Digital Competence: from ICT skills to digital “bildung”

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ITU
Internet is the fabric of our lives.
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Introduction
The Ministry of Research and Education (UFD) has commissioned ITU to develop a report on the concepts *ICT as the fourth basic skill* and *digital competence* (March 10, 2003). The basis for this request was the need expressed by UFD to acquire greater knowledge of this topic. The scope of the commissioned report is comprehensive, encompassing the following themes, among others:

- Account of concepts “ICT as the fourth basic skill” / “digital literacy” / “digital competence”
- Educational policy recommendations (ICT infrastructure/broadband, curriculum, educational integration of ICT in learning strategies and teacher education, testing, educational resources)
- Digital divides
- International models (attachment)

As it was not possible to address in depth all of the questions posed in the extensive mandate, priorities had to be established. The following fields of inquiry have thus not been fully addressed; organization and structure of basic training and lifelong learning programs in ICT, and evaluations of social economic issues.

Through this report, ITU aims to contribute to an innovative initiative that will support ICT and learning in 2004. Implicit in the goal of digital competence as a continued initiative in Norwegian education is the realization of the potential of ICT for better learning.

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Executive Summary

Digital competence and digital bildung\(^1\) are key concepts in a new ambitious national initiative supporting the use of ICT in education. Digital bildung, as the vision and aim of the initiative, implies that national educational institutions will strive to offer students in all phases of schooling the possibility of using ICT in a familiar and innovative manner. This will allow students to develop the skills, knowledge, and competence that they need to attain personal goals and to be interactive participants in a global information society. This move toward digital bildung among students and teachers in the Norwegian educational system will require that we begin with the development of a new curriculum. Curriculum that is developed to educate students for an information society will entail, among other changes, more relevant types of exams (digital evaluation means), the use of digital folders, an extensive revamping of a stable, and maintenance secure broadband infrastructure, the development of digital learning resources in a national learning network, systematic upgrading in schools, and long-range support from FoU.

A link between the concepts information literacy and digital literacy gives meaning to digital bildung and digital competence. Information literacy refers to:

a) Fundamental ICT skills that include searching, locating, evaluating, manipulating, and controlling information from diverse digital sources and formats, and
b) The development of communicative competence, in the sense of a critical, interpretative, and analytical relationship to sources, digital genres, and media forms.

Digital literacy describes the ability to develop the potential inherent in ICT and the innovative use of the technology in learning and work activities. This entails a familiarity with ICT and digital media and is considered a key concept in lifelong learning.

The report e-Norge 2005 emphasizes that competence is society’s most important resource and a prominent factor in building values and economic growth. European and American studies indicate that the cultivation of digital competence will be one of the main driving forces in economic, social, and cultural developments in the future. Initiatives in ICT in education 2004-2007 must have vision and aims that relate Norwegian educational practice directly to the knowledge needs and challenges we face in an information society, and which situate Norway on par with comparable countries that provide an education in digital competence, with quality learning experiences and good teaching strategies.

The development of digital competence is defined as a central goal in Norwegian education. There is a need to consolidate the diverse plans and initiatives currently

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\(^1\) Debates on the concept of bildung run in two veins: a collective concept concerned with what is the true and correct cultural inheritance, and an individual concept with a focus on the “self” culture and identity. See Rune Slagstad, et.al. (eds.): Dannelsens forvandlinger (Bildung’s Transformations) Oslo: Pax (2003).
found in educational policies. The support of ICT must be integrated in education policy rather than channeled into supplementary resolutions.

ITU recommends that the development of digital competence be prioritized in the following areas in 2004-2007:

- Increased national efforts to build an ICT infrastructure. Computers for students and teachers, and expanded broadband.
- New and updated curriculum and study plans with concrete goals for digital competence (from skills developed through a mastery of the subject matter to good learning strategies).
- **New plan for general teacher education that requires digital competence.**
- Exam and evaluation forms that measure quality in learning based on digital environments and national standards.
- Development and production of digital learning resources and the expansion of the National Learning Network.
- Incentives to schools with ICT to better integrate the technology in educational practice.
- Strategic school leadership with ICT.

Furthermore, ITU recommends that UFD establish a working group to review and develop policy on digital competence and consequences for Norwegian education. This group should include researchers, experts, and "policy makers," and should be considered in relation to the international field. The national working group should establish an international network panel to work with the concepts and recommendations for educational policy, and be furnished with adequate resources for the work, with a minimum six-month time frame.

1. **Tomorrow’s School and Digital Bildung – A Vision**

   In the future, schools will use applications for texts and spreadsheets, drawing programs, graphic images, digital video, games, and 3-D simulation as a natural part of learning and evaluation activity. "Exams" will challenge and evaluate students’ digital competence, which will encompass information searching, interpreting, understanding, and the design, production and critical use of sources. The “exam” will focus on evaluation of a digital folder with multimedia documentation of the student’s best work and products. Teachers will evaluate student work during the course of the year by monitoring the folder.

   The school of the future respects and utilizes the students’ personal choice of media. Laptop computers, handhelds (PDA), and cell phones (MMS) are integrated in daily life at school and are part of the students’ daily media use. There is experimentation with different virtual worlds including the use of computer games where students work with molecules and DNA. Tomorrow’s school provides students with different learning settings, serving as a laboratory for experimentation and with virtual spaces for continual (re)construction of the students’ experiences. Access to relevant services and resources in a national learning network is
available via broadband for all students. Software has been developed based on the actual needs of teachers and students.

The teacher of the future combines disciplinary knowledge and digital bildung, and understands how to realize the potential of different learning models in different situations, varying the use of text-based materials and Internet. The good teacher contributes professionally in different learning settings; as inspirational, knowledgeable lecturer, coordinator in complex computer simulated environments, advisor in cross-disciplinary project work, critical navigator on the Internet and erudite user of computer games in learning situations.

2. Concept Definitions

Researchers and curriculum planners have outlined a conceptual framework for a new and important fourth basic skill/competency/cultural proficiency. Broadly and inconsistently referenced in diverse educational policy documents, the concept ranges from a description of proficient technical skills to digital competence and digital bildung.

There is no clear international frame of reference for the field; however, three main directions or trends may be identified. One direction is linked to the definition of fundamental skills in ICT: text, spreadsheet, and presentation software, and Internet searching. A second trend is linked to concepts of a fourth basic skill and cultural practice, and is concerned with basic ICT skills in specific subjects. A third direction works toward developing the concept of bildung with a focus on broader digital bildung and competence.

