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Promoting Effective Digital-Age Learning

A European Framework for Digitally-Competent Educational Organisations

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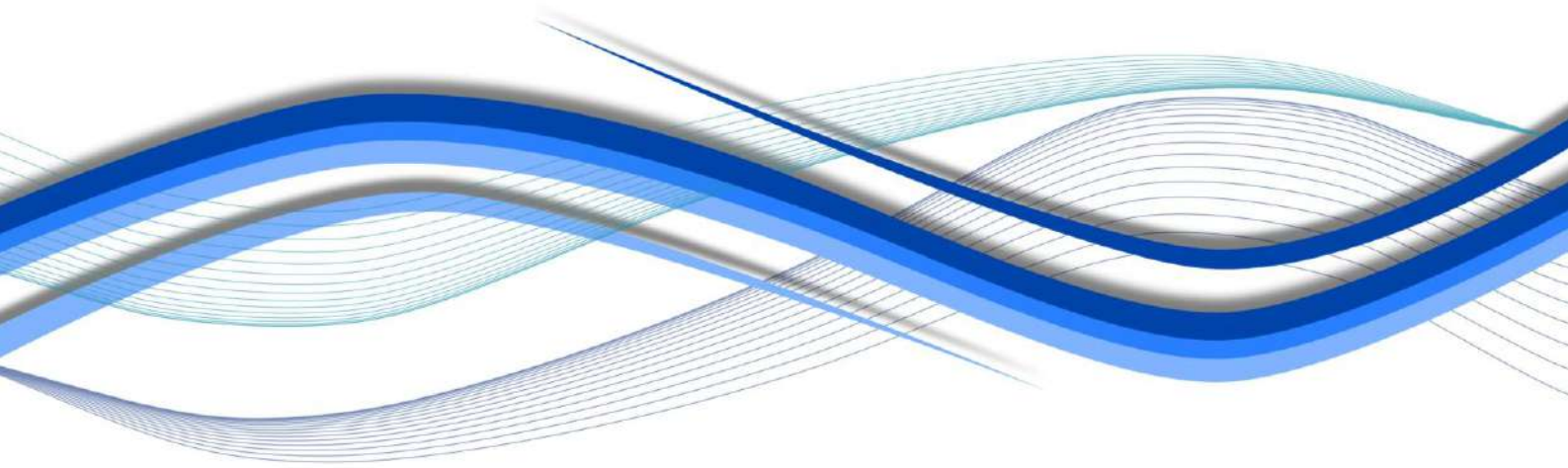
2015



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Abstract
Promoting Effective Digital-Age Learning - A European Framework for Digitally-Competent Educational Organisations
Digital technologies are being incorporated in exciting and promising ways at all levels of education. To consolidate progress and to ensure scale and sustainability education institutions need to review their organisational strategies in order to enhance their capacity for innovation and to exploit the full potential of digital technologies and content. This report presents the *European Framework for Digitally-Competent Educational Organisations* (DigCompOrg). This framework can facilitate transparency and comparability between related initiatives throughout Europe and play a role in addressing fragmentation and uneven development across the Member States. The primary purposes of DigCompOrg framework are (i) to encourage self-reflection and self-assessment within educational organisations as they progressively deepen their engagement with digital learning and pedagogies (ii) to enable policy makers to design, implement and evaluate policy interventions for the integration and effective use of digital learning technologies.

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Foreword

JRC-IPTS has been immersed for more than ten years in research that supports the development of policy and practice in the rapidly evolving field of digital learning, beginning with a workshop and report on *The Future of ICT and Learning in the Knowledge Society*[1]. This workshop and report posited the need for a renewed vision of learning to address new skills and competences required for Europe to achieve smart, sustainable and inclusive growth. They presented a vision of *learning spaces* that embrace the potential of digital learning technologies (then referred to as *ICT for Learning and Skills*) to shape and contribute to expected future characteristics of learning: connected, social, personalised, relevant, trusted, pleasant, emotional, creative, flexible, open and certified. This vision of learning spaces was learner-centric, while at the same time acknowledging that learning is a social process.

Ten years later, many of the issues encapsulated within this vision remain on the educational agenda. Personal and educational technologies have evolved rapidly since then, in terms of functionality, ubiquity and societal penetration. Today, the impact of digital technologies, content and processes can be seen in all educational sectors (e.g., schools, higher education and also informal and non-formal learning), affecting all aspects of the educational value chain (e.g., curricular reform, teaching and learning practices, assessment, initial and continuing teacher professional development) and encompassing all educational actors (teachers, learners, school leaders).

Digital technologies are enablers of a step change in learning and teaching practices; however, they do not guarantee it. Change that is both sustainable and at scale requires a multi-faceted systemic approach, including investment in infrastructure and in teacher professional development, curriculum change, rethinking students' assessment and teachers' appraisal, making the right decisions about curriculum-related content, promoting collaboration and open content and practices, and integrating all these within an environment that ensures good governance and oversight of quality.

Successive JRC-IPTS research initiatives support European policies for the modernisation and innovation of education and training. In particular, the report presents here introduces the *European Reference Framework for Digitally-Competent Educational Organisations* (DigCompOrg) developed through a mixed-research approach including comprehensive review of academic and grey literature, in-depth analysis of existing frameworks and self-assessment questionnaires promoting the integration of digital technologies in education and training systems at national/international level, and a process of expert and stakeholder consultation.

The DigCompOrg conceptual framework may guide different trajectories of integration and effective use of digital learning technologies and stimulate further research in the field, contributing to the momentum for modernising Education and Training systems across Europe.

This report is part of the study "Furthering Innovative Education" (InnovativEdu) launched by DG Education and Culture (DG EAC) and JRC-IPTS IS Unit[2] in December 2014, and it will run until June 2017.

More information on the DigCompOrg framework and links to the related publications can be found on the webpage: https://ec.europa.eu/jrc/en/digcomporg

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1 http://ftp.jrc.es/EURdoc/eur22218en.pdf

2 The Institute for Prospective Technological Studies (IPTS) is one of the seven scientific institutes of the European Commission's Joint Research Centre (JRC). JRC-IPTS consists of six research units, one of which is the Information Society Unit. See more at https://ec.europa.eu/jrc/en/institutes/ipts

Acknowledgements

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The particular contribution of Mario Roccaro in providing valuable and detailed comments on earlier versions of this report is acknowledged, as is his role in coordinating with Konstantin Scheller the group-work and peer-learning sessions on the DigCompOrg framework during the meetings of the ET2020 Working Group on Digital and Online Learning. We also thank the members of the Working Group for providing valuable insights and contributing to the discussion at various stages of the framework development.

The authors would also like to thank the participants of the expert workshops held in Seville on 20 November 2014, in which the preliminary results of the DigCompOrg were presented and discussions about the further development of the conceptual framework were conducted. Our special thanks go also to the experts who provided additional information about the analysed frameworks and self-assessment tools (see fact sheets in the Annex 3) as well as to the experts who provided feedback and insights on draft versions of the framework (list of all experts contributed in the development of the DigCompOrg framework is in the Annex 1).

Last but not least, thanks go to colleagues from the JRC-IPTS that provided comments and suggestions, in particular: Riina Vuorikari, Margherita Bacigalupo, Jonatan Castaño Muñoz, and Andreia Inamorato dos Santos. Thanks also go to Patricia Farrer for proof-reading and editing the final version of this report.

Executive summary

Policy context

The Europe 2020 strategy acknowledges that Education and Training (E&T) have a strategic role to play for Europe to remain competitive, overcome the current economic crisis and grasp new opportunities. Digital transformation of E&T systems is present in several Europe 2020 flagship initiatives, and boosting digital skills and online learning is among the priorities of President J.C. Juncker. Also, the European Commission's Opening up Education initiative emphasises the need for educational institutions to review their strategies in order to integrate digital technologies in their teaching, learning and organisational practices.

However, the digital transformation of educational organisations is progressing at different rates, with different aims and outcomes in different regions and countries in Europe. As a result, **there is little scope for mutual learning** about best practices or about any failures in the process of integration or effective uses of digital learning technologies. Hence, there is a risk that cooperation opportunities are lost, work is duplicated and mistakes or sub-optimal implementations will be repeated.

Key conclusions

Digital technologies are being incorporated in exciting and promising ways at all levels of education. To consolidate progress and to ensure scale and sustainability, education institutions need to review their organisational strategies, in order to enhance their capacity for innovation and to exploit the full potential of digital technologies and content.

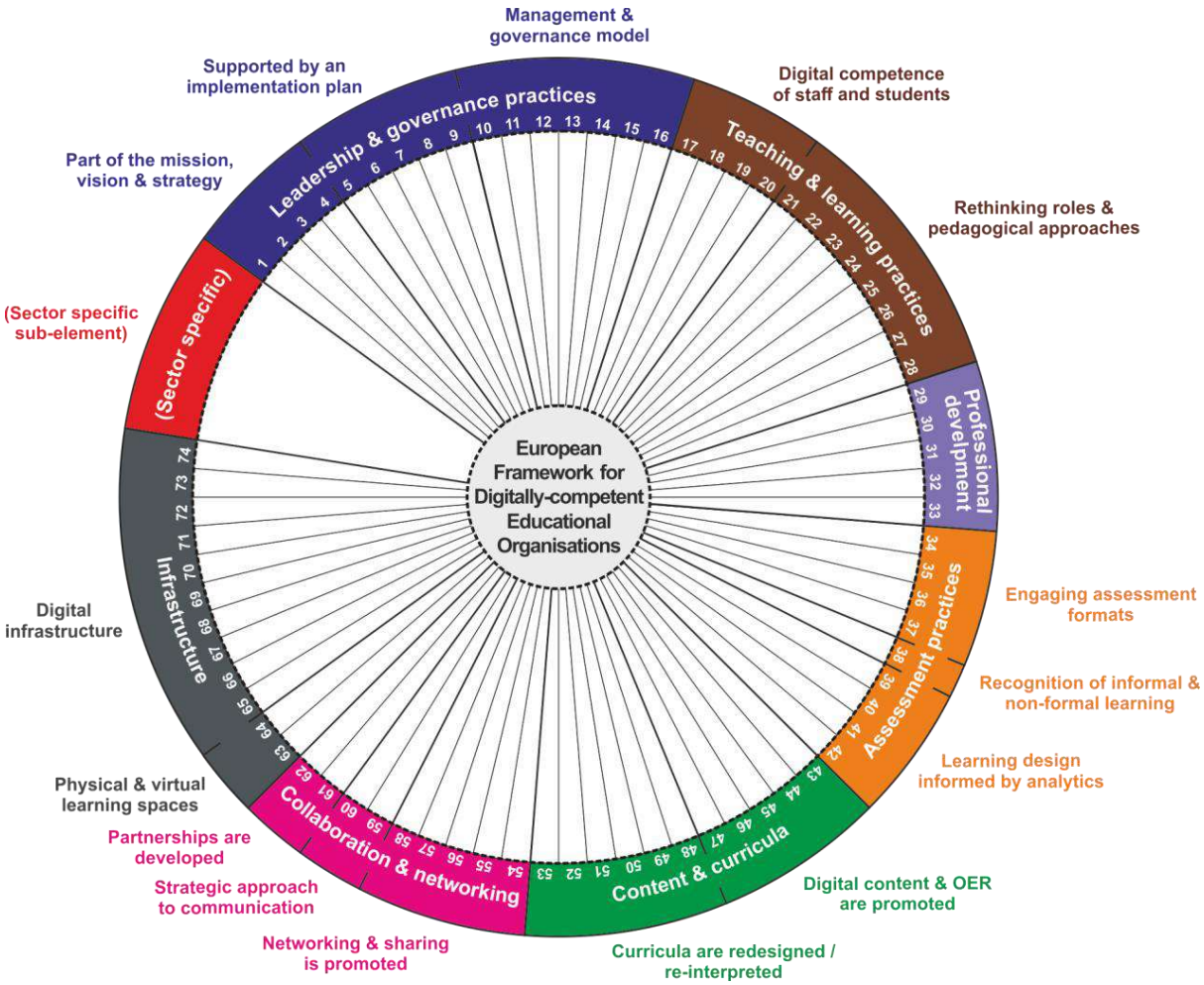
Several frameworks and self-assessment tools are in use in a number of European countries, but no attempt has hitherto been made to develop a pan-European approach to organisational digital capacity. **A European reference framework that adopts a systemic approach can add value by promoting transparency, comparability and peer-learning.**

This is the aim of the *European Framework for Digitally-Competent Educational Organisations* (DigCompOrg). It can **facilitate transparency and comparability** between related initiatives throughout Europe, and it can also play a role in addressing fragmentation and uneven development across the Member States. In addition, the Framework is valuable in its own right because **it can be used by educational organisations** (i.e., primary, secondary and VET schools, as well as higher education institutions) to guide a process of self-reflection on their progress towards comprehensive integration and effective deployment of digital learning technologies. DigCompOrg can also be used as a strategic planning **tool for policymakers** to promote comprehensive policies for the effective uptake of digital learning technologies by educational organisations at regional, national and European level.

Main findings

The key finding of the study is that **a common conceptual approach** at European level, capable of supporting the development of digital capacity in educational organisations, **is both desirable and attainable**.

The DigCompOrg framework has **seven key elements** and **fifteen sub-elements** that are common to all education sectors. There is also scope for the addition of sector-specific elements and sub-elements. For each of the elements and sub-elements of DigCompOrg, **a number of descriptors** were developed (74 in total). Diagrammatically, the elements, sub-elements and descriptors of DigCompOrg are presented as the sectors of a circle, with an emphasis on their inter-relatedness and inter-dependence.



Related and future JRC work

The European Commission's Opening up Education initiative underscores the importance of developing '…**digital competence frameworks and self-assessment tools for learners, teachers and organisations**' and calls for a concerted effort to seize the opportunities of the digital revolution and to improve the knowledge-base on digital skills for the 21st century.

JRC-IPTS, in addition to the DigCompOrg framework, has also developed the Digital Competence Framework for learners (DIGCOMP), and is now developing a Digital Competence Framework for teachers.

The next phase of DigCompOrg will focus on the development of a *Self-Assessment Questionnaire for Digitally-Competent Schools* (i.e., primary, secondary and VET schools) based on DigCompOrg descriptors.

Quick guide

Digital learning technologies, in the context of DigCompOrg, constitute a key enabler for educational organisations, which can support their efforts to achieve their particular mission and vision for quality education. Deep, as distinct from superficial, integration of digital technologies requires significant educational innovation and implies a process of planning for **change on three basic dimensions: pedagogical, technological and organisational**.

DigCompOrg provides a **comprehensive and generic conceptual framework** that reflects all aspects of the process of systematically integrating digital learning in educational organisations from all education sectors. It is adaptable to the particular contexts within which educational organisations, intermediaries or project developers operate (e.g., sector-specific elements, sub-elements or descriptors may be added).

DigCompOrg complements rather than supersedes other frameworks and tools already in use for specific purposes: e.g., the DIGCOMP framework that can be used to develop relevant aspects of students' digital competence.

The primary purposes of DigCompOrg are (i) to **encourage self-reflection and self-assessment within educational organisations** as they progressively deepen their engagement with digital learning and pedagogies (ii) **to enable policy makers** (at local, regional, national and international level) **to design, implement and appraise programmes, projects and policy interventions** for the integration of digital learning technologies in E&T systems.

DigCompOrg is designed to **focus mainly on the teaching, learning, assessment and related learning support activities** undertaken by a given educational organisation. As such, it is not intended to address the full range of administrative and management information systems that may be in use within the organisation. DigCompOrg includes elements, sub-elements and descriptors that may be regarded as linked to 'organisational responsibilities' (e.g., Infrastructure) or to 'individual responsibilities' (e.g., Teaching and Learning practices). This reflects the fact that a digitally-competent educational organisation needs a **balanced combination** of strong leadership and governance (for vision and **top-down strategies**) and staff and stakeholders capable of taking personal responsibility (for self-initiated actions and **bottom-up efforts and initiatives**).

1. Introduction

Education is widely recognised as one of the most important levers for ensuring competitiveness and prosperity in the age of globalisation. In view of that, nations around the globe are striving to modernise their education and training (E&T) systems in order to keep pace with the digital economy and society.

The Europe 2020 strategy [3] acknowledges that a fundamental transformation of Education and Training (E&T) is needed to provide the knowledge, skills and competences required if Europe is to remain competitive, overcome the current economic crisis and grasp new opportunities. Innovating E&T systems is a key priority in several flagship initiatives of the Europe 2020 strategy,[4] in particular the Agenda for New Skills and Jobs, Youth on the Move, the Digital Agenda and the Innovation Agenda. In addition to the digital transformation of education and training, boosting digital skills and online learning are also mentioned among the new priorities of the Juncker Commission, in particular those focused on the Digital Single Market [5] and on Jobs, Growth and Investment[6].

There is a recognised need for educational organisations [7] such as schools and universities to integrate and effectively use digital technologies in order to achieve their core *mission*: to educate *students* to be successful in a complex and interconnected world that faces rapid technological, cultural, economic, informational, and demographic change.

In this context, digital technologies and content play an increasingly important role in fostering and driving educational innovation and, consequently, many policies at local, regional, national and international levels are promoting their use in E&T systems (e.g., Kampylis et al., 2013). The effective use of digital learning technologies is also a key element in the European Commission's strategy for opening up and modernising E&T systems. As emphasised in the Opening up Education initiative (European Commission, 2013), E&T institutions need to review their organisational strategies and improve their capacity to promote innovation and exploitation of the potential of new technologies and digital content. In view of that, there is a clear need for European Commission to develop in collaboration with stakeholders and Member States (MS) '*…digital competence frameworks and self-assessment tools for learners, teachers and organisations*' (ibid., p. 7).

The research discussed in this report builds upon and complements the Digital Competence Framework (DIGCOMP) for citizens[8] (Ferrari, 2013) and it is intended to accompany and support ongoing policy activities by fostering the integration and effective use of digital technologies by educational organisations. Educational organisations and policymakers in Europe are currently active in promoting and integrating digital technologies in their teaching, learning and organisational practices. However, modernisation of educational organisations is progressing at different speeds and with different aims and outcomes in different regions and countries in Europe (e.g. European Commission, 2015). As a result, there is little scope for mutual learning about best practices and/or failure, and there is a risk that cooperation opportunities are lost, work is duplicated and mistakes or sub-optimal implementations are prone to be repeated.

