SWITZERLAND

Country Report on ICT in Education

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1. THE EDUCATION CONTEXT

1.1 KEY EDUCATIONAL CHALLENGES AND PRIORITIES

According to the Swiss Federal Constitution, the main responsibility for compulsory education lies with the cantons. In 2006, the so-called **«Bildungsartikel»** (article on education of the Federal Constitution, Art. 61a), was stipulated. It obliges the Confederation and the cantons to cooperate with each other. In 2015, the Federal Department of Economic Affairs, Education and Research (EAER) and the Swiss Conference of Cantonal Ministers of Education (EDK) elaborated a joint declaration concerning the political objectives in education. *See Section 1.2 Education reforms.* This declaration does not contain a reference to ICT in education. In 2007, the EDK defined, however, several objectives concerning ICT in education. *See Section 2.1 National/ Regional ICT policies*

The federal policy on research and development is explained in more general terms in the framework document **«The Message of the Federal Council on Education, Research and Innovation»** whose current version covers the period 2013-2016. The policy framework is governed by two underlying principles:

1. Ensuring the sustainability and quality of education;
2. Stimulating competitiveness and growth via research and innovation.

In 2010, the first long-term strategic government report in the field of education, research and innovation defined a strategy for education, research and innovation in an international context and the corresponding priorities and targets for the coming years[1]. In 2012, the Federal Council elaborated a strategy for an information society in Switzerland. Its main focus, though, is not on education, but on the society as a whole.

The **Swiss Media Institute for Education and Culture** (educa.ch) is the national coordination platform and the competence centre for various projects in the field of ICT in education. educa.ch is mandated by the Swiss Conference of Cantonal Ministers of Education (EDK) and the State Secretariat for Education, Research and Innovation (SERI, is part of the EAER). Its focal point is the management of the Swiss Agency for ICT in Education and the Swiss Education Server. With its activities, educa.ch promotes the integration of ICT in education.

Sources:
- Federal Constitution of the Swiss Confederation, Art. 61a
  https://www.admin.ch/opc/en/classified-compilation/19995395/index.html#a61a
- Erklärung 2015 zu den gemeinsamen bildungspolitischen Zielen für den Bildungsraum Schweiz (German, French)
  http://edudoc.ch/record/117294/files/erklaerung_18052015_d.pdf
- Promotion of Education, Research and Innovation for 2013-2016
  http://www.sbfi.admin.ch/org/01645/index.html?lang=en
- Internationale Strategie der Schweiz im Bereich Bildung, Forschung und Innovation (German, French)
  http://edudoc.ch/record/60386?ln=de
- Strategy of the Federal Council for an Information Society in Switzerland
  http://www.bakom.admin.ch/themen/infosociety/index.html?lang=en
- Swiss Media Institute for Education and Culture (educa.ch)
  http://www.educa.ch/en/schweizer-medieninstitut-fuer-bildung-kultur

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[1] http://edudoc.ch/record/60386?ln=de

1.2 EDUCATION REFORMS

The key political goals in education are to safeguard Switzerland's position as the most competitive economy in the world[2] at a time of increased uncertainty about the European and global economic outlook. Based on the «*Bildungsartikel*» (introduced in 2006) in the Swiss Constitution, the Confederation and the cantons aim to coordinate their actions and to collaborate closely in the field of education from primary to university education. Numerous developments are currently being realised, which will have a decisive influence on the Swiss education system in the coming years.

The main thrust of the ongoing educational reform in Switzerland does still concern the question of harmonisation between the education systems in the 26 cantons. One key aspect was to harmonise the duration of each level of education and the specific objectives to be attained by students at the end of each level. For compulsory education, it is the **HarmoS project** led by the Swiss Conference of Cantonal Ministers of Education (EDK) working on this topic. Until May 2015, a total of 15 cantons (representing 76% of the country's population) have joined the agreement, seven cantons (14%) have declined joining the agreement and for four (10%) the decision is still pending.

For all 26 cantons, the Federal Department of Economic Affairs, Education and Research (EAER) and the EDK set some common objectives within the document *«Erklärung 2015 zu den gemeinsamen bildungspolitischen Zielen für den Bildungsraum Schweiz»* regarding the joint objectives in education policies for the so-called «*Bildungsraum Schweiz*», the education area Switzerland. It is based on the Swiss Education Report 2014. For compulsory education, they specified the following topics:

1) Harmonisation of compulsory education in Switzerland, through curricular objectives on the basis of so-called «*Grundkompetenzen*», basic skills.
2) Improvement of career choice.

From 2011 to 2015, the «*Plan d'études romand*» (PER) has been gradually introduced in the French speaking cantons. The corresponding curriculum for the 21 German speaking cantons is the «*Lehrplan 21*». Since April 2015, the «*Lehrplan 21*» has been definitely adopted and it is now up to the cantons to decide when to introduce it. Some of the cantons will do so at the beginning of the school year 2015/2016, in August 2015. The «*Piano di studio*» for the Italian speaking canton Ticino will be available in summer 2015.

