DENMARK

Country Report on ICT in Education

Available on http://www.eun.org/observatory

Contact: Leo Højsholt-Poulsen, National Agency for IT and Learning, Danish Ministry of Children, Education and Equity

2015
# TABLE OF CONTENTS

Table of Contents ........................................................................................................................................... 1

1. THE EDUCATION CONTEXT ................................................................................................................... 1
   1.1 Key educational challenges and priorities ...................................................................................... 1
   1.2 Education reforms ............................................................................................................................ 3

2. ICT in education POLICY ....................................................................................................................... 7
   2.1 National/regional ICT policies ......................................................................................................... 7
   2.2 Responsibilities ................................................................................................................................. 8
   2.3 Specific ICT initiatives ...................................................................................................................... 8
   2.4 ICT priorities .................................................................................................................................... 13

3. The curriculum and ICT .......................................................................................................................... 14
   3.1 ICT based assessment ....................................................................................................................... 14
   3.2 School improvement with ICT ......................................................................................................... 16
   3.3 The curriculum framework ............................................................................................................. 16
   3.4 ICT in the curriculum ....................................................................................................................... 16
   3.5 Students’ ICT competence .............................................................................................................. 16
   3.6 Assessment of ICT competence ....................................................................................................... 17

4. DIGITAL LEARNING RESOURCES AND SERVICES ............................................................................. 17
   4.1 E- Content development .................................................................................................................. 17
   4.2 Content sharing ............................................................................................................................... 18
   4.3 Accessibility for learner with disabilities and social inclusion ....................................................... 19
   4.4 Web 2.0 .......................................................................................................................................... 20
   4.5 Learning Platforms ......................................................................................................................... 20

5. TEACHER EDUCATION FOR ICT ......................................................................................................... 20
   5.1 Assessment schemes ....................................................................................................................... 20
   5.2 School leader support ...................................................................................................................... 20
   5.3 ICT for inclusion ............................................................................................................................. 21
   5.4 ICT in initial teacher education ....................................................................................................... 22
   5.5 ICT in in-service teacher education ............................................................................................... 22
   5.6 Training the teacher trainers ........................................................................................................... 23
1. THE EDUCATION CONTEXT

1.1 KEY EDUCATIONAL CHALLENGES AND PRIORITIES

See Overview of the Danish Education System in English.

See Facts and key figures about education and training in Denmark in English.

According to a study from 2013 by The Danish Evaluation Institute, EVA, commissioned by the Ministry of Education, the key educational challenges of public schools differ seen from the perspectives of different groups of stakeholders:

Key challenges

1) Inclusion and inclusive communities
   Put forward by stakeholders: Teachers, pedagogues, school leaders / school managers, parents, students, researchers, local politicians

2) Differentiated teaching and learning
   Put forward by stakeholders: Teachers, school leaders / school managers, researchers, local politicians

3) Leadership
   Put forward by stakeholders: School leaders / school managers, researchers, local politicians

4) ICT as a learning tool
   Put forward by stakeholders: Teachers, school leaders / school managers, students, local politicians

5) Strengthening of teachers’ didactic competencies
   Put forward by stakeholders: Teachers, school leaders / school managers

6) The school has a narrow focus and does not motivate all
   Put forward by stakeholders: Researchers, local politicians

7) What characterizes good teaching
   Put forward by stakeholders: Students

8) Aligning expectations between school and home
   Put forward by stakeholders: Parents

9) The division between school and leisure
   Put forward by stakeholders: SFO pedagogues

10) Teacher-pedagogue cooperation
    Put forward by stakeholders: SFO pedagogues

11) Different understanding of the school’s mission / purpose
    Put forward by stakeholders: Researchers

12) The school as an institution that is difficult to change
    Put forward by stakeholders: Researchers

Many of the challenges that the students point at are addressed in the government’s initiative for public schools (see section 1.2 Education Reforms). They include:

- A more active and coherent school day will provide better opportunities for varied teaching, differentiated teaching and new ways of thinking learning and activities together.

- The government has allocated more than a billion kroner (133 Million Euro) for the training of teachers and leaders, among others, to strengthen the didactic knowledge that teachers in the survey asked for.

- A new team of learning consultants, employed by the MoE, are to strengthen the quality development locally (in the 98 municipalities and 1200+ primary/lower secondary schools) and promote the culture change that stakeholders request.

Another key challenge is youth education in general upper secondary schools and vocational schools: much too few students enter – and complete – vocational education. One of the initiatives to meet this challenge is the reform of vocational education. See section 1.2 Education Reforms.
By 2014, 74% of students enter general upper secondary education, and a reform of this education area is currently heavily debated and on the agenda of the new government (put into office in June 2015). Traditionally, broad political compromises govern Danish education, and no agreement is expected to be reached before 2016.

An increased use of ICT in public schools plays a very important role in the government’s objective to strengthen the academic standards in Danish schools. A key part of the objective is that ICT should be more closely integrated into the daily lessons. In this way, the huge potential for ICT-based teaching is utilized to create a modern and technologically stronger school.

The action is part of the eGovernment Strategy 2011-2015. The government and the association of municipalities, ‘Local Government Denmark’, have agreed to extend the initiative until the end of 2017.

The 67 Million Euro (total State funding) initiative includes support for digital learning resources, competence networks and more research. It’s four main elements to increase and qualify the use of ICT in primary and lower secondary schools are:

1) Sufficient ICT infrastructure,
2) The market for digital learning resources,
3) Competencies and sharing knowledge,
4) Research and knowledge on ICT-based learning.

1) Access to sufficient ICT infrastructure

- the foundation for increasing the use of ICT in public schools,
  - Stable wireless network at all schools,
  - Bring your own device strategy (BYOD),
  - Access to computer or other device for all learners by August 2014,
  - User portal platform from 2016 (a common digital entry/dashboard for students, parents and teachers to support communication and learning).

Local Government Denmark is responsible for implementing and financing this initiative.

2) Development of the market for digital learning resources

- Support the municipalities purchase of digital learning resources (on demand)
  - Support the municipality’s purchase of digital learning resources with a government grant in order to develop a sustainable market and large supply of high quality learning resources.
  - MoE covers 50% of the expenses.
  - Each municipality has a credit facility (approx. 15 euro per student in 2015).
  - The municipalities decide how they prioritize the grant among the schools.
- Investment in developing digital tools and learning resources (supply)
  - Financial support to companies developing new digital learning materials.
  - Focus on new innovative learning resources that are not available on the market today, and which support the new primary and lower secondary school.
  - Idea – or market development

3) Competencies and sharing knowledge

- Network of school principals on leading digital change
- Network of teachers using ICT
- Network of development of digital learning resources

And new paragraph in teacher education:

“The student can plan, implement and develop teaching with and about ICT and media that support students’ ability to act as a critical investigator, analysing recipient, purposeful and creative producer and responsible participant”

4) Research projects on ICT-based learning (a number of ‘demonstration schools’)

- How can ICT and digital learning resources
1.2 EDUCATION REFORMS

The public school (‘Folkeskolen’; K-10, primary and lower secondary) has experienced three major reform elements that have a huge impact on this area of education.

a) Improving the Public School


Link: http://eng.uvm.dk/~media/UVM/Filer/Eng-lish/PDF/140708%20Improving%20the%20Public%20School.pdf

Key priorities:

- A longer and more varied school day,
- Students are given more time and support in a school day, where teachers and pedagogues collaborate on learning, motivation and well-being.

