



## **Denmark**

### **Country Report on ICT in Education**

Available on <http://www.eun.org>

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## 1. THE EDUCATIONAL CONTEXT

### 1.1 *Key educational challenges and priorities*

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 to integrate the use of ICT into the daily lessons in Danish schools. In this way, schools will use the potential for ICT-based teaching to create modern and technologically literate schools.

#### *Key educational challenges:*

- Teachers already in the teaching profession lack ICT skills
- Lack of ICT skills in teacher training
- Inclusion of children with special educational needs in Primary and Lower Secondary Education
- Computational thinking in Primary and Lower Secondary Education

#### *The concrete initiatives that aim to address the challenges:*

- Funds for municipal purchasing of digital learning materials
- Development-funds for digital learning materials
- [Demonstration School project](#)
- Teacher Network
- Effect measurement of digital learning materials
- Digital infrastructure at the schools
- Cooperation Forum

The action is part of the eGovernment Strategy 2011-2015; Danish central government, regions and municipalities propose a new eGovernment strategy in order to accelerate the adoption of digital solutions in the public sector. The focus of the initiative is in three sectors, No more printed forms or letters, new digital welfare and Digital solutions for closer public sector collaboration. Local Government Denmark, have agreed to extend the initiative until the end of 2017. The 67 MEuro (total State funding) initiative includes support for digital learning resources, competence networks and research. Its four main elements to increase and qualify the use of ICT in primary and lower secondary schools are:

- Sufficient ICT infrastructure
- The market for digital learning resources
- Competencies and sharing knowledge
- Research and knowledge on ICT-based learning

A key challenge in general upper secondary schools and vocational schools is that only a small amount of students enter – and complete – vocational education. One of the ways to meet this challenge is the reform of vocational education and related initiatives in the field (see section 1.2).

## 1.2 Educational reform

**The 2014/2015 reform of Primary and Lower Secondary schools** is the latest in this area. Over the last years its implementation has been in focus. As for the reformed areas please refer to the [2015 country report](#).

### *A Reform of Adult and Continuing education (2017):*

A group of experts has been set up to carry out a thorough analysis of the adult and continuing education system. The group will report to the government and the social partners and the recommendations will become part of the tripartite negotiations.

- The tasks for the expert group fall within 3 tracks:
- A coherent adult education system
- A strong and coherent effort
- Modernization of party leadership Improving Vocational Education and Training

The reform agreement establishes **four overall objectives for Vocational Education and Training (VET)**:

1. More students choose to start a VET immediately following former level
2. More students complete a VET programme successfully.
3. The VET must challenge all students so they may reach their fullest potential.
4. The trust and well-being in the VETs must be strengthened.

The four objectives are translated into **measurable result targets for monitoring the development of VETs** at country level and at school level:

1. An Attractive Youth Education Environment:  
The youth education environment at VET 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 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 this.
4. New VET for Adults 25 Years or Older:  
In parallel to the efforts of making VETs a more attractive choice for young people, adults of 25 years or older must be offered a more attractive, predictable and goal-oriented path from low skilled to skilled worker. This can be accomplished by the establishment of a VET for adults (EUV), which will be the future path to a VET for adults of 25 years or older.
5. Clear Admission Requirements and Offers for All Young People:

An admission requirement of the grade 02 (E) is introduced for Danish language and Math to clarify which fundamental qualifications are necessary in order to follow the education and complete a VET programme successfully. Besides, the trade committees 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 is established in the Folkeskole's form level 10 (eud10) which prepares pupils for the VETs and ensures that they meet admission requirements. This aims at pupils who are motivated for a VET, but who do not meet admission requirements or are uncertain whether this educational path 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 programmes must be significantly improved through higher quality and quantity of teaching. This is ensured through multi-pronged efforts such as more teaching time, a significant boost of teachers' skills, a clearer link between schooling and internships and 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 becomes stronger so that students will receive a credible and effective education guarantee. The guarantee must cover the entire spectrum of educations, and the access to school-based practical training must be increased by the establishment of additional openings and by offering more educations 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 pupils in primary and lower secondary schools who are at risk of not proceeding to a post-compulsory education.

