Open Science and Open Education: First Look into Legal Frameworks Concerning Switzerland. Report produced within research projects funded by the LH for MENA region

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Open Science and Open Education:

First Look into Legal Frameworks Concerning Switzerland

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Abstract

This report is produced as part of an Open Education study and must be written in the link of these acts to education. The report is used to understand, in relation to education (training and learning) and research in Geneva, the regulatory frameworks to be considered for the target audience of teachers and students of the University of Geneva. The research work provides a detailed overview of the regulatory frameworks governing OS, OER, Global Citizenship and Sustainability at the international, European, national and local levels in Geneva. Existing regulations, policies and initiatives affecting the academic and research environment are examined.

Keywords: EU, Geneva Canton, Global Citizenship, IOs, Open Educational Resources, Open Science, Sustainability, Swiss Confederation.

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Glossary

Action Plan related to the 2030 Sustainable Development Strategy - The action plan defines further measures in areas that still present gaps or in which strengthened intersectoral cooperation proves to be necessary. Therefore, it only contains measures that are not already integrated into other strategies or instruments [fs].

ALL DIGITAL - The association is a leading pan-European association that represents national/regional organizations across Europe working to enhance digital skills.

cOAlition S - This is a consortium of national research agencies and founders from twelve European countries.

COMPET - This is one of the groups with which the Council of the EU meets and is made up of the ministers responsible for trade, economy, industry, research, innovation and space of the 27 Member States of the EU. It has expertise in four distinct areas: internal market, industry, research, innovation, and space.

Effectiveness - It corresponds to the degree of influence on the conduct of the Member States.

EU Commission Communication - The Communication is a characteristic production of the Commission. Communication is a document without legal scope that the Commission transmits to other European institutions, presenting new programs and policies. It is an atypical act because it does not appear in the nomenclature of Article 249 of TFEU [EU_07].

European Commission Program Guide - This document can be classified as atypical acts that are a category of acts adopted by the EU institutions and relate to the EU's internal organization. They are described as "atypical" because they do not fall into the categories of legal acts provided for in Article 288, TFEU (https://eur-lex.europa.eu/EN/legal-content/glossary/atypical-acts.html).

EU Commission Recommendation - According to Article 292 TFEU, third sentence: "the Commission [...] in the specific cases provided for in the Treaties, shall adopt recommendations".

EU Council Decision - An EU decision is a binding legal act that either may be of general application or may have a specific addressee. A decision is part of the EU's secondary law, the body of law that derives from the principles and objectives set out in the EU treaties (primary law). According to Article 288 of the TFEU, a decision is binding in its entirety.

Finally, an EU decision which specifies those to whom it is addressed is binding only on them (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:decision).

EU Council Recommendation - According the Article 182(5), TFEU, the EU Council adopts the recommendation "as a complement to the activities planned in the multi-annual framework program [...] to establish the measures necessary for the implementation of the European research area", and Article 292, TFEU: "the Council shall adopt recommendations. It shall act on a proposal from the Commission in all cases where the Treaties provide that it shall adopt acts on a proposal from the Commission". Recommendations and opinions shall have no binding force (Art. 288(5), TFEU).

EU Directive - The EU Directive is a legal instrument that allows EU to exercise its competences (Art. 288(1), TFEU). According to Article 288(3), TFEU, the "directive shall be binding, as to the result to be achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of form and methods").

EU Regulation - A EU regulation is part of the EU's secondary law, the body of law that derives from the principles and objectives set out in the EU treaties (primary law). An EU regulation is directed at abstract categories of persons, not at identified persons. An EU regulation shall have general application. It shall be binding in its entirety and is directly applicable in all Member States (Art. 288 TFEU). Therefore, an EU regulation is a legal act binding upon the EU institutions, Member States, the individuals to whom it applies. Furthermore, an EU regulation is directly applicable in all Member States. This means that: (a) it applies immediately as the norm in all Member States, without needing to be transposed into national law; (b) it creates rights and obligations for individuals, and therefore they can invoke it directly before national courts and used as a reference by individuals in their relationship with other individuals, Member States, or EU authorities (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:regulation).

Erasmus+ - Erasmus+ is the EU's program to support education, training, youth and sport in Europe (https://erasmus-plus.ec.europa.eu/about-erasmus/what-is-erasmus?pk_source=website&pk_medium=link&pk_campaign=hp&pk_content=hp-hero).

ETH Domain - It is a cooperating network of Swiss education and research institutions that work closely together and it is regulated by the ETH Zurich Act. ETH Zurich works together with EPFL and four research institutes: EWAG, WSL, EMPA, and PSI.

European Research Area - ERA was launched in 2000 as part of the Lisbon strategy. The purpose of this initiative was to address the fragmentation of the EU's R&I system. At the time, the system consisted of national R&I systems and an EU-level funding program. The initiative aims to create a unified scientific and technological area for the EU. The aim is to create a single market for research and innovation that promotes the free movement of researchers, scientific knowledge, and innovation, while encouraging a more competitive European industry. This requires restructuring the European research landscape to promote

cross-border cooperation, continent-wide competition, the building of critical mass and coordination, and the improvement of national research policies and systems. Since 2009, the achievement of the ERA has also become an explicit Treaty objective, as expressed in Article 179 TFEU [Com20a].

FAIR Data Principles - The FAIR Data Principles, such as Findable, Accessible, Interoperable, and Reusable was published in Scientific Data in 2016 [APS+17]. They are a set of guiding principles proposed by a consortium of scientists and organizations to support the reusability of digital assets. The author explain that: "to be Findable: F1. (meta)data are assigned a globally unique and persistent identifier, F2. data are described with rich metadata (defined by R1 below) F3. metadata clearly and explicitly include the identifier of the data it describes, F4. (meta)data is registered or indexed in a searchable resource. To be Accessible: A1. (meta)data are retrievable by their identifier using a standardized communications protocol, A1.1 the protocol is open, free, and universally implementable, A1.2 the protocol allows for an authentication and authorization procedure, where necessary, A2. metadata are accessible, even when the data are no longer available. To be Interoperable: I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation, I2. (meta)data use vocabularies that follow FAIR principles, I3. (meta)data include qualified references to other (meta)data. To be Reusable: R1. meta(data) are richly described with a plurality of accurate and relevant attributes, R1.1. (meta)data are released with a clear and accessible data usage license, R1.2. (meta)data are associated with detailed provenance, R1.3. (meta)data meet domain-relevant community standards.

Federal Law of the Swiss Confederation - Federal law imposes obligations, confer rights or determine powers in a directly binding and general manner. It is located between the Constitution and ordinances in the hierarchy of norms and serves to implement the provisions of the Constitution while being concreted in the ordinances (Art. 163–165, Art. 140(1)(c), Federal Constitution of the Swiss Confederation, SR 101 and Art. 22, Parliament Act, PA) [fsnd]".

Global Citizenship - UNESCO provides a definition of the global citizenship as follows: "Despite differences in interpretation, there is a common understanding that global citizenship does not imply a legal status. It refers more to a sense of belonging to a larger community and common humanity, promoting a 'global gaze' that links the local to the global and the national to the international. It is also a way of understanding, acting, and relating oneself to others and the environment in space and in time, based on universal values, through respect for diversity and pluralism. In this context, the life of each individual has implications on daily decisions that connect the global with the local, and vice versa" [UNE14a], (p. 14).

Guidelines - They are documents that offer instructions, recommendations, or suggestions on how to address specific issues or situations. They are intended to guide actions, decisions, and practices consistently and in accordance with certain standards or objectives.

International Statement of Principles - This statement provides a framework of the guidelines and objectives underlying a specific commitment, agreement or initiative that are designed to be universally recognized and applied on a global scale.

Legal significance - It refers to a legally bounding nature.

Message FRI - Every four years, the Federal Council presents to Parliament its policy on the promotion of education, research and innovation. The FRI message takes stock of the previous period, presents the challenges to be met, and sets the objectives, priorities, and measures for the new funding period (https://www.sbfi.admin.ch/sbfi/fr/home/politique-fri/2025-2028.html).

Message on the legislative program - The Federal Council, when submits a draft act to the Federal Assembly, attaches a message (Art. 141(1), Parliament Act, PA). In its message, the Federal Council gives reasons for its drought act and comments on its provisions if necessary [...] (Art. 141(2), Parliament Act, PA).

Nationwide higher education policy coordination act -The Higher Education Act, (HEdA) is the legal basis for the Confederation and the cantons to plan and implement education, research and innovation policy in the Swiss higher education landscape. The Art. 36, Higher Education Act, (HEdA) establishes "through the Swiss Conference of HEIs, the Confederation and the Cantons shall work together to ensure coordination of the entire Swiss higher education sector and decide on the allocation of tasks in particularly costly areas [...]. The coordination shall include establishing priorities in relation to common objectives under Article 3 letters a–g and the required measures to be taken throughout the higher education sector [...]". OS and OA strategies and action plans are examples of coordination of national higher education policy. These strategy is not sources of law in the formal sense, however it can play a significant role in the Swiss legal system. For instance, the ORD strategy encourages researchers and research communities to adopt ORD practices and aims to foster the use of and facilitate the development of these practices (Art. 1(2), Swiss National ORD Strategy). The Action Plan sets out the measures envisaged in the National Strategy for OA and OS providing guidance and recommendations to universities and other interested parties.

OECD Recommendation - OECD recommendation is adopted by OECD Council and it represents a political commitment to the principles it contains and entails an expectation that Adherents will do their best to implement them. It is not legally binding [OECnd].

Open Educational Resources - UNESCO provides a definition of OER highlighting that they "are learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others" [UNE22], (Recommendation I, 1).

Open Science - UNESCO provides a definition of OS as "an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community. It comprises all scientific disciplines and aspects of scholarly practices, including basic and applied sciences, natural and social sciences and the humanities, and it builds on the following key pillars: open scientific knowledge, OS infrastructures, science communication, open engagement of societal actors and open dialogue with other knowledge systems" [UNE21b], (Recommendation II, 6).

Policy - "A policy is a course of action for tackling a political problem. Policy-making is itself a process; it is conceived by public or private groups who formulate strategy with regard to a political issue, and carried out by government officials who implement policies as concrete programs and actions." (Harvard Law School, https://hls.harvard.edu/bernard-koteen-office-of-public-interest-advising/about-opia/what-is-public-interest-law/public-interest-work-types/policy/).

Political declaration - This declaration is a statement by political leaders and it express their official positions, goals or intentions on specific issues. The statement is used to communicate the official positions of a government or a political organization on a particular set of issues.

Roadmap - This is a strategic document that provides detailed and planned guidance for achieving specific goals within a context.

Strategy - A strategy can be adopted to address challenges, promote program or policy implementation, or achieve long-term goals offering clear guidance on the priorities, goals, and actions required to achieve specific outcomes in the context of the organization's missions and objectives.

Sustainable Development Strategy - The 2030 Sustainable Development Strategy is a document outlining Switzerland's sustainable development priorities and objectives. This strategy is accompanied by action plans and establishes guidelines for Swiss policy on sustainable development until 2030. It emphasizes the importance of integrating the principles and objectives of the 2030 Agenda into all policy sectors of the Confederation. This strategy does not contain measures that are included within the Action Plan related to the 2030 Sustainable Development Strategy [fs24].

SWITCH - This is a Swiss foundation with the purpose to create, promote, and maintain information and communication technologies in Switzerland at the service of education and research.

Swiss Academies of Arts and Sciences (A+) - This is an association of the SCNAT, the Swiss Academy of Humanities and Social Sciences SAHS, the Swiss Academy of Medical Sciences

SAMS, the Swiss Academy of Engineering Sciences SATW and the Swiss Young Academy SYA. It also comprises the center of excellence for TA-SWISS and the Foundation Science and Cité as well as other scientific networks.

swissuniversities - The association was established on 1 January 2015, coinciding with the implementation of the Higher Education Act, (HEdA). The swissuniversities association is the result of a merger between the former conferences of rectors CRUS, KFH, and COHEP. In 2012, Swiss universities, universities of applied sciences, and universities of teacher education jointly founded the association in preparation for this merger (https://www.swissuniversities.ch/en/welcome).

swissuniversities Program - According to Article 3(4) of the Statute of the swissuniversities Association, the Association may accept responsibility for managing programs and third-party programs of the Confederation. This implies that the swissuniversities association can enter directly into federal programs and manage programs, including third parties [Ass19].

UN General Assembly Resolution - The resolutions adopted by the General Assembly of the UN is one of the main act used to make decisions. Article 10 of UN Charter [UNC45], which defines the functions and powers of the General Assembly, states that: "the General Assembly may discuss any questions or any matters within the scope of the present Charter or relating to the powers and functions of any organs provided for in the present Charter, and, except as provided in Article 12, may make recommendations to the Members of the UN or to the Security Council or to both on any such questions or matters". UN specifies that "resolutions adopted by the General Assembly on agenda items are considered to be recommendations. They are not legally binding to the Member States" (https://www.un.org/en/model-united-nations/how-decisions-are-made-un).

UNESCO Declaration - UNESCO declaration is not explicitly provided for in UNESCO's Constitution, but is an integral part of the Organization's standard-setting mandate. This declaration enunciates the universal principles to which the community of states wishes to give the maximum authority and the widest possible support [UNE23b].

UNESCO Recommendation - UNESCO recommendation is an instrument by which the General Conference formulates principles and norms for the international regulation of any particular question and invites Member States to take whatever legislative or other steps which may be required to apply them. Indeed, "the General Conference formulates principles and norms for the international regulation of any particular question and invites Member States to take whatever legislative or other steps may be required in conformity with the constitutional practice of each State and the nature of the question under consideration to apply the principles and norms aforesaid within their respective territories." (Art. 1(b), of Rules of Procedure concerning recommendations to Member States and international conventions covered by the terms of Article IV, paragraph 4, of the Constitution). The legal

significance of UNESCO recommendations “is determined by the Charter of this organization or, to express it more precisely, by the law of this organization” ([Tun74], p. 179). The following statement: “each of the Member States shall submit recommendations or conventions to its competent authorities within a period of one year from the close of the session of the General Conference at which they were adopted” (Art. IV, 4, Constitution of the UNESCO) aims to ensure that internationally discussed and approved recommendations and conventions are brought to the attention of national authorities for implementation and integration into national policies, even if they do not have binding legal force. However, “the real effectiveness of the norms of recommendations [...] is another question. The more a recommendation of an IO is responsive to the pressing requirements of the cooperation of states in a given sphere, the higher its effectiveness. Finally, the role of normative recommendation of specialized IO undoubtedly is growing in international relations” ([Tun74], p. 179).

Acronyms

AAM Accepted Author Manuscript

AI Artificial Intelligence

ASEAN Association of Southeast Asian of Nations

CC Creative Commons

CC BY Creative Commons Attribution license

CDIP Conférence suisse des directeurs cantonaux de l'instruction publique

COB Company of Biologists

COHEP Swiss Conference of Rectors of Universities of Teacher Education

COL Commonwealth of Learning

CONFINTEA International Conference on Adult Education

CRUS Swiss Conference of Rectors of Swiss Universities

CSTP Committee on Scientific and Technological Policy

CULT European Parliament's Committee on Culture and Education

DelOS Delegation Open Science

DMPs Data Management Plans

DORA Declaration on Research Assessment

ECOWAS Economic Community of West African States

EMPA Swiss Federal Laboratories for Materials Science and Technology

EOSC European Open Science Cloud

EPFL École polytechnique fédérale de Lausanne

EPRS European Parliamentary Research Service

ERA European research area

ERAC European Research Area and Innovation Committee

ERC European Research Council

ERI Education, Research, and Innovation

ERIC European Research Infrastructure Consortium

ESD Education for Sustainable Development

ETH Eidgenössische Technische Hochschule Zürich

EU European Union

EUA European University Association

EWAG Swiss Federal Institute of Aquatic Science and Technology

FRI Formation, recherche et innovation

FSF Free Software Foundation

GAP Global Action Program

GCE Global Citizenship Education

HEIs Higher Education Institutions

Higher Education Act, (HEdA) Federal Act on the Promotion of Universities and Coordination in the Swiss Higher Education Sector (SR 414.20)

ICSU International Council of Scientific Unions

ICT Information and Communications Technologies

IO International Organization

IOs International Organizations

IoT Internet of Things

IPTs Institute for Prospective Technological Studies

KFH Rektorenkonferenz der Schweizer Fachhochschulen

LH Leading House

MENA Middle East and North Africa

MOOCs Massive Open Online Courses

NCCR National Center of Competence in Research

NOADs National Open Access Desks

NREN Swiss National Research and Education Network

OA Open Access

OECD Organisation for Economic Co-operation and Development

OEPs Open Educational Platforms

OER Open Educational Resources

OpenAIRE Open Access Infrastructure for Research in Europe

ORD Open Research Data

OS Open Science

OSPP Open Science Policy Platform

OSPP-REC Open Science Policy Platform Recommendations

OSTP Office of Science and Technology Policy

OSWG Open Science Working Group

Parliament Act, PA Federal Assembly Act (Parliament Act, PA), SR 171.10

PID Personalised Identifier Data

PSI Paul Scherrer Institute

R&I Research and Innovation

RIPA Federal Act on the Promotion of Research and Innovation

SAHS Swiss Academy of Humanities and Social Sciences

SAMS Swiss Academy of Medical Sciences

SATW Swiss Academy of Engineering Sciences

SCNAT Swiss Academy of Sciences

SCOSS Sustainability Coalition for Open Science Services

SDG Sustainable Development Goal

SDGs Sustainable Development Goals

SDSC Swiss Data Science Center

SERI State Secretariat for Education, Research and Innovation

SIG Special Interest Group

SNFS Swiss National Science Foundation

SPARC Scholarly Publishing and Academic Resources Coalition

SPHN Swiss Personalised Health Network

SSH Social sciences and humanities

SUC Swiss University Conference

SYA Swiss Swiss Young Academy

TA Technology Assessment

TFEU Treaty on the Functioning of the European Union

UN United Nations

UN Women United Nations Entity for Gender Equality and the Empowerment of Women

UNDP United Nations Development Program

UNESCO United Nations Educational, Scientific and Cultural Organization

UNFCCC United Nations Framework Convention on Climate Change

UNFPA United Nations Fund for Population Activities

UNHCR United Nations High Commissioner for Refugees

UNICEF United Nations International Children's Emergency Fund

US United States

USA United States of America

WB World Bank

WIPO World Intellectual Property Organisation

WSL Swiss Federal Institute for Forest, Snow and Landscape Research

ZHAW Zurich University of Applied Sciences

Chapter 1

Introduction

This report is part of an Open Education study and focuses on the connection between these documents and education. The report is used to understand, in relation to education (training and learning) and research in Geneva, the regulatory frameworks to be considered for the public target audience of students, teachers, and students of the University of Geneva.

This document is divided into four main chapters. First, a list of relevant documents (such as laws, regulations, guidelines, policies, etc.) is compiled at the four identified levels, namely the international, European, Swiss Confederation, and Geneva Canton levels. Each identified document will then be summarized according to pre-defined variables, including its background, purpose, status, degree of binding force, and importance in the educational context. This step aims to provide a clear and accessible view of the regulations covered in the report. Third, once the regulatory documents have been summarized, we will proceed with a clear and concise definition of key concepts encountered during the research. This includes terms such as policy, strategy, federal and cantonal law, etc., which will be clarified to ensure full understanding. Finally, the report will include three visual representations: two depicting the connections between Open Science (OS) with European and international documents, and Open Educational Resources (OER) with international and European documents, respectively. The third visualization will illustrate the connections between OS and OER within Switzerland. This approach aims to provide a comprehensive understanding of the regulatory landscape surrounding the OS and OER initiatives.

The report is divided into four chapters. Chapter 2 provides an analysis of the international (section 2.2), European (section 2.3), Swiss (section 2.4) and Geneva canton (section 2.5) regulatory frameworks that guide OS (subsection 2.2.1), OER (subsection 2.2.2), global citizenship (subsection 2.2.3), and sustainability (subsection 2.2.4).

Chapter 3 examines the outcomes and implications of the international (section 3.1), European (section 3.2) and Swiss frameworks (section 3.3), as well as the specific Geneva regulatory framework (section 3.4). The analysis of these documents provides a clear understanding of the rules to follow, the policy directions to consider, and the evolution over time of policies and practices related OS, OER, global citizenship and sustainability at different levels.

Chapter 4 presents the graphical analyzes that highlight the international and European influence on OS and OER in Switzerland, with a comparison between the different regulatory contexts. There is also a graph that compares the regulatory framework of OS and OER in Switzerland.

Through this report, our objective is to provide a comprehensive overview of the policies and regulations that guide scientific research, education, and the promotion of global citizenship and sustainability.

Chapter 2

Regulatory Framework Analysis: Interplay of Acts, Documents, and Initiatives Across Four Competency Areas and Governance Levels

This chapter collects and analyzes the documents that are considered the most important in the four areas (OS, OER, global citizenship and sustainability) with regard to the international, European, Swiss and Geneva levels. The list is not exhaustive (section 2.2).

The collection of documents is preceded by a diagram showing the key documents identified for each of the four areas and for each of the four levels (international, European, Swiss and Geneva) (section 2.1).

2.1 Regulatory Framework Schema

The analysis of the regulatory framework is structured by levels, within which there are two basic categories, the Acts and the Documents and Initiatives (Acts - Doc. - Init.). Regarding “acts”, the wording is used to include both typical or atypical acts that refer to the normative documents that establish rules or regulations, while for “documents”, we refer to other information materials or communications relevant for the four areas. The “initiatives” are actions or projects initiated by stakeholders to address a problem or promote a specific objective. The decision to keep the two groups distinct (acts and documents on one side, and initiatives on the other) responds to an organizational need that allows us to highlight the different weight of the two categories.

As we can see in Figure 2.1, there are four main nodes for the four areas: OS, OER, Global Citizenship, and Sustainability. Each node is represented by a different color and a text label indicating the corresponding area. Below each area there are separate nodes representing the different governance levels: International, European, Swiss and Geneva. These nodes are also labeled accordingly. The arrows connect each node of the area to all the nodes of the different governance levels, indicating the relationship between the area and the different levels.

Additionally, there are buttons that appear to be attached to the nodes to display additional information when clicked. For the international level, the buttons are labeled with text that indicates the names of the bodies that have issued the documents in the four competence areas. For example, there are five orange buttons for OS, six blue buttons for OER, two blue buttons for global citizens and two green buttons for sustainability. By clicking on the text inside each button, the user can be taken to the part of the text where the document issued by the corresponding body is analyzed. For the European, Swiss, and Geneva governance levels, the buttons contain the names of the documents issued by the corresponding bodies in the four areas of competence. However, the color of the button remains the same as that of the corresponding open subject area in order to maintain visual consistency and to indicate the subject area to which the documents belong. In summary, the buttons provide an intuitive way to quickly access documents issued by institutions in different areas of expertise and governance levels, facilitating navigation and content consultation.

The following diagram is a useful tool for clearly visualizing the relationships between different areas and governance levels, as well as providing quick access to additional information about specific documents within each category.

