



NORWAY

Country Report on ICT in Education

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1. THE EDUCATION CONTEXT

1.1 EDUCATION REFORM

The national curriculum

The **Knowledge Promotion** is the latest reform in 10-year compulsory education and in upper secondary education and training. It was introduced in 2006 and is now fully implemented but there is an on-going review of the reform. The reform introduces certain changes in the content, structure and organisation of upper secondary education. The aim of this reform is to help all pupils to develop the fundamental skills that will enable them to participate actively in the knowledge society. The most important changes to the Norwegian school system that stem from the Knowledge Promotion are outlined below:

1. Basic skills are to be strengthened;
2. Reading and writing skills are emphasised from first grade;
3. New syllabuses in all subjects, clearly indicating what pupils and apprentices are expected to learn;
4. New distribution of teaching hours per subject;
5. New structure of choices available within education programmes;
6. Freedom at the local level with respect to methods, teaching materials and the organisation of classroom instruction;
7. Local freedom with respect to the distribution of lessons and topics within and among subjects.

The Knowledge Promotion is first and foremost a curricular reform, but should also be regarded as a more comprehensive shift in education policy.

The Kindergarten sector

After assuming responsibility for the day-care sector in 2012, the Norwegian Ministry of Education decided to implement a new general plan and national guidelines for pre-school education, to come into force in autumn 2013. The kindergarten programme at the **Norwegian Centre for ICT in Education** aims to promote digital literacy both in kindergarten and in pre-school education. Digital literacy in kindergarten means using ICT in a playful, stimulating, considered, and safe way within the tasks defined by the general plan. For more information on day care centres and ICT (in Norwegian), see <http://iktsenteret.no/barnehage>.

Framework of basic skills

The Norwegian Directorate for Education and Training has developed a framework for the five basic skills: oral, reading, writing, digital and numeracy skills. The framework describes how these basic skills function at different levels, covering compulsory and secondary education. It is a generic framework that was created to serve as a reference document for developing and revising national subject-specific curricula. Within this process the basic skill “ability to use digital tools” was amended to “digital skills”. Grids have been developed for these five basic skills, describing their progression through the different levels of education. The cells of each grid show what is required at each level. The requirements are general and serve as a basis and point of reference for developing subject- and grade-relevant competence aims. The framework divides the digital skills into four sub-categories: searching and processing, producing, communicating and digital judgment. The **Centre for ICT in Education** has developed a survey test of digital literacy for fourth graders, which was implemented in spring 2013.

Strategy for lower secondary education (grades 8-10)

A strategy has been developed for lower secondary education with the aim of making classes more practical and varied. As of autumn 2012, eighth graders can choose from among eight new optional subjects. In 2014, the scheme will be expanded to include ninth and tenth graders. The strategy, **Better Learning through Motivation and Mastery**, focuses on areas such as classroom leadership and upgrading teachers’ skills. An integral part of the strategy is for teachers to share their experiences of using practical and varied methods. The strategy is currently being tested in selected schools in 22 municipalities, and will be widely expanded across the country in the next school year. Since autumn 2012, lower secondary school pupils are able to choose subjects at an upper secondary level. This scheme shall include all common core subjects and all programme subjects with a final assessment at the end of the school year. The municipality and the school leadership will be responsible for ensuring that pupils can take advantage of this opportunity.

National assessment system

As part of the education reform, a national quality assessment system has been established with the aim of improving the quality of education. This is the most important instrument for quality development in basic education and is based on systematic assessment and analysis of input, process and outcome. Relevant elements of the national quality assessment system are pupil's achievement, school resources and the learning environment, information transparency and accountability in order to make information available to schools, local and central authorities.
<http://www.udir.no/skoleporten>.

The Government also has a stronger focus on quality and on improving the development of the education system by municipalities and counties, while another important objective is to turn schools into learning organisations. The Directorate for Education and Training is responsible for the national quality assessment system and has the overall responsibility for supervising and supporting all school owners in their work with quality development. Its main tasks are assessment and analysis; development, guidance and support; and supervision and administration.