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3 http://ec.europa.eu/europe2020/index_en.htm

4 For an overview see: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/flagship-initiatives/index_en.htm

5 https://ec.europa.eu/digital-agenda/en/digital-single-market

6 http://ec.europa.eu/archives/juncker-commission/priorities/01/index_en.htm

7 A glossary of key terms can be found in Annex 1. The first occurrence of each of the terms included in this glossary has been underlined in the text and a hyperlink to the glossary is provided.

8 The framework identifies the key components of digital competence and is already been implemented in several MS (https://ec.europa.eu/jrc/en/digcomp/implementation).

2. Objectives and methodology

The present work aims to address these problems by developing a European Framework for Digitally-Competent Educational Organisations (DigCompOrg). DigCompOrg has been developed in the context of the *Furthering Innovative Education in Europe* (InnovativEdu) research study, which was launched by DG Education and Culture and JRC-IPTS IS Unit in December 2014, and it will run until June 2017. The InnovativEdu study has the following objectives:

(i) To develop a European reference framework for Digitally-Competent Educational Organisations (DigCompOrg - which is the focus of the present report), accompanied by a self-assessment questionnaire (SAQ) that will be developed based on DigCompOrg;
(ii) To develop a digital competence framework for teachers, accompanied by a SAQ;
(iii) To analyse effective policy models for the integration and innovative use of digital technologies in E&T systems; and
(iv) To provide research evidence on the use of learning analytics in E&T contexts and their potential implications for education policies.

The methodological approach taken for the development of DigCompOrg was for the most part qualitative (see an overview in Figure 1), based on four major elements that are described in more details in the following sections:

- comprehensive review of academic and grey literature;
- an inventory of existing frameworks and SAQs promoting the integration of digital technologies in education and training systems at national/international level;
- in-depth analysis of selected frameworks/SAQs; and
- a number of expert and stakeholder consultations.

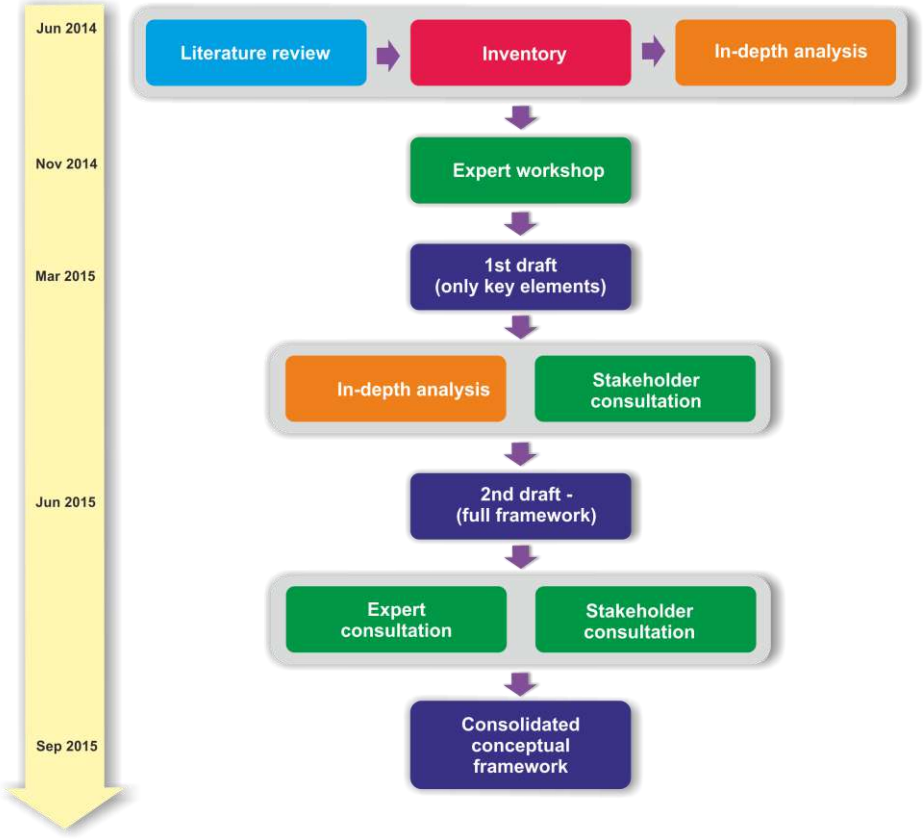

Figure 1: Overall methodology for the development of DigCompOrg

2.1 Literature review

As a starting point for the development of DigCompOrg, JRC-IPTS has conducted an extensive review of academic and grey literature. In particular, data collection and content analysis covered a wide range of materials such as technical, evaluation and policy reports; journal and conference papers; book chapters; websites, wikis and blogs; promotional literature (e.g., leaflets); video clips; and slideshow presentations. The key aims of the literature review were:

- to develop a conceptualisation of the term *Digitally-Competent Educational Organisations* including definitions, key elements, models, enablers and barriers;
- to develop an inventory by identifying and collating frameworks and SAQs related to Digitally-Competent Educational Organisations.

Through the literature review, a number of frameworks and SAQs in Europe and other world regions were identified. A list of 20 'promising cases' was compiled and an analysis was undertaken by JRC-IPTS for selecting the frameworks/SAQs to be analysed further.

2.2 Inventory

The analysis covered the following criteria:

- verification that each framework or SAQ is (or can be) used by educational organisations for the self-assessment of their practices in integrating and effectively using digital technologies and/or by policy makers for informing related policy initiatives;
- verification that the initiative is still ongoing and that reliable and relevant data can be captured;
- mapping of the frameworks and SAQs, using a mapping schema developed by JRC-IPTS (see Figure 2), in order to ensure that the selected frameworks/SAQs reflect the broadest possible coverage of:
    - *implementation phase*: describing the stages of development, ranging from limited application (pilot) to more consolidated up-take (scale) to established use (mainstream);
    - *access level*: referring to geographical coverage of the framework/SAQ, from a restricted area (regional), to a broader realm (national), up to an international or worldwide level (international);
    - *educational sector*: capturing the educational sectors in which the frameworks/SAQs are applicable, from one sector to two or more (multi-sector);
    - *information source(s)*: indicating who provides the information/data about the integration of digital technologies in a given educational organisation, ranging from one person (single contributor), to more than one (multiple contributors), up to a wide range of stakeholders (wide range of contributors);
    - *scope of usage*: referring to the use of the results of the framework/SAQ, ranging from its use solely by individuals, to its use at the level of the organisation or beyond, e.g., aggregation at the system level).
- verification that each case reflects a genuine and unique approach that can provide insights for the development of DigCompOrg and (in the next phase) the related SAQ.

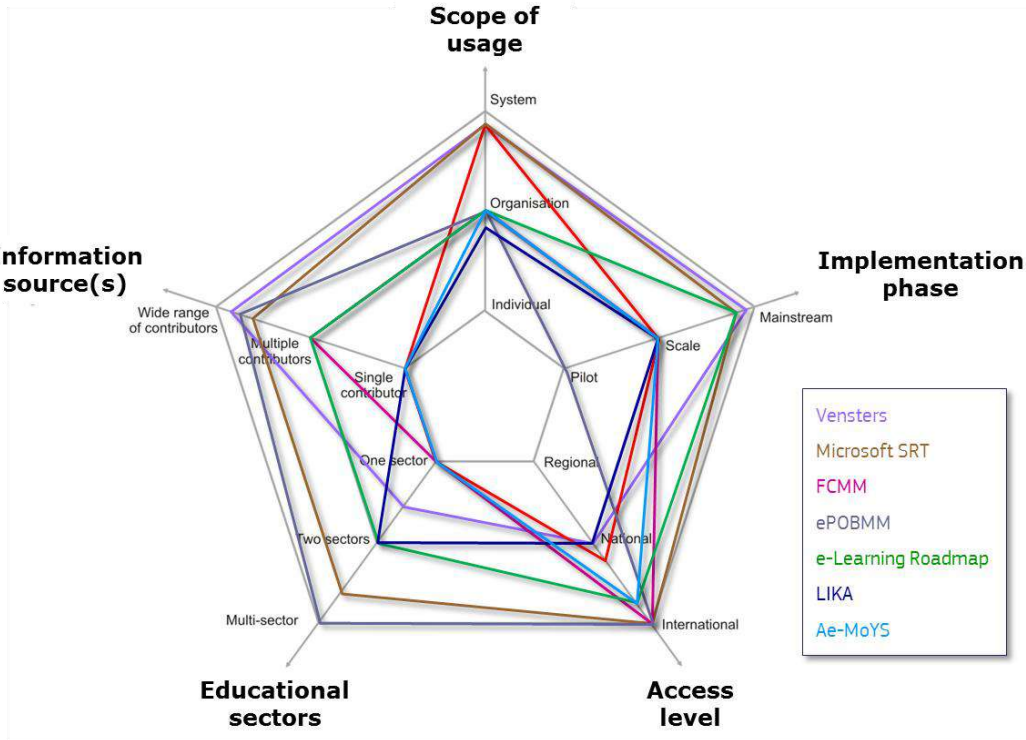

Figure 2: Mapping schema[9]

Table 1 presents an overview of the 15 frameworks/SAQs selected by JRC-IPTS for in-depth analysis based on the abovementioned criteria. Two of the selected frameworks/SAQs do not focus explicitly on integration of digital technologies: HEInnovate targets higher education institutions' entrepreneurial and innovation potential and Vensters is primarily a tool for schools' accountability and transparency. However, the research team decided to analyse them in depth (making an exception to the first criterion) because they offer valuable insights about the structure and implementation practices of frameworks/SAQs for educational organisations.

Table 1: Overview of the frameworks and self-assessment questionnaires analysed

FW/SAQ	Type	Elements / sub-elements / descriptors or statements	Since	Education sector / geographical coverage	Who provides the info
eLEMER	FW and online SAQ	4/40/100	2010	P-S[10], Hungary	Teachers, Students
Opeka	FW and online SAQ	3/17/145	2012	P-S, Finland	Teachers
Microsoft SRT	FW & online SAQ	4/16/16x6	2009	P-S, Worldwide	Leader(s)
LIKA	FW & online SAQ	4/-/78	2013	P-S, Sweden	Leader(s)
Ae-MoYS	FW & online SAQ	5/-/30	2011	P-S, EU	ODS school coordinator
e-Learning Roadmap	FW & and printed matrix	5/-/27x4	2009	P-S, Ireland	Leader(s)

[9] The mapping exercise conducted during the workshop in Seville with the invited experts and includes the 7 frameworks/SAQs they represented.

[10] P-S stands for primary and secondary education, while HE for higher (tertiary) education. FW stands for framework and ODS for Open Discovery Space (http://opendiscoveryspace.eu). The full titles of the frameworks/SAQs are provided in Table 3.

School mentor	FW and online SAQ	6/-/30x5	N/A	P-S, Norway	Leader(s)
NAACE SRF	FW and online SAQ	6/11/55x4	2005	P-S, UK	Multiple options
FCMM	FW and online SAQ	5/-/5x5	2010	P-S, EU	Multiple options
Speak Up NRP	FW and online SAQs	Different SAQs	2003	P-S, USA	A variety of stakeholders
Vensters	Online SAQs	20 indicators	2008	P-S, The Netherlands	A variety of stakeholders
SCALE CCR	FW	8/28/-	2012	mainly P-S, Worldwide	There is no SAQ
ePOBMM	FW and online SAQ	7/-/60x5	2013	mainly HE, EU	-
Jisc	FW and SAQs (as MS Excel file)	6/-/69	2010	HE, UK	Leaders (Business and ICT)
HEInnovate	FW & online SAQ	7/-/44	2013	HE, Worldwide	A variety of stakeholders

An inventory was created including two Excel sheets for each framework/SAQ providing:

(i) all the available information based on desk research and the structured fact sheets provided by experts (Annex 4);

(ii) the full framework/SAQ.

The structure of the inventory is presented in the Table 2 below.

Table 2: Inventory structure

Title and web address(es)	Name of the framework/SAQ and hyperlink to its website(s)
Type	If it is framework, SAQ or both
Short description	Providing a brief context necessary to better understand it
Geographical scope	Which region(s)/country(-ies) it targets or where it is implemented
Educational sector	Primary, secondary, VET, tertiary education
Language(s)	The language(s) in which it is available
Time frame	Including starting and end date of development/implementation
Developer(s)	The entity(-ies) and stakeholders involved in its development
Background	If there are precursors, similar frameworks/SAQs
Key person(s)	Name(s) and contact details of key person(s) involved in its development and/or implementation
Funding/business model	How it is being financed including sources of public/corporate funding
Objectives	Addressing its overall and specific objectives
Focus area	Its key purpose (e.g. integration of digital technologies)
Policy relevance	If it is related to any educational policy at regional, national or EU level
User profile	The population who is directly targeted by the framework/SAQ (sometimes a combination e.g. head teachers, teachers & students) and who provides the data (and when)
Implementation strategy	How the policy initiative is implemented, number of educational organisations targeted, if there are incentives for its use, etc.
Usage	Who has access to the results, how they can be used, if allow to compare your results to others' etc.
Impact	Qualitative and quantitative outputs generated as direct results of its implementation e.g., number of educational organisations reached
Key elements	Headings and description of its key elements
Sub-elements	Headings and description of its sub-elements
Questions / statements	In case of SAQs, the number of questions/statements used, their type, how many are mandatory etc.
Levels/scale	In case of SAQs, the scale/maturity levels used
Lessons learnt	Particular observations / interpretations / conclusions regarding its development and implementation

Publications/sources	Related publications, reports and online documentation
Research notes	Notes taken by the research team
Full framework/SAQ	The full framework/SAQ was inserted in a separate Excel sheet

Almost all the frameworks and SAQs analysed come from the European education context (with the exception of Speak Up NRP from USA), as the aim was to develop a conceptual framework to serve European educational organisations. The list of frameworks and SAQs presented above is not exhaustive but it is quite representative of the available frameworks and SAQs across Europe, especially for school sector, as 12 out of the 15 frameworks/SAQs analysed are for primary/secondary education. The paucity of frameworks/SAQs for higher education institutions might reflect the fact that, because their ICT infrastructures are generally highly developed, they have hitherto not focused on the development of their digital capacity to support teaching and learning and in particular new pedagogical practices.

Some of the frameworks and SAQs analysed have been developed over a period of more than ten years (such as the Speak Up NRP in USA) or are tools that have built on previous initiatives that started some years ago (e.g., the NAACE self-review framework in UK is the successor of Becta Self-review Framework[11]). Furthermore, most of the frameworks/SAQs analysed have been developed by public organisations and research institutions (with the exception of Microsoft SRT). All of the frameworks/SAQs analysed are available to use free of charge, with the exception of NAACE SRF.

Some of these frameworks/SAQs are clearly pilots, such as the ePOBMM, which was set up in the context of the Europortfolio[12] project. On the other hand, others, such as the Vensters in the Netherlands, have already reached the mainstreaming stage (Figure 2). In terms of geographical coverage, the frameworks/SAQs analysed range in scope from national initiatives in a local language, such as LIKA that is offered in Swedish, to Microsoft SRT or HEInnovate that are supra-national cross-border initiatives covering a large number of countries.

The actors involved in these frameworks/SAQs are represented mainly by school leaders who have provided the related information about the integration of digital technologies by the educational organisation at hand. In some frameworks/SAQs a variety of stakeholders provide related information by using customised questionnaires (see for instance the Speak-up NRP). Most of the initiatives have both a framework and a self-assessment questionnaire or matrix. A majority of these questionnaires/matrices are offered as online tools, although one is offered in printed form (e-Learning Roadmap). The frameworks/SAQs analysed have from 3 to 8 key elements. Some are relatively brief (e.g., the FCMM), which is a matrix with 5X5 descriptors, while other tools are more complex (e.g., the ePOBMM with 30x5 descriptors).

2.3 In-depth analysis

The aim was to analyse in-depth and compare the selected frameworks/SAQs in order to identify commonalities, points of divergence and gaps, to get insights about their design, focus, methodology and implementation strategies, and to synthesise best practices and lessons learnt.

Table 3 provides a brief summary of the focus, salient features and lessons learnt from all 15 frameworks/SAQs analysed. Valuable insights for the development of DigCompOrg were also gleaned from other frameworks and online tools:

11 http://webarchive.nationalarchives.gov.uk/20101102103713/https:/selfreview.becta.org.uk/about_this_framework

12 http://www.europortfolio.org/events/eportfolios-and-open-badges-maturity-matrix-webinar

- The Four in Balance model[13] (Kennisnet, 2013), intended to help Dutch schools that use digital technologies to make choices that will improve the quality and productivity of the education they provide;
- The World Bank's SABER-ICT[14] research initiative that identified a set of eight themes that are generally addressed to the global database of policy documents related to ICT use in education (vision and planning; ICT infrastructure; teachers; skills and competences; learning resources; ICT use in the management of the education system; monitoring and evaluation, assessment, research and innovation; equity, inclusion and safety);
- The Balanced Scorecard[15], which is widely used in business as a model that drives performance.

The starting point and the basis for the in-depth analysis is the multi-dimensional concept of Creative Classrooms (CCR) that JRC-IPTS has developed on behalf of DG EAC in the context of the Up-scaling Creative Classrooms in Europe (SCALE CCR) study (Kampylis, Bocconi & Punie, 2012; Bocconi, Kampylis & Punie, 2013). CCR are innovative learning environments that fully embed and exploit the innovation potential of digital technologies for learning and teaching practices in formal, non-formal and informal settings. The CCR conceptual framework offers a systematic approach to the implementation of digital technologies in an educational context and consists of eight encompassing and interconnected key dimensions: Content and Curricula; Assessment; Learning Practices; Teaching Practices; Organisation; Leadership and Values; Connectedness; and Infrastructure.

Another framework/SAQ that has been examined as an exemplar to inform the elaboration of DigCompOrg is the HEInnovate developed by European Commission and OECD. Although HEInnovate is primarily a self-assessment tool for Entrepreneurial Higher Education Institutions, lessons learnt from its structure and implementation strategies have been proved very valuable for the development of DigCompOrg.

In the first phase of the in-depth analysis, key elements of the selected frameworks/SAQs (Table 1) were mapped in a matrix (see Annex 3) leading to the development of the first version of DigCompOrg.

In the second phase of the in-depth analysis, the JRC-IPTS team focused on the sub-elements and related descriptors included in each of the frameworks/SAQs analysed, in order to further develop and detail DigCompOrg. The sub-elements and statements/descriptors from the frameworks/SAQs analysed were mapped against the key elements of DigCompOrg. The final sub-elements and descriptors of DigCompOrg presented in Chapter 3 are the output of:

- the mapping exercise;
- inputs from the literature review;
- inputs from expert and stakeholder consultations.