With the adoption of these curricula the cantons will ensure to take account of to the curricular objectives fixed in the context of the HarmoS framework.

Sources:

- «Bildungsartikel» in the Federal Constitution of the Swiss Confederation, Article 61a ff. https://www.admin.ch/opc/en/classified-compilation/19995395/index.html#a61a
- HarmoS (German, French, Italian) http://www.cdip.ch/dyn/11659.php
- Erklärung 2015 zu den gemeinsamen bildungspolitischen Zielen für den Bildungsraum Schweiz (German, French) http://www.edk.ch/dyn/11672.php
- Swiss Education Report 2014 http://www.skbf-csre.ch/en/education-monitoring/education-report-2014/

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[2] http://reports.weforum.org/global-competitiveness-report-2014-2015/rankings

- Plan d'études romand (French)
  http://www.plandetudes.ch/home
- Lehrplan 21 (German)
  http://www.lehrplan.ch/
- Piano di studio (Italian)
  http://www4.ti.ch/decs/ds/harmos/piano-di-studio/il-piano-di-studio-del-canton-ticino/

2. ICT IN EDUCATION POLICY

2.1. NATIONAL/REGIONAL ICT POLICIES

On a national level, the Swiss Conference of Cantonal Ministers of Education (EDK) defined the following objectives concerning ICT in education (2007):

1. To integrate ICT in teaching at all levels both as a tool and a resource for all subjects, as well as a set of related competences to be taught in the framework of general media education.
2. To ensure digital literacy: to enable all students to acquire the necessary competences but also promoting equal opportunities with respect to ICT and media.

Further, it defines six «*areas of coordination*», i.e. topics to be dealt with by cantons within the framework of the EDK. These topics aim at:
Ensuring that ICT as tools, resources and a set of competences are fully integrated into curricula;

1. **Guaranteeing the availability of suitable digital content** by creating the appropriate context, for example by encouraging networking between content makers or developing policies to ensure standards of quality;
2. **Improving teacher competences for the use of ICT** in education by complementing existing actions such as implementing recommendations regarding ICT in teacher training;

3. **Providing suitable information about the education system** as a platform for exchange and collaboration via the Swiss Educational Server;
4. **Ensuring the sustainability of the development and maintenance of infrastructure** via framework agreements with private actors and through public−private partnerships;
5. **Strengthening Swiss and international collaboration** thanks to expert networks, the gathering and sharing of information and improved dissemination of international projects on ICT use in education in Switzerland.

For compulsory education, the integration of ICT into the curricula is going to be realised with the adoption of the regional curricula *PER* and *Lehrplan 21*. They both include ICT skills and media competence. *See Sections 3.3 The Curriculum Framework and 3.4 ICT in the curriculum.*

As an additional federal programme, the programme «*Jugend und Medien»,* Youth and Media, was set up for the period 2011 to 2015. Its main objective is the support in the field of youth media protection and media skills. The future arrangements on youth media protection in Switzerland are described in a fact sheet released in May 2015 (German, French). Future plans are based on two pillars: fostering media competence and youth protection regulations. The programme that has focused on providing parents with relevant information until now, will focus more on youth work, youth care facilities and vocational schools. As technology quickly develops, there is a lack of regulations to effectively protect children in that new online environment that needs to be addressed.

Sources:
- Strategy of the Federal Council for an Information Society in Switzerland 2012
  http://www.bakom.admin.ch/themen/infosociety/index.html?lang=en
- Strategie der EDK im Bereich Informations- und Kommunikationstechnologien (ICT) und Medien vom 1. März 2007 (German, French)

http://www.edk.ch/dyn/12277.php
- Programm Jugend und Medien (German, French)
  www.jugendundmedien.ch
- Faktenblatt Zukünftige Ausgestaltung des Kinder- und Jugendmedienschutzes in der Schweiz (German, French)
  http://www.jugendundmedien.ch/fileadmin/user_upload/Medienmitteilungen_Aktuellmeldungen/150508_FB_Jugend-und-Medien.pdf
- Integration der ICT und Medien in der Bildung. Zusammenstellung der unterstützenden Massnahmen und Aktivitäten der Kantone zur Integration der ICT in den Unterricht. Schweizerische Fachstelle für Informationstechnologien im Bildungswesen SFIB 2008/2009. (German, French)
  http://sfib.educa.ch/sites/default/files/20121120/erhebung_integration_der__ict_und_medien_sfib_2008.pdf

2.2. RESPONSIBILITIES

Pre-school and compulsory education

According to the Swiss Federal Constitution, the cantons are responsible for compulsory education. The cantons and their municipalities have jurisdiction for all regulations and implementations in the field of compulsory education (including pre-school). The municipalities assume various capacities: in general, they are responsible for the schools. In some cantons, and only in case of schools at lower secondary level, they share this role with the cantonal authorities.

