The digital situation of Norwegian school

ESSENTIAL FINDINGS OF MONITOR SKOLE 2016

Monitor Skole 2016 ("Monitor School 2016") is a survey of head teachers, teachers and students in year 7 that maps out the current digital situation in schools. This study is the seventh in a series of quantitative studies of the digital situation in schools conducted by the Norwegian Centre for ICT in Education, and previously by the Network for IT Research and Competence in Education (ITU). The first six studies were conducted every other year between 2003 and 2013, and these also included data from year 9 and the second year of upper secondary education. The 2016 edition of Monitor Skole puts an emphasis on schools' digital maturity and use of digital technologies in mathematics teaching.

Use of ICT

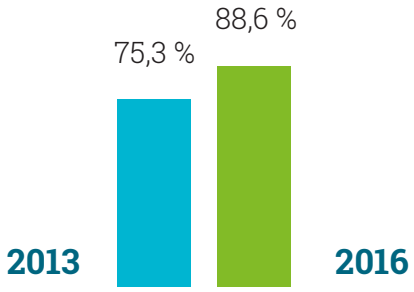
Between 2013 and 2016 there has been an increase in students' use of computers in year 7. 23 % of students report using a computer or tablet for four hours or more per week at school. It is nevertheless worth noting that year 7 students' use in 2016 is still less than that of year 9 students in 2013, and it is actually also less than the use reported by students in the second year of upper secondary education in 2003. Language subjects – of which Norwegian is the clear leader – dominate such use, with social sciences, natural sciences and mathematics exploiting ICT to a lesser extent. For the Monitor study, four hours per week of ICT use has for many years been chosen as the limit for achieving the curriculum's competence aims. As the schools choose different strategies, what is a sufficient amount will vary, but an average of four hours per week split over all school subjects is not a great deal. The goal here is not for ICT to be used as much as possible; however, it is essential that there be a certain level of use to allow the technology to be used systematically and to meet the curriculum's competence aims.

The teachers are active users of ICT; however, they use technology for administrative tasks and preparatory and follow-up work to a much greater extent than they do for teaching. This corresponds to the findings of previous Monitor studies. In teaching contexts, it is teachers of language subjects that report the highest levels of ICT use, whereas teachers of natural and social science subjects use it least. 38 % of teachers report using ICT for four hours or more in their own teaching work. The corresponding figure for students is 23 %. Teachers are therefore responsible for the majority of ICT use in the classroom.

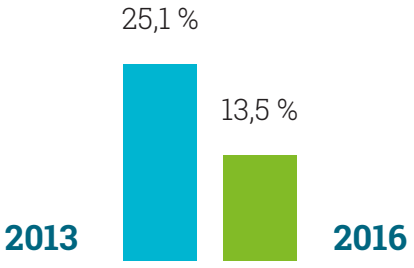
Students in year 7 report that technology distracts them relatively little when doing schoolwork, and they assert that they are motivated and have a strong desire for learning. It is particularly interesting to see that the impression that technology takes up time students need for learning has fallen significantly – from 25.1 % in 2013 to 13.5 % in 2016. There has also been an increase in the number of students reporting a positive experience of ICT use compared with 2013. In general, teachers also state that they feel positive about the use of ICT in teaching, and that they have noticed a positive impact with regard to motivation, variation, differentiation and promoting more exploratory forms of teaching. A relatively modest number feel that ICT use distracts students or that they lose an overview of students' work; however, many teachers also stress the need for firm class leadership and clear rules when it comes to using ICT in teaching.

Despite teachers highlighting many positive aspects of ICT use, there have also been some challenges and negative experiences. A disturbingly high number of teachers report that they have experienced bullying or harassment online at the hands of students. 6 % state that this has happened "sometimes". The students have also experienced digital bullying. The figures presented in Monitor Skole are roughly as expected based on what we know from other studies. 4 % of students are affected by digital bullying. This shows the importance of work to promote digital smarts, but it also shows that the teachers' work environment in this area must be monitored.