Based on these inputs, the research team (JRC-IPTS and Jim Devine) took the final decisions relating to the development, organisation and presentation of DigCompOrg.

[13] https://www.kennisnet.nl/fileadmin/kennisnet/publicatie/vierinbalans/Four_in_balance_Monitor_2013.pdf
[14] http://saber.worldbank.org/index.cfm?indx=8&tb=10
[15] http://balancedscorecard.org/Resources/About-the-Balanced-Scorecard

Table 3: Focus, salient features and lessons learnt from the in-depth analysis

Title / short title & hyperlink	Focus	Salient features and lessons learnt
eLEMER	**ICT integration** – whole school perspective	Users are asked to provide possible **evidence** (e.g. lesson plans, school regulations, e-portfolios etc.) to support their responses. Provides a **country snapshot**. **66% of teachers** and **50% of students** are to be surveyed. Comparison with the national average. Aggregated data are used for **policy making**.
Opeka	Evaluation of teachers' and schools' **digital competences** and culture	**Qualitative research** is conducted to validate tool results. There are also questions about the **quality of the tool itself**. Comparison with other teachers from the same school or the same town, teachers who teach the same subject, or with all teachers. Information from the tool is used to modify Finnish ICT **policy in education**.
Microsoft Innovative Schools Toolkit and Self-Reflection Tool / Microsoft SRT	Change management tool for **ICT integration**	Focus on creating a **vision**. Support to manage **change process**.
Ledning, Infrastruktur, Kompetens, Användning / LIKA	Support schools to evaluate, plan and prioritise **ICT integration**	Complemented by a **blog with Q/A, videos**. **The user decides who has access** to the results (only me, my school, or anyone but anonymously). Comparisons only offline.
Assessing the e-Maturity of your School / Ae-MoYS	Strengths and weaknesses in the use of **ICT for teaching and learning**	No comparisons, but results are used to create the **school's action plan. An indicative percentage of integration** in provided in the case of many items.
Planning and implementing e-learning in your school / e-Learning Roadmap	Where schools are currently positioned in **e-Learning** and where they would like to go	**Printed** planning tool, **part of a Handbook for planning** and implementing eLearning. No comparison but whole school planning and self-evaluation is enabled.
School mentor	Reflect on facilitation and execution of **pedagogical use of ICT**	**Complemented by Teacher Mentor**. Intended for **head teachers** but for use in collaboration with other staff. No comparisons, as only the school has access to the results and can decide to give or not access to the school's proprietor.
Self-review Framework / NAACE SRF	Structured route for reviewing and improving **schools' use of technology – annual cost**	School reaches a certain level (with supporting evidence) and applies for a national **quality accreditation ICT Mark**.
Future Classroom Maturity Model / FCMM	Enables teachers and schools to assess the **level of innovation with technology**	OER **under CC**. Part of the **Future Classrooms toolkit**. **Diagnostic report** to plan for the next level of maturity. Comparability with national and international average.
Speak Up National Research Project / Speak Up NRP	Students, parents, educators on **21st century education and technology**	**40% of questions renewed** each year. Findings are shared each year with **federal, state & local policy-makers** to inform decisions about education programs, policies and funding. **2,6 million stakeholders participated so far**.

Vensters voor Primair en Voortgezet Onderwijs[16] **/ Vensters**	**Accountability and transparency**[17] – mainstream	There is a **national database with the results** and partnerships with **research** institutes. **Schools decide** which results are presented and how and they can **add their own explanation** of them. 88% of primary and more than 95% of secondary schools are involved. Use is on voluntary basis but there is peer pressure and public pressure.
Up-scaling Creative Classrooms in Europe / SCALE CCR	Upscaling **ICT-enabled learning innovation** – **no SAT**	**Ecological model of change**. A number of applications and impact (e.g. more than 120 citations including policy documents).
The ePortfolios & Open Badges Maturity Matrix / ePOBMM	Integration of **ePortfolios and Open Badges**	Blue-print from which **customised matrices** could be designed. **Not prescriptive**.
Jisc Strategic ICT Toolkit / Jisc	Institutional and individual capabilities in '**strategic technology business enablers**'	In MS Excel to allow for **easy adaptation**. **Different sets of questions** for each group. No comparisons, but excel file is easily adaptable.
HEInnovate	HEI's **entrepreneurial**[18] and innovation potential	**An international professional community** is evolving around this initiative. Access to **case studies, guidance notes** etc.

[16] Translated as Framework for Primary and Secondary Education. Known also as *Scholen op de kaart* (schools on the map).

[17] Although Vensters does not directly refer to the use of digital technologies in education settings, it is included in the in-depth analysis as it is already in mainstream phase offering valuable insights for successful implementation strategies.

[18] The focus of HEInnovate is on entrepreneurial and innovation potential of higher education institutions and not in the integration of digital technologies. However, it is included here as it is a well-structured and user-friendly tool with an international scope and interesting implementation strategies.

2.4 Expert and stakeholder consultation

The mapping and in-depth analysis of the frameworks/SAQs as well as the first draft of DigCompOrg was validated through a workshop organised by JRC-IPTS (20 November 2014, Seville) and attended by experts who have been involved in the development and/or implementation of the frameworks/SAQs analysed (see Annex 2). For the majority of these frameworks/SAQs, structured fact sheets were completed by the invited experts (Annex 4) and used in the second phase of the analysis.

Based on the expert consultation during the workshop in Seville, as well as on the mapping exercise and the in-depth analysis of selected frameworks/SAQs, the JRC-IPTS research team has reached the following conclusion:

> "*Although several frameworks/tools relating to the use of digital technologies by educational organisations are available or in use in a number of European countries, a systemic approach has not yet been undertaken and a common conceptual approach is not evident. A European reference framework that adopts a systemic approach can be recommended and can add value by allowing for comparability and peer learning*".

Based on the in-depth analysis and the outputs of the expert workshop, the first draft of DigCompOrg was revised by JRC-IPTS and presented at the 3rd meeting of the ET2020 Working Group on Digital and Online Learning (WG DOL) in Brussels on 18 March 2015[19].

Based on the feedback received by the members of the ET2020 WG DOL, JRC-IPTS developed and presented an updated and more elaborated version (full draft) of the framework[20] at the 4th meeting of the WG DOL in Brussels on 29 June 2015, as well a presentation including an overview of the in-depth analysis performed on the 15 selected frameworks and SAQs. The same materials were sent also to the experts who participated in the workshop in Seville for their feedback on the framework and validation of the in-depth analysis.

The consolidated version of DigCompOrg is presented in detail in the following Chapter 3 and it is discussed in Chapter 4.

[19] https://www.yammer.com/et2020workinggroups/#/uploaded_files/32625464?threadId=512249049

3. Results: The DigCompOrg Framework

The DigCompOrg is intended for educational organisations (i.e., primary, secondary and VET schools as well as higher education institutions such as Universities, University Colleges and Polytechnics) to self-reflect on their **progress in integrating and effectively using digital learning technologies**. Digital learning technologies are widely regarded by educational organisations as an enabler **of their core mission and vision for quality education**. From this perspective, the progressive integration and effective use of digital technologies can have the character of an **educational innovation**, and this implies a process of planning **changes along three basic dimensions**: pedagogical, technological and organisational.

The shell of DigCompOrg is structured in seven thematic elements that are common to all education sectors (i.e. cross-sector). Each of these seven elements reflects a different aspect of the complex process of integrating and effectively using digital learning technologies. **All of the elements are interconnected and interrelated and should be seen as parts of the same whole.** In addition to these cross-sector elements, DigCompOrg is open to the addition of sector specific elements (see more in Section 4, Discussion section).

For six of the seven cross-sector thematic elements, a series of related sub-elements has been identified. Figure 3 provides a graphic representation of DigCompOrg with its elements and sub-elements. The outer arcs represent the seven cross-sector elements, and an additional (as yet unspecified) element is reserved to sector-specific requirements. Outside of the circle the 15 sub-elements of the framework are identified. Inside the circle, in the form of 75 areas, encompassing 74 descriptors plus the sector-specific element that can be subdivided in an X number of descriptors to be defined at a later stage[21].

[21] This number is indicative. As stated in the discussion section, the number of the sector-specific elements, sub-elements and descriptors is open to adaptation to local needs and specificities.

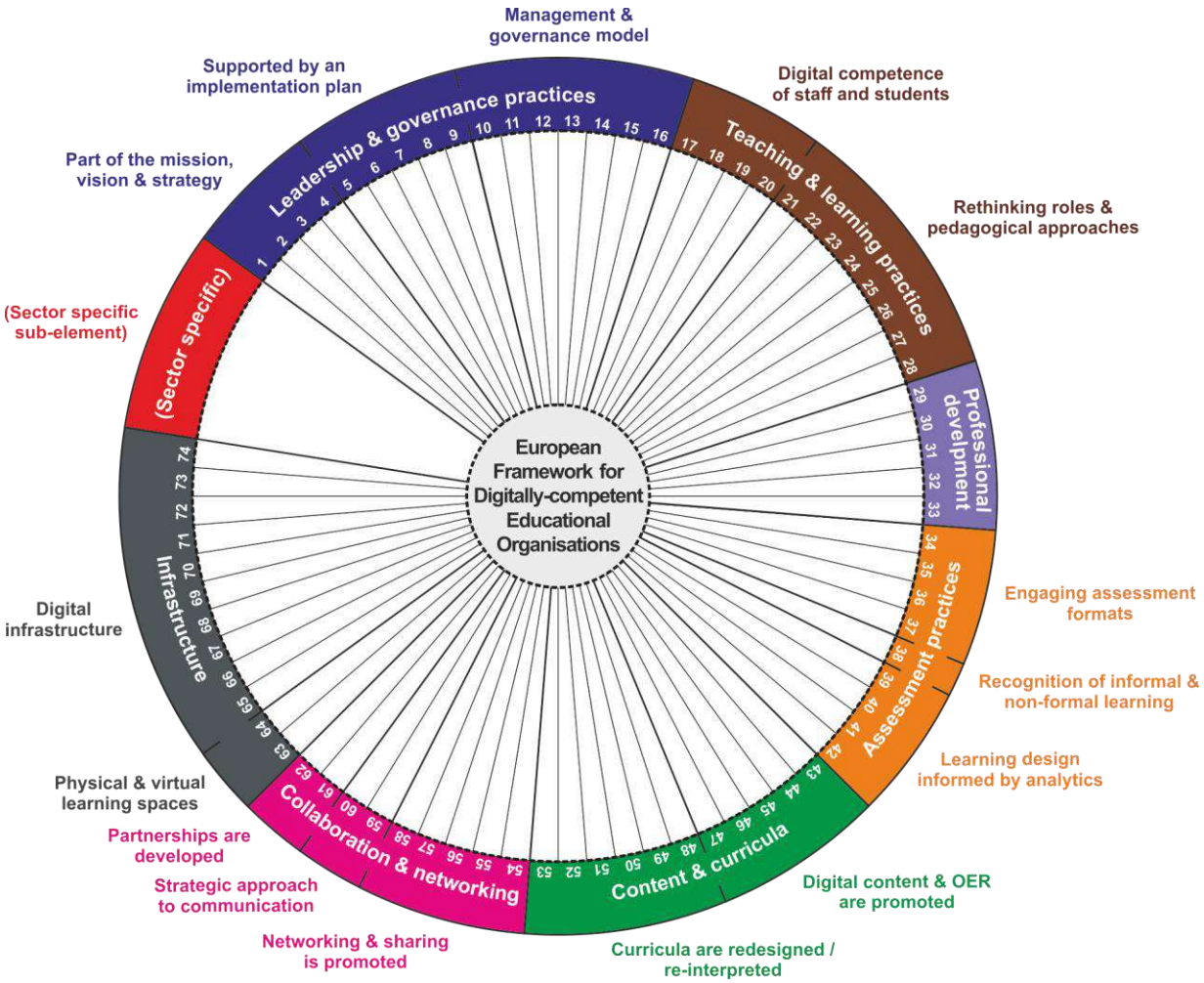

Figure 3: Key elements and sub-elements of DigCompOrg

The 74 descriptors are briefly presented below (see Table 5) and in detail in the sections which follow.

Table 4: Overview of DigCompOrg

Thematic elements	Sub-elements	Descriptors
Leadership & Governance Practices	***Integration of Digital-age Learning is part of the overall mission, vision and strategy***	1. The potential of digital learning technologies is clearly flagged
		2. The benefits of digital learning technologies are communicated
		3. The strategic plan encompasses digital-age learning
		4. Open education is an aspect of public engagement
	Strategy for digital-age learning is supported by an implementation plan	5. Planning builds on enablers while addressing barriers
		6. Internal stakeholders have a degree of autonomy
		7. Opportunities, incentives and rewards for staff are identified
		8. Digital-age learning is aligned with broader priorities
		9. There are twin goals of modernising existing educational provision and offering new opportunities

	A Management and Governance Model is in place	10. There is a shared understanding of and commitment to the implementation plan
		11. Management responsibility is clearly assigned
		12. Resources are aligned with budgets and staffing
		13. The outcomes, quality and impact of the implementation plan are reviewed
		14. Specific initiatives or pilots are evaluated
		15. Implementation status is benchmarked
		16. Oversight of policy and direction is evident
Teaching and Learning Practices	***Digital Competence is promoted, benchmarked and assessed***	17. Staff and students are Digitally-Competent
		18. Safety, risks and responsible behaviour in online environments are foregrounded
		19. The Digital Competence (DC) of staff and students is benchmarked
		20. DC is included in staff appraisal
	A rethinking of roles and pedagogical approaches takes place	21. Staff are partners in change
		22. New roles are envisaged for staff
		23. New roles are envisaged for students
		24. Pedagogical approaches are expanded
		25. Personalised learning is developed
		26. Creativity is promoted
		27. Collaboration and group work is expected
		28. Social and emotional skills are developed
Professional Development	***-***	29. A commitment to Continuous Professional Development (CPD) is evident
		30. CPD is provided for staff at all levels
		31. CPD is aligned with individual and organisational needs
		32. A wide range of CPD approaches is evident
		33. Accredited/certified CPD opportunities are promoted
Assessment practices	***Assessment Formats are engaging and motivating***	34. The scope of formative assessment is extended
		35. Summative assessment is diversified
		36. Self- and peer-assessment are promoted
		37. Rich, personalised and meaningful feedback is encouraged and expected
	Informal and Non-Formal Learning are recognised	38. Prior, experiential and open learning are recognised and accredited
	Learning Design is Informed by Analytics	39. Learning analytics is given strategic consideration
		40. A code of practice for learning analytics is in place
		41. Learning is supported through learning analytics
		42. Quality management and curriculum/programme design are supported through learning analytics
Content and Curricula	***Digital Content and OER are widely promoted and used***	43. Staff and students are the creators of contents
		44. Content repositories are widely and effectively used
		45. Intellectual property and copyright are respected
		46. Digital tools and contents are licensed as required
		47. Open Educational Resources are promoted and used
	Curricula are redesigned or re-interpreted to reflect the pedagogical possibilities afforded by digital technologies	48. Subject-based learning is reimagined to create more integrated approaches
		49. The time and place of learning is rescheduled
		50. Online provision is a reality
		51. Learning in authentic contexts is promoted
		52. Digital learning provision is evident across curriculum areas
		53. Students' digital competence is developed across the curriculum

Collaboration and Networking	***Networking, sharing & collaboration is promoted***	54. Networked collaboration for staff to pool expertise and share contents is the norm
		55. Knowledge exchange efforts are recognised
		56. Students engage in effective networking
		57. Participation in knowledge-exchange activities and events is promoted
		58. Internal collaboration and knowledge exchange is expected
	A strategic approach is taken to communication	59. An explicit communication strategy is in place
		60. A dynamic online presence is evident
	Partnerships are developed	61. A commitment to knowledge exchange through partnerships is evident
		62. Staff and students are incentivised to be actively involved in partnerships
Infrastructure	***Physical and Virtual Learning Spaces are designed for digital-age learning***	63. Physical learning spaces optimise the affordances of digital-age learning
		64. Virtual Learning Spaces are optimised
	The digital infrastructure is planned and managed	65. An Acceptable Usage Policy is in place
		66. Pedagogical and technical expertise direct investments in digital technologies
		67. A range of digital learning technologies supports anytime/anyplace learning
		68. Bring Your Own Device (BYOD) approaches are supported
		69. Risks relating to inequality and digital inclusion are addressed
		70. Technical and user support is evident
		71. Assistive technologies address special needs
		72. Measures to protect privacy, confidentiality and safety are well established
		73. Effective procurement planning is evident
		74. An operational plan for core ICT backbone and services is in place
Sector-specific element(s)	***Sector-specific sub-element(s)***	Sector-specific descriptor(s)

3.1 Thematic element: Leadership and Governance Practices

This element of DigCompOrg refers to the role of leadership in the organisation-wide integration and effective use of digital technologies in respect of its teaching/learning mission and activities. The organisation's strategic planning process should encompass digital learning technologies, and these in turn should be a cornerstone of a well-defined and well-communicated long-term educational vision. This vision should be visibly supported through leadership and governance and articulated in short- and medium-term strategic plans.

The thematic element *Leadership and Governance Practices* consists of three sub-elements and sixteen descriptors presented below.

Table 5: Sub-elements and descriptors of Leadership and Governance Practices

Integration of Digital-age Learning is part of the overall mission, vision and strategy Factors that foster effective learning including the integration and organisation-wide use of digital learning technologies are clearly embedded in statements of the mission, vision and strategy of the organisation.	
The potential of digital learning technologies is clearly flagged	The organisation's strategic/planning processes and documentation include a **vision and mission** that clearly **articulates the potential of digital learning technologies to modernise educational practices**, geared towards more comprehensive learning outcomes.
The benefits of digital learning technologies are communicated	The organisation has **appropriate processes** in place **for communicating** internally and externally the vision for and **the benefits** to be gained **from the integration** of digital learning technologies.
The strategic plan encompasses digital-age learning	The organisation's strategic plan is evidence–based and is informed by ongoing research on the educational use of digital technologies and includes **specific goals and objectives** in relation **to embedding digital-age learning** on a sustainable organisation-wide basis **with associated performance indicators**.
Open education is an aspect of public engagement	The public engagement aspect of the organisation's strategy includes **commitments to open education practices** such as open courses, open lectures and open access to digital resources and publications.
Strategy for digital-age learning is supported by an implementation plan The organisation has a well-defined and realistic digital capacity implementation plan, with clear priorities and measurable targets for the effective organisation-wide deployment of digital learning technologies, in the context of an overarching policy/strategic plan for teaching, learning and assessment.	
Planning builds on enablers while addressing barriers	The digital capacity implementation plan is contextualised and **builds on enablers/facilitators** of digital learning technology integration, **while** addressing possible **barriers**.
Internal stakeholders have a degree of autonomy	The digital capacity implementation plan **affords internal stakeholders a degree of autonomy** in the implementation of digital learning technologies, in the context of an overarching policy for teaching and learning and/or the requirements of a curriculum.
Opportunities, incentives and rewards for staff are identified	The digital capacity **implementation plan identifies opportunities, incentives and rewards for staff who actively engage** in the process of **building digital capacity** and modernisation of learning environments.