Since spring 2012, digital exams are the norm in most subjects. Answers to exams are submitted by means of the "PGS" examination system, allowing examiners to access the answers the day after the exam has been carried out.

In spring 2012, pupils at fifteen schools were allowed to use the internet while taking their exams. This new initiative and pilot project was carried out for exams in Tourism and Language and in International English within the Programme for General Studies. During the exams, pupils could access the internet but were unable to communicate with one another. An evaluation has concluded that the pilot project was a success, and in 2013 the scheme will be expanded, with the addition of two new subjects and potentially with more schools participating.

National Qualifications Framework for Lifelong Learning (NQF)

In September 2009, the Ministry of Education and Research decided that Norway should take part in making a proposal for a **National Qualifications Framework for Lifelong Learning (NQF)**. This is a

continuation of two international processes: The European Qualifications Framework for Lifelong Learning (EQF), which has been developed within the European Union, and the qualification framework for higher education in connection to the Bologna process. The proposal is currently subject to a broad consultation.

The purpose of the NQF is to provide for a more unified, general description of Norwegian qualifications, based on the Norwegian Education system. It will include qualifications from primary school completion to doctorate, and these qualifications will be described through requirements for learning. The NQF is expected to have great importance for making the educational system more comprehensive both nationally and internationally, increasing mobility within and between countries, promoting flexible learning paths and enhancing lifelong learning.

In order to promote targeted and effective measures, policies must be studied and analysed. As of 2012, NOK 5 million (roughly €650,000) is being allocated annually over a five-year period for studies on adults' skills and participation in education. Norway participates in the **Programme for the International Assessment of Adult Competencies (PIAAC)**, which is the most comprehensive international survey of adult competencies that has ever been carried out. The results of the survey are expected in 2013.

Revised teacher education programme

In autumn 2010, a new programme for initial teacher education was launched. The programme puts strong emphasis on subject knowledge, teaching skills, quality of studies and research. Its principal elements are:

1. Two equal programmes geared towards the different levels of schooling (primary and lower secondary);
2. Pedagogy and pupil-related skills (PPS) – a new, expanded subject in educational science;
3. Improved quality of practical training for teacher trainees;
4. Mentoring for all newly qualified teachers;
5. Increased recruitment – new pathways into the teaching profession;
6. Centres of teaching excellence;
7. A national research school.

The Ministry of Education is currently evaluating new general plans in the following areas: teacher education, vocational teacher education, practical and di-

dactic education for vocational subjects, practical and didactic education for grades 8-13 and graduate teacher education for grades 8-13. Since 2008, the number of applicants for teacher education has increased by 54%.

Guidance Service for newly employed teachers

In the school year 2010/2011, all newly qualified teachers in primary and secondary schools received an offer of guidance from their school. This instruction can either be completely in the workplace or together with meetings outside the workplace. The offer continued for the school year 2012/2013, being offered by 90% of the schools that had recruited newly qualified teachers.

School management training for headmasters

In order to strengthen the management and leadership skills of head teachers, several education institutions are offering in-service training for newly employed head teachers, and in time for more experienced head teachers who lack this kind of training. The programme is funded and coordinated by the Directorate for Education and Training, and in 2012 the number of participating universities and university colleges was increased.

Continuous professional development for teachers

A new strategy, **Quality through Competency: A Strategy for Continuous Professional Development for Teachers (2012–2015)** is currently being implemented. The strategy aims to increase the number of teachers who have up to sixty credits of didactical competence in a certain subject. Teachers can apply to seventy-four different courses at twenty-five different universities and colleges.

1.2 KEY CHALLENGES/PRIORITIES FOR EDUCATION

The report presented to the *Storting* (Norwegian Parliament) on 'Quality in the school' (Report no. 31 (2007-2008)) set goals for the quality of education and training, which form the basis for later reports to the *Storting* and for education policy:

1. All pupils leaving lower secondary school must master basic skills that enable them to take part in further education and working life;
2. All pupils and apprentices who are capable of doing so must complete upper secondary education

and training with a certificate/vocational training certificate that is recognised in further studies or in working life;

3. All pupils and apprentices must be included and must experience mastery.

Methods/Instruments used to reach these goals:

Increase completion levels of upper secondary education and training

It is a political priority to increase completion levels of upper secondary education and training. The three-year **Ny GIV** (New possibilities) initiative that was launched in 2010 aims to establish a lasting collaboration between central government, county authorities and municipalities, in order to ensure that more young people complete and pass upper secondary education and training.

