



SWITZERLAND

Country Report on ICT in Education

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1. THE EDUCATION CONTEXT

1.1 EDUCATION REFORM

Currently, reform processes are underway on various levels of the education system. The key political goals in education are to safeguard Switzerland's position as the most competitive economy in the world¹ at a time of increased uncertainty about the European and global economic outlook, and to assure the quality of the education system², to assure permeability between different types of education and to facilitate mobility in education. Numerous developments, a few listed hereafter, are currently being realised, which will have a decisive influence on the Swiss education system in the coming years, particularly with regard to cooperation and harmonisation between the 26 cantons of the Swiss Confederation.

The main thrust of the educational reform in Switzerland currently concerns the question of harmonisation between the education systems in the cantons. Differences in education systems from one canton to another can be a considerable barrier to mobility within the country. One possible solution is to improve the coordination between the many actors involved in the education system. In May 2006, the Swiss population voted massively in favour of modifying the Constitution so as to oblige the Confederation and the cantons to coordinate their actions and to collaborate more closely in the field of education from primary school to university. One key aspect was to harmonise the duration of each level of education and the specific objectives to be attained by pupils at the end of each level. It is the HarmoS project led by the Swiss Conference of Cantonal Directors of Education (CDIP) working on this topic.

Eventually the HarmoS Agreement took effect as from 1st August 2009, after 10 (out of 26) cantons had joined it. The cantonal legislative bodies were free to decide whether they would join the new agreement.

¹ See World Economic Forum's 'The Global Competitiveness Report 2012 - 2013'.

² OECD. Education at a Glance 2013 – Switzerland.

The HarmoS Agreement is binding only for those cantons that ratify it. Once ratified, the HarmoS Agreement obliges the canton to bring its cantonal structures and objectives concerning compulsory education in line with the agreement. The canton is granted a transition period of six years in order to make the necessary adaptations to comply with the HarmoS framework. Until 26th September 2010, 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 pending³.

Since 2011, the "*Plan d'études romand*" (PER) has been gradually introduced in five French and Italian speaking cantons. The corresponding curriculum for the 21 German speaking cantons is the "*Lehrplan21*".

Sources

World Economic Forum. The Global Competitiveness Report 2012 – 2013.

<http://reports.weforum.org/global-competitiveness-report-2012-2013/>

OECD. Education at a Glance 2013 – Switzerland

http://www.oecd.org/edu/Switzerland_EAG2013%20Country%20Note.pdf

HarmoS (In French, German and Italian):

<http://www.cdip.ch/dyn/11737.php>

Plan d'études romand. (In French)

<http://www.plandetudes.ch/web/quest/per>

Lehrplan21 (In German)

<http://www.lehrplan.ch/>

1.2 KEY CHALLENGES/PRIORITIES FOR EDUCATION

The federal policy on research and development is explained in the framework document "The Message of the Federal Council on Education, Research and Innovation" whose current version covers the period 2013-2016. A total budget of about 26 billion Swiss Francs (ca. 22 billion Euros) is to be voted for the four-year

³ CDIP. HarmoS. Procédures d'adhésion et entrée en vigueur.

<http://www.edk.ch/dyn/12536.php>

period. The policy framework is governed by two underlying principles:

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

Within this framework, the State Secretariat for Education, Research and Innovation (SERI), a ministerial body at federal level, funds the federal contribution to the Swiss Educational Server (as well as the participation in the Program for International Student Assessment (PISA) and the monitoring of the education system). SERI also supports the international activities of the Swiss Agency for ICT in Education (SFIB/CTIE) in the area of ICT and education. These activities aim at:

1. Ensuring that Switzerland takes an active role as a member of European Schoolnet (EUN) by engaging in the exchange of information between Switzerland and other European countries on ICT and education issues,
2. Coordinating the possible participation of Swiss Educational institutions (co-ordinating bodies, institutions, departments, schools) in international projects in the field of education and ICT;
3. Ensuring that Swiss educational institutions, especially schools, benefit from the country's participation in international projects, particularly those concerning the use of ICT resources for teaching and learning.

The first long-term strategic government report for the field of education, research and innovation⁴ of 2010 defines a strategy for education, research and innovation in an international context and the corresponding priorities and targets for the coming years.

