Trends in the use of computers in Danish primary and lower secondary schools
- Number of computers, Location and Internet access.

Use of IT is not a separate course in primary and lower secondary education (K9). On the contrary the act states that the use of IT must be integrated in every course and study program where-ever relevant. "The use of IT is not a goal, it is a tool to encourage and support learning" says Danish Minister of Education Bertel Haarder.

Number of students pr. computer
In 1992 an average of 63 students shared one modern computer. By 1996 this number had dropped to 28 students pr. modern computer even though this was an improvement the number was far from promising. Thus in the budget agreement between the Government and the local authorities in 1997, a goal of no more than 10 students pr. modern computer was set for the year 2003. The increase of modern computers from 1996-99 exceeded expectations reducing the national average to 10.8 students pr. modern computer in 1999. A steadily increase the following years led to a national average of 9.8 students pr. computer in 2002/2003 – thus reaching the target set.

In May 2002 the Government organized a cross-departmental working group, tasked with describing access and use of computers for students in primary and lower secondary education (K9)\(^1\). The survey

\(^1\) The Survey: "Undersøgelse af IT i folkeskolen" (2002)
The Ministry of Education
Department of primary, lower secondary and general adult education

showed a 10% increase in the number of modern computers from 1999-2002.\(^2\) However the increase was not sufficient enough to achieve the 1997-goal of less than 10 students pr. modern computer.

The new policy plan (see below) led to a rapid decrease in the number of students pr. modern computer. In 2006 the number had been reduced to a national average of 4.8 students pr. modern computer. The consequences for students directly affected by the policy plan were that they only had to share a modern computer with one other student.\(^3\)

In 2003 the Government adopted a policy plan (ITIF)\(^4\) with the goal of increasing the digital competences of students in primary and lower secondary education. The 2002 survey illuminated that the older students in particular were utilizing the computer facilities thus reducing the younger students’ access computers. To increase the younger students’ access to computers a full 75% of the $90 million funding for the policy plan were earmarked to co-finance the purchase of computers for 3rd graders.

From computer labs to near the students

The goal of the policy plan was to make computers a personal tool for students in the lower grades. To support this goal – only computers allocated directly to the classrooms or general educational areas of the third graders would receive government co-funding. Little had changed from 1999 to 2002 regarding where the computers would be placed at schools still 41% of the computers were found in computer labs\(^5\) - despite a 20% increase in the number of computers. But the new the policy plan has changed the infrastructure of schools by moving the computers from labs to the classrooms. As shown below the computer labs were still dominant (with 25%) in 2006 but the number of portable com-

\(^2\) The low number is despite the fact that fewer schools responded to the 2002 than 1999 survey.

\(^3\) More data; "http://cis.emu.dk/public_national_oversigt.do"

\(^4\) "IT i folkeskolen" (ITIF) – Information and Communication Technology in public primary and lower secondary education (K9).

\(^5\) The 2002 survey and repport: "IT i folkeskolen 2002: Status for elevers adgang til computere og anvendelse af IT i folkeskolen"
puters/laptops are catching up (23%). A total of 29% of computers in the classrooms (18%) and the surrounding areas (11%) indicate that the goal of increasing students’ access to computers is succeeding. When focussing solely at the computers purchased within the policy plan a total of 52% of the computers are portables/laptops and only 16% of the computers are in computer labs. 27% of the computers are found in the classroom and adjacent areas.

### Access to the Internet

The most significant change when speaking of computers in the period from 1999 to 2002 concerns access to the Internet. In 1999 18 students had to share a computer to gain Internet access, this was cut down by half to only 9 students by 2002.

During the 1990’es local networks spread throughout schools. 29% of schools had their own local network in 1996 this had increased to 94% in 2002. The rapid spread of local networks, in particular during the three-year period of 1999-2002 is linked to the Governments policy of digitally connecting the educational sector on national scale (the Sektornet) from 1994. To become edible for Government funding, the institutions of education had to establish local networks. In 2002 more than 97% of all public schools of primary and lower secondary education had access to the Internet and 81% of the educational computers were connected to the Internet. This number has increased to 99.7% in 2006.

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6 In 3. & 4. grade 217 computers were converted to thin clients and 139,133 computers are connected to a local network.
The next challenge
The Government policy-plans of the 1990s and the new millennia constitute the technical foundation for integration of IT in education. An ever increasing number of schools use interactive whiteboards,\(^7\) and more and more schools are experimenting with the application of pod- and vodcast \(^7\) in education. Furthermore by the end of 2007 almost all Danish public primary and lower secondary schools are using Learning Management Systems (LMS) for their daily communication. Unfortunately recent studies have disclosed that many schools does not yet benefit from the full potential of the Learning Management Systems. Teachers feel uncomfortable with the integration of computers in their lectures and in pace with the increase in the students’ digital skills teachers find themselves challenged beyond their IT competences. These challenges must be met to unlock the organizational and pedagogical potential of the Learning Management Systems thus increasing the digital competences of both teachers and students.

\(^7\) in 2006 the number of reported whiteboards had reached 2,013.