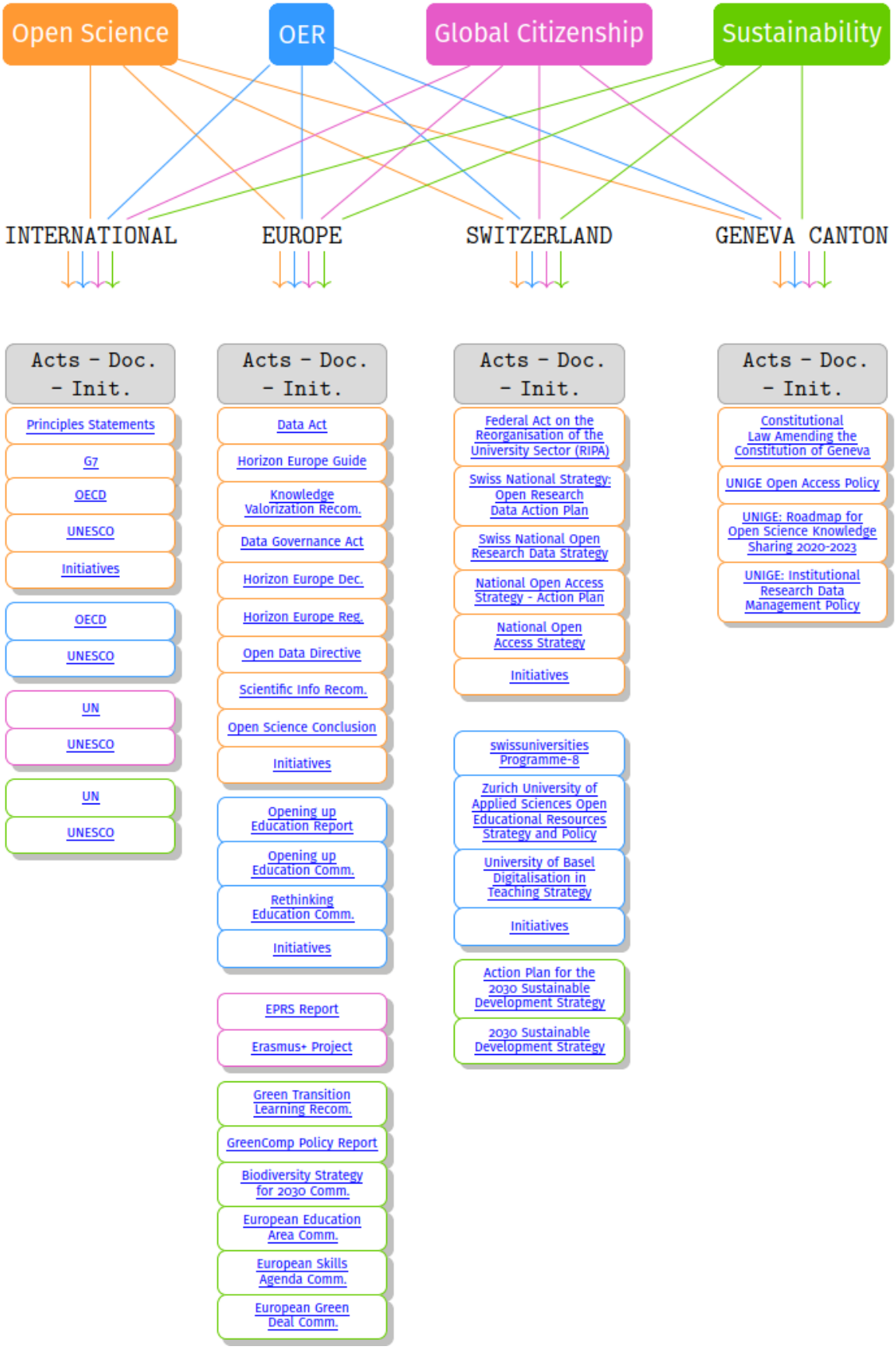


Figure 2.1: Regulatory Framework Schema

2.2 International

At the international level, the process commences with the declaration of statements, followed by the categorization of documents according to the issuing body (such as G7, OECD, and UNESCO. In addition, we have included international initiatives launched by entities with an international scope, regardless of whether they originate from international bodies.

The macro categories are introduced using square bullet points that assume the color corresponding to the competency area. For each macro category, acts and/or documents related to it are listed systematically, indicating the year of issue and the document title. The year of publication is hyperlinked to direct users to the page where the document can be found. Documents are introduced with a colored triangle that corresponds to the competency area.

Each document will be summarized considering predefined variables, that is, the "background", "purpose", "status", "degree of binding and effectiveness", "importance in the educational context", and "related documents" that are mentioned within the documents analyzed. Not all documents are mentioned, but only those that have a correlation with the study domain. The introduction of related documents helps us to examine the correlations between the different documents, and also identifies correlations at an international, European or Swiss level.

2.2.1 Open Science

- International Statement of Principles

  - ▲ 2013 - Declaration of San Francisco on Open Access to Research Assessment, or Declaration on Research Assessment (DORA) [Cag13]

    Background:
    The declaration was issued on December 16, 2012. "A group of editors and publishers of scientific journals, including representatives from the Company of Biologists (COB), publishers of Disease Models & Mechanisms, met at the annual meeting of the American Society for Cell Biology in San Francisco, CA, United States of America (USA)" (p. 869).

    Purpose:
    The declaration discusses "current issues related to assessing the quality of research output and citation of primary scientific literature" (p. 869).

    Status, Legal Significance, and Effectiveness:

    → *Status*: The declaration is a set of recommendations and ethical guidelines to improve the evaluation of scientific research.

    → *Legal Significance*: The declaration is not binding, but it can help shape policies and initiatives in this area.

→ *Effectiveness*: The declaration has gained widespread support from institutions, scientific publishers, funding agencies and researchers around the world.

Highlights for education:
DORA is a set of recommendations aimed at improving the evaluation of research results. It aims (a) to eliminate the use of journal-based metrics, such as impact factors of the journals, to assess the quality of individual research articles, contributions of a scientist, or in hiring, promotion, or funding decisions (Recommendation 1).

The recommendations (b) encourage considering the value and impact of all research outputs, including datasets and software, in addition to scientific publications.

DORA recommendations (c) are aimed at funding agencies, academic institutions, scientific journals, organizations that provide metrics, and individual researchers.

▲ 2003 - Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities [ber03]

Background:
The declaration was issued on October 22, 2003 following a conference dedicated to Open Access (OA) hosted by the Max Planck Society in Berlin, Germany.

Purpose:
The mission is to spread knowledge not only through the classical form, but also and increasingly through the OA paradigm through the Internet. OA is a comprehensive source of human knowledge and cultural heritage (paragraph *Goals*).

Status, Legal Significance, and Effectiveness:

→ *Status*: The declaration is a statement of principles and requirements for OA. Furthermore, it is a statement of commitment as we can extrapolate from the following sentence:

> "*We, the undersigned, feel obliged to address the challenges of the Internet as an emerging functional medium for distributing knowledge*".

→ *Legal Significance*: The declaration is not binding, but it can help shape policies and initiatives in this area.

→ *Effectiveness*: The declaration influenced the development of international and national law together with the Budapest and Bethesda declarations, which marked the fundamental stages of the international OA movement.

Highlights for education:

The declaration establishes that the two requirements that an OA publication must have, such as:

> *"(a) the author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship [...] as well as the right to make small numbers of printed copies for their personal use (point 1).*
>
> *(b) A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards [...]"* (point 2) (paragraph: *Definition of an Open Access Contribution*).

Related document:

→ 2003 - Bethesda Statement on Open Access Publishing [SBC+03]

→ 2002 - Declaration of the Budapest Open Access Initiative [JLI12]

▲ 2003 - Bethesda Statement on Open Access Publishing [SBC+03]

Background:
The statements of principle were drafted during a one-day meeting held on April 11, 2003 at the headquarters of the Howard Hughes Medical Institute in Chevy Chase, Maryland.

Purpose:
The purpose of this document is to stimulate discussion within the biomedical research community on how to proceed, as quickly as possible, toward the widely held goal of providing OA to the primary scientific literature (paragraph *Summary of the April 11, 2003, Meeting on Open Access Publishing*).

Status, Legal Significance, and Effectiveness:

→ *Status*: The declaration is a statement of principle related to OA that are listed at the end of the declaration. It is also a statement of commitment as can be seen, for example, in point 3, paragraph *Statement of Scientists and Scientific Societies Working Group*:

> *"[...] scientific societies agree to affirm their strong support for the OA model and their commitment to ultimately achieve OA for all the works they publish. They will share information on the steps they are taking to achieve OA with the community they serve and with others who might benefit from their experience."*

→ *Legal Significance*: The declaration is not legally binding.

→ *Effectiveness*: The declaration influenced the development of international and national law together with the Budapest and Berlin declarations, which marked the fundamental stages of the international OA movement.

Highlights for education:
The declaration:
(a) defines the OA publication and underlines the role of the author as a rights holder, encouraging the use of free licences that allow users to declare their articles OA and allow reuse for derivative works:

> *"An OA journal is as a periodical that provides free, irrevocable, global, perpetual access and and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use."* (point 1, paragraph *Definition of Open Access Publication*).

(b) emphasises the importance of promptly depositing every published article in at least one repository (point 2, paragraph "*Definition of Open Access Publication*").

Related document:

→ 2002 - Declaration of the Budapest Open Access Initiative [JLI12]

▲ 2002 - Declaration of the Budapest Open Access Initiative [JLI12]

Background:
The Conference on OA to scientific literature took place on December 1-2, 2001 in Budapest, Hungary. The Budapest Declaration had a significant impact on the OA movement, contributing to its global reach.

Organiser:
Open Society Institute

Purpose:
Discussing the current state of OA to scientific literature and develop recommendations to promote it.

Status, Legal Significance, and Effectiveness:

→ *Status*: The declaration is a "statement of principle, a statement of strategy, and a statement of commitment" [BOA02]. It define a series of principles and strategies to promote the OA. Furthermore, it is a commitment statement as shown in the following sentences:

> *"Open Society Institute, the foundation network founded by philanthropist George Soros, is committed to providing initial help and funding to realise this goal."* (p. 4).

→ *Legal Significance*: The declaration is not legally binding as shown by the final formula:

> "*We invite governments, universities, libraries, journal editors, publishers, foundations, learned societies, professional associations, and individual scholars who share our vision to join us in the task of removing the barriers to OA and building a future in which research and education in every part of the world are that much more free to flourish.*" (p. 4).

→ *Effectiveness*: The declaration influenced the development of international and national law together with the Bethesda and Berlin declarations, which marked the fundamental stages of the international OA movement.

Highlights for education:
The declaration :
(a) defines concept of OA for the first time.

> "*By OA to this literature,we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright int his domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited*" (p. 2).

(b) affirms importance of OA to scientific knowledge because this access (i) promotes the global dissemination of knowledge, (ii) accelerates research, (iii) encourages collaboration between institutions and removes financial barriers, (iv) allows students, teachers, and researchers to access high-quality resources without restriction,

(c) identifies the two main ways to achieve OA: (i) self-archiving (BOAI-1) that consists in depositing the refereed journal articles in open electronic archives (p. 3), (ii) OA Journals (BOAI-2) consist of promoting the creation of new scientific journals dedicated to OA and supporting existing ones that choose to adopt this approach. These journals should avoid imposing copyright restrictions on the access and use of articles, instead ensuring permanent OA. To fund themselves, they should avoid subscription fees and instead seek funding from sources such as foundations, governments, universities, donors, and proceeds from sales of extras beyond the core texts (p. 3).

- G7 Open Science Working Group (OSWG)
  - 2023 - G7 Science Ministers' Statement on Open Science [Com]

Background:
The statement was issued at the G7 Science and Technology Ministers meeting held in Sendai, Japan, May 12-14, 2023.

Corporate Authors:
The G7 Science and Technology Ministers include representatives of the following countries: Canada, France, Germany, Italy, Japan, the United Kingdom, the United States, and the European Union.

Purpose:
The declaration represents a commitment by the G7 nations to promote OS, or OA and sharing of data, publications and other products of scientific research.

Status, Legal Significance, and Effectiveness:

→ *Status*: The statement is a Political declaration which is a joint statement of commitment to OS and OA to scientific knowledge.

→ *Legal Significance*: It has no binding legal value in itself.

→ *Effectiveness*: The declaration has an impact on the scientific policies and practices of G7 member countries.

Highlights for education:
The G7's commitment consists of:

(a) expanding OS with equitable dissemination of scientific knowledge and publicly funded publications in according to the FAIR Principles to share scientific data and publications (p. 2),

(b) promoting a collaboration aiming to ensure a global access to knowledge, stimulate innovation, democratise access and address global challenges (p. 2),

(c) supporting for the immediate and public release of government-funded scientific publications and data.

- Organisation for Economic Co-operation and Development (OECD)
  - 2021 - Organisation for Economic Co-operation and Development (OECD) Recommendation of the Council concerning Access to Research Data from Public Funding [OEC21]

    Background:
    Th ise recommendation is a revised version of the first version of the Recommendation adopted by the OECD Council on April 26, 2006 [OEC06]. This new version was taken by the OECD Council on 20 January 2021, and it aims to update the original principles considering advancements in technology and research

practices.

Corporate Author:
OECD

Purpose:
This Recommendation aims to provide guidance on enhancing access to research data and other research-relevant digital objects from public funding.

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used in this case is the OECD Recommendation.

→ *Legal Significance*: The OECD Recommendation is not legally binding. However, Committee on Scientific and Technological Policy (CSTP) has to monitor the implementation of this Recommendation and report thereon to the Council no later than five years after its revision and at least every ten years subsequently (Recommendation XIII, b).

→ *Effectiveness*: The OECD Recommendation 2021 has a significant impact and influenced national and international initiatives.

Highlights for education:
The recommendation:

(a) includes not only publicly funded research data but also other digital objects such as metadata, algorithms, workflows and software. The main objective is to support governments, research organizations and researchers in improving the international sharing of such digital objects, thereby contributing to the advancement of science, technology and innovation,

(b) the access to research data has the goal to improve scientific reproducibility, promoting interdisciplinary cooperation, stimulating innovation and increasing resource efficiency. The 2021 revision reaffirms the principles of the 2006 version [OEC06], namely openness, flexibility, transparency, legal conformity, protection of intellectual property, formal responsibility, professionalism, interoperability, quality, security, efficiency, accountability, and sustainability. Furthermore, the new version provides new policy guidance in seven key areas, including data governance, technical standards, accountability and management, incentives, sustainable infrastructure, human capital development and international cooperation.

Related document:

→ Adopted on 22/05/2019 - Amended on 08/11/2023 - OECD Recommendation of the Council on Artificial Intelligence (AI)

→ 2019 - OECD Recommendation of the Council on Responsible Innovation in

Neurotechnology

→ 2016 - OECD Recommendation of the Council on Health Data Governance

→ Adopted on 17/09/2015 - Abrogated on 26/09/2022 - OECD Recommendation of the Council on Digital Security Risk Management for Economic and Social Prosperity

→ Adopted on 23/09/1980 - Amended on 11/07/2013 - OECD Recommendation of the Council concerning Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data

→ 2008 - OECD Recommendation of the Council for Enhanced Access and More Effective Use of Public Sector Information

→ Adopted on 14/12/2006 - Amended on 20/01/202 - OECD Recommendation of the Council concerning access to research data from public funding [OEC06]

- United Nations Educational, Scientific and Cultural Organization (UNESCO)
  - 2021 - United Nations Educational, Scientific and Cultural Organization (UNESCO) Recommendation on Open Science [UNE21a]

Background:
The UNESCO Recommendation on Open Science was drafted at the 41st UNESCO General Conference, which was held in Paris from 9 to 24 November 2021. During this conference, 193 member states adopted the first international framework on OS, providing a universal definition and legal framework.

Corporate Author:
UNESCO

Purpose:
The aim of the recommendation is to provide an international framework for OS policy and practice that recognizes disciplinary and regional differences in OS perspectives (point 1, p. 6). Also, it outlines a common definition, shared values, principles and standards for OS at the international level and proposes a set of actions conducive to a fair and equitable operationalization of OS for all at the individual, institutional, national, regional and international levels (Recommendation I, 2).

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is the UNESCO Recommendation.

→ *Legal Significance*: The recommendation defines some recommendations for the Member States to apply the provisions of this recommendations as follows:

> *"(a) Recommends that Member States apply the provisions of this Recommendation by taking appropriate steps, including whatever legislative*

> *or other measures may be required, in conformity with the constitutional practice and governing structures of each State, to give effect within their jurisdictions to the principles of this Recommendation; (b) recommends that Member States bring this Recommendation to the attention of the authorities and bodies responsible for science, technology and innovation, and consult relevant actors concerned with OS; (c) recommends that Member States collaborate in bilateral, regional, multilateral and global initiatives for the advancement of OS; (d) recommends that Member States report to it, at such dates and in such manner as shall be determined, on the action taken in pursuance of this Recommendation*" (Preamble, p. 5).

However, the recommendation is not binding under international law [UNE23b].

→ *Effectiveness*: Since the recommendation comes from the organization's governing body, which is made up of all representatives of the Member States, it has great authority and is intended to influence the development of national laws and practices. This is possible on the basis of the obligation of the Member States:

> "*Member States should, according to their specific conditions, governing structures and constitutional provisions, monitor policies and mechanisms related to OS using a combination of quantitative and qualitative approaches, as appropriate*" (paragraph V, point 23, p. 34).

Based on the first endeavor to assess the state of OS at the global level in line with the 2021 UNESCO Recommendation on OS, there is an increase in the adoption of OS practices across regions and disciplines. However, there are still gaps in the growth of OS, particularly along socio-economic, technological, and digital divides between countries. The lack of equity in access to funding, skills, and tools is preventing OS from reaching its full potential [UNE23a].

Highlights for education:
The recommendation defines four values and six principles of OS.

The **four values** include: (a) quality and integrity: OS promotes high-quality research through transparent methods and broad availability for rigorous review, respecting academic freedom and human rights; (b) collective benefit: OS is a global public good, open to all, with the aim of universally benefiting humanity by ensuring OA to scientific knowledge and promoting inclusiveness, sustainability and equity; (c) equity and justice: OS aims to reduce disparities between researchers of different backgrounds, supporting the fair and mutual sharing of scientific resources and ensuring equal access to knowledge for all, and (d) diversity and inclusiveness: OS embraces diversity in knowledge, practices, and research topics, supporting the needs of the scientific community and beyond, including indigenous peoples, local communities, and social actors from different backgrounds (Recommendation III, 13).

The **six guiding principles** provide a framework for enabling conditions and prac-

tices within which the above values are upheld, and the ideals of OS are made a reality. The principles are the following: (a) transparency, scrutiny, critique and reproducibility should be promoted at all stages of the scientific enterprise. This will strengthen the robustness and severity of scientific findings, improve the social impact of science, and increase society's capacity to resolve complex problems. (b) equality of opportunities to access by all actors in OS, regardless of factors such as location, nationality, race, age, gender, income, socio-economic circumstances, career stage, discipline, language, religion, disability, ethnicity or immigration status; (c) responsibility, respect and accountability of all actors. This includes being transparent about conflicts of interest, being vigilant about the potential social and ecological consequences of research activities, maintaining intellectual integrity, and adhering to ethical principles; (d) collaboration, participation and inclusion that is important at all levels, across boundaries of geography, language, generations, and resources; (e) flexibility, and (f) sustainability for OS to be efficient and impact, it should be based on long-term practices, services, infrastructure, and funding models that ensure the equitable participation of science producers from less privileged institutions and countries. OS infrastructures should be organized and financed with a long-term, non-profit vision that improves OS practices and ensures permanent and unrestricted access to all, to the maximum extent possible (Recommendation III, 14).

Related document:

→ 2019 - UNESCO Recommendation on Open Educational Resources [UNE22]

→ 2017 - UNESCO Recommendation on Science and Scientific Researchers (concerning the significant value of science as a common good) [Can18]

→ 2015 - Resolution adopted by the General Assembly on 25 September 2015 – Transforming our world: the 2030 Agenda for Sustainable Development [Uni15]

→ 2009 - UNESCO Charter on the Preservation of Digital Heritage

→ 2007 - United Nations (UN) Declaration on the Rights of Indigenous Peoples

→ 2003 - Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities [ber03]

→ 2003 - Bethesda Statement on Open Access Publishing [SBC+03]

→ 2002 - Budapest Open Access Initiative [JLI12]

→ 1999 - UNESCO/ICSU Declaration on Science and the Use of Scientific Knowledge and the Science Agenda – Framework for Action [UNE99]

→ 1971 - UNESCO Universal Copyright Convention

→ 1948 - UN Universal Declaration of Human Rights (Artt. 19 and 27)

▲ 2017 - UNESCO Recommendation on Science and Scientific Researchers [Can18]

Background:
The recommendation was adopted by the General Conference of the UNESCO, meeting in Paris from 30 October to 14 November 2017, at its thirty-ninth session.

Corporate Author
UNESCO

Purpose:
The recommendation aims to inform worldwide science policy and ethics. It is addressed to research institutions, individuals and scientific organizations that practice, regulate and promote science. The Recommendation calls on Member States and their governments to create conditions in which science can flourish and advance ethically, fairly and usefully, and be relevant to society [Can18].

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is the UNESCO Recommendation.

→ *Legal Significance*: The recommendation is not binding under international law [UNE23b].

→ *Effectiveness*: As the recommendations comes from the governing body of the Organization, consisting of representatives from all Member States, it holds significant authority and are intended to influence the development of national laws and practices. In the recommendation, Member States are advised to take legislative measures for the application of the principles and standards of the recommendation within their territories. The recommendation should be disseminated to authorities, institutions and companies involved in research and experimental development. Member States must notify the competent body of the actions taken to implement the recommendation within the established timescales and modalities (Preamble, p. 4).

Highlights for education:
The recommendation recognizes the significant value of science as a common good demanding to the Member States to encourage and facilitate access to knowledge, including OA (Preamble, p. 1). Furthermore, it requires to freely share knowledge and research results through OS systems [Can18].

Related document:

→ 1971 - UN Universal Declaration of Human Rights (Artt. 27.1)

▲ 1999 - Declaration on Science and the Use of Scientific Knowledge and the Science Agenda – Framework for Action [UNE99]

Background:
The World Conference on Science was organised by UNESCO in cooperation with

the ICSU, from 26 June to 1 July 1999 in Budapest, Hungary.

Corporate Authors:
UNESCO and ICSU

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is the UNESCO Declaration.

→ *Legal Significance*: The declaration is not binding under international law [UNE23b].

→ *Effectiveness*: The declaration aims to emphasize the importance of political commitment to scientific research and to solving issues that arise at the intersection of science and society.

Highlights for education:
The declaration notes the importance of access to information via the Internet and the expansion of the use of Information and Communications Technologies (ICT) across the network :

> *"Cooperation between developed and developing countries should be carried out in conformity with the principles of full and OA to information, equity and mutual benefit. "* (Declaration 3, 35).

- International Initiatives

  - 2018 - Plan S

Background:
On 4 September 2018, a group of national research funding organizations, with the support of the European Commission and the European Research Council (ERC), announced the launch of cOAlition S, an initiative to make full and immediate OA to research publications a reality. It is built around Plan S, which consists of one target and 10 principles.

Purpose:
Plan S mandates that scientists and researchers, who benefit from state-funded research organizations and institutions, must publish their work in open repositories or OA journals by 2021.

Highlight for education:
The Plan S defines 10 principles including: (i) authors or institutions retain copyright, publishing under an open license such as Creative Commons Attribution license (CC BY), (ii) founders establish criteria for high-quality OA services for journals, platforms and repositories, (iii) founders incentives the creation of OA assets when needed, (iv) publication fees in OA are covered by founders or research

institutions, (v) diversified business models are supported, with transparent tariffs proportionate to the services, (vi) alignment of strategies between governments, universities and institutions is encouraged to ensure transparency, (vii) the principles apply to all scientific publications, with consideration for longer time frames for monographs, (viii) the "hybrid" model of publishing is not supported, but only as a transition towards OA, (ix) monitoring and sanctions for compliance with the principles, and (x) the intrinsic merit of the work is evaluated, not the publication channel or impact factor.

Plan S provides three paths for publication, all three perfectly compliant with its principles, including (i) publication in non-hybrid OA journals (gold OA), (ii) publication in subscription journals, not OA, but with the immediate deposit of the Accepted Author Manuscript (AAM) on an open archive (green OA), and (iii) publication in hybrid journals but within the context of a transformative contract.

Related document:

→ 2003 - Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities [ber03]

▲ 2018 - United States (US) Public Library of Science

Background:
The US Public Library of Science "establishes its own non-profit publishing initiative to distribute scientific research online and free-of-charge, in August 2001" [Bro01].

Purpose:
The Public Library of Science, "led by Patrick O. Brown, Stanford University, Michael Eisen, Lawrence Berkeley National Laboratory, and Michael Ashburner, University of Cambridge, UK, as well as others, coalesced last autumn to encourage - some say demand - that scientific publishers turn over their contents to the public 6 months after publication and asked scientists to boycott those journals that do not agree to these demands. They circulated a letter on its website asking scientists to sign on by September 2001, and now have more than 28 000 signatures of scientist from 172 countries" ([Bro01]).