Finally, the OECD Working Paper No.833 "Raising Education Outcomes in Switzerland" describes the situation and challenges for the Swiss school system as follows:

⁴ Internationale Strategie der Schweiz im Bereich Bildung, Forschung und Innovation

"Almost all workers are educated at least to the upper secondary level and vocational education contributes to one of the most successful transition performances of youth to employment in the OECD... Results for children with low socio-economic background or immigration background do not fully measure up to the high standards of the education system... Accountability of schools for their education outcomes should be raised." (Fuentes, OECD, 2011)

Sources

Fuentes, A. (2011), Raising Education Outcomes in Switzerland, OECD Economics Department Working Papers, No. 838.

http://www.oecd-ilibrary.org/economics/raising-education-outcomes-in-switzerland_5kgj3l0wr4q6-en

Promotion of Education, Research and Innovation for 2013-2016

<http://www.sbf.admin.ch/org/01645/index.html?lang=en>

Internationale Strategie der Schweiz im Bereich Bildung, Forschung und Innovation (In German and French)

<http://edudoc.ch/record/60386?ln=de>

2. ICT POLICY

2.1. 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 regulation and implementation 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 the case of the schools at the lower secondary level, they share this role with the cantonal authorities.

Upper secondary level: Vocational

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 system⁵ (basic vocational education and training, higher vocational education and training, and vocationally oriented continuing education). The cantons are responsible for the implementation of basic vocational education and training and for the establishment and maintenance of educational institutions and the professional organisations perform important tasks in the field of basic vocational education and training.

Upper secondary level: Non-vocational

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

Overall, coordination and cooperation among the cantons at national level have been established over a long period of time and are based both on binding “hard law” and “soft law” in the form of recommendations to the cantons. In the realm of « soft law » the Swiss Conference of Cantonal Ministers of Education (EDK/CDIP) has issued several recommendations concerning ICT. The one concerning the overall strategy of the EDK/CDIP with regard to ICT dates from March 1, 2007.

ICT is one of the fields which have profited from a long standing cooperation between the State Secretariat for Education, Research, and Innovation (SERI) at federal level and the EDK/CDIP at cantonal level as well as several other players. It is the "Swiss Conference for the Coordination of ICT and Education" (SKIB)'s responsibility to coordinate the activities of the various bodies involved.

⁵ OECD. Vocational Education and Training in Switzerland - Strengths, Challenges and Recommendations.

Sources

ICT und Bildung in der Schweiz 2007 (in German)
http://sfib.educa.ch/sites/default/files/20121003/ict_und_bildung_2007.pdf

TIC et formation en Suisse (in French)
http://ctie.educa.ch/sites/default/files/20121120/publication_tic_et_formation_en_suisse_2007_f.pdf

OECD. Vocational Education and Training in Switzerland - Strengths, Challenges and Recommendations.
<http://www.oecd.org/edu/skills-beyond-school/45167147.pdf>

Strategie der EDK im Bereich Informations- und Kommunikationstechnologien (ICT) und Medien vom 1. März 2007
<http://edudoc.ch/record/30020>

Stratégie de la CDIP en matière de technologies de l'information et de la communication (TIC) et des médias 2007
<http://edudoc.ch/record/30021>

Swiss Conference for the Coordination of ICT (SKIB)
<http://sfib.educa.ch/de/skib-0>
http://edudoc.ch/record/30036/files/Statut_SKIB_d.pdf (Statute)

2.2. ICT POLICIES FOR SCHOOLS

Until recently, there was no overall strategy for the integration of ICT in schools, although there was a more general “Information Society Strategy”, which was updated in 2012. It is noteworthy that the Federal Council decided at the same time to set up its own Steering Committee to handle the Swiss Information Society strategy placing it at the highest possible governmental level. The strategy’s main objectives are:

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 pupils 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/CDIP. These topics aim at:

1. Ensuring that ICT as tools, resources and a set of competences are fully integrated into curricula;
2. Guaranteeing the availability of suitable digital content by creating the appropriate context, for example by encouraging networking between con-

tent makers or developing policies to ensure standards of quality;

3. Improving teacher competences for the use of ICT in education by complementing existing actions such as implementing recommendations regarding ICT in teacher training;
4. Providing suitable information about the education system as a platform for exchange and collaboration via the Swiss Educational Server;
5. Ensuring the sustainability of the development and maintenance of infrastructure via framework agreements with private actors and through public-private partnerships;
6. 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.

Sources

Information and Communication Technologies (EDK/CDIP) (in German)
<http://www.edk.ch/dyn/12277.php>

Information and Communication Technologies (EDK/CDIP) (in French)
<http://www.edk.ch/dyn/11744.php>

Strategy of the Federal Council for an Information Society in Switzerland 2012
<http://www.bakom.admin.ch/themen/infosociety/00695/index.html?lang=en>

Information Society Steering Committee
<http://www.bakom.admin.ch/themen/infosociety/03933/03934/index.html?lang=en>

Strategie der EDK im Bereich Informations- und Kommunikationstechnologien (ICT) und Medien vom 1. März 2007
<http://edudoc.ch/record/30020>

Stratégie de la CDIP en matière de technologies de l'information et de la communication (TIC) et des médias 2007
<http://edudoc.ch/record/30021>