Several international studies point to the problem of a “skills” concept, considering this too narrow a perspective on education in general and learning activities in particular. In a knowledge society, digital competence, and bildung are more than an exclusive focus on the mastering of skills. Digital bildung expresses a more holistic understanding of how children and youths learn and develop their identity. In addition, the concept encompasses and combines the way in which skills, qualifications, and knowledge are used. As such, digital bildung suggests an integrated, holistic approach that enables reflection on the effects that ICT has on different aspects of human development: communicative competence, critical thinking skills, and enculturation processes, among others. Through greater focus on the integrated use of ICT in all subjects, teachers, and students will develop competence in navigation and the critical use of sources, as well as a sense of the social implications of digital technology.

2 The National Commission on Excellence in Education (USA) acknowledged the need for a curriculum that would produce “technology literate” high school students as early as 1983. Basic skills entailed that students would: “a) understand the computer as an information computation and communicating device; b) use the computer in the study of the other basics and for personal and work-related purposes; and c) understand the world of computers, electronics, and related technologies” (U.S. Department of Education, 1983, p. 26).

3 12 countries contributed to DeSeCo – A summary report. Uni Peter Trier, University of Neuchâtel, on behalf of the Swiss Federal Statistical Office
2.1 The Fourth Basic Skill

A number of EU reports suggest that insufficient competence and qualifications will hamper the development of a knowledge and information society. The Cedefop report (2002), "Competence Building for the Future – Education and Learning in Europe." The report shows that businesses in Europe state that employees lack basic, communicative skills (reading, writing, mathematics) and fundamental ICT qualifications. This served as the background for EU’s initiative to support e-learning, basic competence, and fundamental ICT qualifications.

As most professional occupations require basic ICT skills, many European Union countries, among others, are discussing the need to consider these a fourth basic skill. In the business world, the concept of this fourth basic skill is linked to European Computer Driving License (http://www.ecdl.com/): A computer card is a skills test that documents IT competence within the most typical areas of computer use.

The computer card consists of seven different modules from which one may choose to qualify in any number or order:

• Fundamental understanding of IT
• Use of computer and operative system
• Text applications
• Spreadsheet applications
• Database
• Presentation and drawing applications
• Internet and e-mail

After satisfactorily completing the certified tests, a computer card is issued as proof of IT competence. The computer card tests are based on an internationally approved study plan. In Norway, computer card tests may be taken at one of the 400 authorized test centers or internally through larger organizations and firms. Although the computer card is most common in firms and businesses, many junior colleges offer the card as an elective. It is the most popular elective, for example, at Ringsaker Junior College, where four entire classes of 50 students each will complete the study this year.

In 1998, Denmark initiated the IT-leap, inspired by the European computer card. This offer was made available to Danish teachers in elementary schools and is a combination of three elements: a free computer for home use, computer card tests, and an educator driver’s license. While the concept “the fourth skill” is not used explicitly, such practices nonetheless argue for an understanding of ICT as a new basic skill along with reading, writing, and mathematics.

In the Swedish competency development project ITiS (1999-2002), 75,000 teachers were encouraged to master and combine a fourth basic skill with disciplinary and educational activity.

The Norwegian initiative LærerIKT builds on Danish and Swedish programs, among others, and offers training for teachers in elementary schools and high schools. LærerIKT is based on combining ICT as a fourth skill with the disciplinary and educational use of ICT. Two sets of course modules have been developed for
elementary and high schools, respectively. In Module 2 for elementary schools, for example, which includes “writing, arithmetic and numeracy,” the basic ICT skill is defined as:

Ability to produce spreadsheets with cells and columns, enter symbols, numbers and formulas, copy and format cells and text, make diagrams (curves, column and sector charts), sort and calculate sums and averages, evaluate spreadsheet layouts.

The concept fourth basic skill may be defined as the sum of those fundamental skills required for the computer card. As in the examples above, the concept is used in several contexts. At one level, the concept of the fourth basic skill may be useful in a phase when fundamental ICT skills are lacking among school leaders, teachers, and students, as it can contribute to the definition of standards. It may also serve as a prerequisite when hiring new teachers, for example, and thus encourage established teachers to develop their competence. From a more long-range perspective, it poses a challenge to the development of national standards that combine ICT skills with practical professional and educational uses adapted for different levels.

An objection to conceptualizing ICT as a skill is that it represents a static view of knowledge. A fourth basic skill must be stamped and dated, and like the computer card, will expire after a certain period. This is an argument for the concept of competence (the Qualitative Committee’s emphasis of the concept), which represents a more dynamic and holistic view of the connection between skills and knowledge. Experiences from experiments in school improvements indicate that initiatives such as the computer card and LærerIKT are understood as general programs that become outdated after a short time. Norwegian teachers primarily need competence improvement related to their own disciplinary expertise and the local educational practice.

2.2 The Four Cultural Skills

An alternative to the concept of a fourth basic skill is a fourth cultural skill. The notion of a fourth cultural skill was proposed in Bent Andresen’s (1999) book: School in Time. The book has been an important Nordic contribution in the work with advancing the use of ICT in schools. He describes the four cultural skills as follows:

First Fundamental Cultural Skill: Reading both printed media and screens, where students and teachers seek experiences and find information via digital sources, such as reference works, CD-ROM’s and other learning resources. On the computer screen, digital sources and multimedia resources supplement printed literature.

Second Fundamental Cultural Skill: Writing with tools that range from pencils to the production of digital multimedia texts, digital music, web pages, etc.

Third Fundamental Cultural Skill: Mathematical calculations: mentally, on
paper with pencil, with calculator, and with digital spreadsheets, statistics, graphs, and applications.

**Fourth Fundamental Cultural Skill:** Use of ICT as an extension of the three previous cultural skills, from basic “computer card” abilities to the interpretative and critical use of ICT in the form of digital competence.

The fourth basic skill as explained above is based on a set of fundamental ICT skills that are linked to relevant, educational use. The fourth fundamental cultural skill is more integrated into the three original cultural skills of reading, writing, and arithmetic and is thus a more forward-looking concept. The concept of cultural technique also reminds technology skeptics that writing skills were also once considered unnatural, alien to the oral traditions that were distinctly human. According to Plato (in Phaidros), writing would weaken memory and consciousness. However, as we know, Gutenberg’s controversial printing press evolved into books: a natural learning resource in school, no longer defined as technology but a natural means of mediating knowledge and cultural inheritance.

Resistance toward the concept cultural skill seems to be based on unfamiliarity and the fact that the concept is abstract and not directly relatable to digital media or ICT. ITU’s plan for competence development for ICT in multicultural schools” (Vahl Elementary School, Jordal High School and Elvebakken Junior College) is inspired by Andresen’s concept of cultural skills (see attached).