The *Ny GIV* initiative is made up of three projects:

1. **Gjennomføringsbarometeret**, the Norwegian Report on Upper Secondary Completion, sets common goals for an increase in the number of students completing upper secondary education and training and a common foundation for data and statistics in order to assess whether or not those goals have been met.
2. The **Oppfølgingsprosjektet** (Follow-up Project) aims to ensure better cooperation between county authorities and the Norwegian Labour and Welfare Administration (NAV) with regard to young people who have dropped out of education and training and been unemployed for a period of time. In 2012, 20.300 students took part in this project and 13.000 of these managed to return to school or find work.
3. The **Overgangsprosjektet** (transition project) focuses on the systematic cooperation between the municipality and county authorities with regard to a close follow-up of low-achieving pupils who are at risk of not successfully completing upper secondary education and training.

Mentor team

The Norwegian Directorate for Education and Training has been commissioned by the Ministry of Education and Research to establish a mentor team, a task that was set out in White Paper no. 31 (2007-08). The purpose of the mentor team is to support schools and local authorities (school owners) in the task of improv-



ing learning processes in schools, so that more students learn more, have a better learning environment and finish upper secondary education.

ICT-based exams and assessments

Expand the current scheme to encompass more subjects, include internet access, and revise exam forms and assignments (see also *section 3.5*).

Digital literacy in the curricula

Further integrate digital literacy in the revised curricula (see also *section 2.2*).

Measure pupils' digital literacy

Develop and carry out tests of pupils' digital skills (see also *sections 1.1 and 3.3*).

Digital divides

Carry out measures to reduce the digital divides that continue to exist in regard to skills, equipment, and infrastructure.

ICT in various subjects

Implement measures to increase the didactic use of ICT in various subjects.

ICT in teacher education

Implement measures to strengthen the obligatory integration of ICT in teacher training.

Continuous professional development for teachers

Continue measures to strengthen teachers' digital literacy (see *sections 1.1 and 5.2*).

ICT in kindergartens

Implement measures to motivate day care staff and management to use ICT and increase their skills.

2. ICT POLICY

2.1. RESPONSIBILITIES

The **Ministry of Education and Research** has the overall responsibility for the administration of the educational system and for implementing national educational policy. The **Directorate for Education and Training** is the executive organ of the Ministry and is

responsible for the development of primary and secondary education.

In each of Norway's 19 counties, the **County Governor** represents the central government at regional level, contributing to the implementation of national education policies in schools at all levels. The County Governor ensures that appropriate schooling is provided for young people in compliance with regulations, and also ensures the provision of adequate adult education facilities. Municipalities are responsible for the running and administration of primary and lower secondary schools, while counties are in charge of upper secondary schools.

The **Norwegian Centre for ICT in Education**, established in January 2010, is an executive agency of the Ministry of Education and Research. The primary tasks of the centre are linked to long-term policy targets for the education sector. The centre contributes to the development and implementation of the Government's education policies, in cooperation with relevant actors nationally and internationally.

Statped is a national service for special needs education. Statped assists local authorities in their work and provides special teaching services at individual and system level in areas in which the country's 430 local authorities do not have sufficient competence. Its defined core areas are hearing impairment, visual impairment, deaf-blindness, language and speech difficulties, acquired brain injury and learning difficulties. Statped is currently undergoing a reform intended to secure users all over the country equal access to Statped's services. It is responsible for providing digital learning material for special needs education.

Sources:

<http://www.kd.dep.no/>

<http://www.utdanningsdirektoratet.no>

<http://www.iktsenteret.no>

<http://www.statped.no>

2.2. ICT POLICIES FOR SCHOOLS

Digital literacy is defined as a basic skill in the national curriculum. Because the national curriculum is regarded as a legal directive, it is the most important ICT policy for schools. The Knowledge Promotion curriculum defines general and specific goals in each subject and for each key stage. Key stages are defined after year two, four, seven and ten/thirteen. As defined in



the Norwegian national curricula, the use of digital tools also includes the skills to critically assess and use sources and to exercise digital judgement.