Computer/tablet use – pupils' experiences



Helps me understand the subject better



Takes time away from learning

Digital maturity

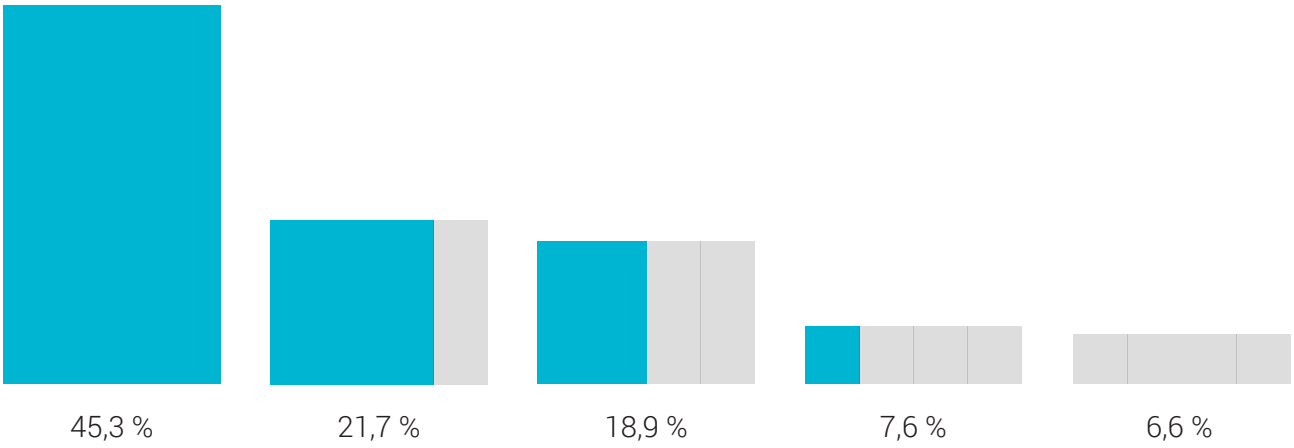
The term "digital maturity" describes ICT integration in schools at an organisational level. A range of ICT conditions can affect a school's operations, and a digitally mature school is characterised by a systematic approach to the ICT field. In Monitor Skole 2016 we discuss digital maturity as a construct that can be split into five fields: equipment, planning work, management, organisation and digital skills.

There are considerable differences between schools with regard to how head teachers evaluate digital maturity in schools. We found the greatest variety when it came to equipment. This field measures factors like quality of equipment and infrastructure, as well as how well the organisation of the digital equipment works at the school. In this field there are schools that report a completely unsatisfactory equipment situation, which in turn offers a very poor basis on which to provide good teaching with ICT. However, although some schools score consistently poorly on the different factors, we see that the majority of schools have strong and weak areas – an uneven profile. Digital maturity highlights the importance of a comprehensive focus, which means that schools must identify areas in which they are weak to work on systematically over time.

Many schools have come a long way and have been successful in their ICT integration, but many have also experienced vulnerability as a result of the lack of any systematic approach or long-term view. Over time, however, the field has grown so extensive and far-reaching with regard to school activities that we are now seeing a greater level of support and systematics in ICT work. Among other things, this is apparent in the tendency to move a number of tasks, responsibilities and to some extent decisions from school level actors to school owners. School owners are increasingly responsible for purchasing digital learning resources and computer equipment, as well as for providing pedagogical and technical support. As ICT systems grow and become more complex, responsibility for operations is increasingly held centrally by the school owner. This centralisation tendency can be viewed as a step towards professionalisation and the maturity of the ICT field in schools. Moving responsibility and decisions upwards in the system presents considerable advantages, especially with regard to consistency. The fact that schools in the same municipality gain a centrally decided minimum supply of equipment and digital learning resources is a good starting point on which to build consistent conditions in the ICT field. On the other hand, it is important that the schools have some room to adapt to meet local needs. Equipment, infrastructure, learning resources and competence must be adapted to the individual school's organisation, pedagogical platform and practice.

