

The Use of ICT in Danish Schools. A study of experience and perspectives **English summary**

The use of information communication technology (ICT) in Danish schools has been a long time coming; from its modest early beginnings, such as the elective 'computer studies' in 1984, to its present status. Today, the Education Act regarding the Folkeskole (Danish primary and lower-secondary education) requires ICT to be integrated in the teaching of all subjects, at all levels.

In order to sum up the initiatives and experience gained throughout this process, the Danish Evaluation Institute (EVA) and the Danish Ministry of Education have carried out a project on how schools and municipalities have experienced the implementation and use of ICT in the Folkeskole, and their views regarding this work. The project was carried out by EVA and the Ministry of Education in collaboration with Local Government Denmark, The Danish Union of Teachers, Skolelederne (the Danish head teachers' association), an expert group, and 14 municipalities, during the period of March 2008 to August 2009. Altogether, more than 550 teachers, head teachers and municipal employees have participated in the various activities included in the project. The participants represent more than 70 different schools, and the local municipal employees represent more than 50 different municipalities.

This summary comprises the most significant conclusions reached in the project's study of experience and views on the use of ICT in schools. It also includes the most significant assessments and recommendations contributed by the associated expert group. Finally, the project is described in greater detail, and the history of ICT in Danish schools is outlined.

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The need for improved integration of ICT in individual subjects

The study shows that pupils, teachers and head teachers all experience that they benefit from the use of ICT for teaching purposes. They especially emphasize the internet, which provides faster and easier access to information. It also serves as an incentive for pupils that, employing ICT, they are able to make well-designed products; and pupils like to use presentation software when presenting their work in class.

The study shows that many teachers focus on the general pedagogic options and benefits provided by the use of ICT - e.g. that it motivates the pupils - and primarily use ICT to supplement their "standard teaching". Only a few teachers describe how they use ICT for subject-specific didactic purposes and in support of specific learning goals.

The expert group finds it problematic that teachers primarily focus on the general pedagogic usage and benefits of ICT, as the beneficial uses of ICT vary greatly depending on the nature of the subject. The expert group recommends that schools, based on Fælles Mål II (Shared Goals II), focus on the subject-content related benefits of employing ICT in teaching, and on the development of ICT-based, subject-specific didactics.

Knowledge sharing systems are primarily used for administrative and organisational purposes

The study shows that knowledge sharing systems are primarily used for administrative and organisational purposes, among teachers and between teachers and school management. As an example, teachers and school managements emphasise that ICT facilitates and speeds up information sharing as well as communication between colleagues, and eases

the process of booking equipment and materials. Knowledge sharing systems are, however, infrequently used as a means of sharing knowledge/information among teachers, and between teachers, pupils and parents.

At most schools, it is left up to each individual teacher to decide how and to what extent the knowledge sharing system should be employed. This limits its usefulness, and in some cases creates confusion among pupils and parents, who are puzzled by the often greatly varying levels, or frequency, of usage of knowledge sharing systems on the part of the school.

The expert group concludes that much could be gained by employing knowledge sharing systems for the purposes of sharing knowledge beyond the administrative and organisational levels. They recommend that schools utilise more fully the possibilities offered by the systems, in terms of knowledge sharing among teachers, e.g. the exchange of information about course planning and learning resources, and to promote communication and cooperation, among pupils as well as between the school and the parents.

Demand for practice-related and use-oriented qualification development

The study shows a persisting need to focus on teacher qualification development and support. There is an immediate demand among teachers for ICT courses, in spite of awareness that some previous courses have failed to upgrade or improve their teaching practices. The study identifies a need for new qualification development models that focus on integrating ICT into individual subjects and are more use-oriented, as well as being based on the teachers' specific needs. The study also uncovers a need to for qualification development to be more firmly rooted in the school structure, and that this task should not be left exclusively to individual resource persons or ICT enthusiasts. One solution suggested by teachers and head teachers is to base qualification development, inspiration and ICT implementation support in existing school structures, which already promote the development of subject-specific didactic practices, such as subject teams.

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The expert group recommends that ICT qualification development be closely linked with education-content goals and subject-specific didactics. Moreover, the expert group recommends a more use-oriented approach to qualification development, and a needs-based supply of qualification courses. Local and practice-related qualification development are judged to offer great potential benefits, as does an active effort on the part of schools to further pedagogical and didactic knowledge sharing among teachers, and to root qualification development within existing structural frameworks, such as the school team structure.

School managements must prioritise and follow up on the use of ICT

Several studies show that the school management plays a vital role in determining how ICT is used at the individual school. The present study confirms this. School managements are generally aware of their import in this regard, but several are unsure of what concrete measures to take in order to promote the implementation of ICT at their individual school.

The study shows that the participating schools have thus developed differing ICT cultures, and that school managements adopt differing positions. The study does not identify any one specific management model as the best suited to facilitate the use of ICT, but it does show that the schools with the most widespread ICT implementation are characterised by having managements that prioritise ICT, and actively follow up on its use.

According to the expert group, the school management is the decisive factor in ensuring that ICT is implemented in each school. The expert group recommends that school managements prioritise ICT, and assume responsibility for developing ICT usage. Moreover, the expert group concludes that beyond ensuring a framework for ICT implementation, it is necessary that the management also engages itself in and actively follows up on the quality of ICT usage in their school.

Access to ICT, but not always to well-functioning ICT

At several of the participating schools, head teachers and teachers feel that they now are doing well in terms of access to ICT equipment. Yet problems persist with getting the ICT equipment to function properly, and many teachers therefore experience a lack of access to well-functioning ICT. This has a negative effect on their use of ICT, and ultimately causes some teachers to refrain from using ICT altogether.