It is the responsibility of school owners to ensure that schools have the necessary equipment to be able to meet the competence aims regarding digital literacy, and each municipality or county authority has its own programmes or initiatives in order to meet these demands. In upper secondary schools, most students have their own laptop provided by the school. This development happened to a large extent as a result of a national requirement to provide free teaching materials for students in upper secondary school starting in 2007.

There are government initiatives regarding digital exams and tests, as well as initiatives on e-Safety (see *sections 1.1 and 3.5*). However, the Government's policy is to reduce the number of national strategies. Instead, a number of National Centres have been established and given responsibility for developing initiatives in various areas of the education system. As mentioned in *section 2.1*, the Norwegian Centre for ICT in Education has been established and receives a mandatory guideline from the Ministry of Education and Research each year.

2.3. SPECIFIC ICT INITIATIVES

Interactive whiteboards, laptop/notebooks, tablets or other mobile devices

There is no national initiative on interactive whiteboards, tablets or mobile devices, but there are several projects initiated by schools or school owners. Many schools are installing interactive whiteboards in their classrooms, with 39% of classrooms having interactive whiteboards (Futuresource 2010). Some schools have pilot projects on tablets and a few schools have introduced 1:1 tablet programmes. Since the introduction by the Government of free means of instruction in upper secondary schools in 2007, almost every student has his/her own laptop.

Bring your own device (BYOD)

There are a few local authorities, such as the Rogaland County Municipality, that have experimented with the concept of BOYD for upper secondary schools. Other authorities such as Hordaland, Hedemark and Sogn & Fjordande are considering introduc-

ing this practice in their schools.

Cloud computing

There are no specific initiatives in this area.

Inclusion and special needs

Inclusion and special needs education is the responsibility of local authorities and school owners. The Education Act of 2000 entitles everyone to adapted education. Most pupils are in ordinary classes and take supplementary lessons based on their needs and the school's resources, as assessed on an individual basis. Statped produces a wide range of learning materials for special needs education, many of which are ICT-based (See also *section 4.1*). The Government has an overall national strategy for making the society (including ICT) accessible to everybody.

Connectivity (e.g. wireless internet, optical fibre connections)

Access to broadband and high-capacity electronic communication is a national target but at the local level it is the school owner's responsibility.

Design of 21st century learning spaces

Room for learning is a modern physical learning space focusing on the design in a learning context where ICT is at the centre. It is a national initiative for local and regional schools, in which schools and kindergartens can book the room for a day and experiment with its possibilities.

The European project **iTec** aims to develop pedagogical scenarios for the classroom of the future. The technological components of these scenarios will be made available, so that teachers can adapt them. The long-term benefit will be the development of new and appropriate ways of using technology in Norwegian schools. <http://itec.eun.org>

Any other ICT initiatives

There are many local activities that inspire teachers and students in the learning process. The **Nordahl Grieg vgs. Upper Secondary School** in Bergen is a good example. Here, teachers experiment with off-the-shelf games for learning purposes. The blogs written by students and teachers within their **Civilization IV-project** are inspiring to read for teachers interested in

games as cross-curricular learning tools. Through the Civilization IV project in social science, English and Norwegian, students work on themes such as “The Individual and Society”, “Working and Business Life” “Politics and Democracy” and “International Relations”.

2.4. ICT PRIORITIES

Area	High	Mid.	Low
ICT in teacher training		X	
In-service teacher training		X	
Curriculum development	X		
ICT-based assessment		X	
Infrastructure and Maintenance	X		
Digital learning resources		X	
School-home connections		X	
ICT for learners with disabilities / special needs		X	
ICT related research		X	
Safety	X		
Reducing the Digital Divide		X	
Interactive Whiteboards	X		
Netbook/notebooks			X
Tablets			X
Developing key competences	X		
Developing 21st century skills (critical thinking, problem solving, communication, creativity, innovation)		X	

2.5. NATIONAL CHARACTERISTICS (OPTIONAL)

No information provided.

