

# THE DIGITAL STATE OF AFFAIRS IN NORWEGIAN SCHOOLS 2009

*The Long and Winding Road*

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The Knowledge Promotion is the latest Norwegian reform in the 10-year compulsory school and in upper secondary education and training- The reform took effect in autumn 2006 for pupils in grades 1–9 in 10-year compulsory school and for pupils in their first year of upper secondary education and training (i.e. the 11th grade). The following are the most important changes in the Norwegian school system that stem from the Knowledge Promotion:

Under the Knowledge Promotion, schools are to prioritize the cultivation of basic skills in all subjects. This is an important foundation for all other learning. These basic skills are as follows:

- the ability to express oneself orally
- the ability to read
- the ability to do arithmetic
- the ability to express oneself in writing
- the ability to make use of information and communication technology

These basic skills have been incorporated into the subject syllabuses for all subjects. All teachers are therefore responsible for enabling pupils and apprentices/trainee teachers to develop basic skills through their work in various subjects.

The objective of ITU Monitor is to survey the use of ICT in Norwegian schools by teachers and students. In ITU Monitor 2009 we have, as in previous years, surveyed how often computers are used in school and for homework at home. In order to obtain indicators of how well digital skills are integrated with school subjects, we have also surveyed

how often computers are used in different lessons in school. We have also studied what computers are used for in school.

Both ITU Monitor 2007 and ITU Monitor 2009 show that Norwegian schools are on the right track regarding computer availability for students. In order for students and teachers to develop digital literacy, they need the time and opportunity to use a computer, and virtually all the students in the survey say they have such opportunity. Having enough computers is a prerequisite for learning and teaching with ICT, although not a sufficient condition for using ICT for teaching and learning. Better learning requires more than having a computer for each student. It is crucial that teachers improve their competence, that the infrastructure is adequate and that the school and teacher have developed clear learning objectives. ITU Monitor 2009 shows that a motivated and competent teacher who has the support of the school management is far better equipped to apply digital tools. Such tools have a positive effect on academic achievement and the student's digital literacy when used in a systematic, professional and educational manner.

With ITU Monitor 2009 we have introduced a digital literacy test that makes it possible to align information from teachers and school leaders with students' test scores. The test focuses on two relevant forms of competence (basic ICT and problem solving with ICT) along with elements of ethical assessments, use of multiple sources and communication. This selection was made because making a test that includes all types of competence contained in the term digital literacy would be too comprehensive and because the selected types of competence were best suited for trials. The sum of the answers is not an absolute measure of digital literacy, but it provides a good empirical indication of the students' level of knowledge. The results are interesting in their own right, but they can also shed light on important correlations between the students' digital literacy, their family background (or social position) and the organisational characteristics of the schools they attend.

Primary school still lags far behind upper secondary school in the use of ICT in daily schoolwork. The results from the period 2003 to 2009 show a developmental disparity in the use of ICT for students in primary school and upper secondary school. The disparity indicates that upper secondary school has come further in the use of ICT in teaching and learning. The gap between primary school and upper secondary school appears to be widening, and among our informants the difference has never been as big as in 2009.

In addition, we find now – as in previous surveys – that there are still major variations among students, schools and grade levels. Among teachers, we find a trend, similar to the students, where teachers in upper secondary school use ICT in subjects far more than their colleagues in the 7th and 9th grade.

Common for all grade levels is that computers are best integrated and used most frequently in the teaching of Norwegian language (i.e. daily use in the second year of upper secondary school). This also reflects that all grade levels primarily use computers for writing, but that reading is the fastest growing activity in this regard.

ITU Monitor 2009 shows that individual characteristics of the students, such as the home situation, academic achievement and mastery motivation, have an impact on their digital literacy. We see digital divides between students in the survey with regard to both computer utilisation and digital literacy. Divides in digital literacy are indicative of the students' academic achievement levels and home situation regarding their parents' education.

Moreover, we see that structural and organisational characteristics of the schools, such as how the school's ICT-plans are designed, have an impact on the students' digital literacy. We find a correlation between the school management's priorities in the educational use of ICT in the subjects and the students' scores on the digital literacy test.