Upper secondary level: Vocational education

As for public upper secondary level education, the cantons and the Confederation share responsibility: The Confederation, cantons and professional organisations work together as partners. The Confederation regulates by federal law the entire vocational education and training system (*basic vocational education and training, higher vocational education and training, and vocationally oriented continuing education*). The cantons are responsi-

ble for the implementation of basic vocational education and training and for the establishment and maintenance of educational institutions. The professional organisations perform important tasks in the field of basic vocational education and training.

Upper secondary level: Non-vocational education

The cantons establish and maintain the baccalaureate schools while the regulations concerning the baccalaureate exam remain with the cantons and the Confederation jointly. The cantons also establish and maintain the specialised middle schools to which inter-cantonal regulations (including regulation of diplomas and certificates) apply.

Swiss Conference for the Coordination of ICT and Education (SKIB)

ICT is one of the fields which have benefitted from a long standing cooperation between the State Secretariat for Education, Research, and Innovation (SERI) at federal level and the EDK at cantonal level as well as several other players. The mission of the SKIB is to elaborate the conditions for the integration of ICT in education on a national level.

Sources:
- Federal Constitution of the Swiss Confederation, Article 62
  https://www.admin.ch/opc/en/classified-compilation/19995395/index.html#a62
- List of cantonal education departments
  http://www.edk.ch/dyn/11589.php
- OECD. Vocational Education and Training in Switzerland - Strengths, Challenges and Recommendations.
  http://www.oecd.org/edu/skills-beyond-school/45167147.pdf
- ICT und Bildung in der Schweiz 2007 (German, French)
  http://sfib.educa.ch/sites/default/files/20121003/ict_und_bildung_2007.pdf
- Swiss Conference for the Coordination of ICT (SKIB) (German, French)

2.3. SPECIFIC ICT INITIATIVES

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

There are several school projects concerning 1:1 Learning at all school levels. Quite a few among those are tablet projects. There is no national strategy, but some of the cantons have specifications at cantonal level.

For further information:
- *Selection*
  www.1to1learning.ch,
  http://sfib.educa.ch/de/didacta-schweiz-basel-2014
- *Conference «formitic 15»*
  https://www.fri-tic.ch/fr/event/formitic-15-espace-limites-portabilite-lecole
- *SAMT*
  https://www.phzh.ch/de/medienbildung/Lernen-mit-Tablets/Samsung/
- *my-Pad*
  http://imedias.ch/projekte/my_pad_mobiles_koope ratives_lernen_im_unterricht.cfm

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

In teacher education (initial teacher education and in-service teacher education), MOOCs are not part of any national strategy, but some universities have adopted MOOCs for their training programmes.

For further information:

- *École polytechnique fédérale de Lausanne (MOOC)*
  http://moocs.epfl.ch/mooc-factory

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

There are several initiatives to support ICT for inclusion and special needs education.

For further information:
- *This public website which is the result of a one-year project on "e-learning for children and adolescents with special needs" in German speaking Switzerland, which ended in January 2013*
  http://www.unbehindertlernen.net
- *Website by the Dept. for Education of canton Vaud on ICT-tools in special needs education*
  www.cellcips.ch/
- *Website with information for students with special needs enrolled in universities, project by AGILE and Federal Bureau for the Equality of People with Disabilities. (German, French and Italian)*
  http://www.hindernisfreie-hochschule.ch
- *EPUB3*
  www.epub3.ch
- *Schweizerische Stiftung zur behindertengerechten Technologienutzung*
  http://www.access-for-all.ch/
- *ICT-Accessibility-Lab, Zurich University for Applied Science, with research projects on: accessible PDF-documents, web accessibility, accessibility in education.*
  http://accessibility.zhaw.ch/

ICT for learning initiatives targeted to boost employability and entrepreneurship

In the context of promoting professions in the STEM area (Mathematics, information technology, natural sciences and technology) there are several initiatives which include ICT to a certain degree. There is also the ICT Competence Framework for vocational education in information technology which helps employers to find young IT specialists and those to find information and employment.

For more information:
- *SATW: www.mint.educa.ch*
- *ICT Competence Framework des Verbandes*

«ICT-Berufsbildung Schweiz»:
http://www.ict-
berufsbildung.ch/fileadmin/user_upload/dokument
e/ICT-Lehre/ICT-CF/BBPD/ICT-
BBCH_ICT_Competence_Framework.pdf

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

Cloud Computing

For compulsory education, cloud computing is not included in a national strategy.

Connectivity

Swiss schools have the possibility to use internet for free. But this standard connection with 6/1 MBit/s today does not meet the needs of a middle-sized school.