### 2.3 Digital literacy, ICT literacy

*Digital literacy* and *ICT literacy* are concepts that arise in different contexts and have varied definitions. The concepts are situated in a new cross-disciplinary research field that is related to *media literacy, media studies,* and *media education* (Tyner, 1998). The concepts are found in popular science discussions and the mass media (Gilster, 1997). The concepts are referred to in educational policy documents from, for example, OECD, EU and in national initiatives (New Zealand and Singapore). In this report, we will primarily consider the use of the concept in educational policy.

In the book *Digital Literacy,* Paul Gilster has contributed to the following definition of the concept: "... the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers." This encompasses, Gilster continues: "...being able to understand a problem and develop a set of questions that will solve that information need." He adds: "Developing the habit of critical thinking and using network tools to reinforce it is the most significant of the network’s core competencies" (Gilster, 1997, p. 33).

Although Gilster’s book is popular science, his definition has had great influence in educational policy debates. The Ministry of Education in New Zealand has made an ambitious plan for supporting ICT in education, with *Digital Literacy* and *Information Literacy* figuring prominently. In *Digital Horizons: A strategy for schools for 2002-*

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4 *Media Literacy is the ability of a citizen to access, analyze and produce information for specific outcomes.* (Aufderheide & Firestone, 1993)
2004, information literacy is defined as

…the ability to locate, evaluate, manipulate, manage, and communicate information from different sources. As learners become increasingly information-literate, they develop skills in discrimination, interpretation, and critical analysis. ICT offers opportunities for higher-order thinking and creativity in processing, constructing, and conveying knowledge.\(^5\)

This is similar to definitions in reports by the Educational Testing Service (ETS) and EU. The definition of digital literacy is cited from the same source:

…the ability to appreciate the potential of ICT to support innovation in industrial, business and creative processes. Learners need to gain the confidence, skills, and discrimination to adopt ICT in appropriate ways. Digital literacy is seen as a ‘life skill' in the same way as literacy and numeracy.

These examples illustrate how digital literacy and information literacy are used as guides in a national plan, providing ambitions and goals. As seen above, the two concepts are given different definitions, with New Zealand’s interpretation unique in terms of the emphasis on digital literacy being linked to innovation and creative processes.

2.4 Digital Transformation: ICT literacy

In 2001, Educational Testing Service (ETS) in the USA assembled an international panel in order to study “…the growing importance of existing and emerging (ICT) and their relationship to literacy.” The panel was composed of experts, "policymakers," and researchers in Australia, Brazil, Canada, France, and the USA. In the report Digital Transformation. A Framework for ICT Literacy, the concept ICT literacy is defined accordingly:

**ICT literacy** is using **digital** technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society. The panel’s definition reflects the notion of ICT literacy as a continuum, which allows the measurement of various aspects of literacy, from daily life skills to the transformative benefits of ICT proficiency. ([http://www.ets.org/research/ictliteracy/ictreport.pdf](http://www.ets.org/research/ictliteracy/ictreport.pdf))

ETS presents five critical components that represent a set of proficiencies and knowledge. In the report, it is emphasized that this set enters into a development of increased cognitive complexity.

After discussions regarding the kinds of tasks represented by each component, the panel agreed on the following definitions:
Access - knowing about and knowing how to collect and/or retrieve information.
Manage - applying an existing organizational or classification scheme.
Integrate - interpreting and representing information. It involves summarizing, comparing and contrasting.
Evaluate - making judgments about the quality, relevance, usefulness, or efficiency of information.
Create - generating information by adapting, applying, designing, inventing, or authoring information."

This five-stage model is expanded with two underlying cognitive and technical proficiencies:

The three proficiencies, then, are defined as follows:

**Cognitive Proficiency** — the desired foundational skills of everyday life at school, at home, and at work. Literacy, numeracy, problem solving, and spatial/visual literacy demonstrate these proficiencies.

**Technical Proficiency** — the basic components of digital literacy. It includes a foundational knowledge of hardware, software applications, networks, and elements of digital technology.

**ICT Proficiency** — the integration and application of cognitive and technical skills. ICT proficiencies are seen as enablers; that is, they allow individuals to maximize the capabilities of technology. At the highest level, ICT
proficiencies result in innovation, individual transformation, and societal change.

Based on this concept of ICT literacy, the report suggests a revision of curriculum adapted to the various levels of skills and age groups. Corresponding new exam forms are recommended that may measure and document digital competence.

The ETS report emphasizes that ICT is a catalyst for change in education and that ICT literacy
- should not be primarily defined as a mastering of static technical skills,
- requires basic skills (reading, writing, arithmetic),
- includes critical thinking and problem solving,
- includes the use of digital media, communication tools and/or tools to access, control, classify, integrate, evaluate, and create information to function in a knowledge-based society,
- will be in continual, dynamic change.

The ETS report is a good point of departure for strengthening UFD’s awareness of the field. Although it was written in 2001, the solid nature of the report has made it a relevant tool for educational policymakers. A weakness with the ICT literacy concept in the ETS report is that it does not emphasize innovation, problem solving, and collaboration, and it is for this reason in particular that ITU recommends the concepts digital competence and digital bildung.

2.5 Digital Competence and Digital Bildung

In an information society, it is difficult to distinguish a fourth cultural proficiency solely related to ICT. Reading, writing, and mathematics, which could previously be classified as fundamental analogue cultural skills, are already in the process of becoming digitized. Students and teachers do not read only books, but read and interpret text in the broader sense on screens. Students and teachers write with a pencil but they also make multimedia texts. Arithmetic can be done on paper, with a calculator or by means of a digital spreadsheet. Therefore, an updated bildung concept is more in keeping with the challenges of an information and knowledge society.

A digital bildung concept may be seen as an updating of the bildung perspective already found in the curriculum at the elementary and high school levels, which emphasizes the creative, working, well-rounded, collaborative, environmentally conscious, integrated aspects of humankind. A number of aims have also been formulated regarding an education that promotes bildung on three different levels: competence; ability, qualifications; knowledge, and identity; independence and reflection. It is a given that students in schools learn the three analogue cultural skills of reading, writing, and calculating, while digital competence or cultural skills are not incorporated in the curriculum.

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6 In addition to the bildung perspective the curriculum also has a more instrumental view on disciplinary knowledge.
A link between the concepts information literacy and digital literacy gives meaning to digital bildung and digital competence. Information literacy refers to

a) fundamental ICT skills that include searching, locating, evaluating, manipulating, and controlling information from diverse digital sources and formats;
b) the development of communicative competence, in the sense of a critical, interpretative, and analytical relationship to sources, digital genres, and media forms.