Digital-age learning is aligned with broader priorities	The digital capacity **implementation plan is aligned with broader priorities, including equal opportunities** and widening participation in order to mitigate social disadvantage and reduce the risk of inadequately addressing the needs of particular groups such as gifted students, migrants, and early school leavers.
There are twin goals of modernising existing educational provision and offering new opportunities	The digital capacity **implementation plan** includes not only provision for the use of digital learning technologies to **modernise existing educational provision** but also to offer **new opportunities** for **formal, non-formal and informal learning**.
A management and Governance Model is in place A management and governance model is in place to co-ordinate and oversee the implementation plan for digital-age learning and digital capacity, including effective use of human and other resources and orchestrating the integration and effective use of digital learning technologies.	
There is a shared understanding of and commitment to the implementation plan	The leadership team has a **shared understanding of why and how the organisation seeks to integrate digital learning technologies**, and commitment to the implementation plan is evident.
Management responsibility is clearly assigned	**Management responsibility has been clearly assigned** for delivery and monitoring of the digital capacity implementation plan.
Resources are aligned with budgets and staffing	**Staffing and budgetary resources** required to underpin the digital capacity implementation plan **are** clearly **identified**, **and are optimised** in the context of organisational budgets and staffing plans.
The outcomes, quality and impact of the implementation plan are reviewed	A process is in place to periodically **review and report** the **outcomes, quality and impact** of the digital capacity implementation plan and to update it to take account of the **evolving needs of the organisation** and **emerging technological trends** and **pedagogical developments**.
Specific initiatives or pilots are evaluated	Appropriate processes are in place for the **evaluation of specific initiatives or pilots** that might be undertaken by the organisation as part of its digital capacity implementation plan.
Implementation status is benchmarked	A process is in place to **externally benchmark the organisation's digital** capacity, with respect to similar organisations, regionally, nationally or internationally.
Oversight of policy and direction is evident	Boards of management or other governing authorities **engage with questions of policy and direction** in relation to digital-age learning.

3.2 Thematic element: Teaching and Learning Practices

For a transition to digital-age learning (European Network of Education Councils, 2014), it is essential for organisations to modernise teaching and learning practices, if they are to realise the potential of digital learning technologies as enablers of more effective learning experiences both internally and in the wider external environment and knowledge ecosystem.

The thematic element *Teaching and Learning Practices* consists of two sub-elements and twelve descriptors presented below.

Table 6: Sub-elements and descriptors of Teaching and Learning Practices

Digital Competence is promoted, benchmarked and assessed This sub-element highlights the importance for staff and students to demonstrate the digital competence (DC) required to effectively use digital technologies for teaching, learning, assessment and leadership. It also addressed the responsibility and the duty of care of the organisation in relation to the safety and wellbeing of staff and students while digitally engaged. Safety and awareness of risks, balanced by a clear understanding of responsible behaviours are of paramount importance.	
Staff and students are Digitally-Competent	The organisation has processes in place to ensure that **staff and students are confident, and competent integrating digital technologies into their everyday practices** (teaching, learning, communication, assessment, administration) and are capable of choosing (or have access to) devices, software, applications, digital content and online services that best suit their needs and educational expectations.
Safety, risks and responsible behaviour in online environments are foregrounded	Staff and student Digital Competence comprehensively addresses safety, awareness of risks and norms for responsible behaviour in online environments.
The DC of staff and students is benchmarked	Digital Competence development measures are described in the organisation's plans. The organisation has adopted/adapted relevant **frameworks and online tools** (e.g., DigComp framework, UNESCO ICT Competence Framework for Teachers) **to benchmark the digital competence of staff and students** in a systematic manner.
Digital Competence is included in staff appraisal	Digital Competence is factored in performance appraisals of staff.
A rethinking of roles and pedagogical approaches takes place The organisation empowers and expects staff and students to adopt and adapt effective and innovative pedagogical practices made possible by the use of digital learning technologies and to use these practices in diverse learning settings (inside and outside the organisation) and for various purposes (formal and informal).	
Staff are partners in change	The organisation aims to establish a culture where **staff** (and including students as appropriate) **are considered as partners in change** and are **encouraged** and incentivised to **take** measured **risks** and to **explore new approaches** that actively contribute to the integration and effective use of digital learning technologies for comprehensive learning outcomes.
New roles are envisaged for staff	The organisation empowers staff to act as **mentors, orchestrators and facilitators** of learning and as **role models** for **lifelong learning and personal professional updating.** It is expected that staff will experiment with the **creative and innovative use of digital technologies** to make improvements to learning and teaching.
New roles are envisaged for students	The organisation promotes diverse digital learning technologies and multi-modal content, tools and platforms that foster **student-centred approaches** optimised for **particular learning contexts** (including, for example, audio-visual

	material, e-portfolios, OER, simulations, serious games, coding and maker environments, creative arts). Students are encouraged and expected to act as **self-directed learners** and may be considered and included as **co-designers of the learning process.**
Pedagogical approaches are expanded	Teaching and learning is 'redesigned' to incorporate digital technologies. Building on relevant research, the organisation promotes a diversity of technology-enabled **learning and teaching practices that are flexible, adaptable** and **engaging** (e.g., learning by playing, learning by exploring, learning-by-creating, learning-by-doing, augmented and enhanced through digital technologies).
Personalised learning is developed	The organisation supports and anticipates the use of digital learning technologies to **increase opportunities for personalised learning**, taking into account **students' strengths, potential, and expectations**.
Creativity is promoted	Students and staff are encouraged to explore and diversify their **creative practices by using digital technologies** as enablers of creativity and creative expression.
Collaboration and group work is expected	As learning is a social process, the organisation encourages and expects **collaboration and group work, supported** in many cases **by digital tools and platforms**. This fosters the abilities of staff and students to think and work both independently and with others, enabling them to consider a plurality of perspectives.
Social and emotional skills are developed	The organisation promotes the **development** by staff and students **of social and emotional skills** (the skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions) and how such skills can be **applied in digital and online environments**.

3.3 Thematic element: Professional Development

The organisation facilitates and invests in the continuous, comprehensive and customised professional development (CPD) of its staff at all levels in order to develop and integrate new modes of teaching and learning that harness digital learning technologies to achieve more comprehensive learning outcomes. The organisation expects staff to fully avail of such CPD opportunities. Learning organisations focus particularly on building capabilities in digital pedagogy among staff who are directly engaged with students and those involved in academic/school leadership, managerial or course design roles.

The thematic element *Professional Development* has five descriptors, but no sub-elements, as presented below. Expert and stakeholder consultations and the findings of the in-depth analysis strongly suggested that, Professional Development should appear as a key element in its own right, as in the case of a number of frameworks/SAQs (see Annex 3). Several policy documents (e.g., European Commission 2013; 2015) do also emphasise that the continuing professional development of teachers is a requirement for relevant and high-quality digital-age learning. Strong support for teachers to use (among other things) innovative pedagogies and digital technologies in an optimal manner is also one of the six new priority areas for Education and Training 2020[22].

Table 7: Sub-elements and descriptors of Professional Development

A commitment to CPD is evident	The organisation has a **commitment to staff professional development** in relation to the integration and effective use of **digital technologies and digital pedagogy**, situated in the wider context of the organisation's vision, mission and CPD provision in relation to teaching and learning generally.
CPD is provided for staff at all levels	Professional development is **organisation-wide** and **targets leadership** as well as **front line staff** through **appropriate CPD interventions** with an expectation of wide staff participation.
CPD is aligned with individual and organisational needs	The organisation has processes in place to **identify, design and develop (or procure) professional development programmes** that address various facets of digital learning technologies and digital pedagogy, **aligned with both individual needs and the particular needs of the organisation.**
A wide range of CPD approaches is evident	The learning organisation utilises **a wide range of approaches to staff professional development (including coaching and mentoring),** blending face-to-face and online delivery within and outside the organisation.
Accredited/certified CPD opportunities are promoted	Learning organisations will **encourage and support** staff in undertaking **accredited/certified professional development opportunities** that contribute to enhanced professionalisation of staff teaching, learning and assessment roles.

[22] http://ec.europa.eu/education/news/2015/0901-et2020-new-priorities_en.htm

3.4 Thematic element: Assessment practices

This element of DigCompOrg refers to the role that digital learning technologies play in supporting an integrated approach to assessment giving all stakeholders timely and meaningful information on students' experiences and achievements. The Assessment element includes measures that learning organisations may consider in order to progressively shift the balance from traditional assessment towards a more comprehensive repertoire of practices. This repertoire will include student-centred, personalised, authentic, integrated and meaningful assessment practices that can also take into account knowledge, skills and competences developed in formal, informal and non-formal settings.

The thematic element *Assessment Practices* has three sub-elements and nine descriptors presented in detail below.

Table 8: Sub-elements and descriptors of Assessment Practices

Assessment Formats are engaging and motivating A variety of assessment formats is used to provide timely, personalised and meaningful feedback that engages and motivates students.	
The scope of formative assessment is extended	Organisations use digital learning technologies to **extend the scope and variety of processes for formative assessment** (assessment *for* learning), enabling teachers/tutors **to assess** not only knowledge but **also skills and competences** (especially digital competence).
Summative assessment is diversified	**Digital learning technologies** are utilised to diversify summative assessment practices (assessment *of* learning). Organisations use online testing methodologies that can **provide immediate,** even real-time **feedback** to students and teachers that can also allow greater flexibility in the scheduling of tests.
Self- and peer- assessment are promoted	A high trust staff-student environment for assessment is encouraged within the organisation and staff and students are encouraged to routinely seek and provide feedback. Practices of effective and accurate **self- and peer-assessment are regarded as competences in their own right**, and digital learning technologies enable the integration of these practices across the organisation for formative, summative or non-formal assessments.
Rich, personalised and meaningful feedback is encouraged and expected	The organisation encourages staff to exploit the potential of digital learning technologies to **provide rich, personalised and meaningful feedback** to the student and to **document and communicate the learning progress** of each student in new and more effective ways such as e-portfolios, adaptive simulations, and intelligent tutoring systems.
Informal and Non-Formal Learning are recognised Digital learning technologies enable individuals to learn where and when they want. Informal and non-formal learning that take place outside formal settings is recognised and valued by the learning organisation.	
Prior, experiential and open learning are recognised and accredited	The learning organisation has policies in place for the **recognition and accreditation of prior, experiential and open learning**, including learning in informal and non-formal settings that can be reasonably verified. These policies are systematically reviewed and improved, based on pedagogical and technological developments (e.g., Open Badges).
Learning Design is Informed by Analytics Use of digital learning technologies potentially makes available vast amounts of data about learning processes. Learning organisations utilise learning analytics for collection, analysis and reporting of data about students and learning contexts for improving learning outcomes and for curriculum or programme planning and decision-making.	

Learning analytics is given strategic consideration	The organisation has given **strategic consideration to the implementation of learning analytics**, intended to optimise individual and group learning outcomes and organisational performance.
A code of practice for learning analytics is in place	Before implementing learning analytics, the organisation has adopted a **code of practice** and processes **for safe and secure collection, validation, storage, aggregation, analysis and reporting of student data**.
Learning is supported through learning analytics	The organisation has implemented different facets of learning analytics, including analytics to provide **real-time personal feedback** to students (impacting on their immediate learning process) and analytics that aggregate data with a view to **improving future learning processes** or supporting tutorial **or remedial interventions by staff.**
Quality management and curriculum/programme design are supported through learning analytics	**Data** relating to individual progress and achievements **are aggregated and analysed at organisational level** to inform processes including **quality management and enhancement**, course design and review, and tailored interventions to improve retention and outcomes generally.

3.5 Thematic element: Content and Curricula

Curricula are reviewed or interpreted (depending on the degree of autonomy the organisation has in respect of such changes) and updated regularly, to take advantage of the leverage potential of digital learning technologies and digital content to modernise teaching, learning and assessment practices and improve the scope of learning outcomes.

The thematic element *Content and Curricula* has two sub-elements and eleven descriptors presented below.

Table 9: Sub-elements and descriptors of Content and Curricula

Digital Content and OER are widely promoted and used The organisation expects, facilitates and encourages the use of suitable, high-quality and customised digital content that is accessible from everywhere, to meet staff and student needs wherever and whenever teaching and learning takes place.	
Staff and students are creators of content	The organisation encourages and supports staff and students to be **creators as well as consumers of subject-specific** and **cross-curricular digital content**, for use in both formal and informal curriculum areas.
Content repositories are widely and effectively used	Staff and students develop proficiency in identifying and using **content repositories relevant to their programmes** of study and in **adding community value** to repositories through **participatory annotation and comments**.
Intellectual property and copyright are respected	The organisation has policies and procedures in place to ensure that stakeholders are **well-informed** about **intellectual property and copyright rules** when sourcing, using, re-mixing or creating digital content.
Digital tools and content are licensed as required	The organisation has **policies and procedures** in place **in respect of licences for content** (e.g., e-books, journals), **software, apps, platforms and other educational resources** sourced from commercial publishers/providers.
Open Educational Resources are promoted and used	The organisation actively promotes the **use/re-mix/creation of Open Educational Resources (OER**) and **Creative Commons licencing** to support modernised curricula and to provide students with opportunities to develop their knowledge and skills and to achieve comprehensive learning outcomes.
Curricula are redesigned or re-interpreted to reflect the pedagogical possibilities afforded by digital technologies Curricula are iteratively redesigned (or re-interpreted as appropriate) in terms of content, pedagogical approach and plans for student engagement. Students may be involved as co-designers of the curricula and are highly engaged as self-directed learners.	
Subject-based learning is reimagined to create more integrated approaches	The learning organisation has processes in place to **reimagine and redesign** subject-based learning **to accommodate more integrated approaches** (cross- and trans-disciplinary) and to offer consistent student-centred learning and assessment. Supporting such an approach, digital learning technologies facilitate the selection, creation and thematic organisation of rich multimodal content that enables students to analyse and understand complex ideas from multiple perspectives.
The time and place of learning is rescheduled	**Flexible and tailored-made timetables** are deployed to provide staff and students with greater opportunities to engage in effective learning, encompassing individual and group activities on and off campus (or in/out of school). Digital learning technologies offer new opportunities for ubiquitous learning and advanced timetable management.

Online provision is a reality	The organisation is committed to developing and providing **whole courses or programmes fully online**, as a means of **opening up access** to new previously unrepresented student cohorts while at the same time **affording greater flexibility to existing cohorts.**
Learning in authentic contexts is promoted	Innovation in curriculum and programme design takes account of the leverage potential of **digital learning technologies to engage staff and students in authentic contexts** where they can comprehensively develop and apply their prior knowledge, inquiry and independent thinking skills. In doing so, they can address challenges that go beyond traditional subject knowledge, requiring them to demonstrate transversal skills, key competences and, in particular, digital competence.
Digital learning provision is evident across curriculum areas	Periodic review of curricula is undertaken at the organisation level with the aim of integrating and effectively using of **digital learning technologies to support learning and teaching.**
Students' digital competence is developed across the curriculum	**Students' digital competence** is routinely **encouraged, developed and assessed** in diverse learning settings and **across the curriculum.**

3.5 Thematic element: Collaboration and Networking

The organisation supports a culture of collaboration and communication and has processes and policies in place to enable staff and students to engage with internal and external stakeholders, share experiences and learn effectively within and beyond the organisational boundaries.

The thematic element *Collaboration and Networking* has three sub-elements and nine descriptors presented below.

Table 10: Sub-elements and descriptors of Collaboration and Networking

Networking, Sharing and Collaboration is promoted Digital-age learning relies extensively on multidimensional communication, networking and sharing with the internal and external knowledge ecosystem. The organisation offers the necessary tools, infrastructure and support systems to develop a culture of connected learning that extends beyond the institutional walls and promotes the kind of anytime, anywhere learning necessary for digital learning environments to thrive.	
Networked collaboration for staff to pool expertise and share content is the norm	The organisation actively promotes and expects **staff engagement with networks, portals and professional/discipline-based communities of practice** that promotes excellence, quality and accessibility of educational content and knowledge about the deployment of digital learning technologies in different contexts. Through such engagement, staff can also access and contribute to the research and evidence base and the wider learning ecosystem.
Knowledge exchange efforts are recognised	**Networking, collaboration and knowledge exchange** activities, including those mediated by online platforms, are recognised as professionally relevant learning outcomes.
Students engage in effective networking	Students are encouraged to **engage with relevant social/professional networks and communities of interest/practice** to connect with ideas, interests and people. Digital technologies and social/professional media platforms are used extensively on an organisation-wide basis for effective networking, interaction, and collaboration and to create a **more challenging learning environment** by opening up and broadening perspectives in this way.
Participation in knowledge-exchange activities and events is promoted	The organisation encourages, facilitates and expects staff and students to organise and/or take part in **knowledge-exchange activities and events** (face to face, online, or in combination) for cross-fertilisation of learning experiences with players in the external knowledge ecosystem.
Internal collaboration and knowledge exchange is expected	The organisation has processes in place, supported by relevant digital tools and platforms, for **bringing internal stakeholders together** (staff and students), to build synergies, exploit internal knowledge and resources, and share action-research and effective practice through cross-functional and cross-disciplinary structures and teams.
A strategic approach is taken to communication The organisation's communication strategies are underpinned by a dynamic digital presence characterised by open communication processes and sharing of experiences. Digital technologies and social/professional media platforms which ensure communication with stakeholders and the wider learning community are deployed and used. These complement other means of communication (e.g., face-to-face) and enable safe and effective two-way communication within, and beyond, the organisation.	
An explicit communication strategy is in place	The organisation has in place an **explicit communication strategy**, which identifies and uses appropriate communication channels/systems for different purposes and target groups, including a website social media presence and learning platform.