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. (in German and French)
http://sfib.educa.ch/sites/default/files/20121120/erhebung_integration_der_ict_und_medien_sfib_2008.pdf

2.3. SPECIFIC ICT INITIATIVES

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

Samsung Smart School @ Leysin American School

For the pilot, Samsung is providing Samsung Smart School Solution packages for two classrooms at the Leysin American School (LAS) consisting of 20 GALAXY Note 10.1 including keyboard docks, a 65-inch interactive whiteboard, a Notebook including charging station as well as the correspondent Samsung Smart School Solution Software. The Smart School Solution provides teachers with the ability to lead interactive lessons and real-time group activities through its convenient screen and content sharing features. It also delivers learning management tools enabling students to access course materials and information, as well as school notices and forums, through their tablets."

Sources

Press release

http://www.las.ch/images/uploads/content/SAM_LAS_20121029_Edef.pdf <http://www.1to1learning.ch/One2One/Schweiz>

2. Bring your own device (BYOD)

Examples of projects like "Brings mIT!" of specific schools can be found here (in German): <http://www.1to1learning.ch/One2One/Schweiz>. During the project "Brings MIT!", grades 5 and 6 of the primary school Arth-Goldau should bring their own device (tablets, Smartphones) as of the school year 2013/2014. The school will provide pupils who do not have their own device with one.

3. Cloud Computing

Examples of projects of specific schools can be found here (in German): <http://www.1to1learning.ch/One2One/Schweiz>

4. Inclusion and special needs

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. www.unbehindertlernen.net/



ICT-Accessibility-Lab, Zürich University for Applied Science, with research projects on: accessible PDF-documents, accessibility in education, personal assistance-software for passengers with visual impairments. www.init.zhaw.ch/en/engineering/institute-of-applied-information-technology/focus-areas/human-information-interaction/ict-accessibility.html

Website by the Dept. for Education of canton Vaud on ICT-tools in special needs education. www.cellcips.ch/

Blog, similar as the one above, on use of iPads in special needs education. <http://ipadspr.wordpress.com/>

Website with information for students with special needs enrolled in universities, project by AGILE and Federal Bureau for the Equality of People with Disabilities (EBGB). (in German, French and Italian) <http://www.hindernisfreie-hochschule.ch>

Other initiatives

The **Project School Goldau (PSG)** is part of the state primary school at Goldau, a small commune in central Switzerland. The aim of the “Project School” is to serve as a model for future schools. The teachers’ aim is to create a modern education environment, while consolidating their endeavours with a theoretical foundation and justification. Therefore, the “Project School Goldau” works closely with the Institute for Media and Schools (IMS) at the Teacher Training University of Central Switzerland at Schwyz (PHZ Schwyz).

This cooperation allows for findings from research being directly used in practical new teaching methods and teaching practice feeding back into research. Thus, problems identified in the teaching practice are brought to the immediate attention of the researchers. By experimenting with various teaching arrangements, valuable conclusions can be drawn for the training of the future teachers as well as for continuous in-service training of active teachers. It is the explicit purpose of “Project School” to *improve the overall quality of teaching in primary schools*. Therefore, the project will give student-teachers the possibility to familiarize themselves with specific and practical issues related to research and development in education. As all the project school’s activities have to be in accordance with cantonal school curricula, the project’s work is

based on the official curriculum and a regulatory framework ensuring the transition of pupils from and to the project school. Moreover, the achievement of learning objectives is a high priority of the project school.

Overall, the cooperation between the Project School at Goldau and the Institute for Media and Schools (IMS) at the Teacher Training University of Central Switzerland at Schwyz (PHZ Schwyz) is a successful implementation of the necessary dialogue between theory and practice in teacher training. This mutually beneficial cooperation has produced a number of projects, two of which have won awards for the successful implementation of ICT in teaching practice: lerntagebuch.ch and <http://www.schweiz.ch/#de/> (in German, French and Italian).

The Learning with personal devices, at home and at school Project

From spring 2012 to summer 2013, all pupils from three classes of the School Project Goldau have received a personal device. The rationale was that personal devices are already widespread among children and their availability will continue to increase. The availability of touch screens enables even very young children to engage with electronic devices long before they enter formal education. Therefore, it is important for young pupils to develop media skills and creativity. In this project, the teacher guides young pupils in the process of getting engaged in learning activities which may occur at anytime and anywhere and focuses on how pupils can use technology to improve their learning both in and out of school. The project fosters critical thinking about the implications of readily available and inter-connected devices and elaborates on how to deal with the ubiquitous and permanent availability of ICT. The children are encouraged to use their devices inside and outside of the school building as part of their personal learning and working environment and by doing so to learn how to deal with constantly available information and communication technology. The teacher provides curriculum compliant content for pupils to deal with in class and customises available digital tools for specific learning activities. Hence, the teacher continues to have a key role and the curriculum is binding. Therefore, content determines the use of technology, not technology the content.