For more information:
- *Whitepaper Cloud Computing SATW*
  http://www.satw.ch/projekte/projekte_ar-chiv/cloud_computing/index
- *Free internet for Swiss schools:*
  https://www.swisscom.ch/de/schulen-ans-internet.html

2.4. ICT PRIORITIES

A: Digital Competence Development

Area	High	Mid	Low
Developing measures to support digital competence for future teachers *(a)*			X
Developing measures to support digital competence for in service teachers (*b*)		X	
Developing measures to support school leaders in the integration of ICT (c)		X	
ICT for learning initiatives targeted to boost youth employability and entrepreneurship (d)		X	
ICT for accessibility and		X	

inclusion: early school leavers, migrants, etc… and special educational needs (e)			

Reference to policy action measure related to Digital Competence Development:

- ***a & b):*** *Empfehlungen für die Grundausbildung und Weiterbildung der Lehrpersonen an der Volksschule und der Sekundarstufe II im Bereich der Informations- und Kommunikationstechnologien ICT:* *http://edudoc.ch/record/24707/files/Empf_ICT_LB_d.pdf (German, French)*
- ***c)*** *Cantonal ICT Competence Centres* *http://swisseducation.educa.ch/en/cantonal-ict-competence-centres*
- ***d)*** *Strategy of the Federal Council for an information society in Switzerland 2012* *http://www.bakom.admin.ch/themen/infosociety/index.html?lang=en*
- ***(e)*** *Federal Bureau for the Equality of People with Disabilities* *http://www.edi.admin.ch/ebgb/05114/index.html?lang=de (German, French)*

B: ICT in Curricula and Assessment

Area	High	Mid	Low
Developing computer/programming skills *(a)*	X		
Developing key competences *(a)*	X		
Developing 21st century skills (critical thinking, problem solving, communication, collaboration, and creativity and innovation) *(a)*		X	
Assessing with ICT/ICT based exams *(b)*	X		
Learning Analytics			X

Reference to policy action measure related to ICT in curricula and assessment:

- *a)Lehrplan 21*
  http://vorlage.lehrplan.ch/index.php?nav=200&code=b|10|0&la=yes

- **a)**Schlussbericht der Arbeitsgruppe zu Medien und Informatik im Lehrplan 21
http://www.lehrplan.ch/sites/default/files/Schlussber-icht_MI_2015-02-23%20mit%20Anhang_0.pdf
  - **a)**La thématique MITIC dans le PER http://www.plandetudes.ch/web/guest/mitic/
  - **b)** http://www.edk.ch/dyn/12928.php (German, French)

C: System-wide innovation

Area	High	Mid	Low
Piloting and validating innovative uses of ICT *(a)*		X	
Mainstreaming ICT in schools			X

Reference to policy action measures related to System-wide innovation:

- *(a) No national management; in the responsibility of the cantons.*

D: Mobile Devices

Area	High	Mid	Low
Use of tablets		X	
Use of mobile phones			X
Bring Your Own Device		X	
Cloud computing		X	

Reference to policy action measures related to Mobile Devices:

No national management; in the responsibility of the cantons. Some policies on the cantonal level:

- *Kanton Luzern* http://www.lu.ch/-/media/Kanton/Dokumente/BKD/Aktuelles/Paedagogisches_Konzept_BKD_Kanton_Luzern.pdf
- *Kanton Basel-Landschaft* https://www.baselland.ch/Projekt-IT-SBL.319118.0.html
- *Kanton Solothurn* https://www.so.ch/fileadmin/internet/dbk/dbk-vsa/Schulbetrieb_und_Unterricht/Informatische_Bildung/201505_Brosch%C3%BCre_Regelstandards_informatische_Bildung.pdf *(page 21)*
- *Kanton Zürich :* http://ict-guide.zh.ch/

E: Use of digital resources

Area	High	Mid	Low
Developing educational content repositories/metadata		X	
Supporting the development of open educational content and resources		X	
Supporting the development of educational content/resources provided by publishers	X		
Promoting the use and sharing of educational resources with teachers			X

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

- *HarmoS-Konkordat (Art. 8, (without mentioning of digital educational content)* http://edudoc.ch/record/24711/files/HarmoS_d.pdf *(German)* http://edudoc.ch/record/24710/files/HarmoS_f.pdf *(French)* http://www.edk.ch/dyn/12928.php *(German, French)*
- *Strategie der EDK im Bereich Informations- und Kommunikationstechnologien ICT und Medien (Handlungsfeld 2) (German, French)* http://edudoc.ch/record/30020/files/ICT_d.pdf http://www.edk.ch/dyn/12277.php
- *Deutschschweiz:* http://www.ilz.ch/cms/index.php/lehrmittelkoordination/sprachregionale-lehrmittelkoordination
- *Westschweiz:* http://www.ciip.ch/documents/showFile.asp?ID=2518
- *This framework is mainly used for print media.* http://www.ciip.ch/CMS/default.asp?ID=1550

F: Learning environments

Area	High	Mid	Low
Linking formal and informal learning using ICT			X
Providing equitable access to ICT (infrastructure, devices and content)			X
Providing a safe learning		X	

environment to students and teachers			
Commissioning ICT related research			*X*

Reference to policy action measures related to Learning environments:

- *Behindertengleichstellungsgesetz (Art.3, lit . f)* *https://www.admin.ch/opc/de/classified-compilation/20002658/*
- *Eidgenössisches Büro für die Gleichstellung von Menschen mit Behinderungen (German, French)* *http://www.edi.admin.ch/ebgb/05114/index.html?lang=de*

3. THE CURRICULUM AND ICT

3.1.   ICT BASED ASSESSMENT

Currently, there is no testing of students' competences at national level. In several cantons, ICT based assessment is compulsory. The assessment tools used are e.g. Stellwerk or Checks. These assessment tools allow for the testing of students' performance at compulsory school level.