A dynamic online presence is evident	The organisation has a **dynamic digital presence (websites, social networks),** which is updated regularly and used by all stakeholders as a hub to support and open up online collaboration, sharing, communication and learning.
Partnerships are developed Engagement and collaboration with the external knowledge ecosystem and its stakeholders can open up new relationships and generate a valuable resource in terms of opportunities for developing expertise and organisation-wide learning experiences. In this context, the learning organisation develops and maintains contacts and develops relationships with local, regional, national and international partners geared towards collaborative working and sharing of resources and expertise, thereby more fully exploiting the potential of digital learning technologies.	
A commitment to knowledge exchange through partnerships is evident	The organisation is committed to **collaboration and knowledge exchange through partnerships** with other learning organisations, private and public sector organisations (including those in the technology/digital media sectors) and the wider community.
Staff and students are incentivised to be actively involved in partnerships	The organisation **encourages and supports staff and students to actively take part in partnerships** with external organisations, facilitated and sustained as appropriate through the use of digital tools and platforms.

3.5 Thematic element: Infrastructure

This element of DigCompOrg refers to the crucial role of infrastructure in enabling and facilitating innovative practices and in extending the boundaries of learning spaces (physical and virtual) in a way that encompasses some or all of the multiple dimensions of openness and flexibility (*any individual/group* learning *anywhere*, *anytime*, using *any device*, with mentoring provided by *anyone*). Whole-organisation approaches to the innovative design, adaptation and/or reorganisation of virtual and physical learning spaces reflect the organisation's vision to modernise practices for achieving more comprehensive learning outcomes. Underpinning such developments is the backbone of digital services, which must be reliable, secure and scalable.

The thematic element *Infrastructure* has two sub-elements and twelve descriptors presented below.

Table 11: Sub-elements and descriptors of Infrastructure

Physical and Virtual Learning Spaces are designed for digital-age learning The way in which physical and virtual learning spaces are designed can deliver an unspoken message about the dominant teaching and learning paradigm and can also shape and influence the teaching and/or learning practices that take place. Therefore, the learning organisation ensures that due attention is paid to the design and organisation of learning spaces so that their utility is aligned with intended teaching and learning activities.	
Physical learning spaces optimise the affordances of digital-age learning	**Physical learning spaces** have been **designed**/re-arranged and furnished **to harness and optimise the affordances of digital learning technologies**, giving access to a wide range of relevant digital tools, content and services in l**earning settings that can be flexibly configured.**
Virtual Learning Spaces are optimised	The design (or customisation) of virtual learning spaces (VLEs and learning platforms) adequately **reflects the intended pedagogic paradigm** and affords a staff/student experience that complements and is consistent with that experienced in face-to-face settings. Virtual learning spaces are also designed (or customised) to **optimise usability, accessibility** and the **user experience.**
The digital infrastructure is planned and managed The organisation has in place the necessary expertise and processes to ensure the effective identification, selection and organisation-wide deployment of a range of digital learning technologies appropriate to its scale and needs. Front facing services must operate seamlessly as far as staff and students are concerned. For this to happen, core ICT backbone and services (networks, portals, Wi-Fi, cloud), must be omnipresent.	
An Acceptable Usage Policy is in place	The use of digital technologies, content, platforms and services by staff and students is regulated by an **Acceptable Usage Policy** formally adopted by the organisation and clearly communicated to all users.
Pedagogical and technical expertise informs investments in digital technologies	The organisation has **access to pedagogical and technical expertise** (internally and/or externally) to support **planning and decision making about investment in technologies, resources and services**.
A range of digital learning technologies supports anytime/anyplace learning	The organisation has in place **a range of digital learning technologies, tools, applications, content and services** and takes appropriate steps to ensure that these can be accessed by staff and students **any-place/anytime** (e.g., in both formal and informal settings and/or including one-to-one deployment).
Bring Your Own Device (BYOD) approaches are supported	Staff and students may **use their own devices and** may **connect these to services provided by the organisation**. A **BYOD policy** defines the parameters for own device usage.

Risks relating to inequality and digital inclusion are addressed	As digital devices and connectivity proliferate, **the organisation is sensitive to the risk of exacerbating inequalities experienced by socio-economically disadvantaged students**, and takes steps to ensure that special measures are in place to provide for the needs of these students.
Technical and user support is evident	**Technical and user suppor**t is planned and integrated in digital infrastructure to **ensure reliable performance, maintenance and interoperability** and to provide students and staff with seamless access to the digital technologies, content and services they require. A **Service Level Agreement** may be used to define the scope of the services and supports that can be provided (internally or by external service providers).
Assistive technologies address special needs	**Assistive technologies and** appropriate **digital content are used** organisation-wide **to address the special needs of students** requiring additional or differentiated learning support.
Measures to protect privacy, confidentiality and safety are clear	The organisation has **appropriate policies, procedures and safeguards** in place **to ensure the protection of individual privacy, confidentiality and the safe use of digital learning technologies and data**. These include legal obligations relating to Data Protection and Licences, policies for Learning Analytics and formal guidelines for staff and students on privacy, confidentiality and safety in online environments.
Effective procurement planning is evident	Procurement planning takes account of **general as well as specialist requirements** (e.g., discipline-specific or professional software, or specialist/high-end workstations) and makes appropriate provision, including, for example, flexibility through desktop virtualisation. **Whole of life costing models inform decisions about procurement** of networks, equipment and software.
An operational plan for core ICT backbone and services is in place	The organisation has in place a **viable operational plan for the procurement**, **maintenance, interoperability and security of core ICT backbone and services** appropriate to its scale and needs.

4. Discussion

The seven elaborated elements of DigCompOrg apply to education organisations from all sectors, namely primary, secondary and VET schools as well as higher education institutions such as Universities, University Colleges and Polytechnics. However, there are significant differences (not least in terms of scale) between educational organisations from different education sectors. In order for DigCompOrg to be operationalised, it will be necessary to fine-tune the elements, sub-elements and descriptors to precisely match the particularities of specific educational sectors. In other words, **for each education sector there are likely to be additional elements** to be considered that are unique in terms of what it means to be a competent digital organisation in that sector.

For instance, higher education organisations have more autonomy than schools and also have a remit for research and innovation. Therefore, in this case, a sub-element about research, development, innovation (RDI) might be added to DigCompOrg; the same is true for scholarship of teaching and learning. Examples of sub-elements that might be added include:

- Pedagogical research and innovation is included in RDI strategies: Research, development and innovation relating to teaching, learning and assessment is an integral part of the organisation's overall research and/or innovation strategy.
- Scholarship of teaching and learning is supported[23]: The organisation's strategy actively supports the scholarship of teaching and learning within subject/discipline domains to ensure continuous updating of the professional practice of teaching.

These additional elements may affect other elements of DigCompOrg, as **everything is interrelated and interconnected**. For instance, in the case of higher education organisations, investments in physical and digital infrastructure are generally regarded as being driven by a combination of requirements that include research and innovation in addition to teaching/learning. Also, digital technologies can play a key role in fostering links between in-house research and the wider knowledge ecosystem though networking and partnerships.

The order in which the elements, sub-elements and descriptors of DigCompOrg are presented in the previous sections does not imply a hierarchy, as **all elements are interrelated and interdependent.** The cross-sector elements of the DigCompOrg framework reflect a convergence of topics widely agreed in the literature and they can also be identified in a majority of the frameworks and SAQs analysed, albeit that specific content or domains of application may vary from framework to framework. DigCompOrg extends beyond a synthesis of current thinking and practice relating to frameworks/SAQs to provide **a comprehensive conceptually grounded basis for operationalising self-reflection and self-evaluation within educational organisations** that wish to further develop their digital capacity.

Experts and stakeholders involved in the review of DigCompOrg regard it potentially as a comprehensive and cross-sector tool. In its totality, DigCompOrg reflects the complexity of integrating digital learning on an organisation-wide basis. Educational organisations, particularly those of smaller scale or at an early stage of digital maturity, however, may find that an incremental approach may suit their needs. In other words, they may initially be interested in developing some but not all the elements, sub-elements and descriptors of DigCompOrg. It is therefore **an option for educational organisations, intermediaries or initiative developers to flexibly use DigCompOrg and to adapt it to their needs and specificities**. The comprehensive nature of DigCompOrg allows for it to be disaggregated into smaller parts and adapted to particular circumstances or implementation needs, while not losing sight of the inter-relatedness of all the elements.

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[23] See for instance, http://publications.jrc.ec.europa.eu/repository/bitstream/JRC94955/jrc94955.pdf

Furthermore, an educational organisation may **use DigCompOrg in combination with other frameworks and tools** in order to complement the organisational perspective. For example, an organisation may also use the DIGCOMP framework (Ferrari, 2013) or UNESCO ICT Competence Framework for Teachers (UNESCO, 2011) to develop the digital competence of individual staff and students.

DigCompOrg is intended to be descriptive rather than prescriptive. For instance, copyright and safety issues are referenced as elements of DigCompOrg but in a neutral way without giving exact rules, directions, or instructions. It is not intended to articulate or prescribe the responses that are expected from the educational organisation and its stakeholders. Particular implementation initiatives have the scope to define the elements, sub-elements and descriptors of DigCompOrg in more prescriptive terms, if they wish to do so, in accordance with their specificities and needs.

A particular challenge that can be anticipated in further developing this proposal is that technological developments are happening very rapidly and it is difficult to precisely describe the trajectory for the development of digital learning technologies. For instance, until the very recent past, the potential of analytics or social media for teaching and learning would have been unrecognised. For this reason, DigCompOrg will need to include a process for **revision that takes into account the implications of new technological developments** and their likely impact on teaching and learning practices.

DigCompOrg is intended to focus on the teaching, learning, assessment and related learning support activities undertaken by a given educational organisation. As such, **it is not intended to address the full range of administrative and management information systems that are in use within the organisation**.

Furthermore, DigCompOrg includes elements such as 'Leadership and governance practices' and 'Infrastructure' may be seen as organisational responsibilities. Other elements such as 'Teaching and Learning practices' refer more to individual responsibilities. This is not a paradox, as a digitally-competent educational organisation needs a combination of strong leadership and governance (for vision and **top-down strategies)** and at the same time needs staff and stakeholders who are individually capable of taking responsibility for self-initiated actions and **bottom-up efforts and initiatives** (Kampylis et al., 2013). This approach is also evident in some of the SAQs analysed (e.g., Speak Up NRS, eLEMER, HEInnovate), where multiple perspectives about the state of play at organisation level are established through a range of stakeholder inputs and not only through the organisation leaders.

5. Concluding remarks and future work

DigCompOrg has not been developed ab initio - it has been developed as a comprehensive meta-framework that can be used as a:

- reference to inspire further development of existing frameworks and SAQs;
- basis for the development of new sector-specific conceptual frameworks;
- basis for the development of self-assessment questionnaires;
- tool for policymakers to promote more effective integration of digital technologies in E&T systems.

DigCompOrg is a holistic conceptual meta-framework that provides a reference guide to existing framework/SAQs initiatives and a model for self-evaluation by educational organisations of their integration and effective use of digital technologies. DigCompOrg has the potential to underpin transparency and comparability between related initiatives throughout Europe and in doing so can play a part in addressing fragmentation and uneven development between and within the Member States.

DigCompOrg may also be used as a reference tool to compare existing frameworks and initiatives, in order to map which elements, sub-elements and descriptors are taken into account by a currently existing framework or SAQ. DigCompOrg can be adapted and used by educational organisations as a development tool for the progressive integration of digital learning technologies for improved outcomes relating to academic subjects, non-cognitive skills and key competences. Moreover, it can be used by Member States to tailor support to educational organisations that wish to develop or enhance their digital capacity.

The DigCompOrg framework proposed here is the result of a mixed-method research process, but remains a conceptual framework, as it has not as yet been piloted nor implemented in real settings. As discussed, a subsequent step in the context of InnovativEdu study is the development of a SAQ based on the descriptors of DigCompOrg. The list of DigCompOrg descriptors is quite comprehensive, but not exhaustive. The intention was to develop descriptors that are applicable to all educational sectors from primary to tertiary education and that can be operationalised in terms of the questions/statements in the SAQ. Consideration has also been given to the evidence or indicators that would support each descriptor. In the context of a follow up study, the proposed SAQ can be adapted to the particular needs of a specific educational sector and can be tested in real settings. In this way, both the conceptual framework (i.e., DigCompOrg) and the related SAQ can be amended and refined according to feedback from users.

In conclusion, we know that digital technologies are being incorporated in exciting and promising ways at all levels of our education and training systems, primary, secondary, post-secondary, vocational and higher education. To consolidate progress and to ensure scale and sustainability, however, educational institutions need to review their organisational strategies and enhance their capacity for innovation and exploitation of the potential of new and emerging technologies and digital content. As Kentaro Toyama [24] puts it, "technology's primary effect is to amplify human forces, so in education, technologies amplify whatever pedagogical capacity is already there". The digital/pedagogical capacity of educational organisations can be developed or enhanced using tools like the DigCompOrg proposed here, which will allow them to reflect on their own state of development and competence in the use of digital learning technologies and to plan further improvements.

[24] http://www.theatlantic.com/education/archive/2015/06/why-technology-alone-wont-fix-schools/394727/

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UNESCO. (2011). UNESCO ICT Competency Framework for Teachers. Retrieved 10 July 2015, from http://unesdoc.unesco.org/images/0021/002134/213475e.pdf

List of abbreviations and definitions

Acceptable Usage Policy	An Acceptable Usage Policy (AUP) is a document that outlines a set of rules to be followed by users or customers of a set of computing resources, which could be a computer network, website or large computer system. An AUP clearly states what the user is and is not allowed to do with these resources. Source: https://www.techopedia.com/definition/2471/acceptable-use-policy-aup
Assistive technology	*Assistive technology* (AT) is a generic term used to refer to a group of software or hardware devices by which people with disabilities can access computers. They can be specially developed and marketed devices or off-the-shelf products that have been modified. Assistive technology can include devices such as alternate keyboards and mice, voice recognition software, monitor magnification software, multiple switch joysticks, and text-to-speech communication aids. Source: http://www.webopedia.com
Authentic Learning (Learning in Authentic Contexts)	Authentic learning typically focuses on real-world, complex problems and their solutions, using role-playing exercises, problem-based activities, case studies, and participation in virtual communities of practice Source: Educause, https://net.educause.edu/ir/library/pdf/eli3009.pdf
Benchmark	Standard, or a set of standards, used as a point of reference for evaluating performance or level of quality. Benchmarks may be drawn from an organisation's own experience or from the experience of other organisations in the same field. Adapted from www.businessdictionary.com
Bring Your Own Device (BYOD)	BYOD reflects a pragmatic response to the reality that today's students are likely to have one or more internet-connected devices available to them for their exclusive personal use (smartphone, laptop, tablet). By allowing students to use such devices for study purposes during their attendance at school (or tertiary education institution), a one-to-one (one device per student) regime can be achieved without the need for the organisation itself to make costly investments in similar devices.
Continuous Professional Development (CPD)	CPD is the means by which members of professions maintain, improve and broaden their knowledge and skills and develop the personal qualities required in their professional lives, usually through a range of short and long training programs, some of which have an option of accreditation. This job-related continuing education and training refers to all organised, systematic education and training activities in which people take part in order to obtain knowledge and/or learn new skills for a current or a future job. Adapted from http://www.umultirank.org/#!/glossary?trackType=home&sightMode=undefined&section=undefined
Creative Commons	Creative Commons is a non-profit organisation that enables the sharing and use of creativity and knowledge through free legal tools. Free, easy-to-use copyright licenses provide a simple, standardised way to give the public permission to share and use an individual's creative work — on conditions of their choice. Adapted from http://creativecommons.org/about
Curriculum	Inventory of activities implemented to design, organise and plan an education or training action, including definition of learning objectives, content, methods (including assessment) and material, as well as arrangements for training teachers and trainers. Source: Cedefop http://www.cedefop.europa.eu/en/publications-and-resources/publications/4106 Curricula, in the context of DigCompOrg, also refer to 'courses' or 'programmes' offered by tertiary education institutions or training organisations.