The iPhone Project

A long term project at the Project School involved the use of smartphones. For the duration of a two-year pilot project starting in 2009, all 12-year old pupils of a fifth class of the Project School at Goldau have been given a personal Apple iPhone 3G to be used by them individually and without any constraints both in their spare time and at school.

The pupils had the possibility to use the iPhone to read, write, calculate, draw, take pictures, record sounds, listen to music, make calls, communicate and surf the internet at any times and places. The children were actively encouraged to use the device inside and outside school as a core part of their personal learning and working environment. They have been thus enabled to emancipate themselves from constraints put on them by both their parents and their teachers, or by the entertainment industry and be put in a position where they could deal critically and in an informed way with a flood of information and communication technology which will increasingly become available both for learning and for entertainment purposes.

The pilot project was planned and monitored by the Institute for Media and Schools (IMS) of the Teacher Education Institute of Central Switzerland at Schwyz (PHZ Schwyz). As the project was supported by Swisscom, the biggest telecom company in Switzerland, there were not extra costs for the schools or parents.

Sources

Projekt Lerntagebuch (in German)
www.lerntagebuch.ch

Projekt schweizr – suissr – svizzr (in German, French and Italian)
<http://www.schweizr.ch/#de/>

1:1 Computing in der Schule (in German)
<http://www.1to1learning.ch/One2One/>

iPhone Project (Projektschule Goldau) (in German)
<http://www.projektschule-goldau.ch/das-iphone-projekt>

<http://www.projektschule-goldau.ch/das-iphone-projekt/publikationen>

<http://www.projektschule-goldau.ch/das-iphone-projekt/wiss-arbeiten>

The Learning with personal devices, at home and at school Project (Projekt "Digitaler Alltag" der Projektschule Goldau) (in German)

<http://www.projektschule-goldau.ch/digitaler-alltag>

<http://www.projektschule-goldau.ch/digitaler-alltag/grundsaeetze>

<http://www.projektschule-goldau.ch/digitaler-alltag/fag>

2.4. ICT PRIORITIES

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

2.5. NATIONAL CHARACTERISTICS (OPTIONAL)

No information provided.



3. ICT IN THE CURRICULUM

3.1. CURRICULAR FRAMEWORK

There is no binding national curriculum in Switzerland as school curricula are in the jurisdiction of the 26 cantonal ministries of education. However, the national HarmoS Agreement, which was developed by the Swiss Conference of Cantonal Ministers of Education (EDK/CDIP) aims at guaranteeing a harmonisation of the quality of education in the cantons by way of defining standards which are to be attained by pupils 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 kindergarten – ages 4 to 7, depending on the canton).

Regional educational organisations, such as the *Conférence intercantonale de l'instruction publique de la Suisse romande et du Tessin* (CIIP), which represents the education ministers of the French and Italian speaking cantons, are currently working towards the implementation of a new curriculum. It 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.

The curriculum 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. Fifteen percent of the time allotted can be used for activities not covered by the curriculum. ICT is included in the general education and transversal competences, but not a subject in its own right.

Since 2011, the “*Plan d'études romand*” (PER) has been gradually introduced in five French and Italian speaking cantons. The corresponding curriculum for the 21 German speaking cantons of Switzerland is the “*Lehrplan21*”, which was published in June 2013. In

2014, it will be implemented according to the decisions of the ministries of education in the cantons.

Sources

HarmoS – Harmonisation de la scolarité obligatoire en Suisse (in German, French and Italian)
<http://www.cdip.ch/dyn/11737.php>

Plan d'études romand. (in French)
<http://www.plandetudes.ch/web/guest/per>

Lehrplan21 (in German)
<http://www.lehrplan.ch/>

3.2. ICT IN THE CURRICULUM

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

1. to allow all pupils 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.

Amongst the proposed actions aimed at achieving these goals, the ICT strategy mentions the possibility of fixing pedagogical objectives for ICT competences as constraints for cantonal curricula within the HarmoS educational harmonisation programme.

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.

Results from the cantons show that 22 out of 26 specify concepts including components to further the integration of ICT during the years of compulsory schooling. From a more didactic point of view, 24 out of 26 cantons have adopted a curriculum which integrates ICT.



As for the non-compulsory level of upper secondary schooling (ages 16-19, but excluding vocational schools), results from the cantons show that 10 out of 26 specify concepts including components to further the integration of ICT during the years of compulsory schooling. From a more didactic point of view, 11 out of 26 cantons have adopted a curriculum which integrates ICT.