▲ 2013 - Research Data Alliance

Background:
The alliance was launched as a community-driven initiative by the European Union (EU), the United States Government's National Science Foundation and National Institute of Standards and Technology, and the Australian Government's Department of Innovation.

Purpose:
The goal is to contribute to the development of ORD standards and best practices at a global level.

▲ 2008 - Biomed Central

Background:
Biomed Central is the first OA publisher founded by Vitek Tracz and sold to Springer in 2008.

Purpose:
Biomed Central aims to advance progress in the life, health and medical sciences by publishing high-quality, impactful research across a broad range of disciplines.

▲ 2001 - Creative Commons (CC)

Background:
CC was founded in 2001 by Lawrence Lessig, Hal Abelson, and Eric Eldred.

Purpose:
CC is “an international nonprofit organization dedicated to helping build and sustain a thriving commons of shared knowledge and culture”. CC “provides CC licenses and public domain tools that give every person and organization in the world a free, simple, and standardized way to grant copyright permissions for creative and academic works; ensure proper attribution; and enable others to copy, distribute, and make use of those works” (https://creativecommons.org/about/).

▲ 1998 - Scholarly Publishing and Academic Resources Coalition (SPARC)

Background:
SPARC is an international alliance of academic and research libraries that supports OA publishing.

Purpose:
SPARC has been advocating for a strong, zero embargo, full-reuse rights OA policy for US federally funded research, including articles, data, and code.
SPARC strongly “endorses updating current US policy and eliminating the unnecessary 12-month waiting period for the public to gain access to the outputs of scientific research, including data, articles, and the supporting computer code”.
SPARC has submitted “comments to the Office of Science and Technology Policy (OSTP) and encouraged the US Senate Committee on Health, Education, Labor, and Pensions to make OA an integral part of the country’s preparedness planning for future pandemics” (https://sparcopen.org/our-work/us-national-open-access-policy/).

- 1991 - ArXiv.org Repository

  Background:
  In 1991, American physicist Paul Ginsparg founded an online repository of electronic preprints of scientific papers at Los Alamos. The repository was later renamed ArXiv.org in 1999. Now, the Cornell Tech maintains this repository.

  Purpose:
  The goal of the ArXiv.org repository is to provide a curated platform for sharing research that is open to anyone. ArXiv promotes openness, collaboration and academic depth as the foundations on which its success is based. Additionally, ArXiv focuses on the preservation and curation of scholarly materials

- 1985 - Free Software Foundation (FSF)

  Background:
  The FSF is a non-profit organization, founded by Richard Stallman on October 4, 1985.

  Purpose:
  The FSF's goal is the removal of restrictions on the copying, redistribution, interpretation, and modification of computer programs.

  Highlights for education:
  Stallman is the author of the GNU's Not Unix General Public License, a widely used license that protects much open source software. Over the years, Stallman has worked to clarify the precise meaning of the term "free software" emphasizing its importance in enabling the revision, compatibility, and free distribution of software. Stallman explains that "free" in the context of software refers to the freedom of users to run, copy, distribute, study, modify, and improve the software [Wil05].

2.2.2 Open Educational Resources

- OECD
  - 2007 - Rapport: Giving Knowledge for Free: The Emergence of Open Educational Resources [OEC07]

    Background:
    The report focuses on the importance of education for economic, social and environmental progress. The report finds that governments around the world are trying to improve their education systems to reach more people, but also to improve the quality and diversity of educational opportunities.

Corporate Author:
OECD

Purpose:
The purpose of this paper is to explore the concept of OER.

Highlights for education:
The rapport underlining that:

(a) the OER should be free of competition and that their value should increase as they are used (open source of goods),

(b) “open” means providing non-discriminatory access to resources and allowing contributions and sharing by anyone,

(c) OER is still evolving, with practices and technologies changing rapidly, which makes it difficult to provide a definitive definition,

(d) OER underscore the importance of returning to the question of how OER should be defined in the future.

Related document:

→ 2005 - OECD, E-learning in Tertiary Education – Where do we Stand?

→ 2001 - OECD, E-Learning: The Partnership Challenge

- UNESCO
  - 2019 - Guidelines on the development of Open Educational Resources policies [MMOJ19]

Background:
UNESCO and the Commonwealth of Learning (COL) publish the guidelines jointly and share the conviction that OER can make a significant contribution to achieving Sustainable Development Goal (SDG) 4 for Education 2030.

Corporate Author:
UNESCO, COL

Purpose:
The guidelines are meant to be referenced as a hands-on plan to develop subject matter knowledge for policy makers on OER and a framework to provoke critical thinking on how OER should be leveraged to address challenges in achieving the targets of SDG 4 in different local contexts.

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is Guidelines [UNE23b] that guides the Member States toward the desired outcomes in education, culture and science.

By using the Director-General's words: "*this is an essential foundation for building a better future for all*" (p. 5).

→ *Legal Significance*: The Guidelines are not binding under international law [UNE23b], in fact "they guide, but do not determine, what involved actors should do in a specific set of circumstances, providing a comprehensive framework for governments and institutions to set out vision and the scope of their policy" (p. 1).

→ *Effectiveness*: As a result of the guidelines, an increasing number of national and institutional policies support the adoption of OER to improve access to and processing of learning materials (as stated in [UNE14b], p. 44).

Highlights for education

The guidelines (a) provide detailed guidelines on how to develop systematic and effective policies on OER. Such policies are important to coordinate, strengthen and drive initiatives in a country; they involve government and institution actors on various levels working together to leverage OER toward achieving common goals under a national educational framework.

The guidelines (b) lay out steps to review, analyse, develop, implement and monitor a context-relevant OER policy. In particular, the guidelines describe the whole process for designing and implementing OER policy in seven chapters, such as: (i) understanding the potential of OER, (ii) planning for governance and implementation, (iii) determining the OER vision, (iv) framing the OER policy, (v) executing a gap analysis, (vi) designing the master plan, and (vii) launching the OER policy (monitoring and improvement) (p. 4).

Related document:

→ 2017 - UNESCO. 2nd World OER Congress: Ljubljana OER Action Plan

→ 2016 - Kuala Lumpur Declaration on the Establishment of the Association of Southeast Asian of Nations (ASEAN) Charter (it presents a set of recommendations, including mainstreaming the use of OER by developing strategies and policies at governmental and institutional levels to enhance quality while potentially reducing the cost of education (p. 10))

→ 2015 - Leveraging information and communication technologies to achieve the Post-2015 Education goal. Report of the International Conference on ICT and Post-2015 Education, Qingdao (it dedicates a section to 'open solutions' and sees OER as improving the quality of and access to materials, as well as catalyzing the innovative use of content for learning and fostering knowledge creation (p. 10))

→ 2015 - UNESCO. SDG 4 - Education 2030, Incheon Declaration and Framework for Action. For the Implementation of SDG 4, Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All, ED-2016/WS/28

[MdPdlNUdlNUpeDU16]

→ 2012 - Mauritius Communiqué, 18th Conference of Commonwealth Education Ministers (18CCEM) (delegations from thirty-nine Commonwealth countries highlighted the need to set up a common platform for OER for harmonization, ease of access, and the development and use of OER to provide quality teaching and learning for all (p. 10))

→ 2012 - Paris Open Educational Resources Declaration, World Open Educational Resources Congress UNESCO [Wor12]

→ 2007 - Group on Earth Observations, Cape Town Open Education Declaration (aiming at accelerating efforts to promote open resources, technology and teaching practices in education)

→ 2002 - UNESCO. Forum on the Impact of Open Courseware for Higher Education in Developing Countries. Final Report (at this meeting, the term OER was coined)

→ 1948 - UN Universal Declaration of Human Rights (Artt. 27.1)

▲ 2019 - UNESCO Recommendation on Open Educational Resources [UNE22]

Background:
The recommendation was adopted in occasion of the General Conference of the UNESCO, meeting in Paris from 12 to 27 November 2019, at its 40th session.

Corporate Author:
UNESCO General Conference

Purpose:
The recommendation is the first international standard-setting instrument on OER and it provides guidance to governments and other stakeholders on how to develop and implement OER policies and strategies.

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is a UNESCO Recommendation [UNE23b].

→ *Legal Significance*: The recommendation is not binding under international law [UNE23b]. Indeed, UNESCO defines some recommendation for Member States, as applying the provisions of this Recommendation by taking appropriate steps, including whatever legislative or other measures may be required, in conformity with the constitutional practice and governmental structures of each State, to give effect within their jurisdictions to the principles of the Recommendation (Preamble, p. 4).
Additionally, UNESCO recommends that Member States report to it, at such times and in such manner as shall be determined, on the measures taken in pursuance of this recommendation (Preamble, p. 4) [UNE23b].

→ *Effectiveness* - As the recommendation comes from UNESCO, which consists of representatives from all Member States of the organization, it holds significant authority and are intended to influence the development of national laws and practices. As a matter, Consolidated Report on the implementation by Member States of the 2009 Recommendation on Open Educational Resources report states that "78 Member States submitted their reports within the first consultation on the implementation of the Recommendation on Open Educational Resources" where they show different ways to implement the five area of actions (II, 30(1)).

Highlights for education:
The recommendation states that:

(a) OER can support quality education that is equitable, inclusive, open, and participatory. Also, OER can eenhance academic freedom and professional autonomy of teachers by widening the scope of materials available for teaching and learning (Preamble, p. 4).

(b) the objectives for five area of actions are the following: (i) building capacity of stakeholders to create, access, re-use, adapt and redistribute OER; (ii) developing supportive policy; (iii) encouraging inclusive and equitable quality OER; (iv) nurturing the creation of sustainability models for OER, and (v) facilitating international cooperation (Recommendation III, 10).

Related document:

→ 2017 - UNESCO. 2nd World OER Congress: Ljubljana OER Action Plan (to mainstream OER to help all Member States to create inclusive knowledge societies and achieve the 2030 Agenda for Sustainable Development, namely SDG 4 (Quality education), SDG 5 (Gender equality), SDG 9 (Industry, innovation and infrastructure), SDG 10 (Reduced inequalities within and across countries), SDG 16 (Peace, justice and strong institutions) and SDG 17 (Partnerships for the goals)).

→ 2015 - UNESCO. SDG 4 - Education 2030, Incheon Declaration and Framework for Action. For the Implementation of SDG 4, Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All, ED-2016/WS/28 [MdPdlNUdlNUpeDU16] (it lists a set of strategic approaches for the implementation of SDG 4).

→ 2012 - Paris Open Educational Resources Declaration, World Open Educational Resources Congress UNESCO [Wor12]

→ 2007 - Group on Earth Observations, Cape Town Open Education Declaration

→ 2003 - World Summit on the Information Society. Declaration of Principles: Building the Information Society: a global challenge in the new Millennium, Geneva

→ 2000 - UN General Assembly, Millennium Declaration, Resolution 55/2

→ 2000 - The World Education Forum, Dakar Framework for Action, Education for

All: Meeting our Collective Commitments, Dakar

→ 1966 - UN General Assembly, International Covenant on Economic, Social and Cultural Rights, Resolution 2200A, (XXI) (Art. 13(1))

▲ 2015 - UNESCO. SDG 4 - Education 2030, Incheon Declaration and Framework for Action. For the Implementation of SDG 4, Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All, ED-2016/WS/28 [MdPdlNUdlNUpeDU16]

Background:
In 2015, UNESCO together with United Nations International Children's Emergency Fund (UNICEF), the World Bank (WB), United Nations Fund for Population Activities (UNFPA), United Nations Development Program (UNDP), United Nations Entity for Gender Equality and the Empowerment of Women (UN Women) and United Nations High Commissioner for Refugees (UNHCR) organised the World Education Forum in Incheon, hosted by the Republic of Korea. This document made two references to OER in relation to increasing the quality and accessibility of teaching and learning through OER materials.

Purpose:
Incheon Declaration constitutes the commitment of the educational community to SDG 4 - Education 2030 and the 2030 Agenda for Sustainable Development [Uni15], recognizing the important role of education as a main driver of development.

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is a UNESCO Declaration.

→ *Legal Significance*: The declaration is not binding under international law [UNE23b].

→ *Effectiveness*: The declaration influences many international initiatives, such as for example the 2019 Guidelines on the development of Open Educational Resources policies [MMOJ19].

Highlights for education:
OER are mentioned as one of the means to achieve the goals of Education 2030, including ensuring inclusive and equitable quality education for all (II, 22).

▲ 2012 - UNESCO Education Strategy 2014-2021 [UNE14b]

Background:
The document presents UNESCO's education strategy for 2014-2021, building upon and fully aligned with the Organization's medium-term strategy in the field of education. During the 37th Session of UNESCO's General Conference in Paris in November 2013, the strategic directions of the organization were approved by its

Member States as outlined in the Medium-Term Strategy (document 37 C/4) and Program and Budget 2014-2017 (document 37 C/5).

Corporate Author:
UNESCO - Director-General, 2009-2017 (Bokova, I.G.)

Purpose:
The strategy aims to outline UNESCO's educational strategy for the period 2014-2021 and it focuses on the importance of quality education as a fundamental tool for achieving the global Sustainable Development Goals (SDGs).

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is the Strategy that guides Member States towards desired outcomes in education, culture, and science. By using the Director-General's words: "this strategy is an essential foundation for building a better future for all" (p. 5).

→ *Legal Significance*: The strategy is not binding under international law [UNE23b].

→ *Effectiveness*: As a result of the strategy, an increasing number of national and institutional policies support the adoption of OER to transform access to and processing of learning materials, as stated in [UNE14b], (p. 44).

Highlights for education:
The strategy aims to :

(a) support the effective use of ICT in education;

(b) prioritize the adoption of OER to transform access to and processing of learning materials. The open textbook initiative is an emerging trend that reduces textbook production and delivery costs and encourages deep learning. Additionally, the Strategy aims (c) to support all Member States in ensuring that learning materials developed with public funds are available under an open license.

(c) analyze effective OER policies and initiatives. The purpose is to inform policy-makers about the factors that underpin successful practices and to assist governments in integrating OER policies into sector-wide education development strategies (*Strategic objective*, point 7, p. 44).

Related document:

→ The strategic directions of the Organization as outlined in the Organization's Medium-Term Strategy (document 37 C/4) and Program and Budget 2014–2017 (document 37 C/5).

▲ 2012 - Paris Open Educational Resources Declaration, World Open Educational Resources Congress UNESCO [Wor12]

Background:
The declaration was written and adopted at the 2012 World Congress on OER in Paris.

Corporate Author:
UNESCO

Purpose:
Through the use of OER, the aim is to promote equitable and universal access to quality education.

Status, Legal Significance, and Effectiveness:

→ *Status*: The standard-setting instrument used is the UNESCO Recommendation [UNE23b].

→ *Legal Significance*: The recommendation is not binding under international law [UNE23b].

→ *Effectiveness*: The recommendation is the basis of subsequent initiatives by International Organization (IO), such as UNESCO and OECD, etc. which use it to develop their proposed acts.

Highlights for education:
The declaration :

(a) promote the use of OER to expand the access to education at all levels, both formal and non-formal,

(b) facilitate enabling environments for use ICT,

(c) reinforce the development of strategies and policies on OER,

(d) promote the understanding and use of open licensing frameworks,

(e) support capacity building for the sustainable development of quality learning materials,

(f) foster strategic alliances for OER creating opportunities for sharing materials,

(g) encourage the development and adaptation of OER in a variety of languages and cultural contexts;

(h) encourage research on OER,

(i) facilitate finding, retrieving and sharing of OER,

(l) encourage the open licensing of educational materials produced with public funds.

Related document:

→ 2011 - UNESCO and COL, Guidelines for Open Educational Resources in higher

education [UC11]

→ 2007 - Group on Earth Observations, Cape Town Open Education Declaration

→ 2006 - UN General Assembly, Convention on the Rights of People with Disabilities, by Resolution A/RES/61/106 (recognizes the rights of persons with disabilities to education (Art. 24))

→ 2005 - UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expression ("Equitable access to a rich and diversified range of cultural expressions from all over the world and access of cultures to the means of expressions and dissemination constitute important elements for enhancing cultural diversity and encouraging mutual understanding" (Art. 2(7))

→ 2003 - UNESCO Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace

→ 2000 - UN General Assembly, Millennium Declaration, Resolution 55/2

→ 2000 - The World Education Forum, Dakar Framework for Action, Education for All: Meeting our Collective Commitments, Dakar (including six regional frameworks for action) (defines global commitments to provide quality basic education for all children, youth and adults)

→ 1996 - World Intellectual Property Organisation (WIPO) Copyright Treaty, TRT/WCT/001

→ 1966 - UN General Assembly, International Covenant on Economic, Social and Cultural Rights, Resolution 2200A, (XXI) (Art. 13(1)))

→ 1948 - UN Universal Declaration of Human Rights (states that: "Everyone has the right to education" (Art. 26(1)));

→ Adopted in 1886 and amended in 1979 - The Berne Convention for the Protection of Literary and Artistic Works

→ n.d. - The declarations of the six International Conference on Adult Education (CONFINTEA) (the conferences emphasis in the fundamental role of adult learning and education)

2.2.3 Global Citizenship

- UN

  - 2015 - Resolution of the UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, (A/70/L.1) [Uni15]

    Background:
    The 2030 Agenda constitutes a program complex and ambitious which involves progressive changes, but also sometimes fundamental transformations. It defines 17 SDGs and formulates 169 specific targets that must be achieved in full. The 2030

Agenda serves as a reference framework for processes, policies, and strategies and all Member States declared accepted to achieve by 2030 the various objectives defined and to provide an appropriate contribution to their implementation at the national level and international.

Corporate Author:
UN

Purpose:
The 2030 Agenda aims to eradicate poverty, promote economic and social prosperity, and protect the global environment.

Status, Legal Significance, and Effectiveness:

→ *Status* - The standard-setting instrument used is UN General Assembly Resolution.

→ *Legal Significance* - 2030 Agenda is not constrained to be troublesome from the point of view of international law.

→ *Effectiveness* - 2030 Agenda establishes a framework of important reference for all the Member States that they are committed to implement it, as shown in the following provisions.

> "*This is an Agenda of unprecedented scope and significance. It is accepted by all countries and is applicable to all, taking into account different national realities, capacities and levels of development and respecting national policies and priorities. These are universal goals and targets which involve the entire world, developed and developing countries alike* " (Art. 5).

> "*The new Goals and targets will come into effect on 1 January 2016 and will guide the decisions we take over the next 15 years. All of us will work to implement the Agenda within our own countries and at the regional and global levels, taking into account different national realities, capacities and levels of development and respecting national policies and priorities.*" (Art. 21).

Highlights for education:
The promotion of global citizenship is a fundamental educational objective that aims to develop globally aware and responsible individuals. Through Education for Sustainable Development (ESD), the teaching of human rights, the promotion of gender equality, and the dissemination of a culture of peace and non-violence, global citizenship aims to raise individuals' awareness of global challenges such as climate change, poverty, conflict, and social inequalities.

> "*By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through ESD and sustainable lifestyles, human rights, gender equality, promotion of*

a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development" (Target 4.7)

■ UNESCO

▲ 2014 - Global Citizenship Education, Topics and Learning Objectives [UNE15]

Background:
The publication is "the first pedagogical guidance from UNESCO. Before it was finalised, the guidance was field-tested by education stakeholders in selected countries in all regions to ensure its relevance in different geographical and socio-cultural contexts" (p. 7).

Corporate Author:
UNESCO

Purpose:
The publication "has been developed in response to the needs of Member States for overall guidance on integrating Global Citizenship Education (GCE) in their education systems. It presents suggestions for translating GCE concepts into practical and age-specific topics and learning objectives in a way that allows adaptation to local contexts. It is intended as a resource for educators, curriculum developers, trainers, as well as policy makers, but it will also be useful for other educational stakeholders working in non-formal and informal settings" (p. 7).

Status, Legal Significance, and Effectiveness:

→ *Status*: The publication is the first pedagogical guidance.

→ *Legal Significance*: The publication is not legally bound.

→ *Effectiveness*: The publication "offers guidance to help Member States ensure that learners of all ages and backgrounds can develop into informed, critically literate, socially-connected, ethical and engaged global citizens" (p. 7).

Highlights for education :
The publication promotes GCE based on three domains of learning: cognitive, social-emotional, and behavioral, that correspond to the four pillars of learning, such as: learning to know, learning to do, learning to be, and learning to live together. The cognitive domain refers to the knowledge and thinking skills needed to better understand the world and its complexities. The socio-emotional domain refers to the values, attitudes, and social skills that allow learners to develop affectively, psycho-socially, and physically so that they can live with others in a respectful and peaceful manner. Also, behavioral domain refers to behavior,

performance, practice and commitment. The three learning domains mentioned above are the basis for the key learning outcomes, key learner attributes, topics and learning objectives that UNESCO proposed in this guide. These three learning types are interrelated and integrated into the learning process and should not be considered as separate learning processes (p. 22).

Learning outcomes "describe the knowledge, skills, values and attitudes that learners can acquire and demonstrate as a result of GCE" (p. 22)

The attributes correspond to the key learning outcomes mentioned above and refer to the characteristics and qualities that GCE seeks to develop in learners. They are: informed and critically literate; socially connected and respectful of diversity; ethically responsible and engaged (p. 23).

Concerning topics, nine topic areas, three for each learner attribute, are presented in this guide based on the learner attributes identified above and the corresponding learning domains and key learner outcomes (p. 25).

Related document:

→ 2014 - UNESCO, Global Citizenship Education: preparing learners for the challenges of the 21st century [UNE14a]

→ 2014 - UNESCO, Teaching Respect for All, implementation Guide

→ 2013 - UNESCO Office Dakar and Regional Bureau for Education in Africa and Economic Community of West African States (ECOWAS), Education for a Culture of Peace, Human Rights, Citizenship, Democracy and Regional Integration, ECOWAS Reference Manual for use by trainer of trainers

→ 2013 - UNESCO, Intercultural Competencies. Conceptual and operational framework

→ 2012 - UNESCO, Exploring Sustainable Development: A Multiple-Perspective Approach

→ 2011 - UNICEF, Educating for Global Citizenship: A Practical Guide for Schools in Atlantic Canada. Canada

→ 2009 - Council of Europe. How All Teachers Can Support Citizenship and Human Rights Education: a Framework for the Development of Competences

→ 2005 - UNESCO, Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability

▲ 2014 - Global Citizenship Education: preparing learners for the challenges of the 21st century [UNE14a]

Background:
The publication is the result of the international community's need for education in order to address the existing and emerging global challenges that threaten our

planet, while at the same time making wise use of the opportunities it offers (p. 5).

Corporate Author:
UNESCO

Purpose:
The publication aims to "improve understanding of GCE as an educational approach and its implications for educational content, pedagogies, and approaches; identify innovative approaches and good practice in GCE globally; and share lessons learned and pathways to scaling up GCE" (p. 12).

Status, Legal Significance, and Effectiveness:

→ *Status*: This publication is "a joint endeavor that draws on the rich experience and expertise of multiple partners from across the globe" (p. 6).

→ *Legal Significance*: The publication is not legally bound.

→ *Effectiveness*: The publication is used as basis for International end European framework on Global citizenship.

Highlights for education:
The publication points out on GCE that is presented as "a framework paradigm that encapsulates how education can develop the knowledge, skills, values and attitudes learners need for securing a world which is more just, peaceful, tolerant, inclusive, secure and sustainable" (p. 9).

Related document:

→ 2015 - UNESCO, Global Citizenship Education. An emerging perspective. Outcome document of the Technical Consultation on Global Citizenship Education

▲ 2013 - UNESCO, Global Citizenship Education. An emerging perspective. Outcome document of the Technical Consultation on Global Citizenship Education [Tec13]

Background:
The publication "draws on inputs to, and common perspectives emerging from, a Technical Consultation on GCE organized by UNESCO and the Republic of Korea (i.e., the Ministries of Foreign Affairs and of Education, and the Asia-Pacific Center of Education for International Understanding) in Seoul on 9-10 September 2013" (p. 1).

Corporate Author:
UNESCO

Purpose:

The publication “intends to present common perspectives emerging from the consultation on the following questions: (1) Why global citizenship and GCE now?, (2) What is GCE?, (3) What needs to be done at the global level to support and promote GCE” (p. 1).

