Digital divides.
Evaluation of the examination in mathematics for 10th grade, spring 2018

This report addresses the examination in mathematics for tenth grade in the spring of 2018. This report is the second in a series of three. The first report (Andresen et al. 2017) analysed the examination held in the spring of 2017, while the last report will address the examination to be held in 2019 and investigate development trends for the period as a whole.

The previous report concentrated especially on the language and illustrations used in the examination paper. This year, we have chosen to focus more on the importance of digital tools for the candidates. All three reports address the question of whether the examination is fair, and is perceived as such. When it comes to digital tools, this presupposes that all students have received approximately the same amount of advance training and that they have equal experience in making use of the available tools.

This report sets out to answer four questions.

- How good is the consistency between the curriculum, the examination and the teaching provided to the students?
- Does the examination include questions with a varying degree of difficulty that can measure all skill levels?
- How do the students assess the examination workload in relation to the time available?
- What kind of training in the use of digital tools have the students received, and how have they been prepared to use digital tools during the examination?

The data used in the study have been collected by various methods. We have sent an electronic questionnaire to tenth-grade mathematics teachers whose students have sat the examination in 2018, and we have undertaken case studies in four different schools, including classroom observations. In addition, we have added questions to the Directorate of Education's survey among examiners, and we have analysed question papers.

In light of our data, the examination appears to have been for the most part fair and proper. However, some findings add nuances to this conclusion. In the report, we have focused on students who have what we have referred to as digital privileges. This means that certain groups of students have bet-

ter preconditions than others for examination success. Their digital advantage is not necessarily linked to their mathematical skills, but to other, external factors, such as access to digital tools, different priorities among schools in terms of procurement, the scope of teaching and varying quality of the teaching provided.

As regards language, which was a main topic in last year's report, this year's question paper is also text-heavy. The number of words and compound terms may represent an obstacle to students with limited Norwegian language skills. Teachers we have interviewed were of the opinion that questions containing much text hinder students from demonstrating their mathematical skills, especially students from a minority language background and students with dyslexia.

Most teachers agree that there is consistency between the competence objectives and what the students are tested on in this examination, and the majority also believes that there are no competence objectives that are rarely or never included in examinations. Based on the students' performance, this year's question paper had an appropriate degree of difficulty and a good spread in its degree of difficulty across the questions, sections and main areas.

In addition to data from students and teachers, we also have data on the examiners' assessments. The examiners call for guidelines that are as clear as possible for their assessment, and are aware of the challenges involved in exercising discretionary judgement. The examiners are largely satisfied with the guidelines and the information for grading of questions, but would prefer that the preliminary assessment report be made available earlier. They also point out that in some cases, digital submissions from schools are so poor that they may affect examination results.