Digital literacy describes the ability to develop the potential inherent in ICT and the innovative use of the technology in learning and work activities. This entails a familiarity with ICT and digital media and is considered a key concept in lifelong learning.\(^7\)

In an information society, digital bildung and competence will be considered more important than skills and proficiencies since bildung expresses a holistic understanding of how individuals learn and how they develop their identity. Bildung thus encompasses and combines the use of skills, qualifications, and knowledge. As such, digital bildung points to an integrated holistic approach that enables us to reflect meta-learning, communicative competence, social competence, etc.

Several international studies indicate that skills concepts give too narrow a perspective on education and learning activity. Based on an increased international interest in results and effects of education, as well as the need for common frames of reference for identifying and analyzing so-called key competencies, OECD invited member countries to participate in a four-year project. The project is called DeSeCo (Definition and Selection of Competences), with the final report released in November 2002. Here, competence is defined as “the ability to meet demands or carry out a task successfully, and consists of both cognitive and non-cognitive dimensions.”

DeSeCo focuses on three categories of key competencies that are important in different life situations, and which are defined as essential for everyone. In the DeSeCo report, it is emphasized that the selection and definition of key concepts must be made in keeping with what the respective societies consider important among individuals, in groups and institutions within the society as a whole.

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\(^7\) Seymour Papert moves in the direction of digital bildung in *Mindstorms* (1980) when he uses the concept fluency, or being technologically fluid, in relation to computers: everyone may learn to use a computer in a competent manner.
The DeSeCo report has been the basis for international work with a competency concept. The use of a competency concept in connection with elementary education is relatively new, although it has been used in adult education and has through lifelong learning become a central concept in education policy, curriculum planning and quality evaluations.

The resolution adopted by the Quality Committee In the First Row (2003) emphasizes that elementary school education today must focus on basic skills to a greater degree, and has defined these as fundamental skills, social competency and good learning strategies. Digital competence is situated alongside skills in writing, reading, and arithmetic. The Quality Committee distinguishes between different types of competencies such as user proficiency, digital practice and super user competence. The digital practice concept signals a willingness to use new technology, and the Committee emphasizes that digital competence is linked to both the bildung aspect and the skills requirements in schools.

Digital bildung may also be defined as a vision, and should be considered a contribution to a new ambitious national initiative supporting ICT in education. This requires all educational institutions to strive to offer students a possibility to use ICT in a familiar and innovative manner in order to develop the skills, knowledge and competence they need to achieve personal goals and become interactive participants in a global information society.

Digital bildung will entail the development of a curriculum for an information society that facilitates a digital “exam,” expansion of a stable and maintainable ICT infrastructure with broadband, the development of digital learning resources, systematic school improvements, and long-range support from the National Research Council.
3. Consequences for Educational Policy

Both European and American studies suggest that digital bildung and the development of digital competence will become the driving forces in future economic, social and cultural growth. There will be no lack of information in Norway in the future; the challenge will to an ever-increasing degree lie in developing competencies and the ability to learn throughout life. In an information society, knowledge is the most important resource and learning the most important process; digital bildung and digital competence are thus key concepts for further work with visions, goals and policy in Norwegian education initiatives. A new national strategy for ICT in education (2004-2007) is built on long-rang and ambitious plans based on digital competence and digital bildung.

Mastering ICT becomes one of the fundamental skills for today’s children and youth, because this comprises a central area for competitive skills and developmental possibilities in an information society. This entails a large responsibility for central authorities, in order to insure that today’s youth develop adequate competencies. An international movement may now be seen, as countries ready themselves to meet the digital challenges and utilize the potential of ICT.

In the eEurope plan approved by European leaders in Lisbon in March 2000, EU describes the following goal:

...to become the most competitive and dynamic knowledge based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion.

This is followed up in e-Learning – Designing Tomorrow's Education (Commission of the European Communities 2002):

**eLearning** seeks to mobilise the educational and cultural communities, as well as the economic and social players in Europe, in order to speed up changes in the education and training systems for Europe’s move to a knowledge-based society.

Digital competence and digital bildung are central concepts in EU’s plans:

*The first essential stage in this move is the acquisition by the citizens of Europe of the confident use of the new tools for accessing knowledge and the widespread development of a ‘digital literacy’ – adapted to the different learning contexts and target groups…*the emergence of the knowledge-based society implies that every citizen must be ‘digitally literate’* and basic skills in order to be on a better footing in terms of equal opportunities in a world in which digital functions are proliferating.*

Norway ought to have the same level of ambition as EU, that is, a prioritizing of digital competence as a central goal in further educational policy initiatives.

3.1 ICT Infrastructure, Computers, Broadband

ITU recommends:
An inter-departmental initiative (anchored in the e-Norway plan) is necessary to meet the demands of digital competence: more computers for teachers and students, better infrastructure and broadband access.

**Computer equipment**
- Continual efforts must be made to improve access to computers in school.
- School computers must be integrated in the actual settings where teachers and students work.
- Programs must be developed to insure well-maintained and up-to-date computers.

**Maintenance and stability**
- Schools have the same demands for stability and maintenance as the modern workplace. Both students and teachers must be sure that the infrastructure and equipment function satisfactorily and that lessons will not be hindered due to technical problems.
- Models must be developed for centralized and professionalized operations staff and routines that will provide schools with technical stability and security.
- Operations requirements must be determined, and service plans must be based on a model that links individual schools with school owners.
- Based on service plans, support functions, professional staff, and a minimum response time must be available for maintenance and emergency needs. Student resources should be utilized.

**Broadband**
ITU recommends full-scale national coordination (national departments, state organs, municipal organizations, and private firms) in building an ICT infrastructure based on broadband. ADSL is a solution for the private market calculated for one household. Deliberate efforts must be made to insure access to Internet and broadband in Norwegian schools that will be on par with schools in other countries. This network must be dimensioned to accommodate upgrades and better solutions as they become available.

ITU’s recommendations are based on the report on broadband from the HØYKOM School (0.9 version). Flexible learning arenas with digital competence mean that broadband in schools must be dimensioned in relation to the following developments.