Digital capacity implementation plan	Some refer to plans like this as 'Digital Learning Strategy', eLearning Strategy' etc. But the main message here is that (i) there should be such a plan; and (ii) that is should be clear where it fits into the wider institutional context.
Digital competence	Digital Competence can be broadly defined as the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society. Source: DigComp Framework http://ftp.jrc.es/EURdoc/JRC83167.pdf
Digital content	Digital content is a 'catch all' term that encompasses text-based and audio-visual *resources* (now in digital format) and interactive media (games/mobile apps, simulations, visualisations).
Digital inclusion	Refers to an individual's effective and sustainable engagement with Information and Communication Technologies (ICT) in ways that allow full participation in society in terms of economic, social, cultural, civic and personal well-being. A digitally inclusive society is therefore one in which all individuals, independent of their socio-cultural and socio-economic background, have equal opportunities to engage with ICT in such a way that a trend for increasing social inequality is halted if not reversed. Adapted from Ellen Helsper's definition in "Digital Inclusion in Europe: Evaluating Policy and Practice". www.ec.europa.eu/social/BlobServlet?docId=11614&langId=en
Digital learning technologies	Refers to the expanding range of standalone and internet enabled devices used by teachers and/or by students in the course of their everyday teaching/learning practices, and includes the enabling software, platforms and services. Devices include computers, laptops, tablets, smartphones, cameras, wearables, projectors, smartboards, 2D, 3D printers, scanners and other peripherals. Software includes general, specialist and education-specific applications, games, 'apps' and tools generally (task-oriented and for communication). Platforms include VLE/LMS (Virtual Learning Environments/Learning Management Systems), social media, web portals and repositories. Services include broadband internet connectivity, security (passwords, privacy) and file storage and management. Synonyms: Educational Technology, ICT and education, Technology Enhanced Learning (TEL)
Digital-age learning	Digital-age learning (or Learning for a Digital Age) acknowledges that, almost without exception, life, work, study and leisure take place for all citizens today in a pervasive, highly internet-connected and digitally mediated world. Learning *in* and *for* this digital age represents a new challenge for educators and their students.
Digitally-competent educational organisation	Refers to the effective use of digital technology by the educational organisation and its staff in order to provide a compelling student experience and to realise a good return on investment in digital technology. Adapted from Jisc Digital Capability initiative: https://www.jisc.ac.uk/rd/projects/building-digital-capability
Educational organisation	The term has multiple meanings according to the settings in which is being applied and often it is used interchangeably with the term 'educational institution' (e.g. European Commission, 2013b). In the context of the InnovativEdu study the term *educational organisation* refers primarily to primary, secondary and VET schools as well as higher education institutions such as Universities, University Colleges and Polytechnics
Experiential Learning	Experiential learning engages students in critical thinking, problem solving and decision making in contexts that are personally relevant to them. This approach to learning also involves making opportunities for debriefing and consolidation of ideas and skills through feedback, reflection, and the application of the ideas and skills to new situations. Source: UNESCO http://www.unesco.org/education/tlsf/mods/theme_d/mod20.html

Formal, informal & non-formal learning	*Formal* is the learning that occurs in an organised and structured environment (in an education or training institution or on the job) and is explicitly designated as learning (in terms of objectives, time or resources). Formal learning is intentional from the learner's point of view. It typically leads to validation and certification. *Informal* is the learning resulting from daily activities related to work, family or leisure. It is not organised or structured in terms of objectives, time or learning support. Informal learning is in most cases unintentional from the learner's perspective. Informal learning outcomes do not usually lead to certification but may be validated and certified in the framework of recognition of prior learning schemes. Informal learning is also referred to as experiential or incidental/random learning. *Non-formal* is the learning which is embedded in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support). Non-formal learning is intentional from the learner's point of view. Non-formal learning outcomes may be validated and lead to certification. Non-formal learning is sometimes described as semi-structured learning. Source: Cedefop http://www.cedefop.europa.eu/en/publications-and-resources/publications/4106
Formative assessment	Formative assessment refers to a wide variety of methods that teachers use to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or course. The general goal of formative assessment is to collect detailed information that can be used to improve instruction and student learning *while it's happening*. Source: Glossary of Education Reform http://edglossary.org/formative-assessment/
Governance	Concerns the structures, functions, processes, and organisational traditions that have been put in place to ensure that the organisation is run in such a way that it achieves its objectives in an effective and transparent manner. It is the framework of accountability to users, stakeholders and the wider community. Adapted from World Bank: http://siteresources.worldbank.org/EXTGLOREGPARPROG/Resources/grpp_sourcebook_chap12.pdf
ICT	See: digital technologies
Informal learning	See: Formal, non-formal and informal learning
Innovation, Education innovation	Innovation involves making changes in something established, especially by introducing new methods, ideas, or products. Source: Oxford English Dictionary
Integration and effective use of digital learning technologies	The term *integration* is used to describe the use of digital learning technologies in a 'natural' and widespread way within and beyond the organisation boundaries for achieving its core mission and vision for a quality education. The term *effective* refers to the production of planned, desired and decisive effects by the use of digital learning technologies, for example, the ability to define and achieve more comprehensive learning outcomes that might be otherwise difficult to achieve or even unattainable without the technologies in question (see also below in the Learning Outcomes).
Learning Analytics	Learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs. Source: Definition adopted at the First International Conference on Learning Analytics. http://edutechwiki.unige.ch/en/Learning_analytics
Learning outcomes	Learning outcomes are defined as the knowledge, skills and competences that people have acquired as a result of learning and can demonstrate if needed in a recognition process. EQF defines learning outcomes as statements of what a learner knows, understands and is able to do on completion of a learning

	process (European Commission, 2006). http://www.eucen.eu/sites/default/files/OECD_RNFIFL2010_Werquin.pdf The term 'comprehensive' is used to emphasise that digital technologies have the potential to broaden the scope of learning outcomes – not just make existing ones more efficient of effective. So, 'Digital' makes for new opportunities to add to the older ones – hence, more 'comprehensive'.
Learning Spaces	Our understanding of learning spaces has broadened considerably in recent years. Students increasingly make use of connected digital technologies, and do so inside and outside traditional classroom, studio, workshop, laboratory or library environments. Consideration of learning spaces spans the built environment and the online environment in which students now study and the learning and pedagogical theories that underpin a diversity of practice. Adapted from Educause: http://www.educause.edu/research-and-publications/books/educating-net-generation/learning-spaces
Management	Concerns day-to-day operations within the context of the strategies, policies, processes, and procedures that have been established by the governing body. Whereas governance is concerned with "doing the right thing," management is concerned with "doing things right. Adapted from World Bank: http://siteresources.worldbank.org/EXTGLOREGPARPROG/Resources/grpp_sourcebook_chap12.pdf
Mission	A Mission statement: defines the present state or purpose of an organization and answers three questions about why an organisation exists: WHAT it does; WHO it does it for; and HOW it does what it does. Source: Psychology Today. Vision and Mission - What's the difference and why does it matter? https://www.psychologytoday.com/blog/smartwork/201004/vision-and-mission-whats-the-difference-and-why-does-it-matter
Non-formal learning	See: Formal, non-formal and informal learning
Open Badges	Open Badges allow individuals to verify skills, interests and achievements through credible organisations. The system is based on an open standard, and individuals can combine multiple badges from different issuers to tell the complete story of their achievements — both online and off. Adapted from: http://openbadges.org
Open Education	The term 'Open Education' has several interpretations. Openness can refer to widening access to educational opportunities and educational resources (particularly for under-represented, disadvantaged, or marginalised groups). Increasing flexibility in terms of the time, place and pace of study is also a defining characteristic of openness, aligned with ambitions to provide more personalised/individualised curricula and study options (including flexible, online education and/or more personalised / open/ customised learning support for students through use of learning analytics).
Open Educational Resources	Teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. Source: UNESCO definition http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/what-are-open-educational-resources-oers/
Opening up education	A Communication of the European Commission setting out a policy for "stimulating high-quality, innovative ways of learning and teaching through new technologies and digital content". http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52013DC0654&from=EN

Peer-assessment	Peer-assessment allows instructors to share the evaluation of assignments with their students. It is grounded in theories of active learning (Piaget, '71), adult learning (Cross, '81) and social constructionism (Vygotsky, '62). Source: Cornell University Centre for Teaching Excellence http://www.cte.cornell.edu/
Performance Indicators	Performance indicator refers to the means by which an objective can be judged to have been achieved or not achieved. Indicators are therefore tied to goals and objectives and serve simply as 'yardsticks' by which to measure the degree of success in goal achievement. Performance indicators are quantitative tools and are usually expressed as a rate, ratio or percentage. Source: EQAVET, http://www.eqavet.eu
Self-assessment	*Self-assessment* involves the ability to be a realistic judge of one's own performance. Proponent of self-assessment suggest many advantages including that it: • Provides timely and effective feedback and allows for quick assessment of student learning. • Allows instructors to understand and provide quick feedback on learning. • Promotes academic integrity through student self-reporting of learning progress. • Promotes the skills of reflective practice and self-monitoring. • Develops self-directed learning. • Increases student motivation. • Improves satisfaction from participating in a collaborative learning environment. • Helps students develop a range of personal, transferrable skills to meet the expectations of future employers. Source: Cornell University Centre for Teaching Excellence http://www.cte.cornell.edu/
Self-assessment questionnaire	In the context of the InnovativEdu study, the term self-assessment questionnaire refers to a set of key questions applicable to educational organisations from different sectors which would like to review and strategically plan towards the integration and effective use of digital technologies.
Staff	Refers to staff in all categories, involved directly or indirectly in formal educational settings. Job titles include, 'teacher', 'tutor', 'academic', 'lecturer', 'faculty', 'trainer', 'mentor', 'coach' and also include support roles such as 'librarian', 'ICT support', 'eLearning support' and those in management/leadership roles, 'principals', 'rectors'.
Strategic plan	Strategic planning is an organisational management activity that is used to set priorities, focus energy and resources, strengthen operations, ensure that employees and other stakeholders are working toward common goals, establish agreement around intended outcomes/results, and assess and adjust the organisation's direction in response to a changing environment. A *strategic plan* is a document used to communicate with the organization the organisations goals, the actions needed to achieve those goals and all of the other critical elements developed during the planning exercise. Source: Balanced Scorecard Institute http://balancedscorecard.org
Students	Refers to persons of any age who are engaged in a *formal* educational process (course or programme). Students are often referred to as 'learners', although this term is potentially broader, as it can refer to learning in both formal and informal settings.
Summative assessment	Summative assessments are used to evaluate student learning, skill acquisition, and academic achievement at the conclusion of a defined instructional period—typically at the end of a project, unit, course, semester, program, or school year. Summative-assessment results are often recorded as scores or grades that are then factored into a student's permanent academic record.

	Source: The Glossary of Education Reform http://edglossary.org/summative-assessment/
Teacher	The generic term 'teacher' is intended to cover all educational sectors. Sectors, other than primary and secondary schools, may identify this role as 'tutor', 'instructor', 'lecturer', or professor.
Vision	Vision defines the optimal desired future state - the mental picture - of what an organisation wants to achieve over time; It provides guidance and inspiration as to what an organisation is focused on achieving in five, ten, or more years. Source: Psychology Today. Vision and Mission - What's the difference and why does it matter? https://www.psychologytoday.com/blog/smartwork/201004/vision-and-mission-whats-the-difference-and-why-does-it-matter
Whole of life cost model	This is also referred to as a *life cycle cost model* or a *total cost of ownership model*. As regards investments in ICT, such models take account of all expenditures that will be required for as long as the particular item of equipment is in service, including maintenance costs and the costs of essential licenses.

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Annex 1: Experts contributed to the development of DigCompOrg

Surname	Name	Affiliation/Expertise	Involved in
Balaban	Igor	University of Zagreb, Faculty of Organization and Informatics	ePOBMM
Balanskat	Anja	European Schoolnet	FCMM
Beetham	Helen	Consultant in Higher Education	Jisc
Bocconi	Stefania	National Research Council of Italy, Institute for Educational Technology	SCALE CCR
Brolpito	Alessandro	European Training Foundation	
Davies	Sarah	Jisc	Jisc
Dimitrov	Georgi	DG EAC	HEInnovate
Ekonomou	Anastasia	Cypriot Institute of Education	Ae-MoYS
Emans	Bruno	Consultant	Vensters
Gallagher	Seán	PDST Technology in Education	e-Learning Roadmap
Halonen	Marianna	Microsoft in Education	Microsoft SRT
Hunya	Marta	Hungarian Institute for Educational Research and Development	eLEMER
Hylen	Jan	Consultant	LIKA
McMorrough	Anne	Lecturer in Education, Marino Institute of Education, Ireland	SCALE CCR
Medina Bravo	Carlos Javier	Spanish Ministry of Education Educational Technologies Unit	
Meuwissen	Maartje	Schoolinfo	Vensters
Ravet	Serge	ADPIOS	ePOBMM
Rubio Navarro	Gabriel	Public University of Navarre (UPNA), Spain	
Scepanovic	Danijela	Serbian Ministry of Education, Science and Technological Development	
Shapiro	Hanne	Danish Technological Institute	
Søby	Morten	Norwegian Centre for ICT in Education	School Mentor
Viteli	Jarmo	University of Tampere, Finland	Opeka

Annex 2: In-depth analysis matrix

1st draft of DigCompOrg	Curricula & content	Assessment & impact	Learning practices	Teaching practices & professional development	Leadership & strategic planning	Openness & networking	Technological and physical infrastructure	Other(s) / Sector specific
Final draft of DigCompOrg	**Content & Curricula**	**Assessment Practices**	**Teaching & Learning Practices**		**Leadership and Governance Practices**	**Communication & Networking**	**Infrastructure**	**Sector Specific**
SCALE CCR	Content & Curricula	Assessment	Learning practices	Teaching practices	Organisation Leadership & Values	Connectedness	Infrastructure	
HEInnovate		Measuring the Impact	Entrepreneurship development in teaching and learning	Entrepreneurship development in teaching and learning	Organisational Capacity, People & Incentives Leadership and Governance	The Entrepreneurial HEI as an Internationalised Institution; HEI-Business/External Relationships for Knowledge Exchange		Pathways for entrepreneurs
Jisc					Enterprise Architecture Strategic Leadership; ICT Governance	Communications and Engagement; Shared Services	ICT Service	
ePOBMM	Curriculum design (in Learning)	Assessment; ePortfolios	Learning; people – learners	People - teaching staff			Technologies; ePortfolios – technologies; Open Badges Technology (tbd)	Open Badges

FCMM	Educational Resources (Underpinning Technology); Educational Outcomes (Learning Objectives)	Management of Teaching, Learning & Assessment	Educational Processes (Pedagogy; Learner Role);	Capacity building - Educational Processes (Pedagogy; Learner Role);	Organisational eMaturity Management of Teaching, Learning & Assessment	Teacher-student collaboration	Tools and resources	
Microsoft SRT		Teaching, Learning & Assessment	Teaching, Learning & Assessment	Capacity Building Teaching, Learning & Assessment	Leadership & a Culture of Innovation Leadership & a Culture of Innovation	Workshop 5 – sharing ideas	Learning Environment	
eLEMER			Learners & learning	Teachers & teaching	Management		Infrastructure	
Opeka				ICT-skills	Digital learning culture		Devices and software	
School mentor				Pedagogical practice, Digital competence	Organisation; Administration & framework conditions; Mapping & planning	(in Organisation: Communication & External Communication)	School resources	
LIKA			Usage (Administration; teacher pedagogical; student)	Usage (Administration; teacher pedagogical; student); (School staff digital) Competences	Leadership: Vision and strategic work, organization, procedures and guidelines, Leading IT, Budget, Monitoring		Infrastructure	Impact
Ae-MoYS	ICT in the Curriculum			Professional Development	School ICT culture Leadership & Vision		Resources & Infrastructure	

e-Learning Roadmap	ICT in the curriculum			Professional Development	e-Learning Culture Leadership & planning		ICT infrastructure	
NAACE SRF	Use of ICT in the curriculum	Assessment of digital capability	Teaching and learning	Professional development Teaching and learning	Leadership & management		Resources	(initially also: Extending opportunities for learning; Impact on learning outcomes
Speak Up NRP	Digital content	Online assessment		Online learning/professional development	Strategic planning	Social media	Technology attitudes and usage; Internet access	Mobile learning; 21st century skills/career exploration

Annex 3: Structured fact sheets of the frameworks/SAQs analysed

Microsoft Innovative Schools Toolkit and Self-reflection tool Info provided by Marianna Halonen	
What is the complete title and the web address(es) of the framework?	Microsoft Innovative Schools Toolkit http://www.is-toolkit.com
What is the organisation leading the initiative? Who are the contact persons?	Microsoft Corporation, Mark Sparvell
Who are the developers / stakeholders involved in its development / implementation?	Microsoft
What is the background? Are there any precursors? Is there any related questionnaire / online tool?	To support schools in the change management process
What are the starting / ending dates of its development / implementation?	2009 till today
Are there any related publications, evaluation reports, online resources, etc.?	
What is it about (please give a short description; mention the educational sectors covered etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	The focus in the change management process and ICT integration in education
Why the framework has been developed? Who is expected to use it and how? Does it have any political backing or policy relevance?	School leaders and teachers in education transformation process
Which are the key areas / dimensions of the framework? Which are the sub-areas (if any)?	Key areas of the framework • Teaching, learning and assessment • Leadership and culture of innovation • Capacity building • Learning environment
Any additional info you feel is relevant and important?	http://pilnetwork.blob.core.windows.net/public/Creating%20Innovative%20Schools.pdf

What is the complete title and the web address(es) of the questionnaire / online tool?	Self-reflection tool http://www.is-toolkit.com/selfreflection/index.php?id=1
What is the organisation leading the initiative? Who are the contact persons?	Microsoft Corporation, Mark Sparvell
Who are the developers / stakeholders involved in its development / implementation?	Microsoft
What is the background? Is it based on any conceptual framework? Are there any precursors?	Strategic management tool to create a vision for education transformation
What are the starting / ending dates of its development / implementation?	2010
What is the format of the questionnaire (online database /paper/ other)?	Online
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g.	Self-reflection tool. The focus is in 21st century learning and ICT integration in education

ICT integration; innovation; openness; pedagogical practices; other)?	
Who fills in the questionnaire and when?	The school leaders once a year
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	No
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your organisation/yourself to others?	The ones who fill in the questionnaires
How many educational organisations/individuals have already filled in the questionnaire / online tool?	-
Are there any consequences (e.g. incentives, sanctions…) for educational organisations/individuals to fill in or not this questionnaire / online tool?	-
Is the questionnaire / online tool related to any educational policy-action (regional/national/European)?	No
Which is the % of educational organisations / individuals targeted within your region /country?	All K12 schools
Is there a process for updating the questionnaire / online tool? If yes, how and how often?	No
Are there any related publications, evaluation reports, online resources, etc.?	Innovative Teaching and Learning Research www.itlreearch.com
Any additional info you feel is relevant and important?	Partners in Learning School Research www.pilsr.com

Future Classroom Maturity Model Info provided by Anja Balanskat	
What is the complete title and the web address(es) of the framework?	Future Classroom Maturity Model
What is the organisation leading the initiative? Who are the contact persons?	European Schoolnet. Contact [depends on who asks and where this info is published]
Who are the developers / stakeholders involved in its development / implementation?	Development: EUN, Futurelab UK (now absorbed into National Foundation for Educational Research), DG CONNECT funded. Implementation: iTEC MoE partners, SMART, Promethean
What is the background? Are there any precursors? Is there any related questionnaire / online tool?	Origins in Becta e-maturity model developed in 1990s, work by Nottingham University, see http://fcl.eun.org/documents/10180/14691/2.4+-+Maturity+Model+Background.pdf/6c708c00-29c6-4b6f-8ace-221dce95f5e7 We also commissioned a report in iTEC on similar schemes worldwide, e.g. Norway, NAACE ICT Mark.
What are the starting / ending dates of its development / implementation?	Started Sep 2010, formally ended Aug 2014, but maintained by EUN as part of the Future Classroom.
Are there any related publications, evaluation reports, online resources, etc.?	iTEC deliverables, e.g. exploitation plan; background paper http://fcl.eun.org/documents/10180/14691/2.4+-+Maturity+Model+Background.pdf/6c708c00-29c6-4b6f-8ace-221dce95f5e7 Reference guide: http://fcl.eun.org/documents/10180/14691/2.2+FCMM+reference+guide.pdf/5fe0addb-3934-436c-aba3-8693bf90a95a?version=1.0 FCMM is online at http://fcl.eun.org/toolkit within the Future Classroom toolkit. Direct access: http://fcl.eun.org/toolset2. Registration required to use the online forms.
What is it about (please give a short description; mention the educational sectors covered etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	A free self-review tool that enables primary and secondary teachers and schools to assess their current level of maturity in how effectively ICT is being used in support of learning and teaching. Its focus is innovation, change, pedagogy, supportive technology, professional and institutional development.
Why the framework has been developed? Who is expected to use it and how? Does it have any political backing or policy relevance?	It was developed as a tool to help school self-assess their level of innovation with technology, and to create and implement future learning scenarios that are based on their strengths and weaknesses, and contextual trends, opportunities and challenges. The toolkit is for schools (and their stakeholders) and individual teachers, and is in English. It is backed by 13 ministries of education in the iTEC project, and was developed with the approval of the 30 in European Schoolnet. Their support is based on its proven use in supporting innovation and school reform and change.
Which are the key areas / dimensions of the framework? Which are the sub-areas (if any)?	There are five progressive stages, level 1 to 5 (1: Exchange 2: Enrich 3: Enhance 4: Extend 5: Empower). As a school moves from one stage to the next, the maturity of the school, in its ability to be innovative in learning and teaching supported by technology, increases. Future Classroom Scenarios are used to create a vision of learning and teaching that moves a school to higher levels of Future Classroom Maturity. The starting point for the scenario development process is to self-assess the school's current use of ICT

	and its position in the maturity model. There are two ways to use the maturity model either as a self-review exercise in a school or during a Future Classroom Scenario workshop. The main purpose is to identify what a school needs to do to increase its level of Future Classroom Maturity. The questions cover five areas, called dimensions, concerned with learning and teaching (Learners' role, teacher's role, learning objectives and assessment, school capacity to support innovation, tools and resources). Once completed, the tool gives an indication of the level of maturity overall, and for each dimension. This is compared to national and international averages. More importantly, a diagnostic report is generated identifying what should be included in a Future Classroom Scenario to help a school move to the next level of maturity.
Any additional info you feel is relevant and important?	The FCMM is OER, Creative Commons.