However, within the HarmoS framework, the EDK has called upon a group of experts to draw up training standards that will be applied to all students and monitored by the EDK. For the time being, this will apply to mother tongue language skills, modern foreign languages, mathematics and natural sciences, but not to ICT. In this context, a database for examination exercises geared to basic competences for the different levels has been developed. A first random evaluation of the national educational objectives is going to take place in 2016. The tests will be ICT based (computers/tablets).

Sources:
- Evaluation Bildungsziele (German, French) http://www.edk.ch/dyn/12928.php
- Institut für Bildungsevaluation, Universität Zürich: Projekt «Stellwerk»

http://www.ibe.uzh.ch/projekte/stellwerk.html
- Checks des Bildungsraums Nordwestschweiz www.check-dein-wissen.ch

3.2.   SCHOOL IMPROVEMENT WITH ICT

There is no national evaluation, inspection or monitoring of improvement with ICT in class.

3.3.   THE CURRICULUM FRAMEWORK

Compulsory education

There is no binding national curriculum in Switzerland as school curricula are in the jurisdiction of the 26 cantonal education departments. However, the national HarmoS Agreement aims at guaranteeing a harmonisation of the quality of education in the cantons by defining standards which are to be attained by students in certain subjects at certain stages in their career: i.e. languages, mathematics and science at the end of the 4th, 8th and 11th year of their studies (including two years of pre-school education – ages 4 to 7, depending on the canton).

With the implementation of the *«PER»* (French speaking cantons), the *«Lehrplan 21»* (German speaking cantons) or the *«Piano di studio»* (Italian speaking canton) at compulsory school level, the cantons will guarantee the aforementioned educational objectives.

Upper secondary level (Vocational schools)

The curriculum framework for general education of 27 April 2006 includes ICT competences as part of the students' orientation in relation to themselves, others and the world. There is a binding

national curriculum for each profession[3] plus a national curriculum framework for the vocational baccalaureate from 18 December 2012. In the list of generic competences, basic skills in ICT have been phrased.

Upper secondary level (Non-vocational schools)

The Confederation and the cantons jointly regulate the recognition of baccalaureate schools. In 1995, the Regulation on Recognition of the Baccalaureate (MAR 95) issued by the Conference of Cantonal Ministers of Education (EDK) brought about a complete revision of baccalaureate education. It includes basic terms for the curriculum. Following the evaluation of this «regulation», reforms have been introduced which are strengthening the STEM disciplines, including information technologies.

Sources:
- Rahmenlehrplan (vocational schools): http://www.sbfi.admin.ch/berufsbildung/01587/01595/index.html?lang=de (German, French)
- Rahmenlehrplan Berufsmaturität http://www.sbfi.admin.ch/themen/01366/01379/01570/index.html?lang=de (German, French)
- Verordnung des Bundesrates über die Anerkennung von gymnasialen Maturitätsausweisen (MAR 1995) http://edudoc.ch/record/38112/files/VO_MAR_d.pdf (German, French)

3.4.   ICT IN THE CURRICULUM

The 2007 strategy of the cantons with respect to ICT in education is still valid. It defines the achievement of digital literacy as one of its two general aims. Its three objectives are:

1) to allow all students who attend compulsory education to acquire basic competences in ICT use;
2) to promote equal opportunities with respect to ICT and media;
3) to ensure that upper secondary school students are conversant with basic technical notions in the field of ICT.

Since 2011, the «*Plan d'études romand*» (PER) has been gradually introduced in the French speaking cantons. It is divided into three cycles, each with an indication of the study time to be spent on the five areas that are to be covered. ICT is included in the general education and transversal competences, but not a subject in its own right. The curriculum encompasses the following fields of activity:
1) **General education**, structured around three axes: the relationship to oneself, the relationship to others, the relationship with the world;
2) **Subject content**, organised into five areas: arts, body and movement, languages, mathematics and natural sciences, human and social sciences;
3) **Transversal competences**: collaboration, communication, reflection, critical approaches, and creative thinking.

German speaking cantons start to implement the «*Lehrp*lan 21» in August 2015. It includes a section «Medien und Informatik», media and information technologies, which encompasses seven fields of competences:

Media
1) Life in the information society
2) Understanding media and media contributions

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[3] http://www.sbfi.admin.ch/bvz/grundbildung/index.html?lang=de

3) Producing media and media contributions
4) Communicating and collaborating with media

Information technologies
5) Data structures
6) Algorithms
7) Information systems

The «*piano di studio*» for the Italian speaking canton will be available in summer 2015.