Work methods in school: how ICT is used in differentiated and collaborative learning activities. This is also related to the organization in schools toward greater openness and flexibility in time and place for learning.
- Downloading of digital content that demands large bandwidth, such as sound, pictures, film, streamed video and simulations.
- Distribution of student and teacher productions based on the use of digital tools such as sound, photos, and video.
- Collaboration on the Internet in real time with sound and video and/or with use of digital tools for shared editing of sound and video, or real time interaction in 3D simulations and Internet games.
• Technical relationships, such as computer equipment age and placement, selection of server solutions, maintenance, and the Internet structure, together with developments within formatting technology for video and solutions for temporary storage of large data quantities.
• The number of simultaneous online users at the school.

Based on the goals of digital competence there is no basis for evaluating the need for broadband in elementary schools differently from high schools. The HØYKOM school report has developed the following estimates for different school sizes, based on an evaluation of the expected need for large bandwidth in approximately 5 to 6 years:

A. A school with less than 50 students without remote servers of thick clients/with remote servers of thin clients will need 2 – 10 Mbit/s
B. A school with 50 students and remote servers will need 10 – 32 Mbit/s
C. A school with 100 students and remote servers will need 32 – 100 Mbit/s
D. A school with 300 students and remote servers will need 100 Mbit/s +

Internet structures
It is impossible to recommend a specific solution in this regard, as the criteria for evaluation and the choice of solution will vary from place to place. Many schools and school owners will nonetheless benefit from an overview of different solutions. A report should be prepared concerning various network structures, costs, and financing models.

3.2 Curriculum and Study Plans

In 1994, Reform 94 was put into effect at the higher education level. Under this reform, the subject “Information Management and Economy” was introduced into the general curriculum. Schools were mandated to procure computer equipment within a five year period that would make it possible to offer the IT course, and this led to comprehensive investments in these schools. However, ICT was not incorporated in the general curriculum in a systematic manner.

In 1997, a new curriculum reform titled L97 was introduced at the elementary school level. The reform included a clause that specified that the IT portion of the curriculum could be realized only to the extent that computers were available, and municipalities were not mandated to procure the computer equipment for the schools. In the Annual Plan for 2003 that deals with ICT in Norwegian education, this clause has been removed.

ITU’s assessment is that the lack of anchoring of ICT in the curriculum has retarded this aspect of school development; without national stipulations and clear goals about the competencies that students should develop in relation to ICT, practice in schools is haphazard and quality is difficult to evaluate. Initiatives for ICT have been developed independently of curriculum and course plans, and educational reforms have had an “analogue” agenda. Neither do the new guidelines for teacher education call for digital competence.

There are no clear and systematically updated concepts of ICT in the curriculum, which also fails to make a connection to children and adolescents’ digital culture.
and how it contributes to the development of their digital competence. ICT is mentioned solely as a tool that one may choose to use and competence in ICT is described in the sense of a static skills perspective.

ITU recommends:

The development of a new curriculum based on the concepts of digital bildung and digital competence, with clear national goals for student digital competence adapted for different age groups and subjects.

The revision of courses and curriculum in order to include digital competence as a basic proficiency, with the cultivation of skills emphasized. Aims for digital competence should be included and viewed in conjunction with the more general goals for education and learning.

3.3 Teacher Education

The new educational policy guidelines for general teacher education established by UFD (March 4, 2002) do not include the goal of educating teachers with digital competence. The guidelines thus break with the ambitions for teachers’ professional development stated in e-Norway 2005, and do not build on the aims outlined in ICT in Norwegian Education. Plan for 2000-2003. The guidelines are characterized by a “massaging” of existing teacher education in its present form, and represent a retreat from national initiatives to promote ICT in education. It is thus important to emphasize that ICT plays a decisive role in the modernization of teacher education, and digital competence is the basis for the teacher of the future in tomorrow’s schools. ICT is consistently insufficiently integrated in the educational guidelines.

ITU has previously analyzed educational policy guidelines, recommending that policy should define and prioritize digital competencies including fundamental ICT skills, disciplinary and educational use of ICT, critical and reflected use of ICT and the innovative use of ICT.

Further, ITU notes that recommendations resulting from ITU’s national program PLUTO (Program for Teacher Education, Technology and Reform) have not been incorporated in national educational policy. PLUTO consisted of 10 projects divided among eight institutions, many of which used ICT in order to create a course plan with greater flexibility and better connections between the different learning arenas in the study. Preliminary results from PLUTO indicate that ICT has been a catalyst for change in teacher education in the following areas:

- Alternative evaluation means/digital folders.
- Use of ICT has systematically changed pedagogy and disciplinary content in teaching.
- Successful integration of ICT in teacher education demands organizational and pedagogical changes.
- Tighter relationships are developed through networks between schools and teacher environments.
PLUTO projects have contributed to an increase in learning quality with ICT, which was acknowledged when the Institute for Teacher Education (ILS), University of Oslo, received the Education Quality Award 2003 for the Pluto project *Practical Education in Digital Learning Environments*. Secretary of State Bjørn Haugstad from UFD presented the award in Tromsø on May 6, during the conference "Quality Reform and Education Quality" arranged by NOKUT (National Organization for Quality in Education).

In his presentation, Haugstad made the following statement: "Teacher education at ILS has achieved a completely new profile through the comprehensive use of ICT resources for all study units, including practical classroom experience. The technology has been a driving force in reform work that has produced significant changes in study and learning forms, with increased emphasis on student activity and practical learning methods, case methodology, digital learning folders and exams."

[http://www.nokut.no/sw467.asp](http://www.nokut.no/sw467.asp)

ITU recommends:
Revitalizing and refining the PLUTO program with an emphasis on digital competence in relation to subject matter, pedagogy, and innovation. A new updated policy for general teacher education is needed that builds on digital competence and is coordinated with national initiatives within ICT.

3.4 Forms of Examination and Evaluation

The traditional forms of evaluation and examination that are used today do not correspond with the aims of ICT projects and plans. Examinations largely impact on pedagogy, organization, and use of ICT in schools, and must thus be considered a catalyst of change.

ITU recommends:
New digital means of evaluation based on national standards for the respective disciplines and levels. Evaluation of digital competence must be adapted for various aspects of such competencies. To date, few studies have been made that attempt to identify good evaluation forms that accommodate different aspects of digital competence.

At a fundamental level, one must question what one actually wants to measure, and concentrate the evaluation in relation to digital competence. Such problems are discussed other places in this report, but also have direct consequences for the development of evaluation forms.

Some means and purposes of evaluation include:

- Tests of digital skills, as in a computer card. As a point of departure, one may look to the USA and Scotland for ideas, among other places, where students master different skills in the use of ICT, adapted to progression at different levels.

- Evaluation of digital competence in specific subjects, with ICT included in evaluation forms adapted to different subjects and levels: mathematics, for example, where spreadsheet programs may be used, word processing in language subjects or drawing programs in art and design.
- Evaluation of good learning strategies and deep knowledge in subjects, as in meta-cognitive learning processes.