Sources

Strategie der EDK im Bereich Informations- und Kommunikationstechnologien (ICT) und Medien vom 1. März 2007 (in German)

http://edudoc.ch/record/30020/files/4_8_ICT_d.pdf

Stratégie de la CDIP du 1er mars 2007 en matière de technologies de l'information et de la communication (TIC) et de médias (in French)

http://edudoc.ch/record/30021/files/4_8_ICT_f.pdf

Integration der ICT und Medien in der Bildung. Zusammenstellung der unterstützenden Massnahmen und Aktivitäten der Kantone zur Integration der ICT in den Unterricht. Bestandsaufnahme Oktober 2008. SFIB, Bern 2009

http://sfib.educa.ch/sites/default/files/20121003/erhebung_sfib_2009.pdf (in German)

<http://ctie.educa.ch/sites/default/files/20110307/L%20integration%20des%20TIC%20et%20des%20medias%20dans%20l%20enseignement.pdf> (in French)

EDK Umfrage bei den Kantonen 2008/2009 : ICT im Unterricht : Projekte (in German and French)

<http://www.cdip.ch/dyn/18009.php?filter=b3>

3.3 STUDENTS' ICT COMPETENCE

The HarmoS programme being currently ratified provides a general framework for the specific competences to be achieved by students. Presently, there is no binding national curriculum in Switzerland, and as a result, cantons still use rather varied curricula.

This situation is currently changing, as the cantons (grouped by linguistic region) are working together on common curricula, such as the PER (*Plan d'étude romand*) for the French and Italian speaking cantons and the *Lehrplan21*, the curriculum for the German-speaking ones.

As regards ICT, both the PER and the *Lehrplan21* suggest integrating ICT in the subject "media integration", which is part of the general education. General educational objectives are organised primarily according to the level of education. In particular, the specific

competences to be achieved by students are specified in the PER⁶ as follows:

1. to foster a selective and critical approach to media at key stage 1 (kindergarten and the first and second years of compulsory schooling);
2. to decode the presentation of various types of messages at key stage 2 (the third and fourth years of school) ;
3. To foster multiple approaches to the consumption and production of media and information (the fifth and sixth years of school).

Each of the general objectives is broken down into specific objectives which can be consulted online on the PER website.

According to the *Lehrplan21*, published in June 2013, ICT is taught in Cycle 2 (K3-6) and Cycle 3 (K7-9) of the school career. The specific competences to be achieved by students can be grouped into three areas of competence of increasing complexity:

1. Knowledge and identification of media: The students understand the rules and know how to orient themselves in both physical and virtual worlds. They learn the basic principles of ICT and media and are aware of and understand terms such as information and data, algorithms and information processing systems.
2. Selection and use of media: students can identify and use media for personal needs, to obtain specific information, and for learning purposes. At the same time, they learn to make use of hardware (equipment) and software (program) and to understand and evaluate multimedia content.
3. Self-expression through media: students can express their own thoughts, opinions and experiences in thoughtful, creative and socially responsible ways by means of diverse media resources. They are objective and can communicate to a specific target group. Students develop the ability to use media for collaborative learning as well as for personal identity formation and to nurture of social relationships.

⁶ PER. Formation générale (FG) - MITIC
<http://www.plandetudes.ch/web/guest/mitic/>

The acquisition of cross-curricular skills is also an important aspect in the *Lehrplan21*. Students are expected to be able to successfully interact in small and large media-based communities, for which both social and personal skills are necessary. Personal skills are also a prerequisite for critical thinking and evaluation of one's own media use. Specific objectives in the *Lehrplan21* can also be consulted online on its website.

Sources

Plan d'études romand (PER) (in French)
<http://www.plandetudes.ch/web/guest/per>

D-EDK. Lehrplan21 - ICT und Medien (in German)
http://projekt.lehrplan.ch/lehrplan/V2/container/31_10_0_0_1_1.pdf

3.4. ASSESSMENT SCHEMES

Currently, there is no testing of pupils' ICT competences at national level.

However, within the HarmoS framework, the EDK/CDIP has called upon a group of experts in order to draw up training standards to apply to all pupils and to be monitored by the EDK/CDIP. For the time being, they will apply to mother tongue language skills, modern foreign languages, mathematics and natural sciences but not to ICT.

Nonetheless, it is possible that as part of a second phase of this project content standards will be redefined and thus provide for a possible framework for ICT competences, which might then be tested nationally.

Sources

EDK/CDIP Report on Education Standards (in progress) (in German and French)
<http://www.edk.ch/dyn/12930.php>

Faktenblatt. Pressedienst Generalsekretariat EDK (4. Juli 2011) (in German)
http://www.edudoc.ch/static/web/arbeiten/harmos/grundkomp_faktenblatt_d.pdf

Feuille d'Information. Service de presse du Secrétariat général CDIP (4 juillet 2011) (in French)
http://www.edudoc.ch/static/web/arbeiten/harmos/grundkomp_faktenblatt_f.pdf

3.5. ICT-BASED ASSESSMENT

There are no ICT based assessment schemes at national level and very few of these assessment schemes exist at cantonal level, the most important of which is called "*Stellwerk*". This web-based and curriculum-linked assessment tool allows for the comparison of the pupils' performance in German and mathematics according to predefined standards at the end of form 8 and 9 (age group 15-16).