Status, Legal Significance, and Effectiveness:

→ *Status*: The publication contains the outcome of the technical consultations.

→ *Legal Significance*: The publication is not legally bound.

→ *Effectiveness*: The publication offers an informative framework on the development of GCE and future directions in this area

Highlights for education:
Concerning GCE:

(a) the goal consists in empowering learners to engage and assume active roles both locally and globally to face and resolve global challenges and ultimately to become proactive contributors to a more just, peaceful, tolerant, inclusive, secure and sustainable world (Subsection, 2.2.1),

(b) it is transformative, giving learners the opportunity and competencies to realize their rights and obligations to promote a better world and future (Subsection, 2.2.2),

(c) it is built on a lifelong learning perspective and can be delivered in all modes and venues of delivery, including formal, non-formal and informal education (Subsection 2.2.3),

(d) its core competencies include: (1) knowledge and understanding of specific global issues and trends, and knowledge of and respect for key universal values (e.g., peace and human rights, diversity, justice, democracy, caring, non-discrimination, tolerance); (2) cognitive skills for critical, creative and innovative thinking, problem-solving and decision-making; (3) non-cognitive skills such as empathy, openness to experiences and other perspectives, interpersonal/communicative skills and aptitude for networking and interacting with people of different backgrounds and origins; and (4) behavioral capacities to launch and engage in proactive actions (subsection 2.2.6.),

(e) a political, social, cultural, or religious environment that is open to universal values (e.g., human rights and peace) is crucial to promote the goals of education in global citizenship. Effective implementation requires policy support and pedagogical guidance (subsection 2.2.7),

(f) there are tensions within the education of global citizenship that are not irreconcilable but deserve some attention. Varying in form, they all point to the question of how to promote universality (e.g. common and collective identity,

interest, participation, duty), while respecting particularity (e.g., individual rights, self-cultivation) (subsection 2.2.9).

2.2.4 Sustainability

- UN
  - 2015 - Resolution of the UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, (A/70/L.1) [Uni15]

    Highlights for education:
    The main purpose of the target goal n. 4.7 is to make education a key tool for addressing global challenges and promoting sustainable development. This involves integrating sustainability issues such as climate change, gender equality, human rights and cultural diversity into education programs at all levels, from basic to higher education.

  - 2003 - Resolution of the UN General Assembly, Decade of Education for Sustainable Development, (A /RES/57/254) [Uni03]

    Background:
    The Decade of ESD has a basic vision consisting in creating " a world where everyone has the opportunity to benefit from education and learn the values, behavior and lifestyles required for a sustainable future and for positive societal transformation" (p. 6).

    Purpose:
    The Decade of ESD aims "to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. This educational effort will encourage changes in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations" (p. 6).

    Corporate Author:
    UN

    Status, Legal Significance, and Effectiveness:

    → *Status* - The standard-setting instrument used is UN General Assembly Resolution.

    → *Legal Significance* - The resolution is not constrained to be troublesome from the point of view f international law.

    → *Effectiveness* - The UN invites Governments to consider the inclusion of measures to implement the Decade in their respective educational strategies and ac-

tion plans by 2005, taking into account the international implementation scheme to be prepared by the UNESCO (Art. 3).

Highlights for education:
The resolution (a) emphases that education is an indispensable element for achieving sustainable development.

The resolution (b) decides to proclaim the ten-year period beginning on 1 January 2005 the UN Decade of ESD (Art. 1)

The resolution (c) designates the UNESCO as the lead agency for the promotion of the Decade of ESD, and requests it to develop a draft international implementation scheme (Art. 2)

Related document:

→ 2020 - Education for Sustainable Development: partners in action; Global Action Program key partners' report (2015-2019) (the decade of ESD was followed by the five-year Global Action Program (GAP) (2015-2019) (it was launched with the UNESCO World Conference in Aichi-Nagoya, Japan and it aims to contribute to the 2030 Agenda and its 17 goals)

→ 2005 - UN Decade of Education for Sustainable Development (2005-2014). International Implementation Scheme [Unio5]

→ 2002 - Report of the World Summit on Sustainable Development, Johannesburg, South Africa, chap. I, resolution 2, annex

→ 2000 - World Education Forum, Final Report, Dakar, Senegal, 26–28 April 2000

→ 1992 - Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992, vol. I: Resolutions adopted by the Conference, resolution 1, annex II (recalls chapter 36 of Agenda 21, on promoting education, public awareness and training)

■ UNESCO

▲ 2020 - Education for sustainable development: a roadmap [UNE20]

Background:
UNESCO "has been the lead UN agency on ESD since the UN Decade of Education (2005-2014). ESD is widely recognised as an integral element of Agenda 2030, in particular SDG 4, and a key enabler of all the other SDGs" (p. 3).

Purpose:
The roadmap sets out the urgent challenges facing the planet and explores the next step UNESCO is taking in responding to them through education with detail on new emphases and actions. In order to build a follow-up to the GAP (2015-2019)

that contributes to Agenda 2030 and its 17 goals, the Education for Sustainable Development: Towards achieving the SDGs (ESD for 2030) framework was adopted with the aim of increasing the contribution of education to building a more just and sustainable world.

Corporate Author:
UNESCO

Status, Legal Significance, and Effectiveness:

→ *Status* - The standard-setting instrument used is Roadmap.

→ *Legal Significance* - The roadmap is not constrained.

→ *Effectiveness* - The roadmap serves as a strategic guide to outline the actions and goals necessary to integrate education into the promotion of sustainability.

Highlights for education:
The roadmap affirms that:

(a) ESD must be integrated into global, regional, national and local policies related to education and sustainable development.

(b) It is needed to promote a whole-institution approach to ensure that you learn what you live and live what you learn.

(c) It focuses on empowering educators with the knowledge, skills, values and attitudes needed to transition towards sustainability.

(d) It is important to recognize young people as key actors in addressing sustainability challenges and in the decision-making processes associated with them.

(e) It is important to emphasize the importance of actions in communities, as that is where meaningful transformative actions are most likely.

(f) National initiatives on ESD for 2030 will guide the integration of ESD into education and sustainable development.

(g) The new framework will aim to encourage strong leadership from Member States and diverse stakeholders from the education and sustainable development communities through the ESD for 2030 Network (ESD-Net) globally and regionally.

Related document:

→ 2020 - Education for Sustainable Development: partners in action; Global Action Program key partners' report (2015-2019) (the decade of ESD was followed by the five-year GAP (2015-2019) (it was launched with the UNESCO World Conference in Aichi-Nagoya, Japan and it aims to contribute to the 2030 Agenda and its 17 goals)

→ 2019 - Framework for the implementation of Education for Sustainable Development beyond 2019 [Uni19]

→ 2019 Education for Sustainable Development: towards achieving the SDGs (ESD for 2030) framework, Document 40 C/23, (it is as the follow-up to the GAP on ESD for 2030 framework and it was developed through broad consultations with various stakeholders from 2016 to 2018. ESD for 2030 will step up actions on five priority action areas, stressing further ESD's key role for the successful achievement of the 17 and SDGs the great individual and societal transformation required to address the urgent sustainability challenges)

→ 2005 - UN Decade of Education for Sustainable Development (2005-2014). International Implementation Scheme [Uni05]

▲ 2019 - Framework for the implementation of Education for Sustainable Development beyond 2019 [Uni19]

Background:
The framework was adopted by the 206th Executive Council of UNESCO and the 40th General Conference of UNESCO. It was recognised by the 74th UN General Assembly.

Purpose:
The framework contains the proposal for a new framework for ESD beyond 2019. It provides a concise overview of the proposed framework, entitled Education for Sustainable Development: Towards achieving the SDGs (ESD for 2030), and covers the period 2020-2030, including its rationale and its implementation modalities (Art. 2, Annex I).

Status, Legal Significance, and Effectiveness:

→ *Status*: - According to the Article IV, B(2) of the Constitution of the UNESCO, the General Conference takes decision on program submitted to it by the Executive Board. Through the 206 EX/Decision, 2019, the Executive Board adopted ESD for 2030 and invited the Director-General to submit it, along with a strategic one-pager of the draft framework, to General Conference at its the 40th session for approval and to the 74th session of the UN Assembly for acknowledgment (Art. 5).

→ *Legal Significance*: - The framework is not legally bound.

→ *Effectiveness*: - The framework endorses the ESD for 2030 framework and invites Member States to actively implement it and mobilize funding for ESD activities and programs at the national, regional and global levels, as appropriate (Art. 9(2)).

Highlights for education:
ESD for 2030 (a) has to be implemented as an integral part of UNESCO's contribution to achieving the SDGs, notably SDG 4-Education 2030 (Art. 6, Annex I).

ESD (b) has to pay more attention to each learner's individual transformation

processes and how they happen (Art. 7).

ESD (c) has to pay more attention to the deep structural causes of unsustainable development, in particular the relationship between economic growth and sustainable development (Art. 8).

Technological advances (d) may provide solutions to some of the 'old' sustainability problems, but some ESD efforts to change people's behavior may no longer be relevant (Art. 9).

While ESD (e) contributes to all SDGs, it is especially relevant for the advancement of SDG 4 – Education 2030 and Target 4.7 (Art. 10).

To meet the ambitious agenda set by the SDGs, (f) enhanced efforts in all five Priority Action Areas will be required. For Priority Action Area 1 on policy, ESD must be integrated into international and national policies related to education and sustainable development. For Priority Action Area 2 on education and training, the whole-institution approach should be strengthened with emphasis on the necessity for education institutions and communities to work together. For Priority Action Area 3 on educators, more opportunities are needed for educators to increase their capacities as facilitators of learning that leads to transformation (Art. 12).

Related document:

→ 2009 - Education for Sustainable Development: towards achieving the SDGs (ESD for 2030) framework, Document 40 C/23, (it is as the follow-up to the GAP on ESD for 2030 framework and it was developed through broad consultations with various stakeholders from 2016 to 2018. ESD for 2030 will step up actions on five priority action areas, stressing further ESD's key role for the successful achievement of the 17 and SDGs the great individual and societal transformation required to address the urgent sustainability challenges).

▲ 2015 - UNESCO. SDG 4 - Education 2030, Incheon Declaration and Framework for Action. For the Implementation of SDG 4, Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All, ED-2016/WS/28 [MdPdlNUdlNUpeDU16]

Highlights for education:
The document highlights the crucial link between education and sustainability, emphasising how education can equip individuals with the knowledge, skills, and values needed to create a more sustainable future, with the promotion of holistic learning, responsible citizenship, and lifelong learning opportunities.

The declaration establishes the link between education and sustainable development by stating that (a) education is fundamental for building peaceful, inclusive,

and just societies, and promoting sustainable lifestyles. Therefore, it is necessary to integrate the principles of sustainable development into all levels and aspects of education, training, and lifelong learning for sustainability; (b) education for sustainability should be interdisciplinary and transversal, covering all aspects of sustainable development, including the environment, economy, society, and culture, and (c) education should be based on a participatory and inclusive approach that involves all stakeholders, such as students, teachers, parents, communities, and governments. Finally, (d) education for sustainability should be action-oriented and encourage students to become active and responsible citizens committed to a sustainable future.

▲ 2012 - Paris Open Educational Resources Declaration, World Open Educational Resources Congress UNESCO [Wor12]

Highlights for education:
The declaration recommends that (a) Member States support capacity building for the sustainable development of quality learning materials by assisting institutions in training and motivating teachers and other personnel to produce and share high-quality, accessible educational resources. This should take into account local needs and the full diversity of learners. Additionally, (b) quality assurance and peer review of OER should be promoted. Finally, they should (c) encourage the development of mechanisms to assess and certify learning outcomes achieved through OER (point (e), p. 2).

2.3 Europe

2.3.1 Open Science

The analysis of European acts, documents and initiatives differs from that relating to international ones due to the variables used, which consist in the definition of the "legal instrument" used by the issuing body to promulgate the act or the document. The tool used is specified in the glossary. Within the definition of the glossary, we also provide indications on whether or not the instrument is binding. For the remaining variables, we continue to use "purpose", the "importance of the document for education", and "related document".

- EU Acts and Documents
  - 2023 - Regulation EU 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonized rules on fair access to and use of data and amending Regulation EU 2017/2394 and Directive EU 2020/1828 (Data Act) [Eur23a]

    Purpose:
    The regulation is a component of the 2020 EU Data Strategy [Eur20a], which seeks to establish EU as a pioneer in a society driven by data. The objective of this Regulation is to put forward a proposal for a regulation that would establish harmonized rules to ensure fair access to and use of data, thus contributing to the creation of a sustainable data economy in Europe. This would include promoting horizontal data sharing between sectors, creating common European data spaces, and setting rules for smart contracts and interoperability standards (point 1: "Context of the proposal").

    EU legal instrument:
    EU Regulation

    In the Proposal for a Regulation of the European Parliament and of the Council on harmonized rules on fair access to and use of data (Data Act), COM/2022/68 final [Eur22a], we read: "the choice of a regulation was made because it is the best mechanism to serve the broader policy goals of ensuring all businesses in the Union are put in a position to innovate and compete, consumers are better able to take control of their data, and Union institutions, agencies and bodies are better equipped to tackle major policy challenges, including public emergencies." (point 2 - "Legal basis, subsidiarity and proportionality").

    Highlights for education:
    The regulation (a) promotes the use of Internet of Things (IoT) data by empowering users of connected products and services (recital 14).

The regulation aims (b) to simplify cloud and other data processing services by imposing obligations on providers (recital 84).

The regulation (c) sets conditions for data holders regarding licensing terms, whether their obligation to provide access derives from the Data Act itself or any other Union legislation (Art. 33).

The regulation (d) includes provisions aimed at achieving interoperability for data spaces, including European Open Science Cloud (EOSC) (Art. 33-35 [CfRIE22].

Related document:

→ 2022 - Regulation EU 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), OJ L 152, 3.6.2022, [Eur22b], p. 1.

→ 2019 - Directive EU 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, OJ L 172, 26.6.2019, [Eur19], p. 56

→ 2018 - Regulation EU 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union, OJ L 303, 28.11.2018, p. 59

→ 2018 - Regulation EU 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC, OJ L 295, 21.11.2018, p. 39

→ 2016 - Regulation EU 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 4.5.2016, p. 1

→ 2004 - Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights, OJ L 157, 30.4.2004, p. 45

→ 2002 - Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications), OJ L 201, 31.7.2002, p. 37

→ 2001 - Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society, OJ L 167, 22.6.2001, p. 10

→ 1996 - Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, OJ L 77, 27.3.1996, p. 20

▲ 2023 - European Commission. EU Grants: Horizon Europe Program Guide [Eur23b]

Purpose:
The aim of this program guide is to assist users in comprehending the program and its calls, and in preparing their proposals. To achieve this, technical vocabulary, legal references, and jargon have been avoided. The guide also aims to provide answers to any practical questions that readers may have about specific parts of the proposal.

EU legal instrument:
European Commission Program Guide

Highlights for education:
The program (a) gives a large definition of OS practices including early and open sharing of research (e.g. through pre-registration, registered reports, pre-prints or crowd-sourcing); research output management; measures to ensure reproducibility of research outputs; provision of OA to research outputs (e.g. publications, models, workflows); participation in open peer-review; and involvement of all stakeholders in research.

Furthermore, the program covers (b) output management, including measures to ensure research reproducibility, OA to research outputs (including publications, data, software, models, algorithms, and workflows), participation in open peer-review, and involving all relevant knowledge actors, including citizens, civil society, and end-users in the co-creation of R&I agendas and contents, such as citizen science.

Also, the program (c) defines some obligations concerning some OS practices that are mandatory for all beneficiaries of the grant agreement. These obligations are described in Model Grant Agreement (Article 17).

Finally, the program describes how to address the best practices of the operating system in the research proposal through the implementation of early and open sharing, writing research data management for projects that generate or reuse data, and the use of federated repositories EOSC.

Related document:

→ 2021 - EU Regulation 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Program for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations EU No 1290/2013 and EU No 1291/2013 [Eur21]

▲ 2022 - Council Recommendation EU 2022/2415 of 2 December 2022 on the guiding principles for knowledge valorisation [Eur22c].

Purpose:
Th decision aims to maximize the socioeconomic impact of research and innovation by aligning policy directions.

EU legal instrument:
EU Council Recommendation

Highlights for education:
The Recommendation (a) promotes the use of OS because "openness as a principle supports value creation [...] and sensible use of research results to create socioeconomic benefits will also add to the overall value and importance of scientific research for society" (recital 17).

The Recommendation (b) states that it encourages increasing awareness and adoption of the intellectual asset management practices in OS and Open Innovation to facilitate innovation by effectively using research results, data, and other intellectual assets (Art. 4(d)).

Related document:

→ 2022 - European Commission, Directorate-General for Research and Innovation, Open Science and intellectual property rights: How can they better interact?: state-of-the-art and reflections: executive summary, Publications Office

→ 2021 - Regulation EU 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Program for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations EU No 1290/2013 and (EU) No 1291/2013, OJ L 170, 12.5.2021, p. 1

→ 2018 - Commission Recommendation EU 2018/790 of 25 April 2018 on access to and preservation of scientific information, OJ L 134, 31.5.2018, p. 12

→ 2015 - European Commission, Directorate-General for Research and Innovation, Open innovation, Open Science, open to the world: a vision for Europe, Publications Office, 2016, p. 13

▲ 2022 - Regulation EU 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation EU 2018/1724 (Data Governance Act) [Eur22b]

Purpose:
The regulation aims "to improve the conditions for data sharing in the internal market, by creating a harmonized framework for data exchanges and laying down certain basic requirements for data governance, paying specific attention to facilitating cooperation between Member States. This regulation should aim to further develop the borderless digital internal market and a human-centric, trustworthy

and secure data society and economy" (recital 3) .

EU legal instrument:
EU Regulation

Highlights for education:
The regulation aims (a) to extend the principles of the Open Data Directive to a wider range of public sector data.

The regulation (b) regulates data intermediation services by imposing requirements, such as registration.

The regulation (c) establishes a registration system. This is a scheme for organizations that engage in data altruism, which involves sharing data for public interest purposes, including academic research [CfRIE22].

Related document:

→ 2019 - Directive EU 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, OJ L 172, 26.6.2019, p. 56 [Eur19]

→ 2018 - Regulation EU 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union, OJ L 303, 28.11.2018, p. 59

→ 2016 - Regulation EU 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 4.5.2016, p. 1

→ 2001 - Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society, OJ L 167, 22.6.2001, p. 10

▲ 2021 - Council Decision EU 2021/764 establishing the specific program implementing Horizon Europe — the framework program for research and innovation [Cou21]

Purpose:
The decision establishes the specific program implementing Horizon Europe as set out in point (a) of Article 1(2) of Regulation EU 2021/695 [Eur21] (Art. 1(1)).

EU legal instrument:
EU Council Decision

Highlights for education:
According Article 2(2), the specific program aims :

(a) to strengthen excellent basic and frontier research; to reinforce and spread

excellence, including by fostering wider participation throughout the Union;

(b) to reinforce the link between research, innovation, and, where appropriate, education and other policies, including complementarities with national, regional and Union Research and Innovation (R&I) policies and activities,

(f) to increase collaboration links in European R&I and across sectors and disciplines, including Social sciences and humanities (SSH),

(g) to strengthen international cooperation,

(j) to foster OS and ensure visibility to the public and OA to scientific publications and research data, including appropriate exceptions,

(k) to encourage exploitation of R&I results and actively disseminate and exploit results, in particular for leveraging private investments and policy development,

(m) to improve the relationship and interaction between science and society, including the visibility of science in society and science communication, and to promote the involvement of citizens and end-users in co-design and co-creation processes.

Related document:

→ 2021 - EU Regulation 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Program for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations EU no. 1290/2013 and EU No 1291/2013 [Eur21]

→ 2018 - Commission Communication of 14 February 2018 entitled "A new, modern Multiannual Financial Framework for a European Union that deliver efficiently on its priorities post-2020" identifies EUR 13 billion spent in main digital activities under the Research and Innovation Framework Program Horizon 2020

→ 2016 - Council Decision EU 2016/1841 of 5 October 2016 on the conclusion, on behalf of the EU, of the 2015 - Paris Agreement adopted under the United Nations Framework Convention on Climate Change (UNFCCC) (the specific program acknowledges climate change as one of the biggest global and societal challenges and reflects the importance of tackling climate change (recital 5))

→ 2013 - Regulation EU No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Program for Research and Innovation (2014-2020) and repealing Decision No 1982/2006/EC, OJ L 347, 20.12.2013, p. 104

→ 2013 - Council Decision 2013/743/EU establishing the specific program implementing Horizon 2020 – the Framework Program for Research and Innovation (2014-2020) and repealing Decisions 2006/971/EC, 2006/972/EC, 2006/973/EC, 2006/974/EC and 2006/975/EC, OJ L 347, 20.12.2013, p. 965

▲ 2021 - EU Regulation 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Program for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations EU no. 1290/2013 and EU No 1291/2013 [Eur21]

Purpose:
The regulation establishes the Horizon Europe research and innovation framework program. Its objective is to strengthen the scientific and technological bases of the Union by enhancing the European Research Area in which researchers, scientific knowledge and technology circulate freely and by encouraging it to become more competitive, including in its industry, while promoting all research and innovation activities in support of the Union's strategic priorities and commitments, which ultimately aim to promote peace, the Union's values and the well-being of its peoples.

EU legal instrument:
EU Regulation

Highlights for education:
The program shall:
(a) encourage OS as an approach to the scientific process based on cooperative work and diffusion of knowledge, in particular according to the following elements: (i) OA to scientific publications resulting from research funded under the program and (b) OA to research data, including those underlying scientific publications, in accordance with the principle "as open as possible, as closed as necessary" (Art. 14(1)),

(b) promote the principle of reciprocity in OS in all association and cooperation agreements with third countries, including agreements signed by funding bodies entrusted with the indirect management of the Program (Art. 14(2)),

(c) ensure a responsible management of research data in line with the principles 'findability', 'accessibility', 'interoperability' and 'reusability' (the FAIR Principles) (Art. 14(3)),

(d) requires beneficiaries of EU funding in the field of research and innovation to adopt an OA-oriented approach, including (i) the obligation to exploit and disseminate, (ii) OA to scientific publications, (iii) OA to research data (Art. 39).

Related document:

→ 2015 - Resolution of the UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, A/70/L.1 [Uni15]

▲ 2019 - Directive EU 2019/1024 of the European Parliament and of the Council of

20 June 2019 on open data and the re-use of public sector information (recast) [Eur19]

Backgroung:
The directive has expanded its scope from traditional public sector information – i.e., documents produced and collected by public sector bodies – to also cover documents held by certain public undertakings and data resulting from publicly funded research (together: 'public data'). Also, the Directive promotes the concept of open data (recitals 16-18) [CfRIE22], (p. 14).

Purpose:
The directive aims to maximize the re-use of public data to further stimulate digital innovation in products and services, and thus to maximize social and economic benefits within the Union (recitals 3-4 and Art. 1(1)).

EU legal instrument:
EU Directive

Highlights for education:
The directive defines that (a) Member States must develop national OA policies that are compatible with the FAIR Principles (Art. 10(1)), and ensure that such research data are available for reuse (Art. 10(2)). In particular, FAIR Principles should be used explicitly in the context of research data, but not for other data from the public sector (Art. 10(1)).

The directive (b) explains that public data must be made available, together with their metadata, in formats that are open, machine-readable, accessible, easily findable, reusable and compliant with formal open standards (Art. 5(1)).

The directive (c) empathizes that "in Member States where licenses are used, Member States shall ensure that standard licenses for the re-use of public sector documents, which can be adapted to meet particular license applications, are available in digital format and can be processed electronically. Member States shall encourage the use of such standard licenses" (Art. 8(2)).

The directive (d) contains the requirement for Member States to make practical provisions that facilitate the search for documents, such as asset lists of key documents with related metadata (Art. 9) [CfRIE22], (p. 14).

