

## WORKSHOP REPORT

### Capacity Building in Mathematics and Statistics Learning Support in Norway and the Czech Republic (MSLS Net)

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## Abstract

This report describes the final meeting of the project "Capacity Building in Mathematics and Statistics Learning Support in Norway and the Czech Republic (MSLS Net)" held at the Tomas Bata University in Zlín, Czech Republic (June 12-14, 2023). Provision of mathematics and statistics learning support (MSLS) is developing rapidly in many parts of the world and activity in Norway and the Czech Republic has been accelerated significantly through this EEA Grants funded project. Representatives of each of the five partner institutions worked on creating a summary of good practices in tutor training, designing learning resources, and in delivering, monitoring and evaluation of mathematics and statistics support. Provision varied considerably across the institutions and the centres represented demonstrated diverse and innovative ways in which mathematics support is evolving. Outputs from the project include a Handbook on good practice and a booklet concerned with mathematics support centre tutor training, including pedagogic training and learning resources for the development of the tutors as described below. Finally, consideration turned to the value of establishing a professional network to continue this important work. The report will be relevant to other international groups interested in working in university level mathematics and statistics support.

**Keywords:** Mathematics support, statistics support, European collaboration, mathematics support network.

## 1. Background and aims of the project

In many parts of the world there is ongoing concern about the quantitative skills of undergraduates, and in some cases, postgraduate university students. In mitigation, universities have introduced a variety of forms of support including drop-in centres and online provision. A key element is that such

support is provided *in addition* to students' regular and credit-bearing programmes of lecturing, seminars etc. (see for example Lawson, Croft & Halpin, 2003). Surveys in the UK, Australia, Ireland, and the United States (see, for example, Grove, Croft, & Lawson, 2020, MacGillivray, 2009, Cronin, Cole, Clancy et al., 2016 and Mills, Rickard & Guest, 2020) demonstrate that such provision is now widespread in these countries. Whilst the main objective of the project reported here is to improve cooperation between higher education institutions in Norway and the Czech Republic in the learning and teaching of mathematics itself, a further objective is to share experiences in the provision of mathematics and statistics support, to promote the idea of such support in higher education and to support the development of national networks bringing together those who work in this developing field. The project addresses four key goals for European higher education: tackling future skills mismatches and promoting excellence in skills development, building inclusive and connected higher education systems, ensuring higher education institutions contribute to innovation, and supporting effective and efficient higher education systems. The project ran from August 2021 until July 2023. The outputs, or products, of the project include a Handbook on good practice and a booklet concerned with the training of tutors who work in mathematics support, both published in English. These include: summaries of the project partners' good practice in setting up, operating, promoting and evaluating MSLS, five case studies describing MSLS practice of the partner universities, an overview of resources for tutor development and learning resources in MSLS, and tips for use of those resources. In addition, there is a collection of materials - training resources, video tutorials, feedback questionnaires, promotional leaflets and other resources related to MSLS provision - developed throughout the project and available in three languages: English, Czech and Norwegian. One of the important outcomes of the project was initiating discussion about establishing a network of practitioners connecting Czech and Slovak MSLS centres tentatively called  $\pi$  (Pi) Network, aiming to foster collaboration and knowledge sharing among the participating institutions. The Pi Network is envisioned as a virtual space where individuals from various universities and educational backgrounds can come together to contribute, seek inspiration, and find support in their MSLS endeavours. This network should serve as a platform to foster collaboration and growth in mathematics education, ensuring that everyone interested in MSLS, regardless of experience or access to a support centre, can actively participate.