The European Computer Driving License (ECDL) is available as a fee-based service on the **educanet**² platform. Fees depend on the status of the school which is using it.

Sources

Institut für Bildungsevaluation, Universität Zürich: Projekt "*Stellwerk*" (in German)
<http://www.ibe.uzh.ch/projekte/stellwerk.html>

Institut für Bildungsevaluation, Universität Zürich: Projekt "Test your ICT Knowledge" (in German)
<http://www.ibe.uzh.ch/projekte/projektealt/entwicklungalt/ict/beschreibung.html>

3.6. QUALITY ASSURANCE OF THE USE OF ICT IN SCHOOLS

In most cantons, the evaluation of the teaching body from pre-school (kindergarten) to upper secondary stages is the responsibility of the school management, often in partnership with the respective teaching monitoring authority (school board, school inspectorate, etc.).

The monitoring authorities are more often involved in the assessment of teaching staff at lower levels, from kindergarten to lower secondary (Secondary I), than in upper secondary. According to regulations in the cantons, colleagues and pupils are rarely involved in this evaluation, and if so, then only at the upper secondary level (although all may participate at all stages in internal quality processes).

The Institute for Media and Schools (IMS) has carried out a survey on the educational platform **educanet**². Financed by the Swiss National Fund, research began in 2007 and was completed in spring 2009. The purpose of the study was to give a detailed and scientifically sound overview on the use of **educanet**² by

schools and to shed light on the link between use of the platform and the following factors:

1. Technical facilities in schools;
2. Schools' organizational frameworks;
3. Support structures;
4. Teachers' knowledge of ICT;
5. Use of the platform's functions in combination with learning objectives.

The study further identifies the different variables which facilitate a successful use of the platform by schools. Also any differences in uses at the primary, lower secondary and upper secondary levels are taken into account. An analysis of the results provides a basis for reflections on the possible emergence of novel ways of learning and teaching and their relation to the use of **educanet**².

Sources

E-Learning und Blended Learning in Schule und Berufsbildung: Die Nutzung der virtuellen Lernplattform educanet² in der Schweiz (in German)
http://www.schwyz.phz.ch/seiten/dokumente/abstract_educanet2pdf

EDK/CDIP survey 2012: Beurteilung von Lehrpersonen (in German)
<http://www.edk.ch/dyn/15891.php>

EDK/CDIP Survey 2012: Evaluation du corps enseignant (in French)
<http://www.edk.ch/dyn/15948.php>

4. DIGITAL LEARNING RESOURCES AND SERVICES

4.1. CONTENT DEVELOPMENT STRATEGIES

There are no content development strategies involving publishers or open source initiatives at national level.

4.2. E-CONTENT DEVELOPMENT

In the French speaking cantons of Switzerland, it is the cantonal ministries of education which coordinate 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 similar to the one in Germany with the project “*Digitale Schulbücher*”, 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, *Mathématiques 9-10-11*, *Milles feuilles*, *ABU*, *Multidingsda*, and *Appolino*.

Most of these initiatives are meant to be piloting initiatives in the context of the current activities for a harmonisation of curricula (*Plan d'études romand, Lehrplan21*, cf. above). There are so far 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.

As a rule, existing print media are not being digitalised to be used electronically 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. Content for Interactive Whiteboards is of special importance to teachers.

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

The digital media for teaching and learning produced by several government bodies, associations and industry in various fields of interest such as STEM education, sports, energy production, theory and practice of economy do usually not form part of a formal curriculum. There are also various Public Private Partnership initiatives in the field: Teacher training universities and universities generally cooperate with industry in the production of digital media.

Sources

ABU eLehrmittel (General education in vocational schools) (in German)
www.hep-verlag.ch/elehrmittel-abu

Appolino (Mathematics and German) (in German)
www.appolino.ch/

Mathématiques 9-10-11 (Mathematics) (in French)
www.cjip.ch/domaines/moyens_d_enseignement_et_ressources_didactiques/mathematiques_et_sciences_de_la_nature

Mille feuilles (French) (in French)
www.1000feuilles.ch

Multidingsda (Basic German Vocabulary) (in German)
<https://itunes.apple.com/ch/app/multidingsda/id418298512?mt=8>

Blended learning in der Berufsbildung (in German)
www.bbbaden.ch/index.php?bm-blended-learning
http://www.swissmem-elearning.ch/file.php/1/XXEL_Flyer_20101008.pdf

4.3. USER - GENERATED CONTENT

The **Swiss Education Server** has already offered for many years a **database for worksheets**, which are mostly created by teachers for teachers. The database is searchable both by a catalogue or a search engine. <http://unterricht.educa.ch/de/worksheet>.