The study also shows that the responsibility for systems operation and technical support often rests with the municipality, and that many municipalities and schools have aimed to limit the responsibilities of the schools' own ICT supporters to the pedagogical applications of ICT. This distribution of responsibility, however, constitutes a challenge that in some cases has resulted in slow error correction, and has encumbered pedagogical use of ICT in school.

In some schools, pupils already have the option of bringing along their own computers and accessing the school network. In the future, schools as well as municipalities expect novel challenges in terms of ICT infrastructure, when more pupils start bringing their own laptop computers to school. Municipalities and schools face the task of preparing themselves for this situation.

The expert group deems it unsatisfactory that teachers and pupils at many schools lack access to well-functioning ICT. It recommends that municipalities give greater priority to ensuring that ICT equipment be operational, and that the pedagogical potential of using ICT in schools is not curtailed by efforts at centralisation.

About the project

The purpose of the project has been to take stock of the use of ICT in view of initiatives launched over a number of years, as well as to contribute to the continuing development of ICT implementation in schools.

The primary part of the project is a study conducted in 11 schools and 11 municipalities throughout Denmark. The study looks at the manner in which schools and municipalities use ICT for pedagogical and organisational purposes, and at the benefits of using ICT as perceived by pupils, parents, teachers, head teachers, and municipal employees responsible for ICT implementation in schools. The study comprises good as well as bad experience on the part of schools and municipalities, and focuses on present and future dilemmas facing them with regard to ICT use in schools.

The study is based on self-evaluation and interviews. It takes into consideration the experience and assessments of teachers, school managements as well as of municipal authorities, just as pupils and parents have been included in the study. The study has been conducted by EVA in collaboration with a group of experts, who have assessed the results and placed them in perspective, and made recommendations to schools and municipalities on the future use of ICT in schools.

To promote the future use of ICT at school, EVA has also published a guide to self-evaluation of the use of ICT.

Improving the benefits of ICT use in schools. Guide to self-evaluation

EVA has developed materials to assist schools and municipalities in improving their benefits from the use of ICT in schools. Carrying out a self-evaluation process in practice means being part of a group, discussing the current state of practice as perceived by the participants, evaluating the strengths and weaknesses of this practice, and which types of approach the participants would like to develop. During the process of self-evaluation, steps are taken to ensure that the participants systematically deal with every aspect of the subject.

The materials are meant for teachers, head teachers, and municipal employees responsible for ICT in schools. It consists of an introduction to the method of self-evaluation, work questions adapted to the different target groups, and templates for use by participants when taking notes during discussions. The self-evaluation process takes approximately three to four hours.

In addition to the self-evaluation guide, two memoranda have been prepared: one describing the experiences of municipalities and schools in connection with the Ministry of Education's initiative "IT i Folkeskolen" ("*It in the Folkeskole*") (ICTIF); the other comprising an analysis of the types of initiatives launched by 14 selected municipalities in support of the implementation of ICT in the Folkeskole in recent years, and of the resulting benefits experienced by the municipalities.

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Central national initiatives promoting ICT in schools

For the past 20-30 years, electronic data processing – later widening in scope, becoming 'information (communication) technology' – has been on the agenda for the Danish Folkeskole. Since the 1993 Education Act, ICT has been mandatory to integrate the aspect of ICT in all subjects. Municipal responsibility for the Folkeskole includes ensuring and developing the use of ICT in schools, but, through a number of national initiatives, the Ministry of Education has supported the development of infrastructure and frameworks for ICT in schools.

Technical infrastructure development and enhancement has long been a Danish priority. Since 1996, UNI-C, a Ministry of Education agency, has supplied Danish primary and lower-secondary schools with a shared, national network solution (Sektornet), and today almost all schools have internet access. Denmark ranks high in terms of having one of the highest percentages of pupils in primary and lower-secondary school with access to computers at school and at home, and in 2007, 3.98 pupils on average shared one late-model computer in the Folkeskole. For further information, see "Computere i skolen" (*Computers in School*): http://cis.emu.dk/public_national_oversigt.do .

Qualification development courses offered to teachers, to support of the use of ICT in their teaching, is another area that has received support in the form of a national initiative. Since the late 1990s, UNI-C has, among other things, offered a pedagogical ICT 'licence' course for teachers, (*Skole-IT (School ICT)*), which has been completed by more than 75% of Danish teachers.

Another area of focus has been the development of digital teaching materials and services the content of which is relevant to the teaching in the Folkeskole. Since 1997, UNI-C has

been developing EMU (Elektronisk Mødested for Undervisningsverdenen (*Electronic Meeting Place for the Fields of Teaching*)); a shared portal where teachers and pupils can access content relevant to Folkeskolen.

Efforts have been made to accumulate practical experience with ICT in schools, through the development initiative "IT og Medier i Folkeskolen" (ITMF) (*"ICT and Media in the Folkeskole"*) ITMF was implemented in the period of 2001-2004, and as one part of the initiative, 87 development projects focusing on the use of ICT and media in the Folkeskole were carried out. 46% of municipalities and 32 % of schools participated in an ITMF project.

Most recently, during the period of 2004-2008, the Ministry of Education has implemented the programme "IT i Folkeskolen" (ITIF) (*"ICT in the Folkeskole"*) the funds for which, including co-financing by the municipalities, came to approximately DKK 750m (approx. EURO 100m). Among other things, the programme has supported the purchase of computers for third-grade pupils, the development of new digital teaching materials, and making qualification development available, as well as additional educational content on the EMU site, and a number of tools for knowledge sharing and dissemination of "best practise".

Would you like to learn more?

The report and the guide to self-evaluation can be freely downloaded from <http://www.eva.dk/projekter/2008/it-i-folkeskolen>

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