3. ICT IN THE CURRICULUM

3.1. CURRICULAR FRAMEWORK

The national curriculum is issued as a directive and is a legal obligation for local authorities, schools and teachers all over the country. However, within schools there is room for individual choice and adaptation regarding the methods and activities used. For each

subject, the learning goals and annual number of lessons are well defined, but with scope for local adaptation. A school curriculum, adapted from the national curriculum and based on local authority priorities, is the operative document from which most other plans derive. Typically, the school curriculum has detailed descriptions of learning goals, methods, teaching materials and evaluation.

3.2. ICT IN THE CURRICULUM

The Norwegian curriculum provides a framework of five basic skills: oral, reading, writing, numeracy and digital skills. Via this framework the Ministry of Education and Research has put strong emphasis on ICT as part of learning activities in schools. ICT should be an integrated part of learning activities for all students, at all levels of primary and secondary education and in all subjects. The actual implementation of ICT for the promotion of learning differs between subject-specific curricula. The major change from previous plans on ICT in education is the specific educational use of ICT in different subjects, often with specific learning goals for digital literacy itself.

The national curricula are available online through the Directorate for Education and Training website: <http://www.udir.no/Lareplaner/> (see also section 1.1).

3.3. STUDENTS' ICT COMPETENCE

Targets for students' ICT competence are mainly related to the use of digital tools and information assessment and management skills. In the national curriculum, the use of different digital tools, such as word processing, spreadsheet and presentation programmes, are, together with the use of the internet, the most frequently mentioned targets. Moreover, the use of digital tools in subjects like arts and craft, music and science is emphasised. In addition, the curriculum includes legal and ethical topics related to intellectual property rights and the critical use of sources. Although not well defined in the national curriculum, e-Safety is still an important target defined in other policy documents. Finally, *Del rett* is a resource on intellectual property rights for both students and teachers. <http://delrett.no>



3.4. ASSESSMENT SCHEMES

Since ICT is an important part of most subjects, ICT-related skills are assessed through tests and exams in the traditional school subjects. There is no separate national test or exam on ICT skills, but a few local initiatives have been set up in this field. In the cities of Oslo and Bergen (the two largest cities in Norway), a test for assessing ICT-skills has been established. This test is quite similar in form to the national tests in the subjects of Norwegian, English and mathematics, and there is an on-going discussion about turning this test into an obligatory national test. A national regulation related to assessment was issued in August 2009, and a more formalised system for evaluation and assessment, which includes ICT as a basic skill, is now in place. In 2012, a decision was made to introduce a national test in 2013 for assessing ICT-skills for all students in the fourth grade. Students will be tested in digital judgment, digital production, digital communication and the use of standard software.

3.5. ICT-BASED ASSESSMENT

For the last few years there has been an option to take the final exam after year ten as a computer-based exam. In addition, some use of ICT, including the use of spreadsheets and the internet, has been obligatory, regardless of the choice to sit the digital or paper exam. Digital exams are likely to replace paper exams within a few years. The Norwegian Directorate for Education and Training and the Norwegian Centre for ICT in Education have initiated a project through which they are examining these issues. In addition to traditional exams, annual national tests in Norwegian, English and mathematics are carried out digitally. All students' data and tasks for traditional and digital exams and national tests is organised in a common administrative system. An annual digital survey on the learning environment, which targets students, teachers and parents, has also been developed. In 2012, 380,183 students in grade 5-13 (66%) participated in the survey. Results showed high scores on the issue of social well-being, medium scores on the question of physical learning environment and suggest that there is little bullying in school.

3.6. QUALITY ASSURANCE OF THE USE OF ICT IN SCHOOLS

In the Norwegian education system it is regarded as a local responsibility to ensure high quality in education, and to stimulate progress. Central authorities control quality and progress to a certain extent, but focus has so far been primarily on special education. Through a national portal, www.skoleporten.no, objectives and key information about each school are collected and presented. A few variables on ICT tools are included, e.g. the number of pupils per PC and connectivity.