For the French speaking cantons of the country, the Lausanne Teacher Training University (HEP Lausanne) is running a database for teachers willing to share or have access to documents developed by other teachers (from elementary to upper secondary level and also special education).
<http://bddp.hepl.ch>

Moreover, there are a number of regional portals such as [zebis.ch](http://www.zebis.ch), which distribute user content.

Further, the Web 2.0 application “LearningApps.org” supports learning and teaching processes with small interactive modules. Those modules can be used directly in learning materials, but also for self-studying. The aim is to collect reusable building blocks which are available to everyone. Therefore, the blocks (so-called “apps”) do not include any specific framework or learning scenario. As they are not complete lessons or tasks, they have to be embedded in an appropriate teaching or learning scenario. The project originates from an initiative of the Berne Teacher Training University (PHBern), in Switzerland, the Universität Mainz and the Hochschule Zittau/Görlitz, both in Germany.

Since tablets, in particular iPads, and corresponding authoring tools are available, companies like Apple and Microsoft have increased their school and teacher targeted marketing activities; aiming at encouraging the production of e-content by individual teachers using proprietary hard- and software.

Sources:

Swiss Education Server. Database for worksheets.
<http://unterricht.educa.ch/de/worksheet>

HEP Lausanne. Database for documents and materials, from teachers to teachers.
<https://extranet.hepl.ch/hep2/searchBddp.do?actn=search>
<http://bddp.hepl.ch>

Learningapps
learningapps.org/

Schweizerischer Bildungsserver educa.ch
<http://unterricht.educa.ch/de/unterrichtsressourcen-0>

Zentralschweizer Bildungsserver zebis.ch
www.zebis.ch

4.4. WEB 2.0

No information provided.

4.5. CONTENT SHARING

The **SWITCHcollection** – National Learning Object Repository (LOR) is a national library of reusable learning materials like courses, modules, images, video clips and text documents provided by Swiss universities. Using SWITCHcollection, lecturers ensure that their investment pays off: produced learning materials are archived on a permanent basis, added to, and made available to others.

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/CDIP), 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 cantonal 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 *Lehrplan21*, cf. above). The Digital School Library facilitates the harvesting of particular sub-sets of data to be included in local or regional databases and displayed by their portals' user interfaces.

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

4.6. LEARNING PLATFORMS

As of January 2013, 3,643 Swiss schools are subscribed to **educanet²**, with more than 138,000 teachers and 432,000 pupils in more than 35,500 classes (updated statistics can be consulted on the **educanet²** website). This platform is provided by the Swiss Educational Sever together with a vast amount of information about education in Switzerland.

The platform **educanet²** offers four distinct areas of activities: a "private" space for each user, an "institutional" space for schools, a "community" space where groups can work together, and a space for online learning. Tools include an address book, task manager, electronic messaging, instant messaging system, workbook, web site generator, wiki, blog, authorware, etc. The *lesson plan tool*, available on **educanet²** offers the possibility to teachers to create a work and learning plan for their pupils and classes, structuring and timing collective and individual activities. The lesson plan tool gives orientation to pupils and teachers alike with monitoring and assisting learning progresses.

Several schools – especially at secondary II level – are also 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.

Sources

educanet² (In French, German and Italian, partly in English and Spanish)

www.educanet2.ch

educanet² Statistics (in German, French and Italian)

<https://www.educanet2.ch/ww3ee/5111556.php>

Stratégie de la CDIP en matière de technologies de l'information et de la communication (TIC) et des médias 2007 (in French)

<http://edudoc.ch/record/30021>

eduhub

<http://www.eduhub.ch>

4.7. ACCESS OF SEN STUDENTS

Equal Opportunities for Persons With Disabilities

There is a working group dedicated to issues of ICT for inclusion, particularly in the field of special needs education, which consists of members of all Swiss institutions offering courses in special needs education. In 2009, the working group has published a report on the role of ICT in the training of special needs education teachers.

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

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 of 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.

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 prerequi-

site 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.

Sources

„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

Sonderpädagogik (in German)
<http://sonderpaedagogik.educa.ch/de>

Pédagogie spécialisée (in French)
<http://pedagogiespecialisee.educa.ch/fr>

5. TEACHER EDUCATION FOR ICT

5.1. 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. It is expected that more guidance for teacher training in the field of ICT will be derived from the future national curriculum for compulsory schools (*Lehrplan21*). The *Lehrplan21* envisages “Media and ICT” not as a subject in its own right but rather as an inter- or transdisciplinary topic (See 3.1 Curricular Framework).