- Evaluation of digital folders from individual students and projects.

- Evaluation of virtual collaboration, problem solving, creativity, and interaction.

**ITU’s Main Recommendations:**

There should be a broad use of digital technology in evaluation methods in schools.

Digital evaluation methods should be researched and tested for implementation in schools.

### 3.5 Digital Learning Resources

Many students are digitally competent. Those with the highest digital competence are characterized as *homo zappiens* (see Wim Ween) – with an ability to work with several media simultaneously and with multi-cognitive and multi-processing cognition. Such students will expect that it is possible to work with interactive digital learning resources: virtual laboratories, 3D-simulations over the Internet, downloading of film/video, real time collaboration on sound/video productions, videoconference/web camera, production and distribution of music, games, and edutainment.

The need for digital learning resources and services are great both in educational and business sectors. Good models for quality assurance are also needed. The development of learning resources should have the aim of continually expanding the borders and combinations of disciplines, pedagogy, and structure. These models should be based on the notion that students of all ages and levels will learn more and better independent of time and space through, for example, net-based solutions. This means that content and service providers may be both new and established in the market.

The needs associated with content and services will be different at various educational levels. Researchers at universities and colleges need quite different resources and services than elementary school, and a manifold of these should be developed. This will raise the competency need of those who produce and those who use the resources.

ITU has developed a set of criteria for the evaluation of learning resources:

- **Content:** Emphasis on quality and diversity in content.
- **Functionality:** Resources are weighted according to user friendliness and how well they function without failing.
- **Interactivity:** Resources are weighted by the extent to which content is steered by user choice and action.
- **Design:** Resources are weighted by comprehensibility, navigation, and how well the design communicates the content component.
- **Innovative:** Evaluation is based on the extent of creativity and innovation in relation to execution and content.
• *Educational value:* Evaluation is based on the ability to integrate the resource in an educational setting.
• *Technical solution:* Evaluation is based on whether the resource is stable and platform independent.
• *Accessibility:* Evaluation is based on whether the resource is open to all or whether registration and fees are required.

Initiatives such as NLN (National Learning Network) and digital learning resources must be undertaken in relation to a downscaling of analogue paper-based media. Support for the production of paper-based media in elementary and high schools for 2002, for example, included Kopinor 83 million Norwegian crowns (Kopinor annual report 2002) and school textbook publication 383 million Norwegian crowns (figures from Norwegian Non-Fiction Writers and Translators Association - NFFO, as reported in Dagens Næringsliv April 1, 2003).

ITU recommends:
Support of the National Learning Network that may encourage and enable collaborative activity to secure the development, exchange, and recycling of digital services and content.

Media-rich and complex learning resources within a multiple of topics for all educational levels (see NLL report).

Resources that may be used in various learning trajectories and that are not “readymade” learning tools.

Use of digital learning resources in learning trajectories must emphasize accessibility, multiplicity, and pedagogical variation.

Digital learning resources should be free of charge for students in elementary school and largely accessible via the National Learning Network.

Measures to stimulate the market for content production, including comprehensive initiatives:
• This entails legal considerations of copyright problems and economic concerns.
• Creative and innovative concerns – in other words, actors should be given real possibilities to participate through means of stimulating content and service production/development of digital learning resources that do not discourage competition (see NLN report).
• Payment solutions should be developed for online content and services.
• All educational system actors should be potential contributing users of NLN digital learning resources.

ITU recommends:
• The advisory committee for NLN should develop a strategy for digital learning resources for *Project 2004-2007* by September 10, 2003.
• The advisory committee for NLN should form a subcommittee for a project in *Project 2004-2007* that works with pursuing recommendations from NLN and this report. The subcommittee should develop concrete suggestions for initiatives within digital learning resources by September 15, 2003.
3.6 Organization and Structure in Basic Education

Elementary, high school and teacher education institutions lag behind other kinds of organizations in terms of actively using ICT in leadership and administration development. There is a need for innovation and organization development with ICT in basic education and teacher education. The innovation concept has traditionally been linked to technology and economy in business, but has been transferred to the education sector; through national programs and initiatives, education should be qualitatively improved through innovative use of ICT. There is an international movement where top down pressing of ICT is followed up with increased support for learning with ICT at the regional level.

School development with ICT demands willingness to change and strong school management. Effective implementation of ICT demands a critical review of the means available in terms of class time and course subjects. Teachers must be provided time and opportunity to exchange experiences, and the ICT infrastructure must be stable.

ITU recommends:

All schools must have a strategic ICT plan for the development of the school as a flexible and learning organization within 2005.

Implementing of program (2004) for ICT school managers and school development (ITU ICT ABC) based on clusters with resources, based on national quality standards.

All schools must have software that supports the basic functions within administration, management and education within 2005.

All schools must have a homepage on a website with continually updated information for parents and students within 2004.

All schools must have a competency plan for teachers and students within 2004.

3.8 Lifelong Learning

ITU has not evaluated this point. The concept digital competence contributes to the further development of basic education and the challenges represented by lifelong learning.

4. Digital Divides

Reading, writing, calculating, collecting, storing, and treating information are changed radically through digitization of increasingly more fields in society. In the book Digital Divides (2002), Frønes describes the digital society as a communication society. This entails the ability to produce communication as much as the ability to interpret information. The digital society demands the development of competence, both in relation to the digital field, to IT production and development, and in the general sense of increased demands for basic competence. This trend is illustrated in the large proportion of disabled persons
who have reading and writing problems. There is an increased demand for reading and writing skills in the job market, as well as digital competence.

Participation in the digital society demands a high level of general competence combined with digital user competence. This poses challenges to schools in terms of strengthening basic skills; reading, writing, calculating. Professional and educational use of ICT requires that students master the three basic skills; for example, learning and administration systems such as ClassFronter, It’s Learning, FirstClass, are based on navigation through text. The three basic skills are a precondition for developing good learning strategies in relation to Internet and digital learning resources.

Digitalization Requires Good Writing Skills
Earlier in history, writing, in the sense of a cohesive text, was not a prevalent demand among the majority of the population. Today, a farmer must write applications in digital format, a nurse must keep digital journals with digital images as attachments. Writing is not the mirror activity of reading; different knowledge is required to compose a message that will communicate with the reader. Producing a text poses a number of formal demands to how the text should function in a context; for example, text with sound and images on a web page places greater demands on presentation and design.