Planning and implementing e-learning in your school Info provided by Seán Gallagher	
What is the complete title and the web address(es) of the framework?	Planning and implementing e-learning in your school - http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/
What is the organisation leading the initiative? Who are the contact persons?	PDST Technology in Education (formerly NCTE) Seán Gallagher, Madeleine Murray
Who are the developers / stakeholders involved in its development / implementation?	Department of Education and Skills (Ireland) and related support services
What is the background? Are there any precursors? Is there any related questionnaire / online tool?	The DES published an ICT strategy for schools in 2008 and all schools expected to have an e-learning plan to integrate ICT in teaching and learning. The e-learning handbook was produced to support schools in this regard. Irish school leaders and teachers are engaged in school development planning. With no dedicated Computer Science subject in either the Primary school curriculum or Post Primary syllabi, there was a need to consider the integration of ICT in teaching and learning into the school development planning process. The e-Learning Roadmap is an accompanying planning tool designed to help a school identify where it currently is in relation to e-Learning, and where it would like to go. - See more at: http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Roadmap/#sthash.6gfyqTK2.dpuf
What are the starting / ending dates of its development / implementation?	Published in 2009, the e-learning handbook will be revised in tandem with the Digital Strategy for Schools (2015-2020) that was launched in Ireland on the 7th of October 2015. One of the deliverables of the Digital Strategy is the revision of the e-learning handbook and roadmap to consider new technologies and align with national priorities of School self- evaluation, literacy and numeracy.
Are there any related publications, evaluation reports, online resources, etc.?	There are related documents for all of the following phases of the planning process The planning process is introduced - http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/Introduction.pdf The school conducts an audit to start the planning process - http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/Getting-Started.pdf Priorities are formed - http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/Step-1-Review-Prioritise.pdf The plan is developed - http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/Step-2-Develop-plan.pdf It is then implemented and monitored - http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/Step-3-Implement-and-monitor-plan.pdf The plan is evaluated - http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/Step-4-Evaluate-plan.pdf
What is it about (please give a short description; mention the educational sectors covered etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	PDST Technology in Education's e-Learning Handbook outlines the process of planning for e-Learning in a school and has been developed in consultation with the school development planning initiatives at primary and post primary level (PPDS & SDPI/SLSS). It provides a step by step guide to the development of the school's

	e-Learning Plan and outlines the key roles and responsibilities of all involved in the development of the plan
Why the framework has been developed? Who is expected to use it and how? Does it have any political backing or policy relevance?	School leaders and ICT Coordinating teachers are expected to be the main users.
Which are the key areas / dimensions of the framework? Which are the sub-areas (if any)?	Key areas of the framework Leadership and planning ICT and the Curriculum Professional Development E-learning culture ICT infrastructure
Any additional info you feel is relevant and important?	

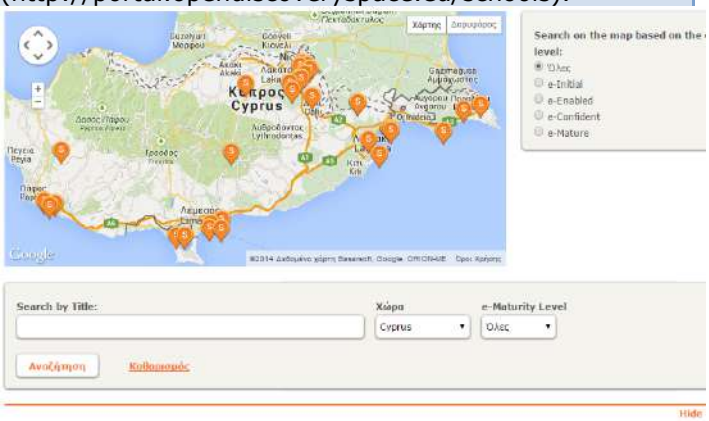
The ePortfolios & Open Badges Maturity Matrix Info provided by Serge Ravet and Igor Balaban	
What is the complete title and the web address(es) of the framework?	The ePortfolios & Open Badges Maturity Matrix http://bit.ly/mmpdf – a pdf to download http://bit.ly/mmgdoc – a Googledoc open for comments
What is the organisation leading the initiative? Who are the contact persons?	Europortfolio is the leading organisation and the contact persons are Serge Ravet, serge.ravet@iosf.org / Igor Balaban, igor.balaban@foi.hr
Who are the developers / stakeholders involved in its development / implementation?	The main author is Serge Ravet with contributions from Helen Barrett, partners of the Europortfolio initiative (Lourdes Guàrdia; Marcelo Maina; Elena Barberà, Ivan Alsina, Birgit Wolf, Peter Baumgartner, Igor Balaban) and members of the Europortfolio community. There is not yet an implementation although an interactive tool based on the Matrix is under development.
What is the background? Are there any precursors? Is there any related questionnaire / online tool?	The maturity matrix is inspired by the work done at Becta on e-maturity, the Self Review Framework and ICT Mark (2006) now transferred to NAACE (revised in 2014), a previous ePortfolio maturity matrix developed by EIfEL (2007) and the Australian ePortfolio Project, the Australian ePortfolio Initiative, Australian ePortfolio Toolkit (2008) and the work from, Jisc, SURF. The full set of publications will be published in the final version of the Matrix.
What are the starting / ending dates of its development / implementation?	We are still at the alpha release. The work started mid-2013. A first version of an online tool for self-assessment should be ready in 2015.
Are there any related publications, evaluation reports, online resources, etc.?	Not yet
What is it about (please give a short description; mention the educational sectors covered etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	The objective of the matrix is to help organisations with the integration of ePortfolios and Open Badges as a means to transform educational practices. A large part of the matrix does not make any direct reference to ePortfolios or Badges, but to the underpinning elements related to pedagogical practices and ICT integration.
Why the framework has been developed? Who is expected to use it and how? Does it have any political backing or policy relevance?	The framework will be foundation of a tool used by organisations or communities for self, 360° or peer reviews. It could also be used to plan further development and measure the progress accomplished in relation to those plans. The focus is on organisations or communities, not individuals. A competency framework will address the individuals.
Which are the key areas / dimensions of the framework? Which are the sub-areas (if any)?	The main areas are: Learning (pedagogy), Technology, ePortfolios and Open Badges.

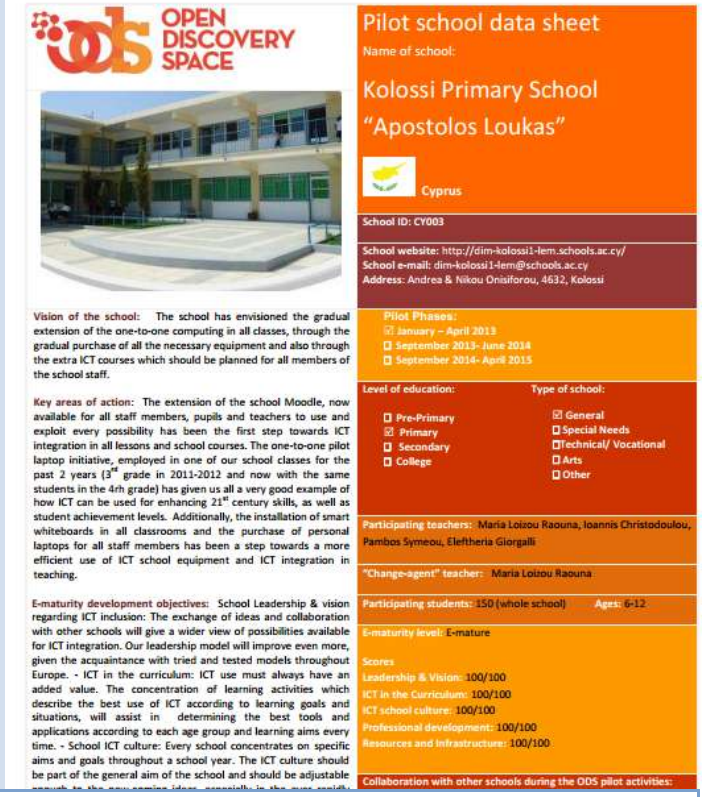
Any additional info you feel is relevant and important?	The Maturity Matrix is an attempt to articulate the complex nature of learning in relation to: > Two contexts: formal and informal; > Three spaces: the learning, working and social spaces; > Four components: learning, technologies and their combination in ePortfolios and Open Badges; and > Five maturity levels: Aware, Exploring, Developing, Integrated, Transformative. The objective of the matrix is not to be prescriptive but to engage organisations to reflect on their practices. It should be understood as a blue-print from which customised matrices could be designed to suit the particular context of an organisation or a community.

eLEMER Info provided by Marta Hunya	
What is the complete title and the web address(es) of the questionnaire / online tool?	eLEMER http://ikt.ofi.hu/ limited English version: http://ikt.ofi.hu/english/
What is the organisation leading the initiative? Who are the contact persons?	Oktatáskutató és Fejlesztő Intézet / Hungarian Institute for Educational Research and Development – PhD Marta Hunya
Who are the developers / stakeholders involved in its development / implementation?	Same as above
What is the background? Is it based on any conceptual framework? Are there any precursors?	Formative assessment self-evaluation tool for schools (), also serves as a country monitoring tool
What are the starting / ending dates of its development / implementation?	Development: 2010-11, implementation: 2011-14
What is the format of the questionnaire (online database /paper/ other)?	Online database
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	A country wide self-assessment tool for the whole public education, from age 6 (grade 1) to age 19 (grade 13). Focus: ICT integration with a whole school perspective, four areas: usage in learning, teaching; organisation and infrastructure.
Who fills in the questionnaire and when?	Two ways: 1) pre-agreed data is filled in by a single person. There are tools for collecting the info from teachers and students; or they can appoint a committee, or at a staff meeting they can agree and fill in the questionnaire. 2) The above method + using individual online questionnaires (teachers and students from age 10). This data automatically appears in the evaluation form as a proof for the chosen value. Min. 2/3 of the teachers and 50% of the students are suggested to respond. Data can be submitted and overwritten any time. There is a campaign in every February and the snapshot is made at the end of February.
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	100, all, 0-4, where 0 means not applicable
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	Yes, yes – for 3 years
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your organisation/yourself to others?	The school with their unique access, to their own data. They can print it in a way that can be used for development purposes, also as a base for their ICT development plan or strategy. The tool shows where the school is compared to the national average. Researchers who are involved have access to all the data.
How many educational organisations/individuals have already filled in the questionnaire / online tool?	There are over 700 schools responding every year. About half of them return every year. There are about 5800 schools in Hungary.
Are there any consequences (e.g. incentives, sanctions…) for educational organisations/individuals to fill in or not this questionnaire / online tool?	No, but we are planning.
Is the questionnaire / online tool related	No

to any educational policy-action (regional/national/European)?	
Which is the % of educational organisations / individuals targeted within your region /country?	100% regarding public education (kindergarten excluded).
Is there a process for updating the questionnaire / online tool? If yes, how and how often?	Yes, every second year
Are there any related publications, evaluation reports, online resources, etc.?	The yearly report always appears online in April or May and other publications, conference lectures also take place every year. There were 2 appearances in international conferences.
Any additional info you feel is relevant and important?	We'd like to introduce the title of "innovative schools" as a reincarnation of EUN innovative schools, but there is not enough time, energy and money, mostly not enough policy attention to succeed.

Assessing the e-Maturity of your School Info provided by Anastasia Economou	
What is the complete title and the web address(es) of the questionnaire / online tool?	Assessing the e-Maturity of your School http://e-mature.ea.gr
What is the organisation leading the initiative? Who are the contact persons?	This questionnaire is administered in the framework of the Open Discovery Space project, which is co-financed by the European Commission CIP-ICT PSP- 2011-5, Theme 2: Digital Content, Objective 2.4: eLearning Objective 2.4 Contact persons: Thanasis Hadzilacos, Open University of Cyprus
Who are the developers / stakeholders involved in its development / implementation?	The Open Discovery Space project partners (hosted at Ellinogermaniki Agogi in Greece)
What is the background? Is it based on any conceptual framework? Are there any precursors?	This questionnaire is based on the Self-Evaluation Tool developed as part of the Digital Schools Award, an initiative of Ireland's NCTE in collaboration with the IPPN, INTO and CESI (www.digitalschools.ie)
What are the starting / ending dates of its development / implementation?	2011-2015
What is the format of the questionnaire (online database /paper/ other)?	Online database
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	The tool consists of a questionnaire that is used for research purposes within the framework of the "Open Discovery Space" project and is addressed to school staff from schools across Europe, in order for them to illustrate their strengths and weaknesses in relation to Information and Communications Technology (ICT). The term ICT is used in this survey to refer to the use of Information and Communications Technology in education in general. It is thus meant as an umbrella term to capture all possible kinds of ICT with an emphasis on e-learning applications for teaching and learning. The questionnaire is a self-assessment tool and it covers 5 areas: 1. Leadership & Vision The school can show evidence of: A whole-school ICT policy that outlines a vision and strategy and conveys a positive attitude to the use of ICT in our school. The policy addresses curriculum linkage, planning for structured ICT access for all and Internet safety. 2. ICT in the Curriculum A school can show evidence of: ICT integration across the curriculum in learning and teaching and staff understand how ICT can be used in the curriculum to improve student learning. 3. School ICT Culture A school can demonstrate: Awareness that ICT has an impact on the quality of learning and teaching, pupils' attitudes and behaviour and the wider school community. 4. Professional Development A school can demonstrate: A commitment to on-going professional development in relation to ICT. 5. Resources & Infrastructure

	A school can demonstrate: The use of appropriate ICT resources to support particular learning environments and it has deployed appropriate ICT resources that reflect the plan for future improvement and development of ICT as outlined in the whole-school policy. Each school can see a summary of the results for each category and use this data so as to develop an action plan for the school. The action plan is based on another online questionnaire which is submitted to the system in order to create the school profile for the ODS portal (http://portal.opendiscoveryspace.eu/schools). 
Who fills in the questionnaire and when?	Teachers participating in ODS as school coordinators are requested to work through all the questions in each category, indicating the extent to which their school meets the criteria. In order to respond as accurately as possible, it is advised to consult the Head of the school, other colleagues and any school records available that may help them illustrate the use of ICT in their school. Before answering the questions, they are asked to enter their details (school name, and a contact email address) so that the ODS team may contact them. A bar graph is generated illustrating how their school has performed in each category. All information remain confidential and are used for research purposes only.
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	5 areas with a total of 30 questions All of them are mandatory 1. Leadership & Vision 6 questions (scale yes/no) 2. ICT in the Curriculum 6 questions (scale 1-4 (agree-disagree, percentages)) 3. School ICT Culture 8 questions (scale 1-4 (agree-disagree, percentages)) 4. Professional Development 5 questions (scale 1-4 (agree-disagree, percentages)) 5. Resources & Infrastructure 5 questions (scale yes/no)
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	You can save the results and access them at any point. The results are updated automatically (there is no record of previous entrances).
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your	Self-assessment questionnaire: All the users have access to their own results for the self-assessment tool. There is no accessibility to other results.

organisation/yourself to others?	Action Plan questionnaire: All the users have access to their own results for the Action Plan questionnaire. There is accessibility to see the results of the other schools as well (even edit them! –bug?) At the same time this information is shared at the ODS portal under the schools profiles (http://portal.opendiscoveryspace.eu/schools).  OPEN DISCOVERY SPACE Pilot school data sheet Name of school: Kolossi Primary School "Apostolos Loukas" Cyprus School ID: CY003 School website: http://dim-kolossi1-lem.schools.ac.cy/ School e-mail: dim-kolossi1-lem@schools.ac.cy Address: Andrea & Nikou Onisiforou, 4632, Kolossi Vision of the school: The school has envisioned the gradual extension of the one-to-one computing in all classes, through the gradual purchase of all the necessary equipment and also through the extra ICT courses which should be planned for all members of the school staff. Pilot Phases: ☑ January – April 2013 ☐ September 2013- June 2014 ☐ September 2014- April 2015 Key areas of action: The extension of the school Moodle, now available for all staff members, pupils and teachers to use and exploit every possibility has been the first step towards ICT integration in all lessons and school courses. The one-to-one pilot laptop initiative, employed in one of our school classes for the past 2 years (3rd grade in 2011-2012 and now with the same students in the 4rh grade) has given us all a very good example of how ICT can be used for enhancing 21st century skills, as well as student achievement levels. Additionally, the installation of smart whiteboards in all classrooms and the purchase of personal laptops for all staff members has been a step towards a more efficient use of ICT school equipment and ICT integration in teaching. Level of education: ☐ Pre-Primary ☑ Primary ☐ Secondary ☐ College Type of school: ☑ General ☐ Special Needs ☐ Technical/ Vocational ☐ Arts ☐ Other Participating teachers: Maria Loizou Raouna, Ioannis Christodoulou, Pambos Symeou, Eleftheria Giorgalli "Change-agent" teacher: Maria Loizou Raouna Participating students: 150 (whole school) Ages: 6-12 E-maturity development objectives: School Leadership & vision regarding ICT inclusion: The exchange of ideas and collaboration with other schools will give a wider view of possibilities available for ICT integration. Our leadership model will improve even more, given the acquaintance with tried and tested models throughout Europe. - ICT in the curriculum: ICT use must always have an added value. The concentration of learning activities which describe the best use of ICT according to learning goals and situations, will assist in determining the best tools and applications according to each age group and learning aims every time. - School ICT culture: Every school concentrates on specific aims and goals throughout a school year. The ICT culture should be part of the general aim of the school and should be adjustable E-maturity level: E-mature Scores Leadership & Vision: 100/100 ICT in the Curriculum: 100/100 ICT school culture: 100/100 Professional development: 100/100 Resources and Infrastructure: 100/100 Collaboration with other schools during the ODS pilot activities:
How many educational organisations/individuals have already filled in the questionnaire / online tool?	There are 114 submissions for the school action plan. There is no record on the submissions of the e-maturity questionnaire.
Are there any consequences (e.g. incentives, sanctions…) for educational organisations/individuals to fill in or not this questionnaire / online tool?	Profile on the ODS schools community
Is the questionnaire / online tool related to any educational policy-action (regional/national/European)?	The Open Discovery Space project, which is co-financed by the European Commission CIP-ICT PSP- 2011-5, Theme 2: Digital Content, Objective 2.4: eLearning Objective 2.4
Which is the % of educational organisations / individuals targeted within your region /country?	By the end of the project in 2015 is expected that about 100 schools will participate in Cyprus while 2000 will participate from all over Europe
Is there a process for updating the questionnaire / online tool? If yes, how and how often?	Not such a process is described
Are there any related publications, evaluation reports, online resources, etc.?	On the ODS portal under *documentation* there are publications, deliverables, presentations and other dissemination material that refer in general to ODS (not specifically to the e-maturity questionnaire
Any additional info you feel is relevant and important?	