There are 13 Universities of Teacher Education in Switzerland⁷, most of which have their own Centres for Media Education affiliated to them, which offer their

⁷ COHEP. Universities of Teacher Education.
<http://www.cohep.ch/en/universities-of-teacher-education/>

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 Universities of Teacher Education in the German speaking cantons of the country offer a total of 31 curricula for all school-subjects and all levels of teaching from pre-school to secondary II level.

Sources

„ICT und Medienbildung in der Lehrpersonenausbildung in der Schweiz. Fallstudie über das Studienangebot an den Pädagogischen Hochschulen. 27.5.2010.“ (in German)
http://www.haslerstiftung.ch/files/webcontent/documents/d/studie_ict_und_medienbildung.pdf

„Das Image der Informatik in der Schweiz. Ergebnisse der repräsentativen Befragungen von Schüler/innen, Lehrpersonen und Bevölkerung“. Erstellt im Auftrag des Förderprogramms FIT in IT der Hasler Stiftung von Rütter + Partner, April 2008. (in German)
http://www.haslerstiftung.ch/files/webcontent/documents/d/imagestudie_2008.pdf

5.2. ICT IN IN-SERVICE TEACHER EDUCATION

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 offered by cantonal expert agencies for ICT. These are usually affiliated to the cantonal Teacher Training Institutions and work both with experienced in-service teachers and experts in the field of pedagogy and ICT.

Source

Cantonal ICT Competence Centres (in German, French, Italian and English)
<http://unterricht.educa.ch/de/kantonale-ict-fachstellen>

5.3. NEW INITIATIVES

The **MINT learning centre** at the Swiss Institute of Technology in Zürich (ETH Zürich) is to develop teaching methods, learning objects, programs and curricula for the teaching of Physics, Chemistry and Technology in schools at upper secondary level in order to improve students applied knowledge of these subjects. The primary target groups are Science Teachers from all



levels of school (from elementary to upper secondary) and vocational training institutions. At the MINT centre, in-service teachers develop new teaching materials while testing them in their schools. Feedback from the teaching at the schools feeds back into the learning centre's development teams.

The **Swiss Museum of Transport** in Lucerne initiated the **i-factory**, which provides an appealing, interactive way of testing basic techniques that underlie our information technology and an international encounter with its culture. At the visual centre of the i-factory, practical examples of the information technology that pervade our everyday lives, in particular the world of transportation, are shown with authentic pictures, film clips and computer animations. They build a bridge between the playful approach of the i-factory and the real world.

The **Museum of Communication** in Berne offers workshops, guided tours, as well as printed or digital guides for several topics relating to ICT.

Source

MINT Learning Centre at the Swiss Federal Institute of Technology
http://www.educ.ethz.ch/mint/index_EN

The Swiss Museum of Transport in Lucerne
<http://www.verkehrshaus.ch/en/museum/i-factory>

Museum of Communication in Berne
<http://www.mfk.ch/lernen.html>

5.4. ASSESSMENT SCHEMES

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

Sources

Durch die EDK anerkannte Zusatzausbildungen in ICT (in German and French)
<http://www.cdip.ch/dyn/13840.php>

Lehrberuf - Analyse der Veränderungen und Folgerungen für die Zukunft, EDK 2008 (in German)
<http://edudoc.ch/record/27311>

Profession enseignante : analyse des changements et conclusions pour l'avenir, CDIP, 2008 (in French)
<http://edudoc.ch/record/27310>

5.5. TRAINING OF TEACHER TRAINERS

The training of teacher trainers is not coordinated at national level. There are two inter-cantonal initiatives in the field. The **teachers' association "MITIC"** offers ICT-courses for in-service teacher trainers as well as general help and guidance in the field in the French speaking cantons of Switzerland. « **PICTS - Pädagogischer ICT-Support** » is the corresponding body in German speaking cantons 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

Association EDUMITIC (for French speaking cantons of Switzerland)
<http://www.edumitic.ch/spip/>

PICTS - Pädagogischer ICT-Support (for German speaking cantons of Switzerland)
http://picts.educanet2.ch/info/ws_gen/

5.6. INCENTIVES

As mentioned above, most training of teachers in the use of ICT takes place in in-service training courses, a few of which may be mandatory.

Sources

Pedagogical scenarios for using ICT in teaching (cantonal initiatives)
<http://www.edk.ch/dyn/18009.php?filter=b3>

EDK/CDIP, Recommandations relatives à la formation initiale et continue des enseignantes et enseignants de la scolarité obligatoire et du degré secondaire II dans le domaine des technologies de l'information et de la communication (ICT)
<http://edudoc.ch/record/24706?ln=de>

5.7. ICT SUPPORTING INCLUSION

See Section 4.7 Access of SEN students



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