Related document:

→ 2016 - Regulation EU 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 4.5.2016, p. 1

→ 2013 - Directive 2013/37/EU of the European Parliament and of the Council of 26

June 2013 amending Directive 2003/98/EC on the re-use of public sector information, OJ L 175, 27.6.2013, p. 1. The Directive is not longer in force by 16/07/2021 and it was repealed by Directive EU 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (recast) [Eur19]

→ 2003 - Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, OJ L 345, 31.12.2003, p. 90. The Directive is not longer in force by 16/07/2021 and it was repealed by Directive EU 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (recast) [Eur19]

→ 2001 - Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society, OJ L 167, 22.6.2001, p. 10

▲ 2018 - Commission Recommendation EU 2018/790 of 25 April 2018 on access to and preservation of scientific information [Eur18]. This Recommendation builds on and replaces Recommendation 2012/417/EU.

Purpose:
The main objective of this recommendation is to improve the accessibility and long-term preservation of scientific data, publications, and research outputs. It highlights the significance of promoting OS, ensuring that research data is easily identifiable, linked to other datasets and publications, and available for proper evaluation and use. (recital 3).

EU legal instrument:
EU Commission Recommendation

Highlights for education:
The Commission states that:

(a) Member States should set and implement clear policies (as detailed in national action plans) for the dissemination of and OA to scientific publications resulting from publicly funded research an Member States should ensure, in compliance with the EU *acquis* on copyright and related rights, that as a result of these policies or action plan (Art. 1).

(b) Member states should establish and implement clear policies (as detailed in national action plans) for the management of research data resulting from publicly funded research, including OA (Art. 3).

(c) Member States should set and implement clear policies (as detailed in national action plans) for further developing infrastructures underpinning the system for access to, preservation, sharing and re-use of scientific information and for pro-

moting their federation within the EOSC (Art. 6).

(d) Member States should ensure that, as a result of those policies or action plans the necessary training and education are provided about OA, data research management, data stewardship, data preservation, data curation and OS, as part of the higher education and training system, at all career stages, and they reach on-the-job best practice in the industry (Art. 8).

Related document:

→ 2018 - Commission Staff Working Document, Implementation Roadmap for the EOSC, SWD (2018) 83 final of 14 March 2018 (presents the results of the exploration with Member States and stakeholders of possible governance and financing mechanisms for the EOSC and further details the action lines for developing the EOSC as a federation of research data infrastructures).

→ 2018 - Communication from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions on the Digital Education Action Plan, COM (2018) 22 final (emphasize on the possibility to develop the appropriate skills to fully engage with OS)

→ 2016 - Communication from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions: "European Cloud Initiative - Building a competitive data and knowledge economy in Europe", COM (2016) 178 final of 19 April 2016

→ 2015 - Communication from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions: "A Digital Single Market Strategy for Europe", COM (2015) 192 final of 6 May 2015 (it highlights the importance of data dissemination as a catalyst for economic growth, innovation and digitization across all economic sectors, particularly for small and medium-sized enterprises and for society) [Com15]

→ 2012 - Commission Recommendation 2012/417/EU of 17 July 2012 on access to and preservation of scientific information, OJ L 194, 21.7.2012, p. 39

→ 2012 - European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions: "Towards better access to scientific information: Boosting the benefits of public investments in research", Brussels, COM (2012) 401 final of 17 July 2012

▲ 2016 - Council Conclusions on the transition towards an Open Science system. Competitiveness Council, 26-27 May 2016 [Cou16]

Purpose:
The COMPET of EU, during its meeting on 26-27 May 2016, addressed several agenda items, including debate on OS followed by the expected adoption of conclusions

on the transition towards an OS system, the conclusions on the 7th Research Framework Program and on the creation of a favorable regulatory environment for research and innovation. The Council promotes the transition towards an OS system in Europe, to maximize access, use and impact of scientific research.

Highlights for education:
The Council highlights the following points:

(a) by 2020, all scientific publications resulting from publicly funded research should be accessible free of charge via OA,

(b) OA options can include publication in OA journals, deposit in OA archives,

(c) OA research data should be made accessible in an open and interoperable way, according to FAIR Principles,

(d) methods of OA to research data may include deposit in OA data repositories, and publishing under open licenses,

(e) develop and strengthen the digital infrastructure necessary for OA to publications and research data,

(f) promote interoperability between different infrastructures,

(g) promote training and awareness on issues related to OA, involving researchers, citizens, and other stakeholders.

Related document:

→ 2016 - Amsterdam Call for Action on Open Science

→ 2016 - European Research Area and Innovation Committee (ERAC) Opinion on Open Research Data (ORD), no. 1202/16

→ 2016 - Commission Communication on a "European Cloud Initiative - Building a competitive data and knowledge economy in Europe", COM (2016) 0178 final.

→ 2002 - Declaration of the Budapest Open Access Initiative [JLI12]

- European Initiatives:

  - 2022 - European University Association (EUA) Open Science Agenda 2025

    Background:
    The Agenda 2025 defines the "association's priorities in this field, and describes the current context, challenges, developments envisaged for 2025, and the actions EUA will take to drive this Agenda forward. For each priority area, the proposed actions are structured around the four priorities of 2020 EUA Strategic Plan [Eur20b]: (1) advocacy, (2) horizon scanning, (3) European solidarity, and (4) enabling enhanced performance" (p. 6).

Purpose:
The Agenda aims at “continue to help its members transition to OS, contribute to the development of national, European and institutional policies conducive to the mainstreaming of OS, and encourage universities to play a more proactive role in the regulatory and financial frameworks shaping this process” (p. 7).

Highlights for education:
EUA Open Science Agenda 2025 : (a) highlights the importance of the promotion of OS practices in universities in order to improve knowledge sharing, collaboration and scientific accessibility, (b) aims to strengthen the education landscape by promoting a culture of openness and innovation in scientific endeavours through advocacy for OA to scientific outputs, ensuring that research data is findable, accessible, interoperable and reusable (FAIR), and implementing effective research assessment approaches.

▲ 2021 - Open Access Infrastructure for Research in Europe (OpenAIRE)-Advance

Background:
Open Access Infrastructure for Research in Europe (OpenAIRE)-Advance project is building on the success of OpenAIRE.

Purpose:
The initiative aims to support OA and Open Data mandates across Europe by strengthening the existing infrastructure and fostering collaboration.

Highlights for education:
OpenAIRE-Advance focuses on (a) empowering National Open Access Desks (NOADs) to become key players in their national data infrastructures. This puts OS on the agenda. Through capacity building activities, including expert working groups and train-the-trainer approaches, knowledge sharing and skills development will be improved.

OpenAIRE-Advance (b) prioritises technical advancements to optimise the performance and scalability of the services. It also incorporates valuable user feedback. OpenAIRE-Advance also fosters partnerships with major research initiatives, citizen science projects, and global collaborators, further solidifying OpenAIRE’s global influence.

▲ 2016 - The Open Science Policy Platform (OSPP)

Background: The platform was established in 2016 by the European Commission’s Directorate-General for Research to advise on the development of OS Policy within the EU.

Purpose:

The Directorate-General for Research and Innovation (European Commission), OS Policy Platform Recommendations (Open Science Policy Platform (OSPP)-REC) https://indico.egi.eu/event/5000/sessions/4493/attachments/13234/16015/integrated_advice_ospp_recommendations.pdf are a set of actionable recommendations developed by the European Commission's OSPP.

Highlights for education:
The recommendations (a) provide guidance and next steps towards the longer-term vision outlined by various European and global OS consultations and expert groups, (b) focuses on eight priorities identified in the European OS Agenda that cover areas such as rewards and incentives, research indicators, scholarly communication, FAIR data, research integrity, skills and education, and citizen science, (c) stress the importance of promoting OS practices, of ensuring the accessibility and interoperability of data, of promoting research integrity, and of fostering collaboration across disciplines and across borders.

▲ 2015 - European Open Science Cloud (EOSC)

Background:
Since 2015, as part of the adoption of the Digital Single Market strategy [Com15], EU has announced its intention to create a cloud for research data. The European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions: "European Cloud Initiative - Building a competitive data and knowledge economy in Europe", COM(2016) 178 final of 19 April 2016 [Com16], presents the rational and broad plan for developing the EOSC as a trusted, open environment for the scientific community for storing, sharing, and re-using scientific data and results. The formal steps then follow until the launch of EOSC in November 2018 and the publication of EOSC Strategic Implementation Plan last July [CfRI+19].

Purpose:
EOSC is being built to become a common, federated, European framework for openly sharing research data and accessing services. In the medium term, EOSC will grow into a trusted research and innovation data space and service platform in Europe that is fully articulated with sectoral data spaces such as the common European health data space, and will open up and connect with the wider public and private sectors (Commission Communication on a new European research area (ERA) for Research and Innovation [CfRI20].)

Highlights for education:
The EOSC is (a) a trusted, (b) virtual, (c) federated environment that crosses borders and scientific disciplines to (d) store, share, process and reuse research digital objects (such as publications, data, and software) (e) that are findable,

accessible, interoperable, and reuseable (FAIR Principles). This initiative will allow researchers from all disciplines and countries to store, curate and share data [CM20].

- 2004 - SparcEurope

  Background:
  SparcEurope is a Dutch foundation committed to delivering on the promise of OA, OS, open scholarship and open education. SparcEurope advocates OA to research and education, for the academic and educational community, and for society as a whole.

  Purpose:
  The mission of the SparceEurope is to provide leadership to Europe's higher education and research communities and those that support it to enable the conditions and opportunities to maximise the access and re-use of Europe's research and educational resources for all whilst respecting diversity and equity (https://sparceurope.org/what-we-do/our-work/).

2.3.2 Open Educational Resources

- EU Acts and Documents

  - 2016 - JRC Science for Policy Report: Opening up Education: A Support Framework for Higher Education Institutions [IDSPCM16]

    Background:
    The report is the "final outcome of the OpenEdu Project, carried out by Institute for Prospective Technological Studies (IPTs) (2013-2015) on behalf of DG Education and Culture (p. 5). The project aims to support the EU Commission Communication, Opening up Education: Innovative Teaching and Learning for All through New Technologies and Open Educational Resources, COM (2013), 654 final [Eur13]. The report also presents the main outcome of the OpenEdu project, the OpenEdu Framework for Higher Education Institutions (HEIs)" (p. 6).

    Purpose:
    The report presents "open education as an umbrella term under which different understandings of open education can be accommodated, such as OER and Massive Open Online Courses (MOOCs)" (p.2). The report presents a supporting framework for HEIs to open up education.

    EU legal instrument:
    Policy Report

Highlights for education:
The authors note that (a) “in Europe, and particularly in higher education, opening up education does not refer exclusively to OER or to the availability of OA research in repositories, or opening up research as open data” (p. 10).

The (b) OpenEdu notion is seen as “a way of carrying out education, often using digital technologies. Its aim is to widen access and participation to everyone by removing barriers and making learning accessible, abundant, and customisable for all. It offers multiple ways of teaching and learning, building and sharing knowledge. It also provides a variety of access routes to formal and non-formal education, and connects the two” (p. 10).

The OpenEdu framework for HEIs (c) presents 10 dimensions of open education tath “6 core dimensions (access, content, pedagogy, recognition, collaboration and research) and 4 transversal dimensions (strategy, technology, quality and leadership). All dimensions are interrelated; the core dimensions are not more important than the transversal ones. Core dimensions represent the ’what’ of open education and transversal dimensions indicate ‘how’ to achieve it. ” (p. 7).

The framework can be used as a tool by staff at HEIs to help them reflect on strategic decisions: pedagogical approaches, collaboration between individuals and institutions.

Related document:

→ 2013 - Communication from the European Commission to the European Parliament, the Coucil, the European Economic and Social Committee and the Committee of the Regions: Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources, COM (2013) 654 final [Eur13]

→ 2007 - Group on Earth Observations, Cape Town Open Education Declaration

▲ 2013 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources, COM (2013) 654 final [Eur13]

Purpose:
This Communication “sets out a European agenda for stimulating high-quality, innovative ways of learning and teaching through new technologies and digital content. ‘Opening up education’ proposes actions toward more open learning environments to provide higher quality and efficacy education and thus contribute to the Europe 2020 goals of boosting EU competitiveness and growth through better skilled workforce and more employment” (p. 1).

EU legal instrument
EU Commission Communication

Highlights for education:
The Commission highlights the importance of OER, because:

(a) OER offers opportunities to use open knowledge to improve quality and access to education.

(b) OER stimulates innovative learning environments where content can be adapted by people according to their needs.

(c) OER can modernise education.

(d) OER, combined with traditional educational resources, can reduce the costs of educational materials for students and their families, as well as for public budgets.

(e) The Commission encourages the sharing of educational materials between educational institutions, teachers and students through the use of open licenses.

(f) Traditional players in the education sector can help make high-quality digital content more accessible through innovative collaborative efforts (Art. 2).

Related document:

→ 2013 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social tee and the Committee of the regions: European higher education in the world, COM (2013) 499 final (the Commission defines that "Europe must take the lead in the global efforts to exploit the potential of digital education - including the availability of ICT, the use of OER and the provision of MOOCs - and to overcome the systemic obstacles that still exist in quality assurance, student assessment and recognition, as well as funding. This potential and obstacles will be addressed in a future Commission initiative".

→ 2012 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social tee and the Committee of the regions. Rethinking Education: Investing in skills for better socioeconomic outcomes, COM (2012) 669 final [Eur12]

▲ 2012 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social tee and the Committee of the regions. Rethinking Education: Investing in skills for better socioeconomic outcomes. COM (2012) 669 final [Eur12]

Purpose:
The Communication "emphasis is being placed on delivering the right skills for employment, increasing the efficiency and inclusiveness of our education and training institutions and on working collaboratively with all relevant stakeholders.

The Commission identifies here a limited number of strategic priorities to be addressed by Member States, alongside new EU actions to leverage national efforts".

EU legal instrument:
EU Commission Communication

Highlights for education:
The Communication specifies that:

(a) Europe "should exploit the potential of OER much more than is currently the case".

(b) The quality of education "relies on a mix of different educational materials. To achieve this, wider access and use of OER needs to be accompanied by clear quality standards and mechanisms to assess and validate skills and competences acquired through it".

(c) It is necessary "scale up the use of ICT-supported learning and access to high quality OER" (Art. 3(5)).

(d) Analyse the impact of providing EU support to up scaling access and use of OER and ICT, establishing quality parameters and certification processes for OER, developing ICT-enabled teaching practices and creating a EU dimension for online education (Art. 4(5)).

- European Initiatives

  - 2013 - Open Education Europa

    Background:
    The European Commission launched Open Education Europa in September 2013 as part of the Opening up Education initiative [Eur13] to provide a single gateway to European (http://www.european-net.org/2015/06/open-education-europa/).

    Purpose:
    The main goal of the Open Education Europa portal is to offer access to all existing European OER in different languages in order to be able to present them to learners, teachers and researchers (http://www.european-net.org/2015/06/open-education-europa/).

    Highlights for education:
    Open Education Europa is a dynamic platform built with the latest cutting-edge open-source technology, offering tools for communicating, sharing and discussing – available in many different languages (http://www.european-net.org/2015/06/open-education-europa/).

Related document:

→ 2013 - Communication from the European Commission to the European Parliament, the Coucil, the European Economic and Social Committee and the Committee of the Regions: Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources, COM (2013) 654 final [Eur13]

▲ 2007-2013 - Open Discovery Space Project: A socially-powered and multilingual open learning infrastructure to boost the adoption of eLearning resources

Background:
Open Discovery Space "addressed the challenges faced by e-learning in Europe: the interaction between user/learners and platforms, the sharing of resources, the co-creation of resources by communities of teachers, students and their families, and so on. The project developed a platform that offers free access to more than 800,000 educational resources all over Europe".

Purpose:
The Open Discovery Space project is an open, socially powered, multilingual learning infrastructure designed to promote the adoption of eLearning resources.

Highlights for education:
The project focuses on (a) providing an environment that supports access to digital educational resources, (b) encouraging sharing and collaboration between teachers and students, and (c) favouring the dissemination of online learning resources across Europe, facilitating the creation and exchange of educational materials within communities of interest.

2.3.3 Global Citizenship

■ EU Acts, Documents and Initiatives

▲ 2021 - European Parliamentary Research Service (EPRS) Report: Implementation of citizenship education action in the EU. European Implementation Assessment [VZ21]

Background:
The "European Parliament's Committee on Culture and Education (CULT) requested the drawing up of an own-initiative report on the implementation of the citizenship education actions", in 2020 to EPRS The report to assist the CULT Committee in its scrutiny of the implementation of citizenship education measures in the EU (p. 3).

Purpose:

This report evaluates the implementation of citizenship education actions within the EU and provides information and recommendations to the European Parliament to strengthen citizenship education across the EU (p. 3).

Highlights for education:
The report (a) describes the EU policy framework for citizenship education, (b) identifies action in the field of citizenship education supported by EU funding programs, (c) defines citizenship education policies and practices.

Related document:

→ 2018 - OECD: "The future of education and skills Education 2030"

→ 2014 - Global Citizenship Education: preparing learners for the challenges of the 21st century [UNE14a]

▲ 2016-2018 - Erasmus+ Project: Boosting GCE using digital storytelling (BRIGHTS) [VZ21]

Background:
BRIGHTS represents a two-year social inclusion project, financed through the Erasmus+ program. Launched in early 2017, the project is coordinated by ALL DIGITAL in collaboration with six organizations from four different countries: Belgium, Greece, Croatia and Italy.

Purpose:
The BRIGHTS project aims to promote GCE in formal and non-formal educational contexts in Europe, with the help of digital storytelling techniques. The project realized a training curriculum and a blended course.

Highlights for education:
The project (a) developed and delivered an online course on "Addressing GCE through Digital Storytelling" to over 1000 secondary school teachers and trainers, (b) allowed students produced engaging digital stories on important topics such as inclusion and racism, (c) enabled students conducting face-to-face workshops that allowed teachers to experiment with and apply the BRIGHTS methodology directly with young people (13-19 years old), (d) allowed the development of social, civic, intercultural, critical thinking, media literacy, creativity and digital skills (http://www.brights-project.eu/en/the-brights-project-is-coming-to-an-end-but-its-results-are-not/).

2.3.4 Sustainability

■ EU Acts and Documents

▲ 2022 - Council Recommendation of 16 June 2022 on learning for the green

transition and sustainable development 2022/C 243/01, ST/9795/2022/INIT, OJ C 243, 27.6.2022, p. 1–9 [Cou22]

Purpose:
Learning for the green transition and sustainable development supports individuals of all ages in acquiring knowledge, skills, and attitudes for a more sustainable lifestyle and to contribute to a more sustainable economy and society. It promotes skills that are in demand on the job market and an understanding of global challenges, such as the climate crisis and biodiversity loss.

Highlights for education:
EU Council Recommendation

Highlights for education:
The Recommendation "sets out how sustainability can be integrated into all aspects of education and training. It calls on Member States to: (a) make learning for the green transition and sustainable development a priority in education and training policies and programs, (b) provide all learners with opportunities to learn about the climate crisis and sustainability in formal education (for example, schools and higher education) and non-formal education (such as, extra-curricular activities, youth work), (c) mobilize national and EU funds to invest in green and sustainable equipment, resources and infrastructure, (d) support educators in developing their knowledge and skills to teach about the climate crisis and sustainability, including dealing with eco-anxiety among their students, (e) create supportive learning environments for sustainability that span all activities and operations by an educational institution and enable teaching and learning that is hands-on, interdisciplinary and relevant to local contexts, (f) actively involve students and staff, local authorities, youth organizations and the research and innovation community in learning for sustainability" (https://education.ec.europa.eu/focus-topics/green-education/learning-for-the-green-transition).

Related document:

→ 2021 - Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030) 2021/C 66/01, OJ C 66, 26.2.2021, p. 1–21

→ 2020 - Education for sustainable development: a roadmap [UNE20]

→ 2020 - European Commission. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on achieving the European Education Area by 2025, COM (2020) 625 final [Com20c]

→ 2020 - Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and

the Committee of the Regions: A new ERA for Research and Innovation, COM (2020) 628 final

→ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Skills Agenda for sustainable competitiveness, social fairness and resilience COM (2020) 274 final [Com20b]

→ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Biodiversity Strategy for 2030. Bringing nature back into our lives, COM (2020) 380 final [Eur20a]

→ 2019 - Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: "The European Green Deal", COM (2019) 640 final [Com19]

→ 2018 - Council Recommendation of 22 May 2018 on key competences for lifelong learning, OJ C 189, 4.6.2018, p. 1

→ 2017 - Interinstitutional Proclamation on the European Pillar of Social Rights, OJ C 428, 13.12.2017, p. 10–15

▲ 2022 - GreenComp: the European sustainability competence framework [BPCG22]

Background:
GreenComp is a reference framework for sustainability competences. It provides a common ground to learners and guidance to educators, advancing a consensual definition of what sustainability as a competence entails. The results presented in this report form a framework for learning for environmental sustainability that can be applied in any learning context.

Purpose:
GreenComp "can serve a wide range of purposes, including curricula review; design of teacher education programs; (self-) assessment/reflection, policy development, certification, assessment, monitoring and evaluation" (p. 3).

EU legal instrument:
The publication is "a Science for Policy report by the Joint Research Centre (JRC), the European Commission's science and knowledge service. It aims to provide evidence-based scientific support as input to the EU's policymaking process. The scientific output expressed does not constitute a policy position of the European Commission" [BPCG22]. GreenComp "is designed to be a non-prescriptive reference for learning schemes fostering sustainability as a competence" [BPCG22].

Highlights for education:

GreenComp (a) comprises four interrelated competence areas: (i) embodying sustainability values, (ii) embracing complexity in sustainability, (iii) envisioning sustainable futures, and (iv) acting for sustainability. Each area comprises three competences, for a total of 12 competences, that are interlinked and equally important [BPCG22].

GreenComp (b) assists educational systems in training students to become systemic and critical thinkers who are focused on caring for the planet and its future. The framework's 12 competencies are relevant to all students, regardless of age or educational level, in formal, non-formal, and informal educational settings ([BPCG22], p. 7).

GreenComp (c) proposes a model that can supplement current sustainability-related skill acquisition efforts at the international, national, regional, and local levels. The value of this model is in providing a common reference and a list of competence components for educators ([BPCG22], p. 7).

Related document:

→ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Biodiversity Strategy for 2030. Bringing nature back into our lives, COM (2020) 380 final [Eur20a]

→ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on achieving the European Education Area by 2025, COM (2020) 625 final [Com20c]

→ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Skills Agenda for sustainable competitiveness, social fairness and resilience, COM (2020) 274 final [Com20b]

→ 2019 - Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: "The European Green Deal", COM (2019) 640 final [Com19]

▲ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM/2020/380 final [Eur20a]

Background:
The strategy aligns with the policies published by the European Commission, such as the European Skills Agenda for Sustainable Competitiveness, Social Equity

and Resilience, COM (2020) 274 final [Com20b] and the Education Area of European Skills by 2025, COM (2020) 274 final [Com20b]. The strategy responds to the ambitions set out in the European Green Deal [Com19].

Purpose:
The EU's biodiversity strategy for 2030 is a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems. The strategy aims to put Europe's biodiversity on a path to recovery by 2030, and contains specific actions and commitments (https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en#:~:text=The%202030%20EU%20Biodiversity%20Strategy&text=The%20EU's%20biodiversity%20strategy%20for,contains%20specific%20actions%20and%20commitments).

Highlights for education:
The strategy emphasizes the crucial role of education and training in promoting a better understanding of the importance of biodiversity and in encouraging individuals to actively participate in its preservation. Indeed, it helps integrate biodiversity and ecosystems into school, higher education and professional training, the Commission will propose a Council Recommendation on encouraging cooperation in education for environmental sustainability in 2021 (subsection 3.3.4).

▲ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on achieving the European Education Area by 2025, COM (2020) 625 final [Com20c]

Background:
The communication presents a reinforced approach to ensure the achievement of a European Education Area by 2025. The European Education Area ties in with Next Generation EU and the long-term budget of the European Union for 2021-2027.

Purpose:
The Commission proposes to consolidate ongoing efforts and further develop the European Education Area in six dimensions that are: quality in education and training, inclusion and gender equality, green and digital transitions, teachers and trainers, higher education, and geopolitical dimension.

Highlights for education:
The Commission suggests that education is a crucial element in promoting sustainability. It emphasizes the need to initiate a profound change in people's behavior and skills through educational systems and institutions. The focus is on behavior change, increasing skills for the green economy, and promoting new sustainable

education and training infrastructure. Additionally, the text mentions the need to renovate existing buildings to create environments that support this change. In summary, sustainable education and training are recognized as fundamental to facilitate a transition toward a more sustainable development model (subsection 2.3).