1) Assisted learning
The longer and more varied school day will give schools additional time for assisted learning.

2) More PE and physical exercise and activity
Physical exercise and activity must be included to an extent corresponding to approximately 45 minutes per day during the longer and more varied school day.

3) Homework assistance
Following the general election in June 2015, it has become compulsory for schools to offer academic in-depth study and homework assistance as part of the longer school day.

4) Better teaching
The academic standards of all children must be improved, and a focused effort will thus be made to improve the quality of the lessons and ensure measurable improvements.

5) More lessons in Danish and math
Danish and math will be strengthened at form levels four to nine by increasing the number of lessons for both subjects corresponding to one additional weekly lesson compared to the currently suggested number of lessons.

6) Strengthening of foreign languages
English will be introduced already from form level 1, and lessons in German or French will be moved up to form level 5 and made compulsory.

7) New subjects: Crafts and design and Nutrition knowledge
Woodwork and needlecraft and the subject of home economics make way for two new subjects.

8) The open schools
Schools are encouraged to work more closely with local sports clubs, cultural centres and other associations.

9) Improved transition to higher education
Older students must be motivated to learn more and elective subjects provide them with the chance to focus on specific interests.

10) Few and clear objectives for the Folkeskole
The strengths and the professionalism of the Folkeskole will be maintained and developed by working towards three objectives.
11) **Competency development**
   The government will allocate DKK one billion between 2014-2020 to strengthen continued development of competencies among teachers and pedagogues in the Folkeskole.

12) **Better learning environment and quietness in class**
   Quietness in class, good friendships, good classroom management and a good school environment are prerequisites for the students’ desire to learn and their ability to do so. At the same time, they are prerequisites for teachers’ ability to teach.

13) **Learning consultants**
   A national corps of approximately 40 learning consultants will be established to offer municipalities and schools advice on quality development.

14) **Stronger parental influence and increased student participation**
   Parents are an important resource and must contribute to the school’s work, which will be specified in the Folkeskole Act.

15) **Simplification of rules**
   The Folkeskole will be managed based on few and clear objectives and be less dependent on rules and procedural demands.

**b) New Common Objectives (Curriculum reform of the Danish Public school)**

The new Common Objectives for primary and lower secondary education are part of the school reform objective that all students should be as knowledgeable as they can. The former curriculum described what teaching should contain. The new simplified curriculum describes what students should learn. From August 2014.

**The three goals for primary and lower secondary school:**

- The school must challenge all students to reach their fullest potential.
- The school must reduce the significance of students’ social background for academic results.
- The trust in school and student well-being must be enhanced by showing respect for professional knowledge and practice.

**Common Objectives is a curriculum framework, and a tool for teaching based on learning objectives:**

- No national curriculum, but attainment targets for all subjects,
- The focus is on learning objectives and not on curriculum content/learning material,
- Learning objectives – instead of content objectives,
- Based on competencies; separated into skills and knowledge objectives,
- Change of framework – not content of the subjects.

**c) Rules for the working time for the education area at the municipalities (by August 2014)**

In Denmark, public schools are owned and governed by the municipalities. Local Government Denmark (the association of Danish municipalities) and the teachers’ union have agreed on new rules for the working hours of teachers in public schools.

Central elements:

- Annual norm
- Average teaching hours per week: 27 hours (10 hours preparation time)
- Normally, working hours (37 hours per week) are in the daytime, Monday to Friday
- Teachers are entitled to an overview of tasks prepared in a dialogue between school leader and teacher
- Ongoing changes and adjustments are introduced according to the needs of the students and the schools
- Need for significant changes must be discussed as soon as possible between management and teacher
- Right to time off or overtime pay by performed overtime, calculated by the end of the year
- Disadvantage Compensation for imposed work at odd times

It is a management decision how much teaching and other tasks, the teacher must carry out.

d) Improving Vocational Education and Training

Reform of the Danish vocational education system as of August 2015

Link: [http://www.uvm.dk/~media/UVM/Filer/English/PDF/140708%20Improving%20Vocational%20Education%20and%20Training.ashx?smarturl404=true](http://www.uvm.dk/~media/UVM/Filer/English/PDF/140708%20Improving%20Vocational%20Education%20and%20Training.ashx?smarturl404=true)

Clear Objectives

The reform agreement establishes four overall objectives for vocational education and training (VET). The four objectives will be translated into measurable result targets for monitoring the development of VETs at central level and at school level.

- More students must choose to start a VET immediately following form level,
- More people must complete a VET,
- The VETs must challenge all students so they may reach their fullest potential,
- The trust and well-being in the VETs must be strengthened.

1) An Attractive Youth Education Environment

The youth education environment at vocational education and training institutions must be academically and socially inspiring.

2) A Simpler Structure and Greater Clarity

It must be easier and more predictable for young people to choose a VET. Therefore, new basic programmes of uniform duration and structure will be established across main subject areas.

3) Better Opportunities for Continued Education

VETs must first and foremost be oriented towards the job market, but young people who complete a VET must have better opportunities for continued education if they want to.

4) New VET for Adults 25 Years or Older

In parallel to the efforts at making VETs a more attractive choice for young people, adults 25 years or older must be offered a more attractive, predictable and goal-oriented path from low skilled to skilled worker. This will be accomplished by the establishment of a VET for adults (EUV), which will be the future path to a VET for adults 25 years or older.

5) Clear Admission Requirements and Offers for All Young People

An admission requirement of 02 will be introduced for Danish and maths to clarify which fundamental qualifications are necessary in order to follow the education and complete a VET. Moreover, the trade committees will get more opportunities to demand specific skills prior to admission to the main programme.
6) **New Vocationally Oriented Form Level 10 (eud10)**

A new stream will be established in the Folke-skole’s form level 10 (eud10) which must prepare the students for the VETs and ensure that they meet admission requirements. This is aimed at students who are motivated for a VET, but who do not meet admission requirements or are uncertain whether the education is the right choice for them.

7) **New Combined Post-Compulsory Education**

A new combined post-compulsory education will be established as an occupation-oriented, qualifying post-compulsory education offer for people aged 15-24 who do not possess the necessary vocational, social or personal skills to complete a VET or an upper secondary education. Students may also obtain a foundation for further qualifying education.

8) **More and Improved Education Must Result in More Competent Skilled Workers**

The quality of the VETs must be significantly improved through more and better teaching. This will be ensured through multi-pronged efforts such as more teaching time, a significant boost of teachers’ skills, a clearer link between schooling and internships and more varied and differentiated lessons.

9) **Continued Efforts Regarding Internships and a Stronger Education Guarantee**

Efforts to establish internships must continue to be improved. At the same time, the education guarantee will become stronger so that students will receive a credible and effective education guarantee. The guarantee must cover the entire spectrum of education, and the access to school-based practical training must be increased by the establishment of additional openings and by offering more education opportunities featuring school-based practical training.