*New reform in upper secondary schools (2017):*

To ensure the future of the Danish welfare state, it is crucial to ensure the following:

- young people who can combine knowledge and production in the creation of innovative solutions

- Committed citizens and skilled employees and managers
- A well-functioning society with small and large communities

We therefore need high school education (10-12) that:

1. Prioritizes basic knowledge and ability to concrete problem solving
2. Create committed citizens, skilled employees and managers
3. Equips young people to handle the changes in society and in the workplace
4. Focuses on modern general education and targeted study preparation

**Reform challenges that need to be addressed:**

1. Students with a weak academic background and lack of motivation for further education, are seeking upper secondary education. This results in greater drop out than before
2. Many courses of which are without clear connection to further education requirements for the professional qualifications and competencies are constantly increasing
3. A large drop in students choosing HF - one of the four educational directions, weak results and fewer further trainings.

*Various digital projects that address the reform challenges:*

**Student focused actions:**

ICT becomes a study direction in the education direction HHX and HTX (the Higher Technical Examination Programme) at B level I (middle level), it can be a selective subjects in the education direction of STX (the Higher General Examination Programme), where it will replace a natural science subject (biology or natural geography) at C and B levels and can replace in the education direction HTX, the subject communication and IT at C level. [Click here for information in Danish](#)

1. The subject of **Informatics** is made compulsory in the education direction HHX (the Higher Commercial Examination Programme) at the C level (lowest level)
2. The subject **Programming** is included in the education direction of HTX at B level and it is included in the study direction. More information in Danish is available though this link.
3. Development of **new test forms** that are suitable for measuring compliance with students' digital knowledge, skills, competencies and literacy.

**Teacher focus:**

1. Experience is part of competence development for teachers and leaders. Therefore, experiences from schools that already use IT and digital learning resources innovatively and successfully are collected and shared with other schools. This in order to renew the pedagogical practice and integrate IT into teaching.
2. A framework for better and easier use of digital platforms, teaching

materials and administrative systems is created through the exchange of data across the systems and by improvement of opportunities for knowledge sharing and collaboration via digital tools.

**Data:**

Initiatives for inspiration in the school's work with data-support education are continued to be implemented. Opportunities and barriers are identified for better use of existing data to promote data-based learning that strengthens the teachers' ongoing guidance and feedback to the students as well as the quality development of the teaching practice.

**Research:**

A research initiative is being launched to identify how ICT and digital learning resources are used in upper secondary schools in order to supports knowledge and literacy. In addition this initiative explores how ICT and digital learning resources can be evaluated and to what extent the students achieve the desired skills through digitization. Read more [here](#)

## 2. ICT POLICY

### 2.1. National/regional policies

See [here](#) Common Objectives for basic, compulsory education, K-10, primary and lower secondary; Folkeskolen.

#### 1. *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 a guideline on how to embed ICT and media in the academic subjects, including the expected role and students' skills: [IT and media as a cross curricular subject](#). See section 3.5.

**Four student roles 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 Danish language subject (i.e. awareness of the consequences of making certain remarks on the internet, digital footsteps).

For more info see section 1.1 an [increased use of ICT in public schools](#)

As for ICT as a separate subject, since summer 2017 "[Technology understanding](#)", is offered to pupils as an optional (pilot) subject in lower secondary schools. This is part of an action plan for digital learning which the Ministry is currently working on.

#### 2. *ICT in upper secondary education (age 16-19)*

Digital tools are now in all students' pockets – or on the table, this creates new

opportunities for:

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

For more information, see [regulations and guidelines for upper secondary education](#).

### Curriculum/basic skills:

**Now:** ICT is used for external materials, visualization, communication, perspective....

**In the future:** students will have to develop curriculum-relevant skills and knowledge as following:

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

This way, ICT changes the learning landscape and it does it irreversibly:

- Individual work → group work ← classroom teaching (Students will work more collaboratively).
- The nature of collaboration between students changes
- Teaching materials and processes can be more personalized and adaptive
- Students' work can easily be surveyed => this will allow the teacher to better assist in the learning process and understand it better.
- 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 are allowed
- Oral examinations and adaptive tests

## 2.2 Responsibilities

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

Besides, there are a number of private schools, which provide compulsory, basic



education (K-10). They are financed by substantial subsidies from the municipalities and parents payments for tuition.