Common for all the three grade levels is a positive correlation between ICT use in subjects like Norwegian, English, social studies, mathematics and science, and the fact that the school leader reports that the school has a person employed full-time as ICT coordinator. There is also a positive correlation in VG2 between having a fulltime ICT coordinator and students' scores on the digital literacy test.

Among the teachers in the survey there is a positive correlation between their digital literacy test scores and the time they spend on a computer. For 7<sup>th</sup> grade teachers there is a positive correlation between having a full-time ICT coordinator and their scores on the digital literacy test. The teachers in ITU Monitor 2009 are most satisfied with upgrading their own ICT skills through trial and error as well as guidance from colleagues. The teachers report a relatively limited use of digital learning resources.

ITU Monitor 2009 shows that the difference between ICT in primary school and upper secondary school is increasing. The two school forms have different ownership structures and vastly different financial and organisational frameworks for ICT. The fact that the municipalities own the primary schools and the county municipalities own the upper secondary schools explains some of the differences in general conditions, for example with regard to free digital learning resources from the National Digital Learning Arena (NDLA). Such resources are currently used in programme for health and social care, science and Norwegian.

As of the school year 2008/2009, many county municipalities have provided (and financed in various ways) Upper Secondary 1 students with laptops. Such availability opens for more direct and personal learning with ICT. Availability of computers in primary school has been improved in recent years. However, access to computers in upper secondary school is much better compared to primary school. Access of computers in upper secondary school education impacts not only availability of learning resources produced for learning purposes, but also the probability that other available online resources and digital tools that can supplement textbooks will be used. However, the increasing density of computers also brings with it a number of issues relating to finance and infrastructure that school owners should be particularly aware of. Almost all computers in

Norwegian schools are connected to the Internet (a greater percentage in upper secondary school than in primary school), but the schools encounter problems such as low broadband capacity and poor stability in wireless networks.

During the course of ITU's inspiration seminars for upper secondary school leaders (September 2008 – March 2009), many school leaders expressed frustration over the great amount of time and resources required to operate and maintain the school's ICT equipment. When the density of computers in the primary and lower secondary school increases, there is reason to believe that such issues will follow. Long-term follow-up and financial planning of infrastructure is central when investments tie up budgets over several years, and close dialogue between school and school owner is hence very important. Within the general frameworks provided by municipalities and county municipalities, it will thus be a challenge for schools and school owners to have sufficient competence to purchase and order infrastructure and learning resources.

The digital literacy test included in ITU Monitor 2009 shows that students' scores are linked to both individual situations and the situation at school. In other words, the home situation is not the only factor impacting the students' test scores. We see tendencies that the school also influences the students' digital literacy. Results show that the school leaders' attitudes toward the educational use of ICT and the priorities that they make have an influence on the students' test scores.

The teachers in ITU Monitor 2009 report having a somewhat limited selection of digital learning resources. The results from ITU Monitor 2009 show that some schools have made considerable progress in the use of digital learning resources, but many of the schools still have much to do to develop and use subject-specific digital learning resources.

In many ways, teacher training emerges as a systemic issue that has major impact on both the school and on the teaching itself. In today's Norwegian schools, it is expected that teachers (digitally literate or not) shall teach students how to locate information, manage to reflect on ethical dilemmas and solve rather sophisticated problems with the aid of ICT. Consequently, there is a need for new, obligatory plans and targeted resources for a strategic competency training of today's teachers and student teachers.

The results from the survey's participants show a great variation between schools and between individuals (students, teachers and school leaders) in a number of factors relating to the educational use of ICT. It seems necessary to have a national strategic plan that provides direction, frameworks and possibilities to create a school that students need to be optimally equipped for going on to higher education and working life. Among other things, it means developing digital teaching aids of adequate quality with regard to curriculum and subject, and a basic technological level that enables a school to apply these teaching aids as a didactic tool in teaching. It is also important to work on enhancing ICT in teacher training and in competency training of teachers in school. One of the school's

most important tasks is to ensure a learning environment for its students. ICT can improve the standard of teachers' practice and students' learning, but this presupposes a good technological infrastructure, high-quality digital teaching and teachers who use ICT as a didactic tool in teaching. A proactive commitment to targeted competency training of teachers can help reduce digital divides among both teachers and students.

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