10) **Focusing of Guidance Activities**

All students must receive guidance, but not everyone needs individual guidance. The agreement stipulates that guidance activities must be focused in order to secure earlier, better and more goal-oriented efforts for students in primary and lower secondary schools who are at risk of not proceeding to a post-compulsory education.

e) **Reform of Teacher Education (by September 2013)**

The purpose of the reform is an academically stronger and more attractive teacher education that caters for the needs of primary and secondary schools, is permeated in general education and raises the bar for the teachers to improve tomorrow’s primary and lower secondary school.

The goal is that teachers teach subjects they have teaching competence in so that children in basic school meet more teachers who have an excellent academic knowledge of just the subjects that are part of the school curriculum.

**Facts about the new teacher education:**

1) Increased focus on the student’s skills – what is expected by a teacher,
2) Masters teaching skills in three subjects in public school,
3) Strengthens the teacher’s basic knowledge by bringing together the disciplines of psychology, didactics and pedagogy,
4) Provides greater choice and opportunities for toning,
5) Makes it easier to study a semester abroad,
6) Is modular and therefore more flexible.

Link: [http://www.emu.dk/modul/l%C3%A6rerruddannelsen-2013](http://www.emu.dk/modul/l%C3%A6rerruddannelsen-2013)
2. ICT IN EDUCATION POLICY

2.1. NATIONAL/REGIONAL ICT POLICIES

See Common Objectives for basic, compulsory education, K-10, primary and lower secondary; Folkeskolen.

ICT in the curriculum of primary and lower secondary education

ICT is incorporated across the Common Objectives, integrated in all subjects. There are no separate objectives for ICT in the curriculum. However, the curriculum is supplemented by guidelines on how to embed ICT and media in the academic subjects, including the expected positions and skills of the student; see IT and media as a cross curricular subject.

See section 3.5. Students’ ICT competence

Four student positions are highlighted in the specific objectives for each subject:

- The student as a critical investigator,
- The student as an analysing recipient,
- The student as a producer,
- The student as a responsible participant.

‘Digital awareness’ is part of the subject Danish (i.e. awareness of the consequences of making certain remarks on the internet, digital footsteps).

ICT in primary and lower secondary education (age 6-16)

See section 1.1 Key educational challenges and priorities; An increased use of ICT in public schools

ICT in upper secondary education (age 16-19)

Digital tools are now in all students’ pockets – or at the table, and this creates new opportunities for:

- Sharing (files, writing together….)
- Communication (between students, student and teacher, teachers)
- Production (text, picture, broadcast, film…)
- Digital teaching materials and interactive whiteboards

a) Curriculum/basic skills

Currently: ICT is used for external materials, visualization, communication, perspective, etc.

In the future: The students must develop curriculum-relevant skills:

- Further and more complex ICT skills,
- Critical collection and validation of information,
- Sorting, evaluating and integrating relevant information,
- Increase of students’ own production – alone and together,
- Involve, use and develop relevant digital communities,
- Creative and innovative skills and methods,
- Ethics, security, attitudes (at the net).

b) In this way ICT changes everything – irreversibly.

- Individual work → group work ← classroom teaching,
- Collaboration between students change,
- Teaching materials and processes can be more personalized and adaptive,
- Students’ work can easily be surveyed => better help in the process and better understanding of learning processes,
- The student – teacher relation changes: product → process,
- The teacher – teacher – relation changes: More co-work on the teaching situation, the students and teaching materials,
- Qualifications and competencies change,
- Digital exams: both process and content change,
- Written exam with use of internet: OK,
- Oral examinations and adaptive tests.
As for ICT as a separate subject, the subject Information Technology is currently an optional subject in upper secondary technical schools and an optional pilot subject in other upper secondary schools. It is expected that the subject will be an optional subject in all upper secondary schools under the name ‘Informatics’, possibly by 2016.

See also section 1.2 Education reforms

2.2. RESPONSIBILITIES

Public primary and lower secondary schools (K-10; ‘Folkeskolen’) are owned and governed by the municipalities. Thus, they pay for everything from the school buildings, salaries, ICT infrastructure to learning resources.

In addition, there are a number of private schools, which provide compulsory, basic education (K-10). They are financed by substantial subsidies from the municipalities and payments from parents.

All basic schools follow the same attainment targets, set out in the national curriculum. How they do this is a local decision and responsibility.

Upper secondary schools, including vocational schools, are self-governed institutions, subsidised by the state - primarily based on the number of students. The same financing model applies to institutions for further education.

All self-governed schools follow the nationally defined curriculum, depending on the area of education. How they do this is a local decision and responsibility.

2.3. SPECIFIC ICT INITIATIVES

1:1 mobile learning initiatives (including the use of netbooks, laptops, tablets, mobile phones or other mobile devices)

Bring your own device strategy (BYOD) and access for all learners to a computer or other device are central elements of the national strategy for public schools. See section 1.1 Key educational challenges and priorities; An increased use of ICT in public schools.

Practically all upper secondary schools comply with a 1:1 mobile situation; (all) students bring their own device.

Throughout the country there are numerous local initiatives. A few examples are:

- **Student collaboration and knowledge sharing, Cromebooks in education**, Maarslet School, Municipality of Aarhus
- **iPads in public schools in Odder Municipality**, all students in Odder public schools were given an iPad; the project was initially followed by a team of Swedish researchers.
- **Educational IT and media learning in Rudersdal municipality** In 2014, the Rudersdal Municipality ran a pilot involving 11 day nurseries. The objective was to test iPads in the educational work. Based on the evaluation of the pilot project, in 2015-16 all educators at Children's Area in Rudersdal will get an iPad.

For further information:

- Report from Maarslet School, contact Ove Christensen
- Report from Odder Municipality.
- Evaluation report, Rudersdal

“IT and digital media are here to stay”, survey from 2014 on digital tools in daycare and day nurseries. The survey was commissioned by a number of ministries and Local Government Denmark (as public daycare and day nursery are the responsibility of municipalities), and included 600
leaders of day nurseries and case visits in six municipalities that are at the forefront of using digital tools, and dialogue with experts.

Main conclusions with respect to learning:

- 75% of daycare and day nurseries significantly use digital tools for learning,
- Half of the day care and day nurseries experience a significant learning effect,
- Digital tools can enhance the quality of the didactic work,
- It is difficult for many day care to figure out the possibilities,
- The pedagogues and educators should be equipped to integrate digital tools in the didactic practice.

For further information:

- Survey report

National IT services in the integration platform:

- Knowledge Portal - e.g. EMU, Materialeplatformen, SkoDa - Portals where you find inspiration for learning
- EMU portal - Overview of the knowledge, methods and tools with documented evidence of effect
- Materialeplatformen - national repository of learning resources
- SkoDa - access to a giant virtual library
- Common Objectives - Common Objectives describes national attainment targets at different steps in each subject
- Well-being objectives - National measurements of well-being in primary and lower secondary schools (indicators of students’ learning environment, well-being, peace and order)
- National online tests - Tools for continuous monitoring in primary and lower secondary school, which can contribute to future organization of learning
- The final exams

- Accession - Digitizing the application process for enrollment to secondary and higher education
- Guide to Education and Training / e-Guide - Digital guide providing information about education, jobs, business and labor, as well as offering guidance on training and job via email, chat, SMS or phone
- Data warehouse - A central data warehouse and business intelligence environment that gathers data on the entire education sector, e.g. analytical results from the MoE’s analyzes of national tests and examinations.