Related document:

→ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Skills Agenda for sustainable competitiveness, social fairness and resilience COM (2020) 274 final [Com20b]

▲ 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Skills Agenda for sustainable competitiveness, social fairness and resilience, COM (2020) 274 final [Com20b]

Background:
The Agenda is a strategic initiative of the European Commission aimed at developing a skilled workforce capable of driving sustainable growth, fostering social cohesion and increasing Europe's resilience in an era of rapid technological advancement and digitalisation.

Purpose:
The Commission "aims to put skills at the heart of the European policy agenda for the next 5 years to make the right to lifelong learning a reality and implement Principle 1 of the European Pillar of Social Rights". This principle concerns: Education, training and life-long learning: *Everyone has the right to quality and inclusive education, training and life-long learning in order to maintain and acquire skills that enable them to participate fully in society and manage successfully transitions in the labor market*) (subsection 5.2).

Highlights for education:
The Agenda aims to achieve its goals over the next five years through 12 actions: (a) a Pact for Skills, (b) Strengthening skills intelligence EU support for strategic national upskilling action, (c) proposal for a Council Recommendation on Vocational Education and Training for sustainable competitiveness, social fairness and resilience, (d) rolling out the European universities initiative and upskilling scientists, (e) skills to support the green and digital transitions, (f) increasing STEM graduates and fostering entrepreneurial and transversal skills, (g) skills for Life, (h) initiative on Individual Learning Accounts, (i) a European approach to micro-credentials, (f) New Europass Platform, (g) improving the enabling framework to unlock Member States' and private investments in skills.

Related document:

→ 2019 - Communication from the European Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: "The European Green Deal", COM (2019) 640 final [Com19]

▲ 2019 - Communication from the European Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: "The European Green Deal", COM(2019) 640 final [Com19]

Background:
The Green Deal "is an integral part of this Commission's strategy to implement the UN's 2030 Agenda [Uni15] and the SDGs, and the other priorities announced in President von der Leyen's political guidelines" (section 1).

Purpose:
The Green Deal aims to become a fair and prosperous society with a modern, efficient, and competitive economy. This includes eliminating net greenhouse gas emissions by 2050 and decoupling economic growth from resource use. The objective is to protect the EU's natural capital and citizens' health while ensuring a just and inclusive transition. To ensure a successful transition, it is crucial to actively involve the public and establish trust through a new pact that includes citizens, national, regional, and local authorities, civil society, and industry in collaboration with EU institutions (section 1).

Highlights for education:
Commission explicitly recommends activating education and training by developing skills, including up-skilling and reskilling, and by investing in learning for environmental sustainability. For example, according to the subsection 2.2.4, "the Commission will prepare a European competence framework to help develop and assess knowledge, skills and attitudes on climate change and sustainable development. It will also provide support materials and facilitate the exchange of good practices in EU networks of teacher-training programs" (subsection 2.2.4).

2.4 Switzerland

At the Swiss level, the analysis commences with the examination of the Federal Act on the Promotion of Research and Innovation (RIPA) and proceeds with documents from the funding bodies.The criteria of the analysis mirror those used for Europe. In this case, we distinguish between the macro-categories of acts and documents on one hand, and initiatives on the other, with a particular difference. We separate the federal act (belonging to the category of Acts) from the framework (belonging to the category of Documents), in order to highlight the specific acts within each macro-category.

2.4.1 Open Science

- Federal Act
  - 2012 - Federal Act on the Promotion of Research and Innovation (RIPA), SR 420.1

    Purpose:
    The Confederation aims to: (a) encourage scientific research, (b) promote science-based innovation, (c) support the analysis and exploitation of research results, (d) ensure cooperation between research bodies, (e) guarantee the economical and effective use of federal funding for scientific research and science-based innovation (Art. 1).

    Swiss legal instrument:
    Federal Law of the Swiss Confederation

    Highlight for education:
    Federal Act does not explicitly mention OS, it indirectly supports its principles through various provisions, including: (a) Article 12 that encourages research bodies to adopt measures promoting the exchange of information and knowledge, which may also include the sharing of research through OA publications, (b) Article 13 which encourages research bodies to develop and implement strategies for data management, including ensuring data quality, accessibility, and long-term preservation. In this way, this provision can facilitate future open data initiatives, (c) Article 14 focuses on the importance of collaboration and networking among research bodies. Sharing data and methods can contribute to effective collaboration and transparency in research.

- The Framework of Funding Body
  - 2021 - Swiss National Strategy: Open Research Data Action Plan [Sci21b]

Background:
The ORD Action Plan is the results of a collaborative process between the Eidgenössische Technische Hochschule Zürich (ETH) Domain, the Swiss National Science Foundation (SNFS), the Swiss Academies of Arts and Sciences (A+), and swissuniversities and it was drafted in the scope of the Swiss National Open Open Research Data Strategy, which in turn was initiated by a mandate of the State Secretariat for Education, Research and Innovation (SERI). The Open Research Data Action Plan is guided by overarching objectives and principles for the ORD landscape in Switzerland, as defined in the ORD Strategy.

Purpose:
The Open Research Data Action Plan aims to integrate, coordinate, and develop ORD management practices in Switzerland, overcoming conceptual and financial challenges. It expands on and details the objectives of ORD Strategy by presenting clear terms and conditions regarding organization, governance, and financing for the 2022–2024 Education, Research, and Innovation (ERI) period and a blueprint for the 2025–2028 period.

Swiss Legal Instrument:
Nationwide higher education policy coordination act described in the Federal Act on the Promotion of Universities and Coordination in the Swiss Higher Education Sector (SR 414.20) (Higher Education Act, (HEdA))

Highlights for education:
The Action Plan (a) ensures that Swiss higher education and research institutions support researchers across Switzerland in making data and results from publicly funded research openly accessible and reusable for further research.
The strategy will be guided by the ORD Strategy Council, which will issue recommendations to ensure consistent and efficient development of ORD practices and infrastructure.

Related document:

→ 2021 - UNESCO Recommendation on Open Science [UNE21a]

→ 2018 - European Open Science Cloud (EOSC)

→ 2018 - Invest in Open Infrastructure (contribute to this new initiative that focuses on “open” infrastructures)

→ 2013 - Research Data Alliance

→ 2011 - Regulation (EC) No 723/2009 – rules for creating a European Research Infrastructure Consortium (ERIC) Infrastructures (ensure an efficient and meaningful integration of Swiss research and data communities and support the infrastructure needs of the communities)

→ 2008 - OpenAIRE supports repository managers in eliminating duplicates and

redundancies, in disambiguation (Explore) as well as in securing a harmonized Personalised Identifier Data (PID) approach

→ 2004 - SparcEurope (it aims to enhance its contributions to the Global Sustainability Coalition for Open Science Services (SCOSS) and introduce new initiatives to promote Open Data, Diamond Open Access, and the Open by Default approach for Research Data).

▲ 2021 - Swiss National Open Research Data Strategy [Sci21a]

Background:
The Swiss National Open Research Data Strategy was initiated on the basis of the ORD Agreement between the SERI, swissuniversities, the SNFS, the ETH and the École polytechnique fédérale de Lausanne (EPFL). The ORD Strategy was drafted under the leadership of the Delegation Open Science (DelOS) and, following consultation with the relevant stakeholders, and was adopted by DelOS on 23 April 2021. The ORD Strategy then received the approval of the Plenary Assembly of swissuniversities, the ETH Domain, the Board of Directors and Delegates of the Swiss Academies of Arts and Sciences (A+), and the Presiding Board of the SNFS National Research Council.

Purpose:
The purpose of the ORD Strategy is to define overarching objectives and principles for the Swiss ORD landscape. The Strategy provides a framework for the development of practices built around sharing research data in Switzerland, and for governing the services and infrastructures that support researchers and enable ORD practices.

Swiss legal instrument:
Nationwide higher education policy coordination act described in the Higher Education Act, (HEdA).

Highlights for education
The Strategy (a) addresses research data from publicly funded research in Switzerland, with research data being understood in a broad sense.
The Strategy (b) defines guiding principles, including (i) FAIR Principles, (ii) good research practice includes openness, (iii) as open as possible, as protected as necessary, (iv) recognition of the value of data, (v) respecting disciplinary diversity, (vi) connection to national and international ecosystems, (vii) a sustainable approach (Art. 3).

The Strategy defines four objectives, such as: (i) *Action Area A* that consists in supporting researchers and research communities in the definition and implementation of ORD practices; (ii) *Action Area B* allowing developing, promoting and maintaining financially sustainable basic infrastructure and services for all

researchers, (iii) *Action Area C* consists in developing skills and exchanging best practices for researchers, (iv) *Action Area D* enabling setting up systems and supportive frameworks for institutions and research communities (Art. 4).

The Strategy involves the creation of the ORD Strategy Council that is held liable for overall strategic management and it is charged with developing a common vision for the future ORD landscape in Switzerland and for ensuring both coherence and interoperability of all infrastructures and services while also underpinning the interfaces with other research area (Art. 5).

Related document:

→ 2021 - UNESCO Recommendation on Open Science [UNE21a]

→ 2020 - Agreement on the Development of a National Open Research Data Strategy and corresponding Action Plan

→ 2018 - European Open Science Cloud (EOSC)

→ 2018 - Open Science Policy Platform Recommendations (OSPP-REC) [CfRI18]

→ 2018 - Plan S

→ 2018 - Collective Benefit, Authority to control, Responsibility and Ethics (CARE) Principles for Indigenous Data Governance

→ 2017 (update 2023) - The European Code of Conduct for Research Integrity developed by the European Federation of Academies of Sciences and Humanities [ALL23]

→ 2016 - FAIR Principles [APS+17]

→ 2016 - Amsterdam Call for Action on Open Science

→ 2015 - The Leiden Manifesto [HWW+15]

→ 2013 - Declaration of San Francisco on Open Access to Research Assessment, or DORA [Cag13]

▲ 2018 - National Open Access Strategy - Action Plan [os18]

Background:
The Swiss National Strategy on Open Access was developed in 2016 by swissuniversities on behalf of the SERI, in collaboration with the SNFS, and adopted by the Plenary Assembly of swissuniversities on January 31, 2017. The Council of Swiss University Conference (SUC) took favorable notice of this strategy on February 23, 2017.

Purpose:
The objective of this action plan is to offer Swiss higher education institutions avenues and solutions to achieve the objectives they set for themselves by adopting the National Strategy Switzerland on Open Access. This means concretely

moving from the current situation (2015), where 30 of the 33,600 publications from Swiss universities are OA - 16 in Green OA (or self-archiving), 11 in Gold OA and 3 depending on a hybrid model - to a situation corresponding to the 2024 vision where 100 of the publications of Swiss higher education institutions must be OA (Art. 1(3)).

Swiss Legal Instrument:
Nationwide higher education policy coordination act described in the Higher Education Act, (HEdA)

Highlights for education:
According to this strategy, (a) academic publications funded by public money must be freely accessible on the internet by 2024 (Art. 1(1))

The strategy (b) proposes a flexible approach to OA that combines three mechanisms: (i) archiving publications on institutional or thematic servers (self-archiving or Green Road), (ii) publishing in OA journals (Gold Road), and (iii) negotiating contracts with publishing houses that allow for OA publication. The objective is to achieve OA through a combination of strategies adaptable to the specific needs of academic institutions (Art. 2).

The strategy (c) specifies that in order to achieve full OA, each academic institution should have its own policy. In 2015, 75% of Swiss universities already had one. In 2018, swissuniversities is expected to issue recommendations based on existing policies, minimum standards, consultation results and international best practices. Policies should cover various aspects such as binding, institutional anchoring, self-archiving, direct OA publishing, infrastructure, publication depository, embargo, links to evaluation, promotion of Gold OA, fund management, right of authorship, monitoring, consultancy for researchers, institutional editions, and publication infrastructures. Furthermore, each Swiss institution should develop a policy adapted to its needs, following the recommendations of swissuniversities and making it accessible online (Art. 4)

The strategy highlights that (d) OA governance and policies are key to developing strategies in academic institutions. National Implementation Measures are presented for this purpose, including (i) the establishment of national monitoring to monitor the proportion of OA publications and expenditure relating to publications, (ii) a communication and awareness campaign aimed in particular at informing researchers about OA and higher education policies; (iii) participation in a reform of research evaluation inspired in particular by of DORA or the Leiden Manifesto [HWW+15] and taking advantage of the experiences acquired, (iv) measures for negotiating with major publishing houses, (v) pooling of services and infrastructure aimed in particular at enabling to small universities or those which are still at the beginning of the process towards OA to have adequate instruments;

(vi) a legal analysis on the possibilities of applying a secondary publication right in Switzerland; (vii) participation in international initiatives and infrastructures likely to support higher education institutions in their implementation of the OA strategy, and (viii) other measures aimed at broadening the offer in terms of OA (Art. 5).

Related document:

→ 2013 - Declaration of San Francisco on Open Access to Research Assessment, or DORA [Cag13]

→ 2012 - Good practices for university open-access policies - Harvard Open Access Project

→ 2003 - Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

▲ 2017 - National Open Access Strategy [OS17]

Background:
In a letter dated 4 December 2015, the SERI commissioned swissuniversities to elaborate, with the support of the SNFS), a national strategy for Open Access to publications. This national OA strategy was formulated by a representative working group led by swissuniversities and was adopted by the plenary assembly of swissuniversities on 31 January 2017.

Purpose:
The strategy aims to achieve the international benchmarks by 2024, including ensuring that all scholarly publications are openly accessible. This means that all scholarly publications funded by public money must be freely accessible on the internet (Art. 4).

Swiss Legal Instrument:
Nationwide higher education policy coordination act described in the Higher Education Act, (HEdA)

Highlights for education:
The Strategy defines (a) five guiding principles, such as: (i) powerful and unified approach, (ii) support and commitment from research communities, (iii) cost transparency and cost neutrality, (iv) ascertaining control and diversity of the scientific production process, and (v) revision of quality assessment system (Art. 3)

The strategy identifies some (b) coordinated actions to achieve its purpose, consisting in (i) aligned nationally and internationally, addressing monitoring and compliance, (ii) negotiate with publishers for OA models, including compensation agreements and green OA clauses, with an exit option, (iii) coordinate and

consolidate resources, focusing on shared infrastructure and ensuring quality and peer review, (iv) promote alternative publishing models by exploring funding from non-profit organizations or public agencies, (v) communicate OA challenges and opportunities to the research community and raise awareness in society; (vi) Encourage dialogue between academics and the public; (vii) adapt the regulatory framework to favour OA, guaranteeing text and data mining and an unconditional right of second publication, and (viii) monitor the implementation of OA at the national level to ensure free accessibility to Swiss research results (Art. 5).

Related document:

→ 2016 - Council Conclusions on the transition towards an Open Science system. Competitiveness Council, 26-27 May 2016 [Cou16]

→ 2016 - Amsterdam Call for Action Open Science
→ 2013 - Declaration of San Francisco on Open Access to Research Assessment, or DORA [Cag13]

- Swiss Initiatives

  - 2022 - SWITCH - Research Data Connectome project

    Background:
    SWITCH is the foundation supporting technology in education, leads the Research Data Connectome project. This initiative aims to connect research data repositories and resources into a knowledge graph, promoting data accessibility and interoperability.

    Highlights for education
    The Connectome project has two objectives: (a) promotes the reuse of open data from heterogeneous areas, and (b) supports the development of open data practices. In order to achieve this goal, the project is harmonizing and linking metadata from different sources in order to improve their accessibility. This is accomplished through the Open Data Navigator, a search platform for end-users, and the Switch Open Data API, an API for service providers (https://www.switch.ch/en/about/innovation).

  - 2021 - Educa's Management of Education Data

    Background:
    The specialised agency Educa carries out service mandates on behalf of the cantons (Conférence suisse des directeurs cantonaux de l'instruction publique (CDIP)) and the Confederation (SERI), Educa analyses technological developments and integrates them into the development of quality for compulsory education

(primary level and secondary level I), basic vocational training, high schools and specialized middle schools (secondary level II). It creates the necessary foundations for the Swiss digital education space at a national level https://www.sbfi.admin.ch/sbfi/fr/home/formation/l-espace-suisse-de-formation/collaboration-en-matiere-de-formation-confederation-cantons/institutions-mandatees/educa.html).

Highlights for education:
Educa's Management of Education Data is responsible for managing educational data in Switzerland, contributes to ORD by promoting data accessibility and potentially sharing anonymized datasets for research purposes.

▲ 2019 - The link.hub.ch Project

Background:
The linkhub.ch project is a collaborative effort between multiple institutions. In 2019, a steering committee was established, consisting of Georg Lutz (FORS), Kurt Schmidheiny (University of Basel, Swiss Network on Fiscal Federalism), Adrian Spoerri (University of Berne, Swiss RDL), Ben Jann (University of Berne), and Philippe Wanner (National Center of Competence in Research (NCCR) for migration and mobility studies, University of Geneva) (https://linkhub.ch/about/). The objective consists in creating a legal and institutional environment to facilitate data linking for research while respecting data security.

Highlights for education:
The link.hub Project facilitates data discovery and sharing within the social sciences, aligning with ORD principles through the (a) promotion the adoption of FAIR Principles for data management, (b) the implementation of an open and accessible data storage system, with comprehensive, standards-compliant metadata, (c) developing standards and best practices for linking data from different sources, and (d) creating a data portal that integrates data from different disciplines and industries [lF20].

▲ 2017 - Swiss Data Science Center (SDSC)

Background:
In 2017, the ETH Board launched a national Data Science initiative that led to the establishment of a collaborative partnership between EPFL and ETH Zurich, and the Paul Scherrer Institute (PSI). The center is supported by ETH Domain.

Highlights for education:
The SDSC (a) supports the Swiss National Strategy for Open Research Data to promote the creation and widespread reuse of research data.

The SDSC (b) assists its partners and ecosystem players in adopting open research practices that maximise impact and the reuse of research results, including creating high-quality, accurate, reliable and reliable data assets and ensuring that those assets are accessed and managed transparently.

The SDSC (c) supports capacity building efforts that help build the skills needed to conduct open research and foster collaboration and innovation across the entire research community (https://www.datascience.ch/open-research).

- 2017 - Open Research Data policy by SNFS

  Background:
  SNFS promotes OS, with a dedicated ORD policy and guidelines for researchers to create effective data management plans.

  Highlights for education:
  SNFS developed the Research Data Management Policy, which outlines guidelines and procedures for effective research data management. The policy requires the creation of Data Management Plans (DMPs) for all funding applications submitted to SNFS from October 2017 onward. The primary aim of this policy is to ensure the secure and accessible management of research data in compliance with international standards. This promotes transparency and reproducibility in scientific research.

- 2017 - Swiss Personalised Health Network (SPHN) initiative

  Background:
  The Swiss Academies of Arts and Sciences (A+) support OS and lead the SPHN initiative, which promotes open data sharing in personalized medicine research. open data sharing in personalized medicine research.

  Highlights for education:
  The SPHN aimed at (a) "developing personalized medicine and personalized health in Switzerland. Its objective is to promote creation of coordinated infrastructures to make relevant health data interoperable and shareable for research purposes" [AKL20].

  SPHN (b) "involves decision-makers from clinical, research, research support, and patient organizations, promoting collaboration among all stakeholders" [AKL20].

2.4.2 Open Educational Resources

- The Framework of Funding Body and HEIs
  - 2021-2024 - swissuniversities Program-8: "Strengthening digital skills in teaching"

Background:
This program deals with issues related to OS. For example, one of the program projects is “Swiss Digital Skills Academy: Mastering OER and Open Educational Platforms (OEPs)” (https://d-skills.ch/) that is funded by the Program-8 and runs from 2021 to 2024.

Highlights for education:
The project aims to develop digital skills related to the conception, creation, and implementation of OER and OEPs. It also involves the development and deployment of these resources in shared learning modules. The learning modules proposed here aim to deliver methodologies and share practices. These digital skills modules for instructors are co-designed and federated between Swiss academic institutions, relying on shared open resources and platforms. Instructors are trained using the same resources and platforms that they will integrate into their own teaching practices (https://www.swissuniversities.ch/fileadmin/swissuniversities/Dokumente/Organisation/PgB/Digital_Skills/230814_P-8_UEbersicht_der_Projekte.pdf).

▲ 2019 and 2020 - Zurich University of Applied Sciences Open Educational Resources Strategy [Zur19] and Policy [Zur20]

Background:
The Zurich University of Applied Sciences (ZHAW) has a strategy and policy that aims to move towards sustainable solutions for society’s problems.

Highlight for education:
The ZHAW (a) recommends the use of OER and that they be adapted for the target audience in order to make the most of didactic synergies, content sharing and new perspectives (p. 1).

The ZHAW (b) encourages active participation in the sharing culture by producing OER that offers many potential benefits, including the “teaching staff can showcase their own expertise in a subject area”, efficiency is increased by using OER from others and duplication is avoided under a secure legal framework (p. 1).

▲ 2018 - University of Basel: Digitalisation in Teaching Strategy [Uni18]

Background:
The strategy focuses on the use of digitalisation in university teaching.

Highlights for education:
The strategy (a) establishes that “teaching staff make innovative teaching/learning services available as OER where appropriate and possible to promote the global exchange of knowledge; they also make students aware of issues of data security,

copyright, the protection of personality rights, and of the quality, origin, and completeness of information" (p. 3).

The strategy states that (b) the "University formulates and communicates data protection, data security, and copyright guidelines to be applied when using OER and freely available tools within teaching" (p. 3).

The University of Basel will formulate and adopt a policy for OER in line with its OA strategy (p. 4).

- Swiss Initiatives
  - 2008 - eduhub's Special Interest Group (SIG) OER

    Background:
    The SIG OER is a special interest group of the Swiss e-learning community eduhub. eduhub is coordinated and funded by SWITCH, the Swiss National Research and Education Network (NREN). SWITCH created eduhub in 2008 to offer networking and assistance to e-learning specialists from all Swiss HEIs (https://www.eduhub.ch/community/Special-Interest-Groups/oer/).

    Highlights for education
    The SIG OER addresses conceptual and practical issues as well as collaborative creation, use and reuse of OER. The main objective is to anchor the thematic area in high schools/universities and in particular in the area of quality development in teaching.

  - n.d. - SWITCHtube supports the OER initiative and offers a special OER video channel setting which makes it very easy to create OER video channels.

    Highlights for education:
    SWITCHtube can serve as a tool for producing and sharing educational video content, as SWITCHtube can be used as a platform for creating and sharing educational videos. This allows you to contribute to the creation of OER that support learning and the dissemination of knowledge in an accessible and inclusive way. In this way.

2.4.3 Sustainability

- Framework of the Swiss Confederation
  - 2024 - (2024-2027) Action Plan related to the 2030 Sustainable Development Strategy [fs24]

Background:
The Federal Council adopts an action plan for each legislature related to Sustainable Development Strategy 2030. The plan presents a selection of new measures that specifies the objectives and strategic axes in areas where gaps remain. At the beginning of each legislative period, the Federal Council adopts an action plan based on a mid-term review, in accordance with the framework of Message on the legislative program. Every four years, Switzerland conducts a review of the implementation of the 2030 Agenda, as mandated by the Federal Council. On this basis, the federal government prepares a national report for the Swiss people, which is also submitted to the UN as part of a voluntary review mechanism.

Highlights for education:
The action plan describes the measure 20 concerning the "Inclusion of training, research and innovation" as a driver for the cross-cutting theme sustainable development in the Formation, recherche et innovation (FRI) 2025-2028 message.

Related document:

→ 2024 - Message FRI 2025-2028 related to the encouragement of training, research and innovation during the years 2025 to 2028. The Federal Council formulated its policy on training, research and innovation for the years 2025 to 202, defining the general themes as digitization, sustainable development, equity and national and international cooperation. The FRI 2025-2028 message is the first FRI message to have been subject to a public consultation procedure (https://www.sbfi.admin.ch/sbfi/fr/home/politique-fri/2025-2028.html).

