UNDERVISNINGS MINISTERIET

Information and Communication Technologies (ICT) in Upper Secondary Education

The Ministry of Education aims to increase and develop the use of ICT in education. Here are some facts and figures concerning the use of ICT in upper secondary education programmes.

Figures from the report "ICT in upper secondary education" by The Danish Evaluation Institute, 2005

- 82 per cent of the teachers have participated in in-service training in ICT
- 87 per cent of the teachers find that access to computers is good for them and the students
- 85 per cent of the teachers find the software good
- 63 per cent of the teachers have a computer at home paid for by the school
- 87 per cent of the teachers use the internet when preparing for lessons
- 84 per cent of the teachers let the students use the internet during lessons
- 69 per cent of the teachers use ICT for communication between teacher and students at least every week
- 80 per cent of the students use ICT for their written homework.

Figures concerning Danish upper secondary education from "Benchmarking Access and Use of ICT in European Schools", 2006

- 100 per cent of schools have a website
- 87 per cent of schools have an e-mail address for most of the teachers
- 63 per cent of schools have an e-mail address for most of the students
- 67 per cent of schools have computers in the classroom
- 77 per cent of schools have computers in the library
- 80 per cent of schools have computers in other locations accessible to students
- 91 per cent of schools have ICT integrated into the teaching of most subjects
- 98 per cent of teachers use ICT in class
- 92 per cent of teachers have the students use ICT in class.

The ministerial order and ICT

a) Use of ICT is mandatory in all curricula. There are no specifications about the extent in each subject, but guidelines are drawn up for every subject including examples of how the teacher can use ICT.

b) Schools are allowed to use 25 per cent of lessons for different ways of distance learning as a form of blended learning. The students do not have to be present in the classroom; they may be in the library, at home or other places. However, most schools still use classroom teaching most of the time.

c) During a school year, each student has to make a certain amount of written homework. The definition has changed and the written homework may now be multimedia products, i.e. PowerPoint presentations and similar.

d) All types of ICT are allowed at all examinations, both written and oral. The students are not allowed to use ICT for communication or for the internet, but that is the only limitation.

The use of ICT during examination

Since 1994 it has been an option for students to use ICT (mainly word processing) at written examinations in Danish, social sciences, biology and a few foreign languages. In the first period, it was a local school decision to allow the use of ICT. This was to make up for local differences in the scope of equipment and technical set-up. In the beginning, the computer must be 'clean' and only used as a typewriter.

From 1997 use of ICT has been permitted in commercial and technical upper secondary programmes (HHX and HTX) during all written examinations. The main rule is that all aids, which are permitted in paper form, are also permitted in electronic form. At the examination in year 2000, 98 per cent of the students in commercial upper secondary used a computer at the written examination in Danish – only 2 per cent chose to use paper and pencil.

From 2000 it was a general possibility for students in STX and HF to use computers with all types of programs in most of the subjects.

The students may use the schools' or their own computers.

Parallel to the increasing use of computers as typewriters up to 2000, the Ministry of Education began to draw up examination questions in electronic form in commercial and technical upper secondary programmes.

The starting point was the anomaly that students used ICT during almost all written examinations, whereas examination questions were not drawn up with a view to being answered by means of ICT, but by means of paper and pencil.

Some questions emerged: How should one formulate the questions if the answers were to be worked out by means of ICT? And would it hereby be possible to also test other desirable competencies than those tested through traditional examination papers? At the same time, the emphasis should be on the aims of the subjects – and not the ICT skills of the students.

The result of the development work was digital exam assignments based on a cd-rom in commercial and technical upper secondary programmes. Assignments began in 2001 with subjects such as Danish language, mathematics and business economics. Later subjects include ICT-exam assignments for physics and English.

A new kind of cross curricular exam assignment has been developed for two upper secondary

subjects: Business education and business economics and marketing. It is a case-study on a cd-rom containing a portrait of a Danish enterprise including a large amount of information about the enterprise, interviews with key persons, press releases, product information, accounts and other things.

The students are allowed two days at home with the cd-rom for preparation and this is followed by an oral examination. There is no question paper included in the cd-rom – since the idea is that the student use methods and theories from the two subjects and should be able to identify the problems of the enterprise and suggest how to solve the problems. This way, the students' understanding of the subjects is tested as well as their ability to use theory instead of merely learning by heart.

The next step

The limitations are the prohibition against use of the internet. The number of schools with wireless connection is increasing and this makes the control more difficult. And the missing relation to the students daily use: we expect them to use the internet doing their homework.

This is the background for a new pilot project. ICT-based exam assignments have been made, where the student has access to the internet in six different subjects: Three subjects in general upper secondary and three subjects in the commercial upper secondary programme.

The first exam was in June 2010 and the pilot continues in 2011.

One objective is also to digitalize the whole process which today is paper based. In the future, the examinations committee will only work digitally, the assignment will only exist digitally and the exam paper will also only exist digitally.