The goal is to progress from ‘information management to ‘data for teaching and learning’.
For example, the national online tests are also for use by teachers in their daily teaching. The data are to be used for more than summative management information. The detailed knowledge that the teacher gets about the student’s strengths and weaknesses in the different topics of the subject, can effectively be used formatively to intervene where the student needs help to move forward.

In general, there might be a point in a distinction between learning and teaching; the data recorded by a resource or a system of the student’s performance might direct or guide the student through her individual learning path. Also, the data might guide the teacher on the proper intervention that will help the student tackle the problems that appear to be the most difficult for her.

The strategy is to try to stimulate a data culture and make teachers curious to try. It offers teachers the opportunity to save time on evaluation and organization of teaching, freeing up more time for the teacher with students.

The premise is that schools are responsible for the data and their provision. The data that they supply to the State at the national level can also be used to learn about what works.

The MoE’s plan is to become sufficiently competent in the LA area, to be able to advise on it.
The issue of assessing, documenting and describing students’ progression in a standardized way transferable from one system to another across learning resources and platforms is not solved yet. A possibility might be to measure progression against the common attainment targets given by the national Common Objectives curriculum (for basic primary and lower secondary education). Pilots and research will be necessary.

**MOOCs for teacher professional development or initial teacher training or MOOCs for students, including certification**

In cooperation with the Research and Innovation and University College Zealand, CFU Zealand has developed 2 MOOC’s (in Danish!) aimed at anyone with an interest in primary and lower secondary schools and ICT, namely:

- Digital literacy in the 21st century
- Robotics and coding in school

Both MOOC’s are based on an ambition to make resources and knowledge available so that it can be used directly by teachers and educators in their work to develop IT in schools. Although participants along the way are dealing with the same subtopics, it is from different angles and with different resources as the basis, so that the common topics complement each other.

- Digital literacy in the 21st century, 36 participants
- Robotics and coding in school, 41 participants

**Digital literacy in the 21st century**

This MOOC aims to introduce the concepts of digitization, digital education and didactic design in a public school perspective. In the first half of the course, participants work with theoretical perspectives relevant to the area. In the other half, they work with practices based on the understanding of 21st century skills as central to didactic design.

**Robotics and coding in school**

This MOOC illustrates robotics and coding in the school from different social, ethical, didactic and practical angles. Via the various modules participants acquire a broad understanding of the area and will also underway have the opportunity to develop their own courses and develop practical skills that they can use in your future work area in the school.

**Teaching for Tomorrow**

An online e-learning course with characteristics of a MOOC.

The course is particularly aimed at lecturers who have an interest in online teaching and learning and lecturers who already undertake online teaching and learning activities or expect to do so in the future. It is offered in the academic year 2015/2016.

The purpose of the course is to give lecturers the competences necessary to design and deliver online courses. Furthermore, the course aims to provide lecturers with an opportunity to network across the partner institutions and find collaboration partners with a view to designing and delivering joint online courses to students.

The course is a cooperation project between Videnregion/Wissenregion Syddanmark Schleswig-Holstein (SDU, University College Syddanmark, University College Lillebælt, Christian-Albrechts-Universität zu Kiel, Fachhochschule Kiel, Fachhochschule Flensburg and Universität Flensburg).

An analysis on quality assurance of MOOC - Massive Online Open Courses

The Danish Accreditation Institution has initiated a transversal analysis of educational institutions’ MOOC. The institution expects that MOOCs will be offered by several higher education institutions in the future and in general be in focus in higher education. Overall, the project will generate knowledge about the role and potentials of
MOOCs in education, including how these courses can be meritorious and engaging in formalized courses. Particular focus will be on how the quality of a MOOC is ensured - both in the external quality assurance and in Danish higher education institutions’ own quality assurance of web-based courses.

The project was initiated in March 2015 and expected to be completed in late summer 2015.

For further information:
- MOOC Zealand (Contact: Pernille Lomholt Christensen)

ICT for inclusion (early school leavers, migrants, etc.) and special needs (physical, mental, emotional)

Inclusion has been identified by school key actors as the current, toughest challenge for schools. Furthermore, better inclusion is addressed as a special point in the policy basis of the new government (of June 2015).

See section 1.1 Key educational challenges and priorities.

Among other initiatives, the MoE has initiated three projects focusing on new forms of learning and digital learning resources that may help students with learning difficulties.

1) "I-DIDACT"
The project is aimed at the inclusion of students with development and attention disorders. Which IT and didactic tools work? Developing a ‘toolbox’ that can be used and combined depending on the needs of each class, student, teacher or parent in relation to inclusion. The project ends in 2015.

2) "Early reading"
The project is developing and testing an iPad-based tool to support early reading and differentiated teaching in pre-school. The project ends in 2014.

3) "Compensatory IT aids in primary school" / IT for dyslexics students

Most municipalities now offer help for dyslexic students in the form of digital learning resources. Especially students at intermediate level get help, but help has also become more widespread to students in primary school.

For further information: Contact for the three MoE projects: Line Knudsen

"Inclusion and differentiated education in digital learning environments"

One of five research projects of the "Demonstration schools" action line of the IT I Folkeskolen initiative deals with ICT for inclusion:

"Inclusion and differentiated education in digital learning environments”:

The project develops and tests learning activities that support inclusion, cooperation and individual self-regulation and frees teacher’s time for students with special educational needs.

Participating schools: Hadbjerg Skole, Favrskov Municipality; Christiansfeld Skole, Kolding Municipality; Nordvestskolen, Lolland Municipality; Højby Skole, Odense Municipality; Præstø Skole, Vordingborg Municipality

For further information: Contact: Jeppe Bundsgaard

Write to read at Specialskolen Tejbjerg

Tejbjerg is a special school at the municipality of Kalundborg. The students used the app “Write to read” to increase their motivation and skills to work with the written language.

The specific learning objectives were to:

1) learn the shape of the letters,
2) learn the sound of a letter;
3) learn reading from left to right,  
4) learn that a text is composed of letters, words and sentences,  
5) to copy words,  
6) to write small words yourself.

The pilot project ran with a limited number of students in 2013. The app is now used by other schools with students with special needs.

For further information:
- Video
- Contact: Jacob Thorsted
- Write to read

ICT for learning initiatives targeted to boost employability and entrepreneurship

Innovation and entrepreneurship is a cross-curricular subject in basic schools. ICT has no specific role in this context except that ICT is supposed to be integrated in all subjects.

One of the four student positions in the cross-curricular subject IT and media (see Section 3.5 Students’ ICT competence) is the position as “a focused and creative producer” strengthening the student’s potential as a future entrepreneur or employee.

The Danish Foundation for Entrepreneurship – Young Enterprise (a partnership between a number of ministries and a non-profit organisation) has developed the app OctoSkills. The goal of OctoSkills is to measure the impact of entrepreneurship education on students’ entrepreneurial competences across all educational levels. The measures are based on the research behind the ASTEE project.