The most recent survey was carried out by the Swiss Agency for ICT in Education (SFIB/CTIE) in 2008 and provides an overview of the political and educational measures addressing the integration of ICT in the Swiss educational system. The survey is based on a questionnaire addressed to those responsible for such matters in the cantons, who were asked to report on existing measures. *See sources.*

Sources:
- Integration der ICT und Medien in der Bildung. Zusammenstellung der unterstützenden Massnahmen und Aktivitäten der Kantone zur Integration von ICT in den Unterricht. Bestandsaufnahme Oktober 2008. SFIB, Bern 2008
http://sfib.educa.ch/sites/default/files/20121003/er-hebung_sfib_2009.pdf (German, French)
- Plan d'études romand (French)
http://www.plandetudes.ch/web/guest/mitic/
- Lehrplan 21 (German)
http://vorlage.lehrplan.ch/index.php?nav=200&code=b|10|0&la=yes
- Piano di studio (Italian)
http://www4.ti.ch/decs/ds/harmos/piano-di-stu-dio/il-piano-di-studio-del-canton-ticino/ (Italian)

3.5. STUDENTS' ICT COMPETENCE

See section 3.4. ICT in the curriculum.

3.6. ASSESSMENT OF ICT COMPE-TENCE

Currently, there is no testing of students' ICT competences at national level. However, within the HarmoS framework, the EDK has called upon a group of experts to draw up training standards that will apply to all students and be monitored by the EDK. For the time being, this will apply to mother tongue language skills, modern foreign languages, mathematics and natural sciences but not to ICT.

Within the PISA 2012 Assessment, data was collected concerning the availability of digital resources and the students' use of ICT.

Sources:

- EDK Report on Education Standards (German, French)
http://www.edk.ch/dyn/12930.php
- PISA – Thematic studies 2012
http://pisa.educa.ch/sites/de-fault/files/20140923/pisa2012_vertiefende_analy-sen_0.pdf (German, French, Italian)

4. DIGITAL LEARNING RESOURCES AND SERVICES

4.1. E- CONTENT DEVELOPMENT

So far, there are no large scale initiatives for the production of e-content. The main reasons are the high production costs and non-proprietary web-based solutions (including OER) which are likely to be favoured in the future.

In the French speaking cantons of Switzerland, it is the cantonal education departments which co-ordinate the production of e-content whereas German e-content is developed by private publishers and thus not governed by the state. There is no coordination among publishers, but some inter-cantonal initiatives exist for the production of e-

content, including web-based e-content, as well as apps for teaching and learning.

Existing print media is seldom digitalised to be used digitally because of barriers such as existing user habits, didactic concepts and the state of hard- and software equipment in schools. For the time being, it is decided on a case by case basis which form of digitalisation, if any, makes sense. Generally speaking, the production of e-content focuses rather on newly conceived content. Rather frequently though, textbooks in printed form are complemented by online learning and testing material.

For the tertiary level and vocational training, e-content offers (courses, classes, materials for blended learning, MOOCs) are widespread and generally of high quality. They thus meet international standards.

Sources:
- Sprachregionale Lehrmittelkoordination http://www.ilz.ch/cms/index.php/lehrmittelkoordination/sprachregionale-lehrmittelkoordination (German)
- Moyens d'enseignement romands (MER) http://www.ciip.ch/CMS/default.asp?ID=1550 (French)
- École polytechnique fédérale de Lausanne (MOOC) http://moocs.epfl.ch/mooc-factory

4.2.   CONTENT SHARING

The Digital School Library Project, launched in 2006 by the Swiss Agency for ICT in Education (SFIB/CTIE) and mandated by the Conference of Cantonal Ministers of Education (EDK), is aimed at creating an interactive repository of meta-data pointing to learning resources for the use in K12 schools.

In general, there has always been a plethora of big and small e-content providers in Switzerland, such as government bodies both at federal and can-

tonal levels, universities, teacher training universities, vocational schools, libraries (both federal and cantonal), museums, broadcasting companies, professional associations and unions, private initiatives and industry. The Digital School Library Project as a repository of meta-data at national level offers these e-content providers a platform where they can publish their own and harvest others' e-content meta-data at the same time. Meta-data description follows LOM-CH, which is an adaptation of the standard LOM application profile to the particular needs of multilingual Switzerland. E-content meta-data contained in the Digital School Library also provide a mapping for the new curricula (PER and Lehrplan 21). The Digital School Library facilitates the harvesting of particular subsets of data to be included in local or regional databases and displayed by their portals' user interfaces.

Moreover, an exchange with European Schoolnets' Learning Resource Exchange (LRE) as well as with other European resources, especially from neighbouring countries with the same languages is envisaged.