Schools are provided with an online tool based on the British self-review framework developed by Becta (<http://www.naace.co.uk/ictmark/srf>), through which they can evaluate their achievements and status within six areas of ICT. This tool, **Skolementor** (School mentor), was launched in 2008 and it is hoped that the service will help schools to improve their "e-maturity", and thus to reach better standards related to ICT. <http://www.skolementor.no/>

Developed in conjunction with *Skolementor*, **Lærermmentor** (teacher mentor) is a self-assessment tool for teachers, which recommends a range of modules tailored to their individual knowledge and level based on results. *Lærermmentor* was released at the end of 2012. Figures are not yet available. <http://larermentor.no>

4. DIGITAL LEARNING RESOURCES AND SERVICE

4.1. CONTENT DEVELOPMENT STRATEGIES

As a rule, the Ministry of Education provides funding to local authorities (school owners), enabling them to choose and purchase learning resources and content freely. The aim is to contribute to a functioning market for learning content. However, the Ministry (through the Norwegian Directorate for Education and Training) does fund the development of learning resources in cases where the market is too small to sustain commercial development. This mainly concerns small subject areas in vocational education, minority languages and special needs education.

The **Knowledge Promotion** reform introduces the use of digital tools as one of five basic skills to be imple-



mented across all subjects and levels. Students are entitled to free learning resources and, in connection with this, the Ministry has supported some development of digital learning resources to ensure an adequate supply for upper secondary schools (see below).

Quality criteria for digital learning resources

In 2011/2012, a set of quality criteria was developed with the aim of helping teachers to assess digital learning resources and to support the developers of such resources; these criteria may also be relevant for consumers. A support forum has also been created, primarily to assess existing resources. The criteria were adjusted in 2011/ 2012. For further information visit:

http://iktsenteret.no/ressurser/kvalitetskriterier-digitale-laeringsressurser#.UO_nV7bSPEM.

4.2. E-CONTENT DEVELOPMENT

As part of the strategy for implementing the **Knowledge Promotion** reform, a three-year funding plan for the upgrading of learning resources was set up in 2007. The plan gives schools the freedom to choose between available analogue and digital resources.

For upper secondary school, eighteen of the nineteen county authorities (all except Oslo) have come together to establish a digital learning resource portal, the **National Digital Learning Arena (NDLA)**. Counties fund the initiative by allocating a portion of the funds that they receive to provide pupils with free learning resources. In addition, the Ministry has allocated funds for the development of a technical platform as well as learning resources. Some of the Ministry funds are earmarked for the purchase of commercial content for the portal. The remainder of the resources are developed by teachers and moderated by universities and university colleges. The content provided is freely available to all. The NDLA aims at providing high quality digital learning resources in all upper secondary subjects, but there is still some way to go before this goal is fully achieved.

Ovttas (ovttas.no) is an educational portal in three Sami languages and Norwegian that provides a complete and searchable overview of Sami teaching resources. The portal shares images, books, films, audio files and articles on themes related to teaching, as well as pedagogical tips. It is a resource for kindergarten staff, teachers and others involved in the field of edu-

cation. The portal was developed in cooperation with the Sami Parliament.

The Norwegian Centre for ICT in Education has been commissioned by the Ministry of Education to pilot a virtual mathematics school. The virtual mathematics school is a service and portal that offers lessons, exam practice and other personalised content for high performing students and for high school students who need extra motivation in mathematics. The resource will be piloted in 2013 and the first half of 2014.

National centres have established digital learning resources in several subjects such as mathematics, and natural sciences, mother tongue and foreign languages. For details visit the links below:

- <http://naturfag.no>
- <http://viten.no>
- <http://www.fremmedspraksenteret.no>
- <http://kraftskolen.no>

4.3. USER- GENERATED CONTENT

There are few widely used resources of this kind. On a national level, one example is **Ovttas** (see *Section 4.2*), which has incorporated the possibility to add and share user-generated content. On a local level, there are different projects around the country. On a European level, the EU **iTec** project involves 1000 classes where learning resources for the 21st century are produced.