The foundation seeks to promote the ability of being innovative to be a basic element in education from primary school to PhD. Innovation and entrepreneurship should be better incorporated into education and anchored in the educational institutions.

For further information: Contact: Kaare Moberg

FabLab@schooldk

The FabLab@SCHOOL concept was developed in 2009 by Professor Paulo Blikstein at Stanford University. Hitherto FabLabs and the cutting edge technology to design and construction was only an offer for college students, but Blikstein established a FabLab for primary and high school students.

In March 2013, Aarhus University, CAVI and Splnderhallerne, Vejle Municipality, took the initiative to establish the FabLab@SCHOOLdk cooperation in Denmark. The project is well in line with the focus that the two parties had on children, learning and technology and on children as design partners. Paulo Blikstein was interested in establishing a Danish partner project because of the interdisciplinary research approach with collaboration between researchers in learning, design and technology.

The municipalities of Aarhus and Silkeborg came on board as the first local authority partners in September 2013. Denmark is thus the first place in the world where the project is a collaboration between several municipalities, and where the concept is implemented in more than 15 municipal schools simultaneously.

The research and teaching concept has been adapted to Scandinavian conditions with a greater degree of user-driven development and as mentioned an interdisciplinary approach to education: focus on design thinking, digital fabrication and pedagogy / didactics.

Cloud computing and connectivity (e.g. wireless Internet, optical fibre connections)

Quite a number of schools, municipalities and regions operate with a cloud based strategy, and practically all Danish educational institutions are wi-fi’ed and hooked-up on very broad broadband...
See e.g. the Crome book project above in the section on 1:1 mobile initiatives.

It is noteworthy that some cloud-initiatives have given up due to unsolved issues of data security and protection.

Concretely, as part of the eGovernment Strategy 2011-2015, agreed by the government and the association of municipalities, Local Government Denmark, the municipalities have guaranteed to provide – and finance - sufficient infrastructure by 2017, including stable wireless networks at all public schools. See section 1.1. Key educational challenges and priorities

Other ICT initiatives of interest to other policymakers

Technology and media in upper secondary schools, a major R&D project initiated by the MoE and followed by a group of researchers at University of Aarhus: The focus of the projects in 17 upper secondary schools was on rethinking of teaching with the use of technology for communication, collaboration, media production.

For further information:
- A number of research reports are available.
- Research contact Helle Mathiasen

2.4. ICT PRIORITIES

A: Digital Competence Development

<table>
<thead>
<tr>
<th>Area</th>
<th>High</th>
<th>Mid</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing measures to support digital competence for future teachers (a)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Developing measures to support digital competence for in service teachers (b)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing measures to support school leaders in</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

the integration of ICT (c) | X

ICT for learning initiatives targeted to boost youth employability and entrepreneurship | X

ICT for accessibility and inclusion: early school leavers, migrants, etc… and special educational needs (d)

Reference to policy action measure related to Digital Competence Development:
- The teacher education curriculum, Competence area 2.10 (a)
- Competency network of teachers (b)
- Network for School Leaders Managing Digital Change (c)
- Inclusion in public schools (d)

B: ICT in Curricula and Assessment

<table>
<thead>
<tr>
<th>Area</th>
<th>High</th>
<th>Mid</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing computer/programming skills</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Developing key competences</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing 21st century skills (critical thinking, problem solving, communication, collaboration, and creativity and innovation)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Assessing with ICT/ICT based exams (a)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Analytics</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reference to policy action measures related to ICT in Curriculum an Assessment:
- Online tests and Net tests (a)

C: System-wide innovation

<table>
<thead>
<tr>
<th>Area</th>
<th>High</th>
<th>Mid</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piloting and validating innovative uses of ICT (a)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mainstreaming ICT in schools (b)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reference to policy action measures related system-wide innovation:

- ICT in public school (a)
- User portal initiative (b)

D: Mobile Devices

<table>
<thead>
<tr>
<th>Area</th>
<th>High</th>
<th>Mid</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of tablets</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of mobile phones</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bring Your Own Device (a)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloud computing</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reference to policy action measures related to Mobile Devices:

- The digital path to future welfare

E: Use of digital resources

<table>
<thead>
<tr>
<th>Area</th>
<th>High</th>
<th>Mid</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing educational content repositories/metadata (a)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting the development of open educational content and resources (b)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting the development of educational content/resources provided by publishers (c)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promoting the use and sharing of educational resources with teachers (d)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reference to policy action measures related to the use of digital resources:

- Materialeplatformen (a)
- EMU (b)
- ITF purchase grants (c)
- ITF development grants (c)
- P2P OER in Materialeplatformen (d)

F: Learning environments

<table>
<thead>
<tr>
<th>Area</th>
<th>High</th>
<th>Mid</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linking formal and informal learning using ICT</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Providing equitable access to ICT (infrastructure, devices and content) (a) | X |
Providing a safe learning environment to students and teachers | X |
Commissioning ICT related research (b) | X |

Reference to policy action measures related to Learning Environments:

- The digital path to future welfare (a)
- ITF demonstration schools (b)

3. THE CURRICULUM AND ICT

3.1. ICT BASED ASSESSMENT

The MoE is in charge of two national initiatives:

- National online tests for basic schools (from 2010), and
- Net tests for upper secondary schools (from 2016).

National online tests in basic education

In 2006, the Parliament changed the Education Act and decided to introduce national tests, which were fully implemented in 2010.

The purpose of the national test is to serve as a pedagogical and administrative tool:

- A pedagogical tool for teachers,
- A tool for the on-going evaluation of the students’ learning,
- Promoting the evaluation culture at schools,
- Strengthening the dialogue and cooperation between school and parents,
- A way to measure and document the performance of students – target group: teachers, headmasters, parents and municipalities.

800,000 national tests are carried out in different subjects during the school year from levels 2 to 8. Items are produced by affiliated teachers from
each subject. Item pools contain 9,000 items which fit a Rasch model and are pre-tested by 500–700 students; approximately 1300 new items are pretested and calibrated each year.

The subjects are Reading, Mathematics, English, Geography, Biology, Physics/Chemistry and Danish as a second language.

The characteristics of the tests are:

- They are IT-based – each student completes the test by login on to the MoE’s website
- Results are automatically generated – available the day after (the teacher sees the records of all her classes and can track student performance down to the individual test)
- They follow an adaptive principle – items adjust to student performance
  - Correct answer – more difficult question
  - Wrong answer – easier question

Future developments:

- With the recent reform of the Danish public schools, national objectives for the students’ performance (measured by results from the national tests) were introduced:
  - At least 80 pct. of students must be "good" at Math and Reading
  - The share of very good students must increase every year
  - The share of students with bad results must decrease every year
- Promotion of the formative use of national tests among teachers (and not just a normative comparison of student/class performance compared to national average)
- New tests in Math and English (from 2017)

In 2013, a **Strategy for digital welfare** was agreed upon by the Government and local authorities. One of its initiatives was **Digital written tests**:

- By 2016, the relevant written tests, assignments and examinations in primary, secondary and higher education are implemented and delivered digitally.
- Digital support of giving marks to assignments and tests are used in primary and secondary schools, where it is academically relevant.