All basic schools follow the same attainment targets, set out in the national curriculum. Through local decision making and responsibility of the municipalities and school boards.

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

All self-governed schools follow the nationally defined curriculum, depending on area of education. This is done through local decision making and responsibility.

## 2.3 Specific digital education initiatives

### *a. Projects regarding the upper secondary education:*

#### **DiDaK:**

The purpose of this project is to map out how the digital competencies (information, production, participation, operational competences) highlighted in the reform of upper secondary education implemented in the teachers' practice. The idea is that the participating schools will cooperate with scientists, develop and implement a range of different courses that focus on digital competencies. The goals for the schools are: to make sure that the students have the required digital competencies, teachers and managers have the capacity to work with digital competencies in accordance with the vocational goals, strengthening the teachers' digital competencies and strengthening the schools' strategic, organizational and cultural focus on working with digital competencies.

#### **10 “knowledge centres” in VET**

The agreement on vocational education reform (2015) has decided to establish up to 10 [“knowledge centres”](#) in vocational education and training. Among other things, the centers will help students in vocational education to handle rapid technological development and match the competencies demanded by companies in the digital labor market.

### *b. Student identity management and School management systems*

#### **Uni-Login**

Single Sign On solution that connects pupils, teachers, parents the school and

digital learning resources. More than 1 million registered users.

## **Use and adoption of digital learning platforms and resources (2016-17)**

The goal of this [project](#) has been to understand how the platforms impact the schools and their pedagogical practices.

### *c. New learning spaces*

#### **Fablab@school**

The research and teaching concept has been adapted to Scandinavian relations with a greater degree of user-driven development and as mentioned an interdisciplinary approach to teaching: focus on design thinking, digital fabrication and pedagogy / didactics. FabLab @ School aims to achieve the following:

- To enable school students to understand technologies by examining, testing and designing technological things in a digital manufacturing workshop. The aim is to train in technological mastering, which is considered to be a crucial competence in the future.
- To teach school students to see themselves as problem solvers on the basis of a Design Thinking and Collaborative Ideation approach, so they can not only use technology but also think about it in problem solving in their everyday lives.

#### **Future Classroom Lab**

The vision is to find new ways to understand and work with technologies in teaching contexts. FCL collaborate with a wide range of technology providers to develop new teaching methods, learning rooms and approaches to integrating technology in teaching. FCL embraces both teacher training and supporting the pre service teacher education at one of the largest teacher training colleges UCC.

### *d. Game based education*

#### **Center for Applied Games Research**

The lighthouse in game based education in Denmark. Located at Aalborg University, the center does research, conferences and trainings in game based learning in close collaboration with the Danish teacher training colleges.

### *e. Implementation of computing, coding, computational thinking initiatives*

#### **Informatics as a curricula subject**

The subject Informatics has been implemented in upper secondary schools and is no longer a pilot subject ([Evaluation results](#) from 2014 concerning the pilot subject. In Upper Secondary: Clear goals are set for students' digital knowledge,

skills and competencies. While in Low. Secondary: The subject “Technology understanding” is from summer 2017 an optional (pilot) subject in lower secondary schools. Pilot scheme is planned for the following three years.

### **Coding Class**

An industry driven initiative focusing on computational thinking and collaboration between (IT) companies and schools. Students from 10 municipalities and approx. 60 it companies collaborate using coding tools to solve real world problems produced by the companies.

#### *f. Tests (ICT or non ICT based) for teachers*

### **Participation in ICILS 2018**

Upper Secondary: New test forms are developed that are suitable for measuring compliance with students' digital knowledge, skills, competencies and literacy (has not yet been launched)

#### *g. Digital literacy*

### **Project on digital literacy for primary and secondary school (2017)**

The project consists of two parts, the first one includes information campaign on social media on how to communicate with the public sector. The second, evolves around collecting, developing and disseminating inspiration materials to the teachers on digital literacy.

### **National championships in digital skills**

The challenge consist of three steps: Students work with innovative projects combining real world problem solving and IT. Then they present the projects at a regional level and the winners participate at the national finals at the Danish Learning Festival. Here they present for both a jury and the conference audience in general. Compared with traditional student competitions the Digital skills championship emphasis teachers and leaders learning from innovative student experiences and sharing pedagogical practices at the local and national events. The event include approx. 2000 students and 200-300 teachers, leaders, researchers and industry representatives.