It is important to develop skills in choosing, evaluating, and organizing information for relevance in different contexts. How to create a connection between information bits from different contexts? Developing skills such as comprehending, condensing and critically evaluating are central. In these contexts, guidance from competent teachers is important. Demands will made for overview, structuring skills and written presentation forms combined with concept based knowledge.

In Digital Divides (2002), Frønes points to two main challenges for education and digital competence development in Norway: The competence of teachers as digital users is weak, and large investments in school ICT infrastructure is necessary. His conclusion:

Digital Norway is changing. However, despite expensive ring tones on teenagers’ cell phones, there are strong indications that the country is moving more toward Kuwait than California and Finland (Frønes 2002:132).

Competence and learning concepts today appear as the basis for a transition to an information society. The challenge in Norwegian society is neither the lack of nor access to information; rather, it is the ability to learn to develop competence throughout life. It is thus necessary to focus on digital competence in the work to counter digital divides.

ITU recommends:

As relatively large differences exist in today’s Norwegian school in terms of both access and the educational use of computers, Internet and broadband, it must be a national goal for schools to offer their students good access to ICT. ICT must be integrated in schoolwork methods to actively counter the development of digital
divides. All schools need broadband to be able to give children adolescents the competence they and society need in the future.
Appendix

1 Digital Horizons (New Zealand)

The Ministry of Education in New Zealand has produced an ambitious plan in which the concepts Digital Literacy and Information Literacy have a central role. In Digital Horizons. A strategy for schools for 2002-2004, it reads: “Good progress has been made through the previous strategy in developing school ICT infrastructure, capability and programmes. This strategy focuses on helping schools to extend their use of ICT to support new ways of teaching and learning.”

DEFINITIONS

**Information technology** (IT) is the term used to describe the items of equipment (hardware) and computer programs (software) that allow us to access, retrieve, store, organise, manipulate, and present information by electronic means. Personal computers, scanners, and digital cameras fit into the hardware category; database programs and multimedia programs fit into the software category.

**Communication technology** (CT) is the term used to describe telecommunications equipment through which information can be sought, sent and accessed, for example, phones, faxes, modems, and computers.

**Digital literacy** is the ability to appreciate the potential of ICT to support innovation in industrial, business, and creative processes. Learners need to gain the confidence, skills, and discrimination to adopt ICT in appropriate ways. Digital literacy is seen as a ‘life skill’ in the same way as literacy and numeracy.

**Information literacy** is the ability to locate, evaluate, manipulate, manage, and communicate information from different sources. As learners become increasingly information-literate, they develop skills in discrimination, interpretation, and critical analysis. ICT offers opportunities for higher-order thinking and creativity in processing, constructing, and conveying knowledge.

**e-learning** is flexible learning using ICT resources, tools, and applications, and focusing on interactions among teachers, learners, and the online environment. E-learning usually refers to structured and managed learning experiences, and may involve the use of the internet, CD-ROMs, software, other media, and telecommunications.

**Online learning** is more specific to the context of using the internet and associated web-based applications as the delivery medium for the learning experience.


2 ITU’s Competency Plan for Teachers in the Project *ICT in Multicultural Schools*

**Fundamental ICT competence**

In ITU’s competency plan for teachers in the project ICT in Multicultural Schools, there are three proficiency levels that correspond with phases in school development with ICT: 1) Fundamental ICVT skills, 2) Disciplinary and pedagogical use and competence, 3) Innovative ICT competence. This three-stage model is based on the understanding that school development with ICT requires all teachers to have the necessary fundamental ICT skills. The fundamental ICT skills include:

**Mastery of ICT skills at a level that enables teachers to begin testing and using ICT in the subjects they teach:**

- Master the combination of ICT use and fundamental cultural skills: reading, writing, and mathematics (for example, Windows, Word and Excel).
- Master communication via digital media (e-mail, chatting, online discussion
groups, information searches).

- Test possibilities and opportunities in relation to the use of ICT linked with reading, writing, and calculating/mathematics.
- Familiarity with different forms of presentation tools.
- Methodological qualifications, the ability to systematize impressions, actions, and practice through problem solving with ICT use.
- **Use Internet with a special focus on search skills in order to recognize various information sources and evaluate their usability in disciplinary domains.**
  - Plan searches by formulating search keywords and developing search profiles.
  - Conduct searches by means of keywords, text strings, logical operations, indexes, and catalogues.
  - Collect and organize search data and store for later use.
  - Interpret and use search data.

**Use various digital learning resources in specific subjects and within cross-disciplinary learning programs:**

- Explore diverse software applications and online resources in collaboration with project leaders and teachers in specific subjects.
- Develop strategies that enable the teacher to consciously test some of the same learning resources and/or consciously choose different learning resources for practical experience.
- Develop criteria for evaluating what are satisfactory and good learning resources.

**Use learning and administration tools (learning management systems) in order to communicate with managers, colleagues, and teachers on different levels, and create a forum for experiences:**

- Build familiarity with LMS tools by placing documents and making classes, etc.
- All communication, management - teachers – students should be conducted through learning and administration system.
- LMS is used as a basis for experience-based teacher forums dealing with the use of ICT in subjects.
- Establish a physical and virtual forum for the exchange of experience and reflection between teachers.

**3 e-Europe: digital literacy; e-skills, e-learning, e-citizen**

In eEurope, the plan approved by European leaders in Lisbon in March 2000 contains the following goal: “...to become the most competitive and dynamic knowledge based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion.” This is followed up in *e-Learning – Designing Tomorrow’s Education* (Commission of the European Communities 2002): *“eLearning seeks to mobilise the educational and cultural communities, as well as the economic and social players in Europe, in order to speed up changes in the education and training systems for Europe's move to a knowledge-based society.*

Digital competence and digital bildung are central concepts in EU’s plans: *“The first*
essential stage in this move is the acquisition by the citizens of Europe of the
certain use of the new tools for accessing knowledge and the widespread
development of a ‘digital literacy’ – adapted to the different learning contexts and
target groups…the emergence of the knowledge-based society implies that every
citizen must be ‘digitally literate’ and basic skills in order to be on a better footing
in terms of equal opportunities in a world in which digital functions are proliferating”.