4.4. WEB 2.0

There is no national initiative that addresses the use of Web 2.0 technology in teaching or education, but there are some initiatives from practitioners, such as **the Del & Bruk** (Share & Use) site, which encourages content sharing by teachers: delogbruk.no.

4.5. CONTENT SHARING

There are two national education portals. **The National Education and Career Portal** (<http://utdanning.no>) includes an overview of education in Norway and has more than 500 career descriptions. The other portal is ovttas.no, which provides Sami teaching resources (see *section 4.2*).



The **National Digital Learning Arena (NDLA)** initiative (See *section 4.2*) provides learning resources, freely available to all, for several central subjects in upper secondary school. The two main Norwegian broadcasting companies, **NRK** and **TV2**, both offer digital content aimed at the education sector. NRK (Norwegian Broadcasting Corporation) is the state broadcasting company; their resources consist of historical and contemporary video and audio clips linked to curriculum goals, freely available at <http://nrk.no/skole>. This service is developed with public funding and some initial funding from the Ministry. TV2's service allows for content from TV2 to be integrated into the **itslearning** platform. This is a commercial service launched in 2009, and can be found at <http://portal.tv2skole.no>.

The **Norwegian Publishers Association** has established a new portal for all digital learning resources of publishing houses in Norway: www.lmp.no. Their ambition is to create a viable commercial solution for simple access to digital learning resources, and to simplify the distribution of digital learning content for primary, secondary and higher education. The portal's distribution solution can be accessed by all content vendors and learning platforms.

Kart i skolen (School Maps) is a free service that offers updated Norwegian maps from many public agencies and research communities, as well as data that have been adapted for schools. The service includes base maps, thematic maps, and readymade teaching plans that use up-to-the-minute data. Since 2006, the Ministry of Education has had an agreement with **Norway Digital**, a national geographic data project with around 600 partners, concerning the delivery of geographic data, used in the school maps service: <http://kartiskolen.no>.

FEIDE ("Common Electronic Identity") is an important initiative related to content sharing. This project aims to implement a system for identity management and single sign-on for the entire educational system. The FEIDE project is currently about halfway through its implementation phase; once completed it will provide students with access to learning resources and other school-related sites. At the end of 2012, 89.5% of Norway's counties were FEIDE-approved, with 87.6% of upper secondary school pupils as users, while 42.2% of municipalities were FEIDE-approved, with 50.8% of primary and lower secondary school pupils as users.

Through EUN-projects such as **Calibrate**, **Celebrate** and **eQNet**, digital learning resources have been made available to other European countries. Norway participated in the Learning Resource Exchange (LRE) project, eQNet, which targeted the use of digital content across borders. The project also evaluated resources from the different national initiatives to find "resources that travel well" and add these to the LRE if possible.

4.6. LEARNING PLATFORMS

Almost all schools, both primary and secondary, use a learning platform; by far the most widely used platforms are **Fronter** and **itslearning**, while **PedIt** and Microsoft's **Learning Gateway** have smaller shares of the market. Although these systems are well developed, digital learning platforms have limitations and bottlenecks that hinder their use. The transfer of information and resources in a simple yet safe manner is a challenge that applies to all systems. Security has been criticised from relevant authorities, although the security within the systems has improved over time.

4.7. ACCESS OF SEN STUDENTS

Development and production support

Every year, the Parliament allocates funds from the government budget for the development and production of teaching aids for special needs pupils, marginal subjects in upper secondary schools, and speakers of minority languages. The design of such teaching aids should be as universal as possible; printed material should be made available in editions for the visually impaired and for those with reading difficulties, while digital components should be web-based and accessible from various browsers, and operating systems and should use open standards.

Specially adapted teaching aids and materials should be:

1. connectable to assistive technology;
2. able to change font size, font colour and background;
3. able to use graphic symbols as a supplement to or substitute for text;
4. able to make text available through sound (for pupils with reading and writing difficulties and for the visually impaired);



5. able to be operated through a switch interface (for pupils with motor difficulties or in need of alternative operating methods);
6. available in a text version and a Braille terminal (for the visually impaired).