→ 2021 - (2021-2023) Action Plan related to the 2030 Sustainable Development Strategy [fs24]

→ 2020 - Message FRI 2021-2024 related to the encouragement of training, research and innovation during the years 2021 à 2024

▲ 2020 - 2030 Sustainable Development Strategy [fs]

Background:
Federal Council is politically committed to implementing the 2030 Agenda [**?**] at the national and international levels, as well as to achieve by 2030 the 17 objectives of sustainable development that it defines. In this context, the Federal Council actively takes this commitment adopting a Sustainable Development Strategy (p. 4).

Highlights for education:
The strategy declares that (a) "training, research, and innovation play an important role in engines that are important to represent Switzerland's priority objectives of the strategy" (p. 5).

The strategy (b) defines the objectives to be achieved by 2030 and the strategic orientations of domestic and foreign policy, with particular attention to the three priority thematic areas: (i) sustainable consumption and production, (ii) climate, energy and biodiversity, and (iii) equal opportunities and social cohesion.

In particular, the strategy promotes sustainable education as follows:

> *"Within the framework of its skills, and taking into account the structures federalists of the country, it is committed to education with a view to sustainable, which includes ecological components and therefore also changes climatic. Within the limits of existing legal bases, it supports training basic and continuing training in its areas of expertise, in order to strengthen knowledge and operational skills regarding the protection of the climate at all levels of training.* (p. 28)"

The strategy supports the OS as follows:

> *"Science and research are essential to understanding the current state and evolution of natural resources and the environment in general, as well as the new risks and benefits arising from technological, societal and economic developments. They provide data and analysis on which the company and decision-makers can rely on them. Higher education institutions and science academies also maintain a dialogue with society and make scientific discoveries accessible and understandable for a wide audience. International collaboration is particularly important for training, research and innovation given the fact that many of the issues addressed by sustainable development are international in nature.*) (p. 50)".

2.5 Geneva

2.5.1 Open Science

For the Canton of Geneva, the analysis begins with the examination of the act amending the constitution of the Republic and Canton of Geneva, and it continues with the analysis of the initiatives introduced by the University of Geneva to promote OS.

- Acts and Documents

  - 2022 - Loi constitutionnelle modifiant la constitution de la République et canton de Genève (Cst-GE) (Pour une protection forte de l'individu dans l'espace numérique) (12945) [gen]

    Background:
    On September 22, 2022, the Grand Council of the Republic and Canton of Geneva decided to amend Art. 21 of the Constitution of the Republic and Canton of Geneva of October 14, 2012 (Cst-GE - A 2 00). Constitutional law was subject to the electoral

body in relation to article 65(1) of the Constitution of the Republic and Canton of Geneva. The people of the canton of Geneva voted to include the right to digital integrity in the cantonal constitution on June 18, 2023.

Purpose:
The law introduces the right to be forgotten that was added in the new Article 21A "Right to digital integrity" of the constitution of the Canton of Geneva as follows:

> *"1. Everyone has the right to safeguard their digital integrity.*
>
> *2. Digital integrity includes, in particular, the right to be protected against abusive processing of data linked to one's digital life, the right to security in the digital space, the right to an offline life as well as the right to oblivion.*
>
> *3. The processing of personal data for which the responsibility lies with the State can only be carried out abroad to the extent that a level of Adequate protection is ensured.*
>
> *4. The State promotes digital inclusion and raises public awareness of the issues digital. He is committed to the development of sovereignty digital technology of Switzerland and collaborates in its implementation. "*

Highlights for education:
The constitutional amendment indirectly helps create a safer and more transparent environment for scientific research and data sharing, key elements of OS initiatives.

Related document:

→ 2022 - Proposal of the amendment on September 29, 2022 by Bendahan Samuel who is a Swiss Socialist Party politician and member of the National Council elected from Canton of Vaud in 2017. He submitted a proposal to include the right to digital integrity in the Federal Constitution of the Swiss Confederation amending Article 10(2) as follows : "2. Every person has the right to personal freedom, in particular to physical, psychological and digital integrity and freedom of movement". The National Council refuses to follow up on the proposal on 11 December 2023.

▲ 2022 - University of Geneva Open Access Policy

Background:
In accordance with the Action Plan of National Open Accessstrategy, the University of Geneva published a Policy Open Access ensuring consistency with other higher education institutions and the requirements of donors. The Open Policy University Access will be used to clarify and mark the position and requirements of the University of Geneva in terms of dissemination and access to scientific publications, thus demonstrating his engagement ([Uni20], p. 13).

Highlights for education:
The University of Geneva promotes OA as part of its mission to provide high-quality education and conduct advanced research.
The policy is based on the free and unlimited sharing of publicly funded research results. Authors are responsible for making their publications freely accessible, preferably through Gold OA, avoiding hybrid journals. The University of Geneva supports authors in maintaining rights to publications and choosing the least restrictive license.
The university encourages training and participation in the OA research community and manages the UNIGE Archive for the digital preservation of works.
The University of Geneva covers the costs of Gold OA publishing under certain conditions and negotiates agreements with publishers. Evaluate research considering publications in the archive and regularly informing the academic community about its OA initiatives.

Related document:

→ 2017 - National Open Access Strategy [os17]

→ 2013 - Declaration of San Francisco on Open Access to Research Assessment, or DORA [Cag13]

→ 2003 - Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities [ber03]

▲ 2020 - University of Geneva: “Road map Science ouverte à l’Université de Genève. Feuille de route pour un partage des connaissances scientifiques 2020 - 2023” [Uni20].

Background:
The Road map is an action plan aiming at implement OS principles within the University of Geneva.

Highlights for education:
The action plan (a) defines the objectives to reach for the OS consisting in (i) managing change, an organization and governance adapted to respond to the institutional challenges of OS and meet the needs of researchers should be put in place; (ii) facilitating change, researchers should be provided with the means and techniques for managing, storing, securing, sharing, and archiving scientific knowledge; (iii) explaining the change, awareness should be raised among the university community and communication about the change should be improved, (iv) supporting researchers in managing and disseminating their projects by providing training on OS tools and practices tailored to their discipline, as well as supporting the adoption of OS practices.

The action plan aims to (b) promote the transparency and sharing of research

data, with an awareness of the challenges related to data protection and intellectual property, (c) foster publication in OA mode, with the aim of making the results of research funded by the University accessible to the public, (d) support the adoption of principles similar to those of the DORA in order to lead to the implementation of new evaluation criteria based on qualitative indicators, the encouragement of open sharing of research results and greater recognition of practices that favor the transparency and accessibility of scientific information, (e) raise awareness and provide training on OS issues and practices not only to research teams, but also to teachers, students, support staff and academic leaders.

Related document:

→ 2020 - Sorbonne Declaration on research data rights

→ 2018 - Commission Recommendation (EU) 2018/790 of 25 April 2018 on access to and preservation of scientific information

→ 2018 - National Open Access Strategy - Action Plan

→ 2018 - LERU: Open Science and its role in universities: A Roadmap for cultural change, Advice Paper No 24

→ 2018 - Plan S

→ 2017 - National Open Access Strategy [os17]

→ 2016 - Council Conclusions on the transition towards an Open Science system. Competitiveness Council, 26-27 May 2016 [Cou16]

→ 2013 - Declaration of San Francisco on Open Access to Research Assessment, or DORA [Cag13]

→ 2007 - OECD Principles and Guidelines for Access to Research Data from Public Funding

→ 2018 - Institutional policy on Research data management

▲ 2018 - University of Geneva Institutional policy on research data management

Background:
The University of Geneva has an institutional policy on the management of research data. The policy applies to data derived from observations, experiments, or existing sources used as primary sources for internally or externally funded scientific research (Art. 1).

Highlights for education:
The University aims to promote (a) the accessibility and dissemination of research results, recognizing the importance of appropriate data management. The decision on long-term data storage is based on their usefulness, quality and possibility of reuse, considering economic, technical, legal and administrative aspects. The policy promotes (b) compliance with lender regulations and offers infrastructure

support and data management services. Researchers are responsible for data management, must comply with laws, contractual and ethical obligations, ensuring the quality and accessibility of data.

Related document:

→ 2012 - Memento: “Intégrité dans la recherche scientifique”

→ 2007 - OECD Principles and Guidelines for Access to Research Data from Public Funding

Chapter 3

Analysis of Outcomes

In this chapter, we will focus on the discursive analysis of the acts, documents and initiatives mentioned in the four reference areas identified. This will allow us to get a clear and immediate picture of the research results. The expected results of the research include the definition of the regulatory landscape at the international, European, Swiss Confederation and Geneva canton levels, as well as the evaluation of the effectiveness of the acts, examining their binding nature and their effectiveness, and the relationships that exist between the acts adopted at different governance level.

3.1 International Regulatory Framework

Open Science: Acts and Documents

There are several types of documents that are not legally binding but have an impact on the higher education and research landscape in the Member States, including UNESCO/ICSU Declaration on Science and the Use of Scientific Knowledge and the Science Agenda - Framework for Action (1999); Berlin Declaration on Open Access to Knowledge in the Humanities and Sciences (2003); Bethesda Statement on Open Access Publishing (2003); Budapest Declaration on Open Access to Scientific Publishing (2002); OECD Council Recommendation on Access to Publicly Funded Research Data (2021); UNESCO Recommendation on Science and Scientific Researchers (2017); the San Francisco Declaration on OA to Research Evaluation DORA (2012); UNESCO Recommendation on Open Science (2021); and G7 Statement OSWG Science Ministers on Open Science (2023). These documents take the form of guidelines and ethical principles for shaping policies, practices and collaborations in science, research and education. In particular, they aim to promote openness and accessibility in scientific endeavors and to foster international cooperation for the advancement of knowledge and innovation.

In terms of priority, the UNESCO/ICSU Declaration (1999) focuses on the importance of scientific research and political involvement in resolving issues of science and society. Berlin Declaration (2003) focuses on the dissemination of knowledge through traditional means and OA via the Internet, and sets out principles and requirements for OA without binding legal value. The Bethesda Statement (2003) aims to stimulate discussion in the biomedical research community about OA to primary scientific literature. It also has no binding legal value. Budapest Declaration on OA to Scientific Publishing (2002) focuses on OA to scholarly literature and provides principles, strategies and commitments without binding legal value. OECD Recommendation (2021) provides guidelines aimed at improving access to publicly funded research data and other relevant digital objects, without binding legal value, but of great importance in international research policy scientific research. UNESCO Recommendation (2017) provides ethical and policy guidance for science, without binding legal force. The San Francisco Declaration or DORA (2012) focuses on evaluating the quality of scientific production and citation of primary scientific literature, and offers ethical recommendations and guidelines to improve the evaluation of scientific research. The UNESCO Recommendation (2021) provides an international framework for OS policy and practice, influencing national and international policies. Finally, the G7 Declaration (2023) promotes the equitable dissemination of scientific knowledge by supporting the publication of government-funded scientific publications and the sharing of scientific data.

Open Science: International Private Initiatives

Among the international initiatives, we identify Free Software Foundation of 1985, which aims to remove restrictions on the copying, redistribution, interpretation, and modification of computer programs; the ArXiv.org Repository (1991), an online repository of electronic preprints of scientific articles that promotes openness, collaboration, and scholarly depth; the SPARC (1998) that supports OA publishing; the Creative Commons (2001), which provides public domain licenses and tools that allow people and organizations to grant copyright permission for creative and scholarly works. Biomed Central (2008), which publishes high-quality research in the life, health, and medical sciences. The Research Data Alliance (2013), which aims to help develop standards and best practices for research data worldwide; the US Public Library of Science (2018), which distributes scientific research online and free of charge and promotes the free dissemination of scientific content; and finally, the Plan S initiative (2018), which aims to make scientific publications fully and immediately accessible through open repositories or OA journals by 2021.

Open Educational Resources: Acts and Documents

There are several types of documents that are not legally binding but have an impact on the higher education and research landscape in the Member States, including OECD Report: Giving Knowledge for Free: The Emergence of Open Educational Resources (2007); Paris Open Educational Resources Declaration (2012); UNESCO Education Strategy 2014-2021 (2014); UNESCO Recommendation on Open Educational Resources (2019); and UNESCO Guidelines for the Development of Open Educational Resources Policies (2019). Although these documents are not legally binding, they provide guidance to governments and stakeholders on the development and implementation of policies related to Open Educational Resources, influencing national policies and practices.

With regard to precedence, OECD Report (2007) is one of the first documents to highlight the importance of OER and explore the concept, focusing on the role of education in economic, social and environmental progress and on government initiatives to improve education systems. The Paris OER Declaration promotes equitable and universal access to quality education through the use of OER at all levels of education, developing OER strategies and policies, and supporting the use of open licensing for educational materials. UNESCO (2015) commits the education community to work towards achieving SDG 4. OER is mentioned as one of the means to achieve the goals of Education 2030, including the goal of ensuring inclusive and equitable education for all. UNESCO Recommendation on OER (2019) represents the first international regulatory instrument on OER and provides guidance to governments and other actors on how to develop and implement OER policies and strategies in orer to exploit the potential of OER in supporting equitable, inclusive, open and participatory education. Finally, UNESCO COL Guidelines (2019) promote critical thinking on how OER can be used to address challenges under the SDG 4 for Education 2030. It provides a framework for developing systematic and effective policies on OER, involving governments and institutions at various levels to achieve common objectives within a national educational framework.

Global Citizenship: Acts and Documents

There are various types of documents that are not legally binding but have an impact on the higher education and research landscape of the Member States, including some UNESCO publications such as: the UNESCO, Global Citizenship Education. An Emerging Perspective. Proceedings of the Technical Consultation on Global Citizenship Education (2013); UNESCO Global Citizenship Education, Topics and Learning Objectives (2014); UNESCO Global Citizenship Education: preparing learners for the challenges of the 21st century (2014); and the resolution of the UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, A/70/L.1 (2015). These documents provide frameworks and recommendations for promoting global awareness, sustainability and citizenship values in educational contexts worldwide.

With regard to precedence, UNESCO (2013) is a one of the first document presenting the perspectives emerging from a technical consultation on GCE, offering an informative framework on the development of GCE and future directions. UNESCO (2014) is one of the first document that provides pedagogical guidelines for the integration of GCE into national education systems. In the same year, UNESCO (2014) is a publication aiming to improve understanding of GCE and to identify innovative approaches and good practices in this field. Finally, UN Resolution, A/70/L.1 (2015) outlines the 2030 Agenda for Sustainable Development, which includes specific objectives to promote global citizenship through education.

Sustainability: Acts and Documents

There are various types of documents that are not legally binding but have an impact on the higher education and research landscape of the Member States, including: Resolution of the UN General Assembly, Decade of Education for Sustainable Development, A/RES/57/254 (2003); Paris Open Educational Resources Declaration, World Congress on Open Educational Resources UNESCO (2012); Resolution of the UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, A/70/L.1 (2015); UNESCO SDG 4 - Education 2030, Incheon Declaration and Framework for Action (2015); Framework for the implementation of Education for Sustainable Development beyond 2019 (2019); and Education for Sustainable Development: a roadmap (2020). These documents can be used to influence policies, set agendas and guide actions related to ESD and to integrate the principles of sustainability into education systems.

In terms of precedence, the UN General Assembly Resolution, A/RES/57/254 (2013), marks the beginning of the Decade of Education for Sustainable Development and sets the goal of integrating the principles and practices of sustainable development into education. The Paris Declaration promotes the exchange and development of OER as an integral part of ESD (2012). UN General Assembly resolution, A/70/L.1 (2015), endorses the 2030 Agenda for Sustainable Development, which includes the goal of making education a key tool for addressing global challenges and promoting sustainable development. UNESCO SDG 4 (2015) highlights the critical link between education and sustainability, promoting a holistic approach to learning, responsible citizenship and lifelong learning opportunities. UNESCO (2019) proposes a new direction for ESD beyond 2019, emphasizing the need for coordinated action to achieve the 2030 ESD goals. Finally, UNESCO (2020) presents a roadmap for ESD to achieve the SDGs, emphasizing the need to integrate ESD into global, regional, national and local policies.

3.2 EU Regulatory Framework

Open Science: Acts and Documents

There are different types of documents, some binding and some not. The ones that are binding are the following: Directive EU 2019/1024 of the European Parliament and of the Council of June 20, 2019 on open data and the re-use of public sector information (recast), based on Art. 288(3) TFEU; EU Regulation 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe - The Framework Program for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations EU no. 1290/2013 and EU No 1291/2013; Regulation EU 2022/868 of the European Parliament and of the Council of May 30, 2022 on European data governance and amending Regulation EU 2018/1724 (Data Governance Act); Regulation EU 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonized rules on fair access to and use of data and amending Regulation EU 2017/2394; and Directive EU 2020/1828 (Data Protection Act), based on Art. 288(1) TFEU.

The following acts are non-binding but have an impact on the European higher education and research landscape, such as: Council Conclusions on the transition towards an OS system Competitiveness Council, 26-27 May 2016; Commission Recommendation EU 2018/790 of 25 April 2018 on access to and preservation of scientific information; Council Decision EU 2021/764 establishing the specific program implementing Horizon Europe - the framework program for research and innovation; Council Recommendation EU 2022/2415 of 2 December 2022 on the guiding principles for knowledge valorization; and European Commission, EU Grants: Horizon Europe Program Guide (2023) (see Glossary).

In terms of priority, the Council Conclusions (2016) emphasize the transition to an OS system and promote OA and interoperability of research data. The Commission Recommendation (2018) aims to improve the accessibility and preservation of scientific information by promoting OS and public access to research data. Directive EU 2019/1024 focuses on opening up data in the public sector, extending its scope and promoting digital innovation. Regulation EU 2021/695 establishes the Horizon Europe Framework Program, promoting open research and innovation and public access to research results. Council Decision EU 2021/764 establishing the specific programme implementing Horizon Europe. Regulation EU 2022/868 (Data Governance Act) aims to improve the conditions for data sharing in the internal market by establishing a harmonized framework for data exchange and promoting cooperation between Member States. Council Recommendation EU 2022/2415 outlines guiding principles for the valorisation of knowledge to promote the effective use of research results for the benefit of society. European Commission, EU Grants: Horizon Europe Program Guide (2023) provides guidance on the funding available under the Horizon Europe program, which supports research and innovation in the European Union. Finally, Regulation EU 2023/2854 (Data Act) establishes harmonized rules for fair access to and use of data, helping to create a trusted, secure and human-centered data society and economy.

Open Science: European Initiatives

Among the European initiatives we identify SparcEurope (2004), which provides leadership to the European higher education and research communities to maximize access to and reuse of European research and education resources, while respecting diversity and equity. European Open Science Cloud (2015), which aims to build a common, federated, European environment for the open sharing of research data and access to services, and to promote trust in the reuse of scientific data through principles such as FAIR Data (findable, accessible, interoperable, reusable). The Open Science Policy Platform (2016) provides recommendations and concrete actions to promote OS practices, ensure data accessibility and interoperability, promote research integrity, and foster collaboration. Open Access Infrastructure for Research in Europe-Advance (2021) enhances existing infrastructure and fosters collaboration to support OA and open data goals in Europe, as well as improving skills and competencies through training activities; and European University Association OS Agenda 2025 (2022), which aims to support members of the Association in the transition to OS by contributing to the development of policies at national, European and institutional level that are conducive to the diffusion of OS and by encouraging universities to play a more active role in regulatory and funding processes. These initiatives are part of a regulatory and practical drive towards greater OA, sharing and transparency in scientific research and higher education in Europe.

Open Educational Resources: Acts and Documents

There are several types of documents that are not legally binding but have an impact on the higher education and research landscape in the Member States, including: Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Rethinking education: Investing in skills for better socio-economic outcomes. COM (2012) 669 final; Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Opening up Education: Innovative teaching and learning for all through new technologies and open educational resources, COM (2013) 654 final; and Opening up Education: A support framework for higher education institutions (Report, 2016). These documents highlight the importance of openness in education and promote the adoption of open educational resources and new technologies to improve access, quality and effectiveness of education in Europe.

In terms of priorities, Communication from the European Commission, COM (2012) 669 final emphasizes the importance of providing the right skills for employment, increasing the efficiency and inclusiveness of education and training institutions, and working together with all relevant actors. The Communication from the European Commission, COM (2013) 654 final, proposes a European agenda to stimulate innovative ways of learning and teaching through new technologies and digital content. The aim is to contribute to the Europe 2020 goals of increasing the EU's competitiveness and growth through a better skilled workforce and more jobs. Finally, Opening up Education: A Support Framework for Higher Education Institutions (Report, 2016) presents a support framework for higher education institutions to open up education.

Open Educational Resources: European Initiatives

Among the most important initiatives, we find Open Discovery Space Project (2007-2013), which addresses the challenges of e-learning in Europe by promoting sharing and collaboration between teachers and students through a multilingual platform of educational resources. and laid the foundation for sharing educational resources in Europe. Open Education Europe (2013) has extended this vision by providing a central portal to access OER across Europe. Both initiatives aim to promote collaboration and dissemination of online educational resources, thereby improving the accessibility and effectiveness of digital education.

Global Citizenship: Acts, Documents, and European Initiatives

We draw your attention to two documents that are not legally binding, such as: Global Citizenship Education: preparing learners for the challenges of the 21st century (2014), which aims to prepare learners for the challenges of the 21st century through global citizenship education, and European Parliamentary Research Service Report: Implementation of the Action on Citizenship Education in the EU. European Implementation Assessment (2021), which evaluates the implementation of citizenship education actions in the EU and provides information and recommendations to the European Parliament to strengthen citizenship education in the EU. Also, the Erasmus+ project: Boosting GCE using digital storytelling (BRIGHTS) 2016-2018 - has played an important role in this area, promoting GCE in formal and non-formal settings in Europe using digital storytelling techniques. The development of these documents reflects a growing focus on global citizenship education in Europe, from the identification of 21st century challenges in the oldest document, to the implementation of specific projects such as BRIGHTS within programs such as Erasmus+, to the evaluation and monitoring of citizenship education policies in the EU in the most recent document.

Sustainability: European Initiatives

There are a number of non-binding documents that represent important milestones in this area, including Communication from the European Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal (2019), which mentions education as an essential part of the green transition, with a focus on skills acquisition, including up-skilling and re-skilling, and investment in learning for environmental sustainability. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A European skills agenda for sustainable competitiveness, social fairness and resilience (2020) proposes a series of actions to achieve the objectives, including investment in learning for the green and digital transition. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Biodiversity Strategy for 2030 Bringing nature back into our lives (2020), which identifies education as a key element in promoting a better understanding of the importance of biodiversity and encouraging active involvement in its conservation. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on achieving the European Education Area by 2025 (2020), which identifies education as a key element in promoting sustainability, with a focus on changing behaviour, increasing skills for the green economy and promoting new sustainable education and training infrastructures. The Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development promotes education as a means of integrating sustainability into all aspects of education and training, with specific recommendations for Member States on the inclusion of learning for the green transition and sustainable development in educational programmes. Finally, GreenComp: the European Competence Framework for Sustainability (2022), which aims to help education systems train students to think systemically and critically, with a focus on caring for the planet and its future.

3.3 Swiss Regulatory Framework

Open Science: Acts and Documents

There are different types of documents, some binding and others not. Federal Act on the Promotion of Research and Innovation (2012) is binding while the following are not: National Open Access Strategy (2017); National Open Access Strategy - Action Plan (2018); Swiss National Open Research Data a Strategy (2021); and Swiss National Strategy: Open Research Data Action Plan (2021).

In terms of priority, we highlight Federal Act on the Promotion of Research and Innovation (2012), which which aims to stimulate scientific research, promote science-based innovation, support the analysis and exploitation of research results, ensure cooperation between research institutions, and ensure the effective use of federal funds for research and innovation, as well as some nationwide coordination of higher education policy and related action plans, including National OA Strategy (2017), which aims to ensure that all publicly funded academic publications are freely accessible online by 2024. It emphasizes cost transparency, negotiation with publishers, and coordination of resources. Swiss National OA Strategy - Action Plan (2018) is an extension of the Swiss National OA Strategy, detailing concrete steps for Swiss higher education institutions to achieve the goals set out in the strategy. Swiss National Open Research Data Strategy (2021) focuses on the sharing of research data from publicly funded projects in Switzerland. It sets out guiding principles and objectives for open research data practices to support researchers and improve the accessibility and reusability of data: Open Research Data Action Plan (2021) collaborative action to integrate and develop open research data management practices in Switzerland. It provides conditions for the organization, governance and funding of open research data initiatives. These documents reflect an evolution towards OA and open research practices, and an effort to promote transparency, collaboration and accessibility in the academic and research community over the long term.