The objectives of Net tests are to raise the quality and promote more effective educational institutions.

**Digitization of test processes in upper secondary education:**

- Digital distribution of assignments
- Digital delivery of responses
- Digital plagiarism check of responses
- Digitally supported assessment and marking

**The digital Net tests process:**

- Assignments are created in a DOPLO tool and put into the solution
- An XPRS service provides information on
  - Classes, Students and Assessors
- Distribution
  - Students log in and see their assignment and download it
- Submission
  - Students submit answers
- Plagiarism check
- Assessment
  - Assessor sees his classes and the students’ answers, and records possible feedback
- Marks
  - Assessor gives marks
- Student admin. systems
  - Marks are transferred to the student admin. Systems

**Link:** [http://uvm.dk/Uddannelser/Folkeskolen/Elevplaner-nationale-test-og-trivselsmaaling](http://uvm.dk/Uddannelser/Folkeskolen/Elevplaner-nationale-test-og-trivselsmaaling)
During the test students have free access to the Internet.

**Please notice the difference between the two test approaches.** The adaptive, online tests are automatically evaluated by the system. In the Net tests the student’s completed, written assignments are evaluated and assessed by an assessor.


### 3.2. SCHOOL IMPROVEMENT WITH ICT

As part of the national [Network for School Leaders Managing Digital Change](http://www.uvm.dk/Uddannelser/Gymnasiale-uddannelser/Proever-og-eksamen/Digital-proeveafvikling/), some schools and school leaders have used the Norwegian self-evaluations tool(s) [School Mentor](http://www.uvm.dk/Uddannelser/Gymnasiale-uddannelser/Proever-og-eksamen/Digital-proeveafvikling/) [Skolementor] and [Teacher Mentor](http://www.uvm.dk/Uddannelser/Gymnasiale-uddannelser/Proever-og-eksamen/Digital-proeveafvikling/) [Lærermentor].

The School Mentor is a resource for reflections and school development intended to support the work of school administrators in enhancing the digital competence. The Teacher Mentor is a resource for reflections on teachers’ own digital competence.

One example is at [Uldum School](http://www.uvm.dk/Uddannelser/Gymnasiale-uddannelser/Proever-og-eksamen/Digital-proeveafvikling/).

### 3.3. THE CURRICULUM FRAMEWORK

The various education areas each have their own national curriculum.

See: [Common objectives for basic, compulsory schools (primary and lower secondary)](http://www.uvm.dk/Uddannelser/Gymnasiale-uddannelser/Proever-og-eksamen/Digital-proeveafvikling/)

See: [Upper secondary schools](http://www.uvm.dk/Uddannelser/Gymnasiale-uddannelser/Proever-og-eksamen/Digital-proeveafvikling/)

Vocational Schools, see section 1.2 Education Reforms about the [Reform of the Danish Vocational Education System](http://www.uvm.dk/Uddannelser/Gymnasiale-uddannelser/Proever-og-eksamen/Digital-proeveafvikling/) (From August 2015)

### 3.4. ICT IN THE CURRICULUM

In all education areas, ICT is integrated in all subjects across the curriculum. See sections 2.1 National/ regional ICT policies and 3.5 Students' ICT competence (below).

### 3.5. STUDENTS' ICT COMPETENCE

**IT and media as a cross curricular subject**

The national curriculum for basic schools (K-10) is supplemented by a guideline on how to embed IT and media in the academic subjects, including the expected role and skills of the student.

The student competencies have been summarized in four student positions. In the students’ learning processes, they work in varied ways and use different digital skills. In the learning process, students are not bound to defined roles, but to positions that are developed in the process, they move in. The student can work recurrently between different positions.

The four student positions, which are key positions for the learning of the student:

- a critical investigator,
- an analyzing receiver,
- a focused and creative producer,
- a responsible participant.

In some learning processes one, two, three or all four student positions run simultaneously. During the learning process, the individual student positions may in turn be of relevance. In other situations, the student will primarily be in one position.

Link: [http://www.emu.dk/modul/vejledning-det-tv%C3%A6rg%C3%A5ende-emne-it-og-medier](http://www.emu.dk/modul/vejledning-det-tv%C3%A6rg%C3%A5ende-emne-it-og-medier)
3.6. **ASSESSMENT OF ICT COMPETENCE**

There is no formal, organised assessment of students’ ICT competences except in the optional subject Information Technology in upper secondary schools, at present optional in the technical upper secondary schools, and a pilot in others. *See section 2.1. National/ regional ICT policies.*

Until 2010, a **Students’ ICT Licence** launched by the Government, a certification initiative existed that primary and lower secondary schools could offer to students documenting their ICT competencies.

4. **DIGITAL LEARNING RESOURCES AND SERVICES**

4.1. **E- CONTENT DEVELOPMENT**

An increased use of ICT in public schools is a very important strand of the [eGovernment Strategy 2011-2015](#). The government and the associations of municipalities, Local Government Denmark, have agreed to extend the initiative until the end of 2017. *See also section 1.1. Key educational challenges and priorities.*

The central element of the initiative is action **2) Development of the market for digital learning resources.** The 67 Million Euro funding from the State is to support both the demand side and the supply side:

1) **Support the municipalities purchase of digital learning resources (demand)**  
new 8,7 Million Euro in 2015
   - Support the municipalities’ purchase of digital learning resources with a government grant in order to develop a sustainable market and large supply of high quality learning resources.
     - Covers 50 % of the expenses,
     - Each municipality has a credit facility (approx. 15 euro per student in 2015),
   - The municipalities decides how they prioritize the grant among the schools.

2) **Investment in developing digital tools and learning resources (supply)**  
5,3 Million Euro in 2015
   - Financial support to companies developing new digital learning materials,
   - Focus on new innovative learning resources that are not available on the market today, and which support the new primary and lower secondary school,
   - Idea – or market development.

All new digital learning resources are Internet based and are also accessible via mobile devices and different operating systems, in compliance with the national BYOD strategy.

**Analysis of digital tools in upper secondary education**

In 2014, As part of the national strategy for digital welfare, Deloitte Consulting has analysed the use of digital tools in the education of youth and adults.

According to the analysis, the use of digital tools in teaching at upper secondary schools and general adult education (AVU) is widespread and creates, according to the vast majority of teachers, essential professional and educational gains in education.

On average, the individual teacher uses four different tools for the preparation, implementation and follow-up of education. Teachers use in particular peer-to-peer tools, presentation tools and document sharing tools. The professional and educational effects that the vast majority of teachers experience, particularly relate to the possibilities for organizing teaching in new ways, introducing new learning activities, increasing differentiation of teaching and strengthening student activity.

A smaller ‘best practice’ group of 3-8 % of all teachers even manage to both generate tangible academic and educational effects and to save
time. The analysis concludes that the majority of teachers in upper secondary schools and at the AVU area will be able to achieve the same usage patterns as ‘best practice’ teachers within a period of six years, if a number of barriers, e.g. jurisdictional, cultural and technical are removed. The analysis also points out that most teachers spend a bit more time on the use of digital tools instead of analogue tools.