## 2. Universities involved in the project and past meetings

The consortium includes five higher education institutions: Brno University of Technology (BUT) in the Czech Republic (Project Promoter coordinating the efforts of four other participants), two further Czech universities, Masaryk University (MU) also in Brno and Tomas Bata University in Zlín (TBU), and two Norwegian Universities, The Arctic University of Norway (UiT) and University of Agder (UiA). The consortium features a balanced mixture of experienced organisations and those new to mathematics support. UiA, MU and TBU had established mathematics and statistics support centres in autumn 2015, spring 2016 and autumn 2016 respectively. BUT later set up a centre in autumn 2021, and UiT has since developed an innovative form of "remote support" offered to students who are not on campus using the platform Discord (<https://discord.com>). To date, three project workshops have taken place in Brno, Kristiansand and Alta. The first workshop in Brno (CZ) was arranged as a hybrid event because some colleagues including the guest speaker David Bowers from the **sigma** Network could not participate physically due to COVID-19 travel restrictions in place at the time. Presentations of partners' MSLS activities and **sigma** Network experience laid the groundwork for plenary discussions and group work where the focus and main topics of the project outputs were outlined. The second workshop in Kristiansand (NO), where a list of chapters of the two outputs was created, was fully face-to-face and benefited from the experience of Professor Duncan Lawson, former chair of the **sigma** Network, as well as other experts in the field invited by The Centre for Research, Innovation and Coordination of Mathematics Teaching (MatRIC) to the MatRIC Annual

Conference 2022 (<https://www.uia.no/en/centres-and-networks/matric>). Duncan Lawson also participated in the third workshop in Alta (NO) and arranged a virtual excursion to the Coventry University mathematics and statistics support service. The structure of the two outputs was discussed and content for several chapters was developed during the third workshop. In addition to the three workshops, online meetings and working sessions have taken place approximately once a month. Details of the project were presented at two conferences in Norway and one in the Czech Republic, and a dedicated promotional event took place in Brno (CZ) in January 2023 which was reported in the **sigma** Newsletter, Issue 26: Spring 2023.

### 3. The purpose and realisation of the final workshop

The purpose of the final workshop was to collect together all the information and learning that has taken place throughout the two years of the project. Of particular focus was creating a summary of good practices in tutor training, creating learning resources, and in delivering, monitoring and evaluation of mathematics and statistics support provision. The workshop took place over three days at the Tomas Bata University in Zlín, within the Faculty of Applied Informatics (June 12-14, 2023). On each day the programme had a specific focus.

On the first day work focussed on the development of training materials for new support centre tutors and learning resources for students. The workshop started with a brief introduction by each participant and a project update from each partner university. Then, there followed a presentation of training and learning resources of the **sigma** Network by the guest speaker Professor Tony Croft. The workshop continued with two collaborative work sessions the aim of which was to put together material for the booklet for training MSLS tutors. The collaboration took place in a shared document on Google Drive displayed on the wall, so that everybody could see what was being written and what was the direction of the plenary discussion.

On Day 2, focus was upon the concept and history of mathematics support in the partner institutions, with partners explaining the rationale for support in their own institution and the way support has evolved there. Then, the different aspects of provision were considered including how to set up and run a centre, collecting feedback and evaluation of the service, promotion of the service at the university, and dissemination beyond. An introduction was again given by Tony Croft and was followed by six collaborative work sessions aimed at collecting material for the intended Handbook on good practice.

Day 3 started with an excursion to the Tomas Bata Memorial, a memorial of the founder of the world-famous Bata shoe company. Following this most interesting visit, delegates returned to focus upon the value of networking and establishing a form of professional association which would enable this important collaborative work to continue. Discussion was informed by the development of the **sigma** network. A special hybrid session (Figure 1) was arranged with focus on network building. Remote participants from three universities joined us in listening to Tony Croft's experience of establishing the **sigma** Network and in the follow-up discussion about possible means and forms of collaboration within the emerging Pi Network.



Figure 1: The hybrid session with a focus on network building.

Finally, one more special session should be mentioned which took place in the evening of Day 1. After the grill party in the bar on the roof of the student dormitory, the event manager arranged a pantomime game with challenging, mostly abstract words that had been used during the workshop on Day 1. We saw plenty of creative performances (in the end all words had been guessed), and we thank Dominika for this unique experience. Figure 2 shows some of the workshop participants.



Figure 2: Some of the workshop participants.

For further information about the project contact Josef Rebenda, Brno University of Technology, (rebenda@vutbr.cz) or visit the project website <https://msls-net.ceitec.cz/en> where the project outputs can also be found.

## 4. Acknowledgment

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