Sources:
- http://biblio.educa.ch/de (German, French)

4.3.   ACCESSIBILITY FOR LEARNER WITH DISABILITIES AND SOCIAL INCLUSION

There is no official national institution responsible for the accessibility of learners with disabilities and social inclusion. Rather, the peripherally placed digital educational offers have to comply with the demands of the law on persons with disabilities. This is an important objective of the Federal Bureau for the Equality of People with Disabilities. There are also several private initiatives to foster accessibility like the project ePUB3 which is concerned with the development of standards for accessible learning media. In this context an editor for teachers has been developed for the production of accessible tests and work sheets.

The Swiss foundation for handicapped accessible use of technology offers several ways of support. For more examples, *see 2.3. Specific ICT initiatives.*

Sources:

- Eidgenössisches Büro zur Gleichstellung von Menschen mit Behinderungen
http://www.edi.admin.ch/ebgb/index.html?lang=de (German, French)
- Projekt EPUB3
www.epub3.ch
- Schweizerische Stiftung zur behindertengerechten Technologienutzung
http://www.access-for-all.ch/
- Stiftung Schweizer Zentrum für Heil- und Sonderpädagogik.
www.szh.ch (German, French)
- EDK Sonderpädagogik
http://www.edk.ch/dyn/12917.php (German, French)

4.4.   WEB 2.0

There is no national initiative to promote the use of web 2.0 tools in schools.

4.5.   LEARNING PLATFORMS

As of March 2015, 3802 Swiss schools have been registered with **educanet²**, with more than 147,000 teachers and 474,258 students in more than 39,000 classes (updated statistics can be consulted on the educanet² website). This platform is provided by the Swiss Education Server together with a vast amount of information about education in Switzerland.

The platform educanet² offers four distinct areas of activities:
1) a «private» space for each user,
2) an «institutional» space for schools,

3) a «community» space where groups can work together
4) a space for online learning.

Tools include an address book, task manager, electronic messaging, instant messaging system, workbook, web site generator, wiki, blog, author ware, etc. The *lesson plan tool*, available on educanet² offers teachers the possibility to create a work and learning plan for their students and classes, structuring and timing collective and individual activities. The tool for the planning of lessons offers support to students and teachers alike with a monitoring function and a function to assist learning progresses.

Several schools – especially at upper secondary level – are using **Moodle** and **ILIAS** alongside or as an alternative to educanet² as those platforms are widespread at tertiary level. Further, **eduhub** is a platform for new learning technologies at Swiss universities. Its aim is to implement sustainable IT based methods in academic teaching, to exchange experiences and to promote collaboration. eduhub furthermore provides an overview over platforms used in tertiary level (Stand 2014)[4].

Sources:

- educanet² (German, French, Italian, partly in English and Spanish)
www.educanet2.ch
- educanet² Statistics (German, French, Italian)
https://www.educanet2.ch/wws/34911236.php?sid=58993624467554254143383238323400
- Strategie der EDK im Bereich Informations- und Kommunikationstechnologien (ICT) und Medien vom 1. März 2007 (German, French)
http://www.edk.ch/dyn/12277.php
- eduhub http://www.eduhub.ch/res/lms-installations/

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[4] http://www.eduhub.ch/res/lms-installations/

5. TEACHER EDUCATION FOR ICT

5.1.   ASSESSMENT SCHEMES

There are no assessment schemes at national level for teachers using ICT in teaching. The EDK has regulated the recognition of diplomas awarded for the successful graduation of in-service ICT training courses for teachers.

Sources:
- Durch die EDK anerkannte Zusatzausbildungen in ICT (German, French)
  http://www.cdip.ch/dyn/13840.php
- Lehrberuf - Analyse der Veränderungen und Folgerungen für die Zukunft, EDK 2008
  http://edudoc.ch/record/27311 (German)
  http://edudoc.ch/record/27310 (French)

5.2.   SCHOOL LEADER SUPPORT

Teacher training in ICT topics comes under the responsibility of the cantons and is organised by cantonal ICT competence centres. These are usually affiliated to the Universities of Teacher Education or to the cantonal education departments and work both with experienced in-service teachers and experts in the field of didactics and ICT. They also support headmasters in their decision making processes regarding the use of ICT.

Source:
- Cantonal ICT Competence Centres
  http://swisseducation.educa.ch/en/cantonal-ict-competence-centres

5.3.   ICT FOR INCLUSION

The **Swiss Foundation for special needs education** (SZH) is the national competence centre for special needs education[5]. On ICT in special needs education, the website has assembled lists on ICT tools, information on behalf of self-teaching platforms and general software for special needs education.

Equal Opportunities for Persons with Disabilities

A task group formed of representatives from all special needs education training centres in German speaking cantons of Switzerland and chaired by the Swiss Agency for ICT in Education (SFIB/CTIE) formulated reflections and recommendations on the topic of ICT and special needs education. The aim was to raise the awareness on the significance of ICT in special needs education and encourage experts involved in special needs education training to expand and intensify steps towards the integration of ICT in special needs education training.

