, the school offers both Kven and Sami language classes to Norwegian-speaking students. Two interesting programming features for the Kven class were (a) a small class size and (b) two teachers. When we asked teachers and administrators about this, the response was that they felt it was important not to have any discipline issues in the language classes. The Sami class was also small, but in this case, there was just one teacher.


*Visit to Lakselv Elementary School, Lakselv, Norway*

*Playing a game in Sami language class, Lakselv*

The Norwegian visit ended with a final meeting at UiT Alta between the Canadian and the Norwegian participants to discuss future collaboration and potential for research and student involvement.

*Northern Lights viewing, Alta, Norway*

*Trasti & Trine Dogsledding, Alta, Norway*

The chance encounter of Karla Culligan and Anita Movik Simensen at a mathematics conference in 2014 led to an international partnership between two universities and an enhanced understanding of minority and indigenous language education in two unique contexts. The fact that this project included disciplines as distinct as French in Canada and mathematics and indigenous languages in both countries underlies the value of interdisciplinary work in education, of the critical role of language and culture in education, and of the value and potential of global education.

## References

Cenoz, J., & Ruiz de Zarobe, Y. (2015). Learning through a second or additional language: Content-based instruction and CLIL in the twenty-first century. *Language, Culture and Curriculum*, *28*(1), 1-7. Retrieved from https://doi.org/10.1080/07908318.2014.1000921

Corson, D. (1995). Norway's "Sámi Language Act": Emancipatory implications for the world's aboriginal peoples. *Language in Society*, *24*(4), 493-514. Retrieved from https://doi.org/10.1017/S0047404500018996

Culligan, K. (2017, February). *Using classroom-based research to explore mathematics and language learning in secondary immersion*. Paper presented at the research seminar on "Multilingualism in Education in the High North," UiT The Arctic University of Norway, Alta, Norway.

Culligan, K. (2014). The purpose and implications of first language use in second language mathematics tasks. In S. Oesterle, C. Nicol, P. Liljedahl, & D. Allan (Eds.), *Proceedings of the 38th Conference of the International Group for the Psychology of Mathematics Education and the 36th Conference of the North American Chapter of the Psychology of Mathematics Education (PME-38 & PMENA-36, Vol. 6)*. University of British Columbia, Vancouver, British Columbia, Canada: PME. Retrieved from http://www.pmena.org/html/proceedings.html

Dicks, J. (2017, February). *Talking about mathematics: Linguistic repertoires of French immersion students*. Paper presented

at the research seminar on "Multilingualism in Education in the High North," UiT The Arctic University of Norway, Alta, Norway.

Hornberger, N. (2008*). Can schools save indigenous languages? Policy and practice on four continents*. London, United Kingdom: Palgrave MacMillan.

Huru, H., Simensen, A., & Räisänen, A.-K. (2017, February). *Culturally based mathematics tasks: A framework for designing tasks from Kven traditional knowledge.* Paper presented at the research seminar on "Multilingualism in Education in the High North," UiT The Arctic University of Norway, Alta, Norway.

Language Nest Handbook. (2014). Brentwood Bay, B.C.: First Peoples' Cultural Council. Retrieved from http://www.fpcc.ca/files/PDF/Language/Language_Nest/FPCC_LanguageNestHandbook_EmailVersion2.pdf

Räisänen, A.-K. (2017, February). *Language educational rights– Kven language in Porsanger.* Paper presented at the research seminar on "Multilingualism in Education in the High North," UiT The Arctic University of Norway, Alta, Norway.

Sami Act, The (1987). Retrieved from https://www.regjeringen.no/en/dokumenter/the-sami-act-/id449701/

**Joseph Dicks** is a professor in the Faculty of Education and director of the Second Language Research Institute of Canada at UNB, Fredericton. His scholar work includes language assessment,

content-based language teaching, program evaluation and language teacher competencies in bilingual/plurilingual education programs.

**Karla Culligan** is a researcher associate at the Second Language Institute of Canada in the Faculty of Education at UNB, Fredericton. Her research and teaching involve bi/multilingualism and education, mathematics education, translanguaging practices, and teacher education.

**Hilja L. Huru** is a professor in mathematics at OsloMet – Oslo Metropolitan University/UIT – The Arctic University of Norway. Her background is in pure mathematics with a PhD in non-commutative algebra connected to mathematical physics. Her research interests also include multicultural classrooms with a focus on pressured minorities and Indigenous mathematics.

**Anita Movik Simensen** is an assistant professor of mathematics education at UIT – the Arctic University of Norway. Her research interests include mathematics education in inclusive classrooms, Indigenous mathematics, and the use of natural outdoor learning environments for young children's mathematical experiences.

Correspondence regarding this article can be addressed to Joseph Dicks at jdicks@unb.ca