*h. Competencies*

**Project Capacity for Professional Development**

All 7 Danish teacher training institutions and 20 municipalities are involved in developing better pedagogical IT training for teachers as well as preservice teachers. The goal is to transform the classic instructional training workshops to action learning based training and consulting located at the schools rather than at the college premise.

**2.4 Digital education priorities**

Area	High priority	Medium priority	Low priority	Reference to policy action measure (if any)
<b>A: Digital Competence Development</b>				
Developing measures to support digital competence of <b>future teachers</b>	x			<a href="#">The teacher education curriculum, Competence area 2.10</a>
Developing measures to support digital competence of <b>in service teachers</b>	x			
Developing measures to boost youth <b>employability and entrepreneurship</b>		x		

ICT for <b>accessibility</b> and <b>inclusion</b> : early school leavers, migrants, special educational needs etc.		x		<a href="#">Inclusion in public schools</a>
<b>B: Curricula and Assessment</b>				
Developing <b>digital competence/media literacy</b> of students	x			
Developing computer/programming skills/ <b>computational thinking skills</b>	x			
Developing <b>key competences</b> <sup>1</sup>	x			
Developing <b>21st century skills</b> (critical thinking, problem solving, communication, collaboration, creativity and innovation)		x		
Assessing with ICT/ICT based exams		x		<a href="#">Online tests</a> and <a href="#">Net tests</a>
<b>C: System-wide innovation</b>				
Developing measures to support <b>school leaders</b> in the integration of ICT		x		<a href="#">Network for School Leaders Managing Digital Change</a>
Piloting and validating innovative uses of ICT	x			<a href="#">ICT in public school</a>
Mainstreaming ICT in schools	x			
Monitor and research digital learning in schools	x			
Learning analytics (using digital technologies and data to support learning)		x		
<b>D: Mobile Devices</b>				
Use of tablets			x	
Use of mobile phones			x	
Bring Your Own Device			x	

<sup>1</sup> See EC Key competences for lifelong learning: digital competence, math science technology, communication in mother tongue, communication in foreign languages, learning to learn, social and civic competences, sense of initiative and entrepreneurship, cultural awareness and expression. [http://europa.eu/legislation\\_summaries/education\\_training\\_youth/lifelong\\_learning/c11090\\_en.htm](http://europa.eu/legislation_summaries/education_training_youth/lifelong_learning/c11090_en.htm)

Cloud computing/services			x	
<b>E: Use of digital learning resources</b>				
Developing educational content repositories/metadata		x		<a href="#">Materialeplattformen</a>
Supporting the development of open educational content and resources		x		<a href="#">EMU</a>
Supporting the development of educational content/resources provided by publishers	x			<a href="#">ITIF purchase grants</a> <a href="#">ITF development grants</a>
Promoting teachers' use, creation and sharing of educational resources		x		<a href="#">P2P OER in Materialeplattformen</a>
<b>F: Learning environments</b>				
Developing/adapting flexible learning spaces		x		
Linking formal, non-formal and informal learning using ICT	x			
Providing equitable access to ICT (infrastructure, devices and content)	x			
Providing a safe learning environment to students and teachers	x			

### 3. INTEGRATION OF DIGITAL TECHNOLOGIES IN THE CURRICULUM

#### 3.1 Digital technology based assessment

Students in primary and lower secondary schools must complete **10 compulsory**

**national tests** in different subjects. The purpose of the national test is to serve as a pedagogical and administrative tool for the following:

- A pedagogical tool for teachers
- A tool for the on-going evaluation of the pupils' 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 pupils; approximately 1300 new items are pretested and calibrated each year.

Pupils in primary and lower secondary schools must complete 10 compulsory national tests in different subjects. The subjects are Reading, Mathematics, English, Geography, Biology, Physics/Chemistry and Danish as a second language.

In the school year 2017/18, **two additional national tests** will be introduced in mathematics and English. Furthermore the compulsory tests in biology and geography in the 8th grade will be changed to voluntary tests.

The characteristics of the tests are the following:

- They are IT-based – each pupil completes the test by login on to our 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 pupil performance: Correct answer – more difficult question, Wrong answer – easier question.