Summary of the report: ICT in Special Needs Education on the relevance of including ICT in special needs education teacher training (2009)

As ICT has a growing impact on everyday life, ICT skills should be added to the cycle of basic and lifelong learning. As people with special needs are already confronted with all sorts of difficulties in everyday life, they should not be burdened with further difficulties while accessing, handling and using ICT; even more so, as ICT offers genuine advantages to people with special needs. Hence, basic and extended technical as well as didactic expertise in ICT should be a prerequisite for teachers in general and for special needs teachers in particular. There is a need for action both on a political and an institutional level, e.g. with special needs education training centres.

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[5] http://www.edk.ch/dyn/12917.php

Sources:

- Swiss Education System – Special Needs Education
  http://swisseducation.educa.ch/en/special-needs-education-0
- EDK Sonderpädagogik
  http://www.edk.ch/dyn/12917.php (German, French)
- Nationales Kompetenzzentrum «Stiftung Schweizer Zentrum für Heil- und Sonderpädagogik» (German, French)
  http://szh.ch/de/page33721.aspx
- «ICT in der Sonderpädagogik. Zur Bedeutung der Informations- und Kommunikationstechnologien in der Ausbildung der Lehrpersonen», Schweizerische Fachstelle für Informationstechnologien im Bildungswesen (SFIB) 2009.
  http://sfib.educa.ch/sites/default/files/20121003/ict_und_sonderpaedagogik_.pdf

5.4. ICT IN INITIAL TEACHER EDUCATION

Teacher Training curricula for primary and secondary school teaching are defined at local level by the university or teaching training institution itself. These institutions are also responsible for the assessment of their students. Digital competences are considered to be a key competence for initial teacher education. Therefore, knowledge about ICT and how to use digital technology is integrated in the curriculum. As part of the general curricula, ICT related training is compulsory. The goal is that future teachers are competent using media and ICT in the classroom.

There are 17 Universities of Teacher Education in Switzerland[6], most of which have their own Centres for Media Education affiliated to them, which offer their services to the university as a whole.

Depending on the individual university, the centre may be a mere library for media, a consulting agency for the field of media education, or an independent department for research in the field.

The recommendations of the EDK in 2004 for initial and continuing education of compulsory and upper secondary level teachers set an informal framework. With the introduction of the «*PER*» and the «*Lehrplan 21*» the need for initial and in-service teacher education in the field of ICT will increase. Universities of teacher education and the cantons will have to take action.

Sources:

- Empfehlungen der EDK für die Grundausbildung und Weiterbildung der Lehrpersonen an der Volksschule und der Sekundarstufe II im Bereich der Informations- und Kommunikationstechnologien ICT (German, French)
  http://edudoc.ch/record/24707/files/Empf_ICT_LB_d.pdf
- «ICT und Medienbildung in der Lehrpersonenausbildung in der Schweiz. Fallstudie über das Studienangebot an den Pädagogischen Hochschulen. 27.5.2010.» (German)
  http://www.haslerstiftung.ch/files/webcontent/documents/d/studie_ict_und_medienbildung.pdf

5.5. ICT IN IN-SERVICE TEACHER EDUCATION

The In-service training on all kinds of knowledge and skills related to the use of ICT in the classroom has already been compulsory for many years. In-service teacher training on ICT topics is the responsibility of the cantons and is organised by cantonal ICT competence Centres. These are usually affiliated to the Universities of Teacher Education or to the cantonal education departments

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[6] [7] http://www.swissuniversities.ch/en/higher-education-area/recognised-swiss-higher-education-institutions/

and work both with experienced in-service teach-ers and experts in the field of pedagogy and ICT.

Source:

- Cantonal ICT Competence Centres
  http://swisslearning.educa.ch/en/cantonal-ict-competence-centres

5.6. TRAINING THE TEACHER TRAINERS

The training of teacher trainers is not coordinated at national level. There are inter-cantonal initia-tives in the field:

1) *«Groupe de coordination F3 Romand»*: This groups' objective is to harmonise the different offers for continuing education in ICT and me-dia competence for teachers' trainers in the French speaking parts of Switzerland:

2) *«PICTS - Pädagogischer ICT-Support»* is the corresponding body in German speaking can-tons of the country. It offers a course on the theme of pedagogic ICT support, which caters for those in-service teachers who are in charge of ICT issues, irrespective of subject or school type or level.

Sources:
- Groupe de coordination F3 Romand
  http://f3romand.educanet2.ch/info/.ws_gen/1/in-dex.htm
- PICTS - Pädagogischer ICT-Support
  http://picts.educanet2.ch/info/.ws_gen/
- Projektbericht ICT – 2012 Ausbildung der Lehrpersonen an den Pädagogischen Hochschulen im Bereich der Medien und der Informations- und Kommunikationstechnologien
  http://www.swissuniversities.ch/fileadmin/swissuniversities/Dokumente/DE/PH/Dokumente/130808_Projektbericht_ICTanPH_d.pdf

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