In 2008, the **Anti-Discrimination and Accessibility Act** came into force. Section 11 of the act (“Duty concerning a universal design of information and communication technology”) applies to technology and systems that are to be made available to the general public. The act does not apply to ICT solutions where the design is regulated by other legislation, and the Education Act provides for a general right to individual adaptation (Ot.prp. no. 44 (2007-2008)). The education sector is therefore exempt from the Anti-Discrimination and Accessibility Act.

In 2011, the **Norwegian Association of the Blind and Partially Sighted (NABP)** commissioned a report by the Swedish agency **Funka Nu** that investigated the accessibility of three Learning Management Systems widely used in Norwegian education. This report which was funded by the Directorate of Education and Training showed that none of the Learning Management Systems met the Web Content Accessibility Guidelines of the W3C.

5. TEACHER EDUCATION FOR ICT

5.1. ICT IN INITIAL TEACHER EDUCATION

ICT is not taught as a separate subject in initial teacher education, but should be integrated in relevant subjects. Teacher training institutions have different approaches to how they organise teaching with ICT. Schools, as well as authorities, have expressed concern that ICT is not sufficiently integrated in initial teacher training and that newly educated teachers lack the ICT competence they need for working in schools. While the revised curriculum framework for initial teacher training has developed some points regarding digital competences, it does not generally include sufficient integration of ICT. Currently, the implementation of ICT in teacher education is being evaluated and the study was due to be completed by April 2013 (see section 1.1).

5.2. ICT IN IN-SERVICE TEACHER EDUCATION

There is no compulsory in-service training on ICT for teachers. Almost all in-service training is initiated locally and provided by universities, university colleges or private companies on a commercial basis. Courses on the pedagogical use of ICT are available, both as learning/blended learning courses and as traditional courses. The level of training a teacher receives varies greatly and depends on local priorities and decisions. (See section 1.1).

5.3. NEW INITIATIVES

There is no national initiative for training teachers to use ICT, but several local and regional initiatives exist. The city of Oslo and the Akershus University College host a special unit on digital literacy, which trains student teachers in pedagogical uses of ICT. The use of ICT in teaching practice is also one of the disciplines that students can choose to specialise in during the last two years of their teacher training. Students in their first or second year receive specific classes on the general and pedagogical use of ICT from the special ICT unit. In these classes, two teacher trainers (one subject teacher and one teacher trainer focused on integrating ICT) work together in one educational setting.

Moreover, at the University College in Østfold (HiOF), students in the first year of the general teacher-training program carry out a project in which they initiate and run a comprehensive ICT-project at a practice school. The result is presented at a regional conference on educational technology (Datamessa Østfold). The aim of the project is to present to other teachers novel ways of applying ICT in their teaching practice.

Finally, the **ProTed** Centre of Excellence in Education at the Universities of Tromsø and Oslo is implementing a program dedicated to training in-service teachers and to build a digital repository of best-practice cases in collaboration with selected schools.

5.4. ASSESSMENT SCHEMES

There is no assessment or accreditation scheme for teachers' ICT competence, but ICT should be integrated in subjects. Specialised courses on the pedagogical use of ICT are offered at some, but not all, teacher training institutions.

5.5. TRAINING THE TEACHER TRAINERS

Teacher education is still struggling to meet the national curriculum aim of integrating the use of digital tools as a basic skill in all subjects. It is likely that the training of teacher educators in digital literacy will improve as institutions adapt to the national curriculum. As the training provided for teacher trainers currently differs between institutions, it is difficult to make general comments.

5.6. INCENTIVES

Incentives vary from local or regional networks between schools to locally administered courses. There is a wide range of activities and plans that are used on the municipal level. One example is the **ICT-plan** web-resource set up by the Drammen municipality. This resource seeks to define how teachers should understand the descriptions of digital skills in the curriculum, and provides examples and practice-level experiences on these topics.

5.7. ICT SUPPORTING INCLUSION

Both teachers in both in-service and pre-service training have the opportunity to specialise in working with learners with disabilities and other special needs or in using ICT as an educational tool.

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