### **Net tests - Digitization of examination processes in upper secondary education**

In 2013 a strategy for digital welfare was agreed by the Government and local authorities. One of its initiatives was [Digital written tests](#):

In 2016, the relevant written tests, assignments and examinations in primary,

secondary and higher education was 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 raising the quality and promote more effective educational institutions.

Digitization of test processes in upper secondary education includes the following:

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

The digital Net tests process includes:

- 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
- 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 students' completed, written assignments are evaluated and assessed by an assessor.

### 3.2 School improvement with ICT

Progress in learning with digital technologies is not measured in itself. Therefore, **National Data Warehouse** gives institutions, regions, municipalities and the public access to a number of predefined reports and graphs of statistical information. There is also a possibility to define own reports in the different data areas. Most reports show country-relevant data, relevant geography (region / municipality) and institution / school.

### 3.3 The curriculum framework

The various education areas each have their national curriculum.



Common objectives for primary and lower secondary schools

[Upper secondary schools](#)

Vocational schools; see section 1.2 about the Reform of the Danish vocational education system (from August 2015)

### 3.4 Digital technologies in the curriculum

In all education areas ICT is integrated in all subjects across the curriculum

### 3.5 Students' digital competence

[ICT as a cross curricular subject](#)

The national curriculum for primary, lower and upper secondary schools is supplemented by guidelines on how to embed ICT 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. The student can work recurrently between different positions.

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

- critical investigator
- analysing receiver
- focused and creative producer
- responsible participant.

As part of the 2014/2015 reform of the primary and lower secondary school schools have turned their (traditional) school libraries into [Pedagogical learning Centres](#), often with a focus on digital media.

Main topics addressed:

- Work with digital learning resources, including the use of 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 mediatization in relation to student learning of today.
- Offer help to students using the pedagogical learning center in the use of digital learning resources
- Ensure that digital learning resources are available 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.

### **3.6 assessment of digital competence**

There is no formal, organised assessment of students' ICT competences in primary and lower secondary schools. In upper secondary schools the subject/optional subject "Informatics" is assessed formally.

## **4. DIGITAL LEARNING RESOURCES AND SERVICES**

### **4.1 Digital content development**

The Danish Government has allocated approximately 0.5 billion DKK (approx. 68 million euros) from 2012 through 2017. The Danish municipalities are co-funding the strategy with an equivalent amount. The aim is to stimulate the demand for digital learning resources among schools in order to support them, to encourage that teachers use IT and digital learning resources as an integrated part of everyday teaching.

The Government also develop the market for digital learning resources to increase the supply of high quality products by supporting development of new materials.

### **4.2 Content sharing and creation**

[Materialeplatformen](#) and [EMU.dk](#) are the most successful sharing and creation platforms for teachers.

On a national level The Ministry of Education runs a number of services facilitating (among other things) the provision and sharing of OER; EMU and [Materialeplatformen](#)

[The EMU](#) is the national knowledge and learning portal offering free inspirational resources for teachers in schools and pedagogues in pre-schools. 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 pupils in the classroom. They serve as inspiration and guidelines, but some are easily localised for use in the classroom. Parts of the OER can be used in the classroom, e.g. videos. The EMU is about to undergo changes, and a new EMU is expected to be launched in mid 2018.

[The Materialeplatformen](#) is the national educational web repository. In one

section it is a catalogue of all learning resources for Danish schools (mostly commercial and from e.g. museums). In another peer-2-peer section it is a national repository of OER, produced by teachers for teachers.

#### **4.3 Accessibility of learners with disabilities and social inclusion**

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

This requirement entails the following:

- All content text must be readable using one or more text-to-speech tools for this. That is, the content of the text need to allow this feature and it cannot designed to block this option. Thus, pupils with visual disabilities are assured to have the option of hearing the text.
- The content of all typing fields must be readable using one or more text-to-speech tools. That is, the input field may not be designed or protected by blocking this opportunity.
- 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 by blocking these opportunities.

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

Students with special needs are 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. Nonetheless, the offer of the 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 that are allowed to be used in exams.