Open Science: Swiss Initiatives

Among the various initiatives, we will take a closer look: Swiss Personalised Health Network Initiative (2017) promotes the creation of coordinated infrastructures to make research-relevant health data interoperable and shareable. SNFS Open Research Data Policy (2017) requires the creation of data management plans for all funding applications submitted to the SNFS, promoting transparency and reproducibility in scientific research. Swiss Data Science Center (2017) supports the adoption of open research practices to maximize the impact and reuse of research results, as well as the development of the capacities needed to conduct open research. link.hub.ch project (2019) promotes data discovery and sharing in the social sciences by promoting the adoption of the FAIR Principles for Data Management and the implementation of an open and accessible data storage system. Educa Educational Data Management (2021) promotes the accessibility of educational data and the potential sharing of anonymized datasets for research purposes, and the SWITCH Initiative - Research Data Connectome (2022): Promotes the reuse of open data and supports the development of open data practices by harmonizing and connecting metadata from different sources.

Open Educational Resources: Acts, Documents, and Swiss Initiatives

There are some documents developed by the following institutions: University of Basel with the Digitalization in Teaching Strate gy (2018), which aims to involve students and teachers through the innovative use of technology in teaching and to raise their awareness of the legal and ethical aspects of digitalization. Zurich University of Applied Sciences with the Open Educational Resources Strategy (2019) and Policy (2020), which promotes the sharing of knowledge and educational resources, leading to greater accessibility and diversity of educational materials. The swissuniversities program 8: "Strengthening digital skills in teaching" (2021-2024), which can improve the digital skills of teachers, enabling them to use digital tools and resources more effectively in teaching. This could lead to more engaging learning experiences that are more responsive to students' needs, while fostering collaboration and exchange of practices between Swiss academic institutions. Among some of the Swiss initiatives, we highlight eduhub's Special Interest Group (SIG) OER: (2008), which aims to address conceptual and practical issues related to the collaborative creation, use and reuse of OER, with the aim of integrating this topic into the quality of teaching in Swiss educational institutions, and SWITCHtube: SWITCHtube, which supports the OER initiative with a dedicated video channel that facilitates the creation and exchange of educational video content.

Sustainability: Acts, Documents, and Swiss Initiatives

Two non-binding documents are reported as follows: 2030 Sustainable Development Strategy (2020) promotes the importance of education, research and innovation in achieving the priority objectives of the Strategy, in particular in the field of sustainable education and the promotion of OS. (2024-2027) Action Plan related to the 2030 Sustainable Development Strategy (2024) focuses on the inclusion of education, research and innovation as transversal drivers for sustainable development.

3.4 Geneva Regulatory Framework

Open Science: Acts and Documents

There are some documents issued by the University of Geneva such as UNIGE Institutional Policy on Research Data Management (2018), which focuses on promoting the accessibility and dissemination of research results, recognizing the importance of appropriate data management; UNIGE "Roadmap Science opens at the University of Geneva. Roadmap for a part of the scientific knowledge 2020 - 2023", which defines objectives for the implementation of the principles of OS within the University of Geneva, including the promotion of transparency and sharing of research data, OA publishing and support for training and awareness on aspects of OS; and finally, the Constitutional Law amending the Constitution of the Republic and Canton of Geneva (Cst-GE), which introduces the right to be forgotten in the context of digital integrity, promotes the protection of personal data and raises awareness on digital issues, indirectly contributing to the creation of a more secure and transparent environment for scientific research and data sharing.

Chapter 4

Graphical Insights: International and European Influence in Swiss Open Science and OER

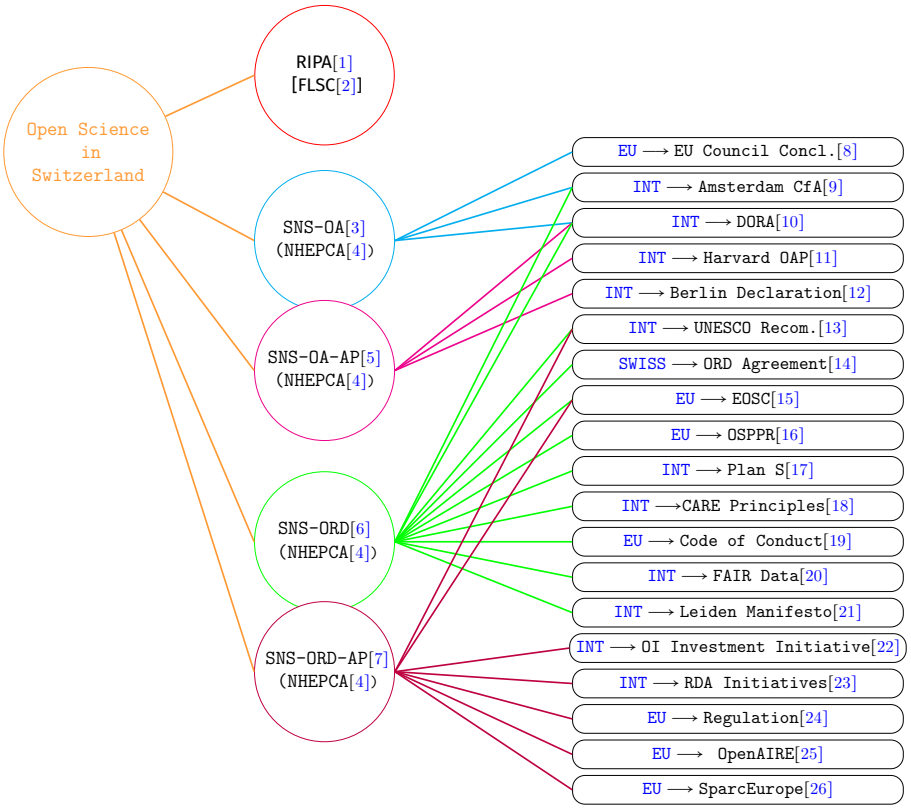
4.1 The Swiss Open Science: International and European Influences

The following diagram represents the relationship between OS in Switzerland and various international and European documents and initiatives. In the center of the diagram, there is the concept of "OS in Switzerland", symbolized by a main circle. Radiating from this central circle are arrows that connect the main concept to smaller circles, which represent related Swiss documents concerning the OS. The smaller circles contain abbreviations and acronyms that represent the names of documents. For example, "FA" represents the "Federal Act", while "SNS-OA" indicates the "Swiss National Strategy on Open Access", and so on. Each acronym o small name is also identified by a number in square brackets, such as "[1]", "[2]", which corresponds to a legend that provides further details.

There are also two pairs of circles that overlap, representing combinations of strategies and action plans based on those strategies.

The smaller circles are connected to the documents by arrows. The documents, represented by rectangles, are labelled as coming from the European Union (EU) or from the international scope (INT). These documents are essential for understanding and implementing OS in Switzerland.

1



1 2012 - Federal Act on the Promotion of Research and Innovation, SR 420.1
2 Federal Law of the Swiss Confederation
3 2017 - National Open Access Strategy
4 Nationwide Higher Education Policy Coordination Act
5 2018 - Swiss National Open Access Strategy - Action Plan
6 2021 - Swiss National: Open Research Data Strategy
7 2021 - Swiss National: Open Research Data Action Plan
8 2016 - Council Conclusions on the transition towards an Open Science system, 26-27 May 2016
9 2016 - Amsterdam Call for Action on Open Science
10 2013 - Declaration of San Francisco on Open Access to Research Assessment
11 2012 - Good practices for university open-access policies - Harvard Open Access Project
12 2003 - Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities
13 2021 - UNESCO Recommendation on Open Science
14 2020 - Agreement on the Development of a National ORD Strategy and corresponding Action Plan
15 2018 - European Open Science Cloud
16 2018 - Open Science Policy Platform Recommendations
17 2018 - Plan S
18 2018 - CARE Principles for Indigenous Data Governance
19 2017 (update 2023) - The European Code of Conduct for Research Integrity
20 2016 - FAIR Data Principles
21 2015 - The Leiden Manifesto
22 2018 - Invest in Open Infrastructure Initiative
23 2013 - Research Data Alliance
24 2011 - Regulation (EC) No 723/2009. Rules for creating a ERIC Infrastructures
25 2008 - OpenAIRE
26 2004 - SparcEurope

Figure 4.1: International and European Influences

4.2 Swiss OER Landscape: International and European Influences

The diagram illustrates the connections and relationships between various OER initiatives in Switzerland and international and European documents.

The diagram presents the OER in Switzerland that form the core of this network, showing the central role and the presence of local initiatives and policies aimed at promoting the sharing of and access to educational resources. What stands out is the close relationship with international and European documents and initiatives. These include reports UNESCO, European Commission communications, and other global initiatives that outline guidelines and recommendations for the development and adoption of OER.

1

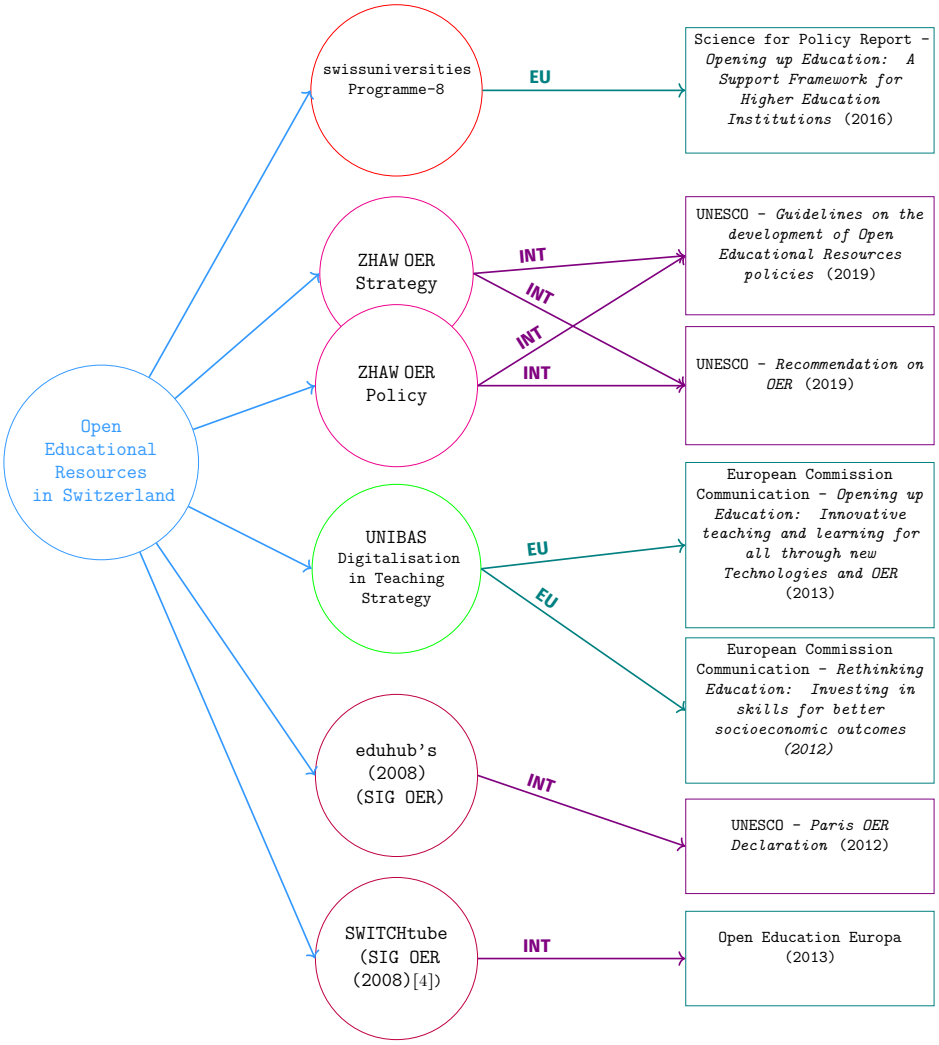


Figure 4.2: Swiss OER Landscape: International and European Influences

4.3 A Comparative Examination of Swiss Open Science and OER

The diagram provides an overview of Swiss acts, documents, and initiatives related to OS and OER.

In the middle of the diagram, we find the types of document in the three areas of competence: first, the federal law, then the documents issued by the bodies responsible for funding academic research, and finally the initiatives. To the right of the diagram are documents specifically focused on OS, such as the "Swiss National Strategy: Action Plan for Open Research Data" and the "National Strategy for Open Access", and so on. On the left of the diagram, there are documents related to OER, such as programs like "swissuniversities Program-8: Enhancing digital skills in teaching", and so on. At the bottom of the diagram, there are a number of projects and initiatives related to OS, on the right side, and OER, on the left side. These include projects such as "SWITCH Project - Research Data Connectome" and initiatives such as the "eduhub OER SIG". The arrows connecting the various components illustrate the relationships between the different initiatives and the main themes of OS and OER in the Swiss context.

1

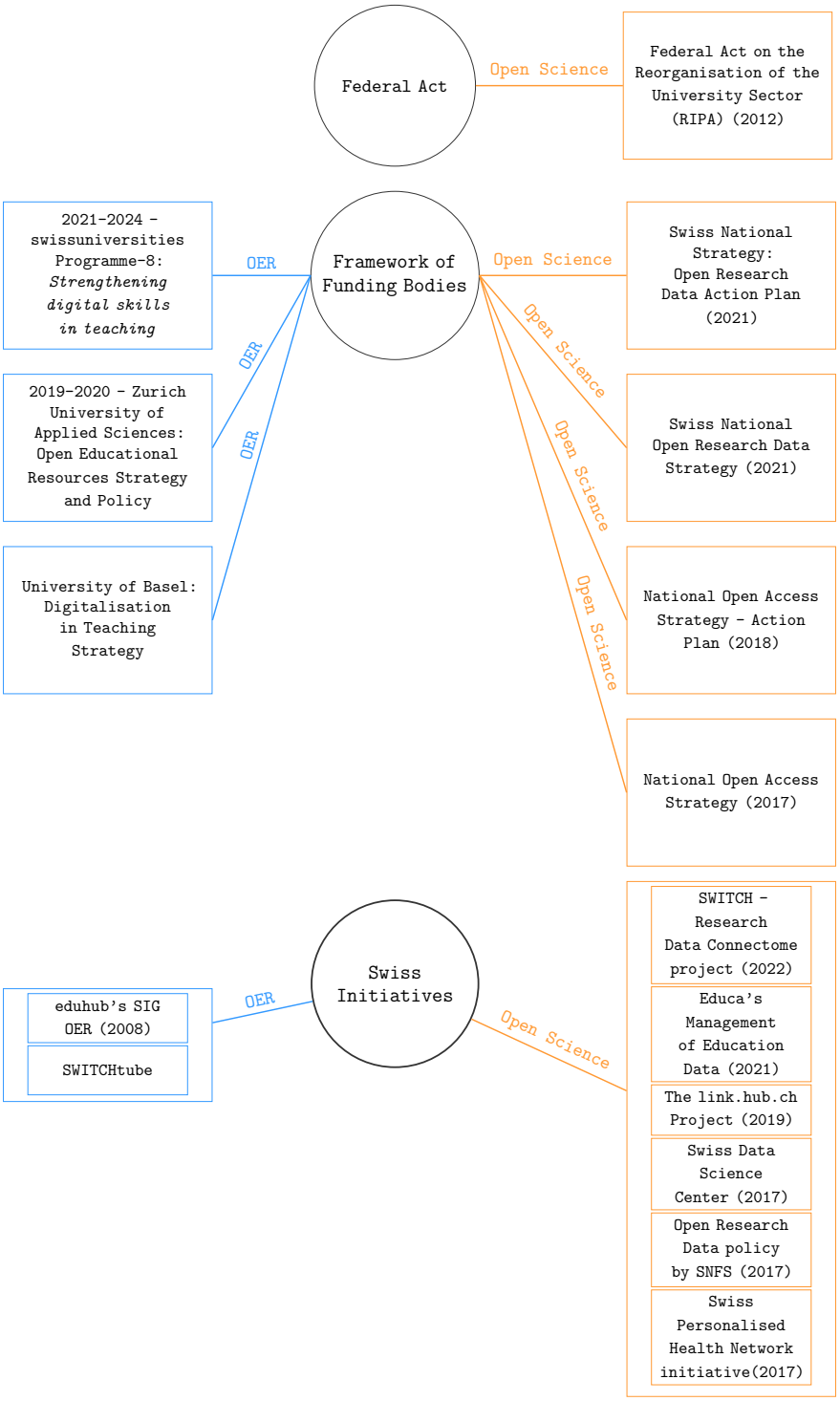


Figure 4.3: Comparative Examination of Swiss Open Science and OER

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Appendix

International

Open Science

International Statement of Principles

a) 2013 - Declaration of San Francisco on Open Access to Research Assessment, or DORA

b) 2003 - Berlin Declaration on Open Access to Knowledge in Sciences and Humanities

c) 2003 - Bethesda Statement on Open Access Publishing

d) 2002 - Declaration of the Budapest Open Access Initiative

G7

a) 2023 - G7 Science Ministers' Statement on Open Science

OECD

a) 2021 - OECD Recommendation of the Council concerning Access to Research Data from Public Funding

UNESCO

a) 2021 - UNESCO Recommendation on Open Science

b) 2017 - UNESCO Recommendation on Science and Scientific Researchers

c) 1999 - UNESCO and ICSU. Declaration on Science and the Use of Scientific Knowledge and the Science Agenda – Framework for Action

International Initiatives

a) 2018 - Plan S

b) 2018 - US Public Library of Science

c) 2013 - Research Data Alliance

d) 2008 - Biomed Central

e) 2001 - Creative Commons

f) 1998 - Scholarly Publishing and Academic Resources Coalition

f) 1991 - ArXiv.org Repository

g) 1985 - Free Software Foundation

Open Educational Resources

OECD

a) 2007 - OECD. Rapport: Giving Knowledge for Free: The Emergence of Open Educational Resources

UNESCO

a) 2019 - UNESCO. Guidelines on the development of Open Educational Resources policies

b) 2019 - UNESCO Recommendation on Open Educational Resources

c) 2015 - UNESCO. SDG 4 - Education 2030, Incheon Declaration and Framework for Action. For the Implementation of SDG 4, Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All, ED-2016/WS/28

d) 2012 - UNESCO Education Strategy 2014-2021

e) 2012 - Paris Open Educational Resources Declaration, World Open Educational Resources Congress UNESCO

Global Citizenship

UN

a) 2015 - Resolution of the UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, (A/70/L.1)

UNESCO

a) 2014 - Global Citizenship Education, Topics and Learning Objectives

b) 2014 - Global Citizenship Education: preparing learners for the challenges of the 21st century

c) 2013 - UNESCO, Global Citizenship Education. An emerging perspective.

Sustainability

UN

a) 2015 - Resolution of the UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, (A/70/L.1)

b) 2003 - Resolution of the UN General Assembly, Decade of Education for Sustainable Development, (A /RES/57/254)

UNESCO

a) 2020 - UNESCO. Education for sustainable development: a roadmap

b) 2019 - UNESCO. Framework for the implementation of Education for Sustainable Development beyond 2019

c) 2015 - UNESCO. SDG 4 - Education 2030, Incheon Declaration and Framework for Action

d) 2012 - Paris Open Educational Resources Declaration, World Open Educational Resources Congress UNESCO

Europe

Open Science

1.1 EU Acts and Documents

a) 2023 - Regulation EU 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonized rules on fair access to and use of data and amending Regulation EU 2017/2394 and Directive EU 2020/1828 (Data Act)

b) 2023 - EU Grants: Horizon Europe Programme Guide

c) 2022 - Council Recommendation EU 2022/2415 of 2 December 2022 on the guiding principles for knowledge valorisation

d) 2022 - Regulation EU 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation EU 2018/1724 (Data Governance Act)

e) 2021 - Council Decision EU 2021/764 establishing the specific program implementing Horizon Europe — the framework program for research and innovation

f) 2021 - EU Regulation 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Program for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations EU no. 1290/2013 and EU No 1291/2013

g) 2019 - Directive EU 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (recast)

h) 2018 - Commission Recommendation EU 2018/790 of 25 April 2018 on access to and preservation of scientific information

i) 2016 - Council Conclusions on the transition towards an Open Science system Competitiveness Council, 26-27 May 2016

1.2 European Initiatives

a) 2022 - EUA Open Science Agenda 2025

b) 2021 - Open Access Infrastructure for Research in Europe (OpenAIRE)-Advance

c) 2016 - The Open Science Policy Platform (OSPP)

d) 2015 - European Open Science Cloud (EOSC)

e) 2004 - SparcEurope

Open Educational Resources

2.1 EU Acts and Documents

a) 2016 - JRC Science for Policy Report: Opening up Education: A Support Framework for Higher Education Institutions

b) 2013 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Opening up Education: Innovative teaching and learning for all through new Technologies and OER, COM (2013) 654 fina

c) 2012 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social tee and the Committee of the regions. Rethinking Education: Investing in skills for better socioeconomic outcomes. COM (2012) 669 final

2.2 European Initiatives

a) 2013 - Open Education Europa

b) 2007-2013 - Open Discovery Space Project: A socially-powered and multilingual open learning infrastructure to boost the adoption of eLearning resources

Global Citizenship

2.3 EU Acts and Documents

a) 2021 - EPRS Report Implementation of citizenship education action in the EU. European Implementation Assessment

b) 2016-2018 - Erasmus+ Project Boosting GCE using digital storytelling (BRIGHTS)

Sustainability

2.4 EU Acts and Documents

a) 2022 - Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development 2022/C 243/01, ST/9795/2022/INIT, OJ C 243, 27.6.2022, p. 1–9

b) 2022 - GreenComp: the European sustainability competence framework

c) 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM/2020/380 final

d) 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on achieving the European Education Area by 2025, COM (2020) 625 final

e) 2020 - Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Skills Agenda for sustainable competitiveness, social fairness and resilience, COM (2020) 274 final

f) 2019 - Communication from the European Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: "The European Green Deal", COM(2019) 640 final

Switzerland

Open Science

1.1 Federal Act

a) 2012 - Federal Act on the Reorganization of the University Sector (RIPA), SR 420.1

1.2 The Framework of Funding Body

a) 2021 - Swiss National Strategy: Open Research Data Action Plan

b) 2021 - Swiss National Open Research Data Strategy

c) 2018 - National Open Access Strategy - Action Plan

d) 2017 - National Open Access Strategy

1.3 Swiss Initiatives

a) 2022 - SWITCH - Research Data Connectome project

b) 2021 - Educa's Management of Education Data

c) 2019 - The link.hub.ch Project

d) 2017 - Swiss Data Science Center

e) 2017 - Open Research Data policy by SNFS

f) 2017 - Swiss Personalised Health Network initiative

Open Educational Resources

2.1 The Framework of Funding body and Higher Education

a) 2021-2024 - swissuniversities Program-8: "Strengthening digital skills in teaching"

b) 2019 and 2020 - Zurich University of Applied Sciences Open Educational Resources Strategy and Policy

c) 2018 - University of Basel: Digitalisation in Teaching Strategy

2.2 Swiss Initiatives

a) 2008 - eduhub's SIG OER

b) n.d. - SWITCHtube

Sustainability

3.1 Framework of the Swiss Confederation

a) 2024 - (2024-2027) Action Plan related to the 2030 Sustainable Development Strategy

b) 2020 - 2030 Sustainable Development Strategy

Geneva

Open Science

1.1 Acts and Documents

a) 2022 - Constitutional Law Modifying the Constitution of the Republic and Canton of Geneva. (*Loi constitutionnelle modifiant la constitution de la République et canton de Genève (Cst-GE) (Pour une protection forte de l'individu dans l'espace numérique)*) (12945)

b) 2022 - University of Geneva Open Access Policy

c) 2020 - University of Geneva: "Road map Science ouverte à l'Université de Genève. Feuille de route pour un partage des connaissances scientifiques 2020 - 2023"

d) 2018 - University of geneva Institutional policy on research data management