The four categories and the selected tools for the analysis

1) Digital learning resources
   - I-books (eBooks)
   - Blogs
2) Virtual education
   - Virtual meetings and conference systems
   - Podcast
3) Sharing Tools
   - Document sharing tools / virtual group rooms
   - Peer-to-Peer tools
4) Production Tools
   - Presentation Tools
   - Digital recording tools

Links:


4.2. CONTENT SHARING

No doubt the most successful sharing platforms are the local learning platforms where teachers share resources with colleagues, mostly from their own school but also in e.g. among networked public schools of a municipality.

On a national level, the Ministry of Education runs a number of services facilitating (among other things) the provision and promotion of OER; EMU, Materialeplatformen, and Skolekom.

1) Skolekom

The most successful facilitator of OER among teachers is no doubt the Skolekom conferencing system, based on a First Class environment. All (at least compulsory) schools subscribe to this system, and in the national subject conferences (e.g. conference/community for Math teachers) a lot of exchange of OER takes place. No evaluation, validation or rights management exist.

2) EMU

The EMU is the national knowledge and learning portal offering free inspirational resources for the teachers in schools and pedagogues in preschools. Most of these (reference) resources are created by teaching professionals and a corps of subject experts/editors, and validated with respect to e.g. evidence and quality. The bulk of these OER are not typically for direct use together with students in the classroom. They serve as inspiration and guidelines, but some are easily localised for the use in the classroom. Parts of the OER can be used in the classroom, e.g. videos.

3) The Materialeplatformen

The Materialeplatformen is the national educational repository on the web. One section provides a catalogue of all learning resources for Danish schools (mostly commercial and from e.g. museums). Another peer-2-peer section offers a national repository of OER, produced by teachers for teachers. This initiative – together with local projects – has demonstrated that it is very difficult to persuade teachers to produce and share OER nationally. Some type of encouragement is necessary. However, central initiatives like the Competency network of teachers produce OER for nationwide sharing. All P2P contributions are centrally screened for possible violations of rights, but not validated with respect to quality. The Materialeplatformen also contains exam sets from the
last couple of years for exercise (both primary, lower and upper secondary schools).

Moreover, many schools have turned their (traditional) school libraries into Pedagogical Media Centres, often with a focus on digital media:

- Work with digital learning resources, including understanding the relationship between didactic and non-didactic learning resources,
- Be investigative and experimental in relations between different types of digital resources and their pedagogical use,
- Follow the market of digital learning resources,
- In collaboration with colleagues, qualify the choice of digital learning resources,
- Provide guidance in the use of digital learning resources,
- Inspire the development of educational practices that work with digitization and mediation in relation to student learning of today,
- Offer help to students using the learning center in the use of digital learning resources,
- Ensure that digital learning resources are visible for teachers, educators and students.

Many schools have organized ‘Media patrols’ of students with good ICT skills, who help teachers and demonstrate tools and resources to fellow students. In the national Demonstration Schools Project, media patrols are a focused action line that helps teachers to overcome the barrier it is for some of them to use ICT in their teaching.

4.3. ACCESSIBILITY FOR LEARNER WITH DISABILITIES AND SOCIAL INCLUSION

The national support programme for stimulating the demand and supply of learning resources has among it’s criteria that in order to be eligible for 50% reimbursement from the State, the digital learning resource must allow the use of reading and writing technology.

This requirement entails:

- All content text must be readable using one or more text-to-speech tools for this. That is, the content of the text must not be designed or protected blocking these opportunities.
- The content of all typing fields must be readable using one or more text-to-speech tools for this. That is, the input field may not be designed or protected blocking these opportunities.
- All typing fields must be accessible for prediction and open for inserting text copied from other programs. That is, the input field may not be designed or protected blocking these opportunities.

If the digital learning resource itself contains similar features, the requirement is also met.

Students with special needs should be offered a special organization of the ninth-form test. The special organization of the test has the purpose to equate students with special needs with other students in the exam situation. It is a condition that the offer of special exam conditions does not change the academic level of the exam. The Ministry of Education has published a set of guidelines on the compensating digital tools, which are allowed.

Materialebasen is a database of more than 3000 learning resources that teachers from all over the country have scanned producing digital copies of e.g. textbooks and other analogue leaning resources. All scanned resources comply with the copyright laws §17:

- **Section 1:** It is allowed to reproduce and distribute copies of published works when the reproduction and the scattered copies are specifically intended for use by the blind, visually impaired, deaf and people with speech deficiencies and people in general who because of a handicap are unable to read printed text.

The provision in Section 1 shall not apply to reproduction or distribution of copies for business purposes.
Section 3: Sound recordings of published literary works may be reproduced and disseminated for use by the visually impaired when it is not done for commercial purposes. The author is entitled to remuneration. If the parties cannot agree on the amount of remuneration, either party may refer the matter to the Copyright License Tribunal, see § 47.

Section 4: State or municipal institutions and other social or charitable institutions can, for the use by people with visual and hearing disabilities, by audio or video recording produce copies of works broadcasted on radio or television, if the conditions of the license agreement in accordance with §50 are met. Such recordings may be used only for activities covered by the in §50 agreement envisaged.

4.4. WEB 2.0

A private company, LærIT.dk, has pooled a suite of 17 web 2.0 tools in a video and media platform, SkoleTube. Once logged in using the national UNI-Login SSO authentication and authorization system, SkoleTube manages integration and interoperability between the various tools.

4.5. LEARNING PLATFORMS

Currently, the Danish market for virtual platforms for collaboration and learning is dominated by two brands: SkoleIntra with more than 90% of all compulsory (primary and lower secondary education) schools, and Lectio, which is also a student administration system, at general upper secondary education. There are also other systems with different features, e.g. at vocational schools Fronter, Itslearning, Blackboard, Lodus, and ElevPlan.

By now, the so far very successful SkoleIntra is considered to be kind of obsolete in so many ways that the Government and Local Government Denmark, representing the municipalities, have agreed on a joint project developing a new virtual infrastructure for public schools: a digital user platform for compulsory schools.

The project aims at improving the students’ tuition using digital tools and is part of the Danish Government’s educational reform for all public schools. The project will provide a digital learning platform that allows students and teachers to use digital learning tools, and parents to cooperate with the schools.

The project consists of several components: a joint public infrastructure (an integration platform to a number of national IT-services) which will be provided by the Ministry of Education. The local authorities, who run the public schools, will commission the development of a common cooperation management system, integrating local learning platforms and digital learning tools for all schools. All schools will be conducting local implementation projects by deploying the cooperation management system, learning platforms, and digital learning tools. The infrastructure is expected to be in place at all schools by 2018.

5. TEACHER EDUCATION FOR ICT

5.1. ASSESSMENT SCHEMES

Currently no recognized assessment frameworks are in place.

5.2. SCHOOL LEADER SUPPORT

Network for School Leaders Managing Digital Change

For two years, 2013 – 2014, a national network of a hundred school leaders has collected knowledge, experience and good ideas to manage the digital change of public schools, and used them in their own schools. The initiative was part of government efforts to increase the use of IT in schools. The Danish Association of School Heads, together with Local Government Denmark and the
Ministry of Education, were in charge of the network. The purpose of the network was to ensure that the many good ideas and initiatives with IT in public schools were organized, implemented and disseminated.