[Materialebasen](#) is a database of more than 3000 learning resources that teachers from all over the country have scanned producing digital copies of textbooks and other analogue learning resources. All scanned resources comply with the copyright laws. Materialebasen is managed by Nota, the Danish Library and Expertise Center for people with print disabilities.

#### 4.4 Learning Platforms

Primary and lower school: The Government and the Local Government Denmark (KL) has signed an **agreement about a common IT infrastructure and common public standards** to ensure easy and safe access to school's digital solutions, data exchange between IT systems and ensure good competition in the IT market for IT solutions for schools.

In the **The User Portal initiative (BPI)** the students' academic products, test results, goal achievement and progression are assembled and LMS platforms will increasingly form the basis for education planning, execution and monitoring. At the same time schools use the wide range of digital learning resources in the classroom and it also generates a lot of data on students' school-related activities. Teachers must also learn how to use data in planning activities and assessing progression. As a part of The User Portal initiative (BPI) different learning platforms are scheduled to be extended to all the country's public schools before the end of 2017.

The teacher gets data on the students' position and progression and therefore enables the teacher to set learning goals for students based on common objectives and simultaneously evaluate and monitor developments closely. This way, teachers can adjust both the support to students' learning process as the learning objectives.

All learning resources must follow a standard to be used as a basis for learning programs. Upper secondary schools decide themselves if they want to use learning platforms.

## 5. TEACHER EDUCATION FOR DIGITAL LEARNING

### 5.1 Assessment Schemes

Currently no recognized assessment frameworks are in place.

### 5.2 School leader support

The school leaders in public school have been supported by **several central initiatives**, e.g.:

- [The Demonstrations School Projects \(pdf\) \(2013-15\)](#)
- Use and adoption of digital learning platforms and resources (2016-17)
- IT competencies development through capacity building schools and profession schools (2017-18).

The Danish educational portal emu.dk has a special [area for school leaders in public school](#), and the school leaders are supported by a team of learning consultants from the Ministry of Education. The central education of school leaders is to be revised with more focus on the school leaders own practice, including the use of ICT.

### **5.3 Digital technologies 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](#).

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 pupil’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.

### **5.4 ICT in in-service teacher education**

ICT in in-service training is not compulsory. Currently there are quite a number of local in-service initiatives, e.g. organised by municipalities, which include ICT.

### **5.5 Studies on digital technologies in school education**

- [The Demonstrations School Projects \(pdf\) \(2013-15\)](#)

From 2013-2015 the National Agency for IT and Learning has worked together with three universities, seven university colleges, 28 primary and lower secondary schools in Denmark and approximately 515 teachers and nursery teachers in a major effort to create insight into how, when and why IT

can enhance student learning. The general aim of the project, known as The Demonstration School Projects, has been to support student learning and participation, create more innovative teaching, reallocate time in the classroom and give direct attention towards 21st century skills.

- [Use and adoption of digital learning platforms and resources \(2016-17\)](#).

The goal has been to understand how the platforms impact the schools and their pedagogical practices.

Main conclusions:

1. The need for involvement and the skepticism towards platforms is a well known problem.
2. The implementation of learning platforms concerns the entire school – not only the pedagogical staff.
3. Avoid rapid and short-term implementation strategies. Focus on aligning the platforms with the values of the pedagogical staff.
4. Support dialogues about meaningful use of the platform. Critique is important and must be taken seriously.
5. Experimental approaches has potentials, but they require room for collaborative work and a vocabulary to talk about the platforms with.
6. The choices approaches of the pedagogical staff is of great importance.
7. The platforms are used in a variety of ways and they affect the pedagogical practices in a number of different ways.
8. The work with the platforms can be oriented to different goals and involve different actors.
9. The user friendliness of a platform is related to the interaction between the existing practices at the schools and the platform.
10. Plasticity of the platforms can support the collaboration between different stakeholders and ensure that the platforms can meet local practices constructively.
11. The user friendliness of the platforms is a matter of the interactions between technology and the organization.
12. Participatory approaches can support reflective use of the platforms.

- [ICT as an educational tool in vocational education \(EVA, 2017\)](#)

Six good tips to work with ICT as a pedagogical tool

1. Examples of experiences with how ICT tools have been used on selected Schools.
2. Focus on differentiated teaching and the link between school and internship

Further reading: [The Danish Education System](#)

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