Head teachers that agree somewhat or completely that technology is satisfactory in four areas

(Internet, computers/tablets, projectors/interaktiv whiteboard, digital learning materials)



Competencies

The digital competence of both students and teachers represents an important theme of Monitor Skole. In addition to assessing one's ability to perform different common tasks using a computer, the study also contains a test on digital competence in which all of the questions relate to skills targets for students in year 7.

Teachers generally report a high level of digital competence. They state that they are most skilled at searching for information and least skilled at using co-writing tools and typical operations in spreadsheets. In general, the teachers also completed many of the tasks in the test, but in 2 of the 17 tasks less than 40 % of the teachers chose the correct answer. There is a good level of conformity between the teachers' assessment of their own competence and their score on the test. However, students evaluate their digital competence as being better than is justified by their results in the test. Three out of four believe that they can perform the five self-assessed tasks, but the average score on the test was roughly 50 %.

One part of the test for both students and teachers consisted of tasks relating to the use of spreadsheets. The students' average score on this part was 39.2 %, compared to 61 % on the part of the test relating to digital skills. Spreadsheets are also the part of the students' self-reported digital skills that appears weakest, with 37.8 % of students believing they can perform and present calculations in a spreadsheet without any help. Teachers' self-efficacy presents a similar situation; their use of spreadsheets comes out poorly compared to other competences. Just over half of all teachers (not only mathematics teachers) believe that they can perform and present calculations in a spreadsheet without any help. The teachers also received a lower score on the mathematics part of the test than on the other questions.

The teachers stress trial and error and peer guidance when asked about the importance of different forms of competence development. Internal courses are described as being less significant, and this may be linked to the fact that almost half of head teachers report that their schools do not have pedagogical ICT support teams with any formal responsibilities. If internal courses are to have an effect on teachers' competence development, resources are needed at the school in question. In addition, time must be allocated for this by the school's management team, but something remains to be done here too. Roughly half of the head teachers report that too little or no resources for competence enhancement are allocated in the fields of basic skills, pedagogical competence in ICT use and the integration of subject-specific learning resources. The two most important mechanisms for competence development highlighted by the head teachers are informal contact and competence exchanges between colleagues. Also highlighted as important are formalised meeting places, such as the fixed department meetings, where colleagues can exchange their experiences. The main impression given is that competence development for teachers has only a modest presence in many schools' planning work, is only partly formalised and is often schools-based.

Use of ICT in mathematics

The students' use of ICT in mathematics follows a different pattern to the use we have studied in other subjects and more generally at school. Students generally report a positive experience of ICT use in mathematics, but to a lesser extent than they do with ICT at school in general. There are also a number of students who feel that ICT use in mathematics distracts them more than it otherwise does in school. Nevertheless, the bigger picture shows that the students have a positive attitude to the subject, are positive about ICT use and only feel distracted to a small extent when using ICT in mathematics. Monitor Skole 2016 reinforces the impression that digital technologies are used less in mathematics than in many other school subjects. Roughly half of students state that they use ICT for half an hour or less per week in mathematics in school, and 16% report that they never use ICT at school in the subject. Using technology at home can to some extent compensate for not being able to use it during school hours, but we have seen that this is not the case for a number of the students in this study. 11 % of students do not use computers/tablets in mathematics – either at home or at school.

Spreadsheet use is essential to being able to meet the year 7 skills targets for mathematics. When asked which digital learning resources they use in mathematics at school or at home, the majority state that they use spreadsheets. However, it is nevertheless no more than just over 40 % in total that say this. Teachers were also asked about the extent to which they use digital resources in their mathematics teaching. Just under 30 % answer that they use spreadsheets very or quite often, which places this resource far behind other online resources and office support programmes.

Teachers state that online resources linked to textbook series, other online resources such as matematikk.org and word processors are the digital resources they use most often in their mathematics teaching. It is no surprise that websites linked to the textbook series have an important position here. Mathematics has traditionally been a textbook-driven subject, and the associated online resources are strongly linked to the textbooks with regard to both content and structure.