Under the heading "Digital change in schools", the network particularly focused on the management of change and professional development of IT didactics, including how the school head may enter into a dialogue with the staff to optimize the use of IT and digital learning resources improving student learning.

The network’s work consisted in part of creating an overview of existing initiatives and sharing knowledge of specific tools that raise digital teaching and learning in all the country’s schools.

Link: [http://www.emu.dk/modul/skoleledernetv%C3%A6rket](http://www.emu.dk/modul/skoleledernetv%C3%A6rket)

**Municipal development project on ICT in teaching and learning**

ICT changes learning and must be incorporated in all disciplines and help all students become as proficient as they can.

With the reform of public schools, the new digital possibilities and the user portal initiative offer an opportunity to all municipalities in the coming years to check their ICT strategy on schools or/and perhaps draft a new one.

Over six months from May 2015, 15 municipalities will be inspired and get new knowledge about how municipalities should organize and coordinate actions with digital technologies, new forms of learning and skills development of employees. Each municipality is represented by 4 participants from management, school leadership and education professionals.


**Learning advisors - On school leadership and performance management**

Learning advisors tutor school managements and administrations in how the organization, management and leadership can promote students’ learning and wellbeing.

A professional boost of the public school places new demands on the school management and the municipal administration - both when it comes to the professional management of student learning and well-being, and in relation to implementing the changes, which form the framework for the professional development.

Learning advisors tutor school managements and administrations in ways to enhance the professional management of the school, which increasingly is controlled through measurement and evaluation, and implemented as a strategic competence development of the employees.

Link: [http://www.uvm.dk/Laeringskonsulenterne/Vores-vejledningsomraader/Skoleledelse-og-maalstyring](http://www.uvm.dk/Laeringskonsulenterne/Vores-vejledningsomraader/Skoleledelse-og-maalstyring)

### 5.3. ICT FOR INCLUSION

The government has a strong focus on inclusion, and IT has a central role as a tool to improve accessibility and opportunities, and as a compensatory aid. On a national base, a number of initiatives have been launched, see also sections 2.3. Specific ICT initiatives and 4.3. Accessibility for learners with disabilities and social inclusion. However, the bulk of the work takes place locally in schools, institutions and homes.

**Compensatory IT aids in primary schools**

The Ministry of Education’s Resource Centre for Inclusion and Special Education has initiated several projects that are helping to create new knowledge about the use of IT in special education. The projects are part of the Resource Center’s work to strengthen the knowledge base for
special education.

**Link:** [http://inklusionsudvikling.dk/Aktiviteter-og-samarbejde/Udviklende/it-til-elever-med-saerlige-behov/Kompenserende-it-hjaelpemidler-i-folkeskolen](http://inklusionsudvikling.dk/Aktiviteter-og-samarbejde/Udviklende/it-til-elever-med-saerlige-behov/Kompenserende-it-hjaelpemidler-i-folkeskolen)

**Project on compensatory IT aids**

The project on compensatory IT aids in public schools examines, which IT support tools students with reading difficulties are using in the mainstream teaching, and what effect the use of IT tools has on the continued reading and language development of students with reading difficulties. Among other issues, the project examines the effect of “IT backpacks”.

IT aids impact on students’ reading, writing and spelling development - with special focus on students with weak language skills.

“The CD-word”

The purpose of this project is to examine the effect using the commercial product “CD-word” in initial reading and writing on reading and spelling development of beginning readers. There are now a number of practical experiences in relation to the use of this kind of technology in primary and lower secondary schools, but this project will examine the impact on students’ language and literacy outcomes and motivation for reading and writing. The project has a special focus on the development of reading and spelling strategies of students with weak language preconditions.

The project partners are the University of Aarhus and the municipality of Norddjurs. The project ends in 2016.

**Competence area 2.10:**

“The student has knowledge of ICT and media skills. The student can plan, implement and develop teaching with and about ICT and media that support the student’s ability to be a critical examiner, analytical receiver, purposeful and creative producer and responsible participant.”

Teachers of primary and lower secondary education graduate from university colleges, and these institutions are in the process of developing new optional modules for both initial teacher education and in-service training.

Teachers of upper secondary education graduate from universities. ICT in education is not a special focus nor compulsory.

**Links:**

- [https://www.retsinformation.dk/Forms/R0710.aspx?id=170032#Bil1](https://www.retsinformation.dk/Forms/R0710.aspx?id=170032#Bil1)

5.4. ICT IN INITIAL TEACHER EDUCATION

In the Curriculum of initial teacher education (teachers of primary and lower secondary education), **ICT is included in the compulsory competence area 2.**

**5.5. ICT IN IN-SERVICE TEACHER EDUCATION**

ICT in in-service training is not compulsory.

In the years 1999 – 2010, the government ran the very big programme Pedagogical ICT Licence, which became known internationally as ‘**EPICT – European Pedagogical ICT Licence**®’. Depending upon education area, 60% - 80% of Danish teachers from pre-school to university colleges participated in this programme.

Currently, there are quite a number of local in-service initiatives, e.g. organised by municipalities, which include ICT.

The major national programme “**ICT in primary and lower secondary education**” (see Sections 1.1 Key educational challenges and priorities and...
2.1. National/ regional ICT policies) includes action lines that address ICT in in-service education at a much smaller scale (hundreds and not thousands) and focus very much on the academic subjects and daily practice, and knowledge sharing, e.g.:

The IT teacher network initiative (Competency network of teachers)

The IT-teacher network will help to strengthen teachers’ IT didactic professional competences with strong ties to the teachers’ daily, concrete teaching practice. The network comprises primary and lower secondary teachers of Danish and Math from across the country.

Link: http://www.emu.dk/modul/if-t%C3%A6l%C3%A6rer-netv%C3%A6rket

Based on the teachers’ own practice, the network works with IT-based learning scenarios, and teachers in the network act as local IT ambassadors. The knowledge and skills, teachers acquire will be shared in the academic environments in individual schools and also in specially organized municipal, regional and national knowledge sharing networks.

Naturally, also the “Demonstration schools” projects both directly and indirectly act as in-service training of the participating teachers.

The MOOCs offered by UC Zealand are also in-service trainings. See section 2.3. Specific ICT initiatives

5.6. TRAINING THE TEACHER TRAINERS

There is currently no national initiative addressing the teacher trainers. The MOOCs offered by the University College Zealand are also for staff members (i.e. teacher trainers) of university colleges. See section 2.3. Specific ICT initiatives

The forthcoming Denmark’s Learning Festival 2016, March 2016, will host a special session, dedicated to ICT in education for teacher trainers.

6. ICT STUDIES

1) Digital learning resources, impact study
   ○ Resume in English
2) Analysis of digital tools in upper secondary education
   See section 4.1 E-content development
3) Technology and media in upper secondary schools
4) ICILS 2013 - International Computer and Information Literacy Study
5) Danish ICILS report (in Danish)

Publisher: European Schoolnet (EUN)
Author: Leo Højsholt-Poulsen, National Agency for IT and Learning, Danish Ministry of Children, Education and Equity
Editor: Katja Engelhardt (European Schoolnet)
Coordinator: Anja Balanskat (European Schoolnet)