This is reiterated in Proposal for a Decision of the European Parliament and of the
Council Adopting a Multi-Annual Programme (2004-2006) for the effective
integration of ICT in education and training systems in Europe (Brussels, December
19, 2002): “In the eLearning Action Plan1, ‘e-learning’ was defined as ‘the use of
new multimedia technologies and the Internet to improve the quality of learning by
facilitating access to resources and services as well as remote exchanges and
collaboration’”. However, ‘e-learning’ has become shorthand for a vision in which
Information and Communication Technologies (ICT)-mediated learning is an
integral component of education and training systems. In such a scenario, the
ability to use ICT becomes a new form of literacy - “digital literacy.” Digital literacy
thus becomes as important as “classic” literacy and numeracy were one hundred
years ago: without it, citizens can neither participate fully in society nor acquire the
skills and knowledge necessary for the 21st century…digital literacy needs to be
addressed, taking into account the many facets of how the use of the Internet and
electronic devices can become part of everyday practices. On the one hand, the
use of the Internet presupposes sound proficiency in the mother tongue and other
languages, and other basic skills. On the other hand, a whole range of new
competencies is required: media competences; creating, producing and using new
digital services; designing new educational objects and games. European countries
should address the full range of proficiencies that are required and revisit the
teaching of basic educational skills. Only then can the Internet serve as a stimulus
to learning by extending the physical boundaries of the classroom through access
to information and communication environments.

4 21st Century Literacy
According to the Summit of 21st Century Literacy, Berlin 2002, new approaches
emphasize the abilities to use information and knowledge that extend beyond the
traditional base of reading, writing, and math.

Teachers, students, employees, and citizens must now incorporate the
following components to enhance their knowledge and critical thinking skills:

Technology Literacy: The ability to use new media such as the Internet to access
and communicate information effectively.

Information Literacy: The ability to gather, organize, and evaluate information,
and to form valid opinions based on the results.

Media Creativity: The growing capacity of citizens everywhere to produce and
distribute content to audiences of all sizes.

Global Literacy: Understanding the interdependence among people and nations
and having the ability to interact and collaborate successfully across cultures.

**Literacy with Responsibility:** The competence to consider the social consequences of media from the standpoint of safety, privacy, and other issues.

http://21stcenturyliteracy.org/whatis/

### 5 Sweden

Sweden has integrated ICT in school relatively goal-oriented for many years. The vision of Sweden as a leading knowledge society has encouraged large investing in recent years. A flagship in this respect is the ITiS program, which has primarily focused on infrastructure, teacher competence and digital learning resources. Two significant changes have now given work with ICT in school new direction. Firstly, the school curriculum is divided in two, with the newly established Office for School Development assumes responsibility for ICT initiatives. Secondly, the ITiS-program has ceased to exist. In earlier policy documents, references are scant to concepts of ICT as a basic skill, digital bildung, or literacy. The initiative has also been critiqued for an insufficient focus on the educational use of ICT, and the lack of a clear strategy for developing the student role toward knowledge production. This is again linked to the view of ICT as a part of the guidelines of digital bildung.

**Committee for New ICT Strategy in Schools After ITiS**

The concept of digital bildung is nonetheless present in Swedish plans. The committee for new ICT strategies in school, led by Jan Hylén, presented a final report in October 2002, which reads: "The question should be considered as to whether the educational plan should state as a goal the handling of ICT mentally and technically. Further, the educational system should examine the IT situation first and foremost from an equality perspective, in regard to the development of competence for school personnel and investments and maintenance in municipal schools."

The use of the concept is nonetheless downplayed in relation to the preliminary report from May, which recommended that concepts and understandings of digital bildung should be included in course plans and curriculum in the future: [www.it.is.gov.se/publikationer/eng/interim report.pdf](http://www.it.is.gov.se/publikationer/eng/interim report.pdf)

*Sweden is committed to providing the whole of its population with a 'digital culture' and basic skills to create better conditions in a world where digital communication is expanding. A more common description of the knowledge required is that referred to in English as "digital literacy," which in Swedish terms is translated to basic digital competence.*

*This should not be understood as a requirement for technical knowledge, but rather linking together skills and knowledge about technology, the ability to relate ICT to the surrounding society and giving prominence to creative elements in learning.*

*The question of introducing into the curriculum "digital competence," namely the ability to handle information technology and large amounts of*
information, both mentally and technically, should be considered.

It is further emphasized that ICT accessibility, together with teacher ICT competence is an egalitarian right, on par with other demands for quality in school.

6 Canada

Canada has a long tradition in developing visions and coordinating plans for ICT in society. In 1997, the federal organ Information Highway Advisory Council (IHAC) pointed out in *Preparing Canada for a Digital World* that digital literacy is necessary for survival in a network and information society, and that this is best provided by the school system. Canadian officials followed up with the program "Connecting Canadians" to link schools, libraries, and historical institutions on the Internet. The program refers to the necessity of certain skills, recognizing the need for “helping our citizens to develop the skills necessary to flourish in the new environment” (Minister of Industry, April 2000).

In the plans for SchoolNet, we again meet the concept “digital literacy” specified in relation to students’ needs: “SchoolNet encourages the integration of information technology into Canada’s education system to help students acquire digital literacy skills and experience in using the Internet for research and communication” (Canada’s SchoolNet, 2000).

7 Great Britain

DfES – Dept for Education and Skills

In strategic educational policy planning for the department, DfES is mentioned as a collaborative partner that aims to achieve a more effective integration of ICT in learning processes. ([http://www.dfes.gov.uk/delivering-results/docs/Startegic Framework.doc](http://www.dfes.gov.uk/delivering-results/docs/Startegic Framework.doc))


Digital and visual bildung are essential to success in an information society, and are understood as follows.

‘Digital literacy’ describes effective information handling, including the ability to:
- Identify, locate, and retrieve relevant information.
- Discern and evaluate.
- Assess the provenance, reliability, and accuracy of information and arguments.
- Present in an appropriate style and medium.

‘Visual literacy’ describes effective interpretation and production of visual imagery, including the ability to:
- Translate thinking and creativity into effective presentations.
- Manipulate a variety of media, including video.
- Appreciate aesthetic values.

Although the concepts are linked to an argument about new collaboration forms and greater possibilities for creative expression, it is nonetheless striking that the definition appears under a point titled “New opportunities to gain key skills for the
knowledge economy.” DfES focuses on “skills” and makes little distinction between what we in Norwegian call skills and competence. Further, the concept is closely linked to being successful in an information economy, in keeping with the common goal of ICT initiatives in the UK to increase competitiveness.

In its strategy for ICT in education, the related organ National Grid for Learning states a number of instrumental goals for what an increased ICT initiative in school should contain, among others "ensuring that school leavers have a good understanding of ICT, with measures in place for assessing their competence in it". (http://www.ngfl.gov.uk/about_ngfl/background.jsp)

The concept content is associated with an understanding of bildung, but is guided to a larger extent by a quantifiable use that may be easily linked to here-and-now skills such as spreadsheets, word processing, etc.

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