Mathematics Collaboration with a Countryside School

Matematiksamarbete med skola i glesbygd

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Abstract

This project aimed to strengthen mathematics education for lower secondary pupils (grades 7–9) with a particular interest in the subject at Kungsskolan in Örkelljunga. We employed a teaching assistant (amanuens) who supported in-class instruction during school hours for students who opted into an advanced mathematics group (one group per year level).

The gender distribution among the 35 participants was relatively balanced: 15 girls and 20 boys. One of the three weekly mathematics lessons was devoted to advanced mathematics. In the remaining lessons, students followed the standard curriculum. The project promoted mathematical thinking beyond the official syllabus. The pupils also participated in two mathematics competitions—**Pangea** and the **Kangaroo Math Competition**—achieving impressive results.

Background and Motivation

Kungsskolan in Örkelljunga is home to highly dedicated and competent teachers in mathematics and science. In spring 2024, one of these teachers contacted the Centre for Mathematical Sciences at Lund University seeking collaboration in the form of teacher professional development and enrichment activities for students.

A small group of pupils at the school had achieved exceptional results in the Pangea mathematics competition. Despite these successes, there was uncertainty about whether these talented students would choose upper secondary school programs that grant eligibility for university studies in science and engineering. Beyond the standout performers in Pangea, there were additional pupils receptive to mathematics enrichment.

Through our project, we aimed to provide this smaller group of pupils with opportunities to explore mathematics more deeply by engaging with an LTH student in conversations and problem-solving sessions.

Project Implementation

Funding from the **ELLIIT Gender and Diversity Programme** enabled us to employ a teaching assistant who held weekly mathematics lessons for grades 7–9 in the school (one hour per group per week). Due to travel constraints, the teaching assistant participated **remotely for three weeks each month** and **in person during the fourth week**. We considered it essential that pupils had the opportunity to meet the LTH student face-to-face and not solely through Zoom.

Part of the instruction was connected to the standard curriculum but went significantly deeper. During certain weeks, the focus shifted to preparing for upcoming mathematics competitions.

At the end of the academic year, the pupils visited **LTH**, where they received a demonstration from our teaching assistant, **Leonid Meledin**, who showcased a **self-driving car** he had programmed as part of his Master's thesis in Engineering Mathematics at LTH. (See picture).

Results and Impact

We measured outcomes by analysing pupils' **upper secondary program choices**. Among the six participating 9th-grade pupils (four girls and two boys), **five chose the natural sciences program** and one (a boy) chose the economics program.

In previous years, **almost no pupils from this school had opted for science or technology programs** at the upper secondary school level. By this measure, our project has been successful: it helped **raise awareness of LTH** and **encouraged more pupils to consider career paths in science and engineering**.

We are very happy that we have received funding from ELLIIT's Gender and Diversity Programme for one more year, and so we will continue the project in 2025-26 with another teaching assistant. We are keen to see the development and upper secondary school program choices of next year's 9th-graders.