Jisc Strategic ICT Toolkit Info provided by Sarah Davies	
What is the complete title and the web address(es) of the questionnaire / online tool?	Jisc Strategic ICT Toolkit http://www.jisc.ac.uk http://www.jiscinfonet.ac.uk/tools/strategic-ict-toolkit/
What is the organisation leading the initiative? Who are the contact persons?	Jisc, Myles Danson
Who are the developers / stakeholders involved in its development / implementation?	Lead team comprised Jisc, The Leadership Foundation for Higher Education [25](LFHE) and University of Nottingham. Wider field tests via; City of Glasgow College, Coventry University, Deeside College, Liverpool John Moores University, Loughborough University, Manchester Metropolitan University, University of Central Lancashire, University College Falmouth, University of Gloucestershire, University of York
What is the background? Is it based on any conceptual framework? Are there any precursors?	In 2008 Jisc and the LFHE identified an opportunity to assist in HEIs in their strategic use of ICT. At the time there was disparity between business leaders and ICT leaders resulting in sub optimal integration of ICT in business strategies, their implementation and the resulting benefits from ICT investment. A team at the University of Nottingham was commissioned to develop a self-analysis toolkit to help HEIs to analyse, assess and develop their strategic use of information technologies. The use of ICT is considered important to the support and delivery of core businesses, however, a Jisc / commissioned report[26] showed that HEIs differed widely in the maturity of strategic ICT use. Jisc and LFHE commissioned this toolkit to support CIOs, IS Directors and senior leaders in HE, in developing towards more strategically directed ICT deployment. The project drew on the experience, insights and existing practices of a representative sample of HEI's in developing a self-analysis toolkit to stimulate this understanding and support institutional development.
What are the starting / ending dates of its development / implementation?	2010-2011
What is the format of the questionnaire (online database /paper/ other)?	There are two versions of the self-assessment tool, both developed in MS Excel to allow institutional editing of phraseology. There is also a web presence to assist in implementation and analysis comprising; • A knowledge base of information that provides awareness of the factors that impact and influence an institution's strategic use of ICT and ultimately therefore, the value that is gained from its deployment. We have identified these areas as key 'enablers' of strategic ICT • A set of case studies drawn from institutions within the HE sector with models of operational, strategic and transformational maturity. They illustrate the different context set by institutions for ICT to provide operational, strategic or transformational support. The University of Nottingham, who completed this project, undertook research, during early 2010, with 20 institutions from across the UK HE

[25] http://www.lfhe.ac.uk

[26] http://jisc.ac.uk/media/documents/programmes/jos/lfhe_finalreport.pdf

	sector • The self-analyses tools themselves across the two perspectives of Institutional Maturity and an individual's disposition to strategic ICT, called 'Individual ICT Strategy Savvy'
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	Self-assessment tool to benchmark institutional (organisational) and individual (business and IT senior managers) capabilities in various 'strategic technology business enablers'. The results provide insights into strengths and weaknesses which, when considered with institutional strategic priorities allows action to be taken to improve matters.
Who fills in the questionnaire and when?	Business leaders and ICT leaders often through existing groupings; members of the institutions senior management team, all senior decision-makers with local responsibility for the strategic use of ICT within their own faculties, schools, departments or teams and the senior ICT management team.
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	Institutional tool; Strategic leadership (12Qs), ICT Services (11Qs), ICT Governance (18Qs), Communications and engagement (8Qs), Shared Services (7Qs), Enterprise Architecture (13Qs). Individual tool; Senior Strategic Leader (44Qs), Head of Department (40Qs), CIO (40Qs), Senior IT Professional (48Qs),
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	Yes it's in Excel
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your organisation/yourself to others?	Not automatically but manually yes
How many educational organisations/individuals have already filled in the questionnaire / online tool?	Hard to say, it was developed and released across the pilot sites that all state they intended an annual exercise based on the tools. They were embedded into LFHE courses (claim 80% of UK HE Senior Leaders have attended courses) so may proliferate
Are there any consequences (e.g. incentives, sanctions…) for educational organisations/individuals to fill in or not this questionnaire / online tool?	None
Is the questionnaire / online tool related to any educational policy-action (regional/national/European)?	Probably but wasn't developed in reaction to any
Which is the % of educational organisations / individuals targeted within your region /country?	No longer actively developed
Is there a process for updating the questionnaire / online tool? If yes, how and how often?	No longer actively developed
Are there any related publications, evaluation reports, online resources, etc.?	Not that we are aware of
Any additional info you feel is relevant and important?	

School Mentor Info provided by Morten Søby	
What is the complete title and the web address(es) of the questionnaire / online tool?	School Mentor http://www.skolementor.no/index.php/en/
What is the organisation leading the initiative? Who are the contact persons?	Norwegian Centre for ICT in Education
Who are the developers / stakeholders involved in its development / implementation?	Developer: Norwegian Centre for ICT in Education together with School leaders & experts. Stakeholders: Municipalities, Counties
What is the background? Is it based on any conceptual framework? Are there any precursors?	Digital literacy is defined as a basic skill in the national curriculum. Because the national curriculum is regarded as a legal directive, it is the most important ICT policy for schools. The Knowledge Promotion curriculum defines general and specific goals in each subject and for each key stage. Key stages are defined after year two, four, seven and ten/thirteen. The Norwegian Directorate for Education and Training has developed a framework for the five basic skills: oral, reading, writing, digital and numeracy skills.
What are the starting / ending dates of its development / implementation?	Anytime
What is the format of the questionnaire (online database /paper/ other)?	Online. (School Mentor) is a web based self-assessment tool, which supports school managers in their work with digital competence. Use of School Mentor helps to strengthen the development plans and strategies of the school in meeting demands for digital competence. It has been developed with the aim of ensuring that the school's investment in ICT, in terms of equipment and the raising of the digital competence level of the staff, is carried out in the context of realistic goals. The School Mentor is a resource for reflections and school development intended to support the work of school administrators in enhancing the digital competence. The School Mentor is available free of charge and has been developed by the Norwegian Centre for ICT in Education.
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	The School Mentor is a resource intended for reflections, and the key element is the discussions generated by the various statements. The School Mentor is not intended as a status or reporting tool. As a point of departure, only the school will have access to its own reports. The school may decide to grant the school owner access to the results. The School Mentor is best utilised by having the school's administration discuss the various statements in cooperation with a group at the school. A single person should be responsible for registering the response to the statements in the School Mentor. The School Mentor provides the school with an opportunity to reflect on its own facilitation and execution of pedagogical use of ICT. Through use of the School Mentor, the school's administration will be able use the reflections on the current status and the subsequent proposals for measures to improve the school's strategic and pedagogical work, which in turn may improve the students' learning outcome. The School Mentor has been developed to ensure that the school's investments in ICT in terms of both equipment and enhancement of the personnel's digital competence, will be based on realistic objectives. It may prove beneficial to use the School Mentor to start

	a dialogue with the school owner to document needs and identify challenges. Strengths and weaknesses at the school will be identified through reflections. Recommendations for further work will be presented when the process has been completed. Although the School Mentor is primarily intended for the school's administration, the program should be used in collaboration with the teachers and other employees. Such involvement of members of the teaching staff should ensure a strong integration and understanding of the school's vision, practice and learning in terms of use of ICT.
Who fills in the questionnaire and when?	School leader
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	The School Mentor has 30 statements divided among six different areas. The appropriate response to the statements is determined by reflecting on which level the school is at, and you may start with any one of the areas. The areas are as follows: * Administration and framework conditions * School resources * Mapping and planning * Digital competence * Pedagogical practice * Organisation Information on each area is available in the Area Guide. The Area Guide will also become available when you start the School Mentor. The answers will be saved consecutively, and the School Mentor may be completed as fast or slow and in any order you like. It is also possible to save data from one round, and use this data for comparison with subsequent rounds. 500 users. Demo users 1200? 1200 users/answers
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	A report will be generated within each area showing the status and proposals for measures. When the entire School Mentor has been completed, a main report will be generated based on all proposed measures with specific advice for further work on planning and execution of pedagogical use of ICT.
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your organisation/yourself to others?	
How many educational organisations/individuals have already filled in the questionnaire / online tool?	We do not have figures for the demo version.
Are there any consequences (e.g. incentives, sanctions…) for educational organisations/individuals to fill in or not this questionnaire / online tool?	No
Is the questionnaire / online tool related to any educational policy-action (regional/national/European)?	
Which is the % of educational organisations / individuals targeted within your region /country?	
Is there a process for updating the questionnaire / online tool? If yes, how	School Mentor will be integrated in planning resource for school owners

and how often?
Are there any related publications, evaluation reports, online resources, etc.?
Any additional info you feel is relevant and important?

Opeka Info provided by Jarmo Viteli	
What is the complete title and the web address(es) of the questionnaire / online tool?	Opeka, an online evaluation tool for teachers and schools about their digital competencies and cultures www.opeka.fi
What is the organisation leading the initiative? Who are the contact persons?	Tampere Research Center for Information and Media (TRIM), University of Tampere, Finland
Who are the developers / stakeholders involved in its development / implementation?	Originally Opeka was developed by TRIM in close partnership between the City of Tampere, Board of Education and Ministry of Education
What is the background? Is it based on any conceptual framework? Are there any precursors?	OPEKA is based on evaluation methods of teachers ICT-competences (Skills, attitudes, Motivation, Pedagogical practices, collaboration)
What are the starting / ending dates of its development / implementation?	Development started in the beginning of year 2012. First pilots were conducted in the spring of 2012 and during the year 2013 the service was deployed nationwide.
What is the format of the questionnaire (online database /paper/ other)?	Online web-service based on an online database.
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	- Finnish teachers, primary and secondary - Self-assessment for teachers - Three "modules": Digital learning culture, Devices and software and ICT-skills
Who fills in the questionnaire and when?	Teachers as often they wish, mainly once a year or after every ICT-related intervention.
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	145 questions including 10 questions related to the quality of the questionnaire, few questions related to devices and software the responder chooses and about ten questions about background information (school the teachers teaches in etc.) Only mandatory questions are about background information. In practice most teachers answer all questions.
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	- Results can be viewed at any time during the calendar year - Comparisons to earlier results can be done
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your organisation/yourself to others?	- Questions linking individual answers to questions cannot be viewed through the WWW-interface. - Individual respondents can compare themselves to their school, their town, teachers that teach the same subject or level as them or the whole answer population - Comparisons are given also during the filling out the questionnaire after the respondent has answered each question. - The reports that contain answer distributions of schools, towns or combinations of these can be viewed by personnel related to that organization. These are only given when at least 5 responses have come in to protect the anonymity of respondents.
How many educational organisations/individuals have already filled in the questionnaire / online tool?	151 municipalities / Out 330 1267 schools / out of 2800 13540 responders / out of 50 000
Are there any consequences (e.g. incentives, sanctions…) for educational	No.

organisations/individuals to fill in or not this questionnaire / online tool?	
Is the questionnaire / online tool related to any educational policy-action (regional/national/European)?	Information will be used to modify Finnish ICT-policies in school settings
Which is the % of educational organisations / individuals targeted within your region /country?	We target all schools and municipalities in Finland, but in practise individual schools and municipalities (and in some cases individual teachers) decide themselves if they want to take part.
Is there a process for updating the questionnaire / online tool? If yes, how and how often?	We have updated the questionnaire some times, but there is no defined process in place.
Are there any related publications, evaluation reports, online resources, etc.?	Some publications: Heikki Sairanen ja Mikko Vuorinen. "Opetusteknologian käytön trendit". Tuovi 12: Interaktiivinen tekniikka koulutuksessa 2014-konferenssin tutkijatapaamisen artikkelit. 2014. Jarmo Viteli, Heikki Sairanen ja Mikko Vuorinen. "The building blocks of a working digital culture: The case of some Finnish schools." World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education. Vol. 2013. No. 1. 2013. Jarmo Viteli. "Teachers and Use of ICT in Education: Pilot Study And Testing of the Opeka System". In Jan Herrington et al. (Eds.), Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2013 (pp. 2326-2346). Chesapeake, VA: AACE. Heikki Sairanen, Jarmo Viteli ja Mikko Vuorinen. "Laitteiden ja ohjelmistojen käyttö suomalaisissa kouluissa vuonna 2012." (2013). Heikki Sairanen ja Mikko Vuorinen. "Opetusteknologian kartoittimen kehittäminen ja arviointi." Tuovi 10: Interaktiivinen tekniikka koulutuksessa 2012-konferenssin tutkijatapaamisen artikkelit (2012): 22. Heikki Sairanen, Mikko Vuorinen ja Jarmo Viteli. "Collecting and Using Data to Develop Digital Learning Culture at School", esitelty TEPE 2013 konferenssissa
Any additional info you feel is relevant and important?	

Vensters voor Primair en Voortgezet Onderwijs Info provided by Maartje Meuwissen & Bruno Emans	
What is the complete title and the web address(es) of the questionnaire / online tool?	www.scholenopdekaart.nl, in Dutch 'Vensters voor Primair en Voortgezet Onderwijs' Online tool for accountability and transparency of all primary and secondary schools
What is the organisation leading the initiative? Who are the contact persons?	• The Dutch council for primary education • The Dutch council for secondary education • Organized in the foundation "Schoolinfo" Maartje Meuwissen, maartjemeuwissen@schoolinfo.nl Bruno Emans, bruno@emans.nl
Who are the developers / stakeholders involved in its development / implementation?	Primary stakeholders: All schools Primary audience: Parents, pupils, public Secondary stakeholders: Ministry of Education, Inspectorate of Education, others
What is the background? Is it based on any conceptual framework? Are there any precursors?	• Newspapers and other media were "ranking" the schools. ("What are the best and the worst schools of the Netherlands?") • Rapid availability of data without direct involvement of school • www.scholenopdekaart.nl is a counter-initiative of the educational sector to achieve ownership of the data process • The system provides transparency and accountability on the provided quality and policy of all Dutch schools • Now, there is a shared 'golden standard' around educational information • The ownership of the framework is with the schools. They decide which information is presented and in which way
What are the starting / ending dates of its development / implementation?	2008: start of its development 2011: national coverage for secondary education Current status: stability for secondary education, achieving national coverage primary education, regular updates
What is the format of the questionnaire (online database /paper/ other)?	Central database combined with online system for schools to provide additional information. Results on a public website.
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	• Accountability and transparency of policy and achievements of all Dutch schools • Primary (6.000) and secondary schools (1.360) • Twenty standardized indicators containing a broad range of subjects: students' numbers, exam results, students' satisfaction, parents' satisfaction, characteristics of teaching team, financial situation, partnerships, school plan etc. On a national website schools can present themselves based on a standard set of twenty indicators accompanied with benchmarks. The figures are presented together with an explanation by the school. Next to the public website, there is a website with more information and benchmarks (management information) for the schools themselves in a secured online environment. Key principles: 1) Information presented at school level

	(recognizable for public) 2) Keep it simple but accurate 3) School present a "digital" report of their performance 4) Provide material to start a dialogue with stakeholders and provide benchmarks to start improving 5) A fair and balanced picture (20 indicators of various nature)
Who fills in the questionnaire and when?	• Centralized data: Ministry of Education, Inspectorate of Education, twice a year. • Other data and information: Schools, standardized periods in year-cycle. Two principles: • use existing data where possible • reduce repetitive questioning of schools (and thus reducing workload)
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	20 indicators with centralized data and school-data. Schools can choose the depth-level of the information provided and can add their own story and explanation of the data.
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	Yes, historical benchmarking up to five years is standard in easy useable reports for schools.
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your organisation/yourself to others?	20 indicators are public and include benchmarks. Audience is the parents, the pupils and the public interested in educational issues. With correct, undisputed, up-to-date information, the dialogue between stakeholders about policy and achievements can be improved. Sensitive and more elaborate management information is only accessible for the schools. This part contains even more options for benchmarking and comparison.
How many educational organisations/individuals have already filled in the questionnaire / online tool?	• >95% of the secondary schools • 88 % of the primary schools • Centralized data 100%
Are there any consequences (e.g. incentives, sanctions…) for educational organisations/individuals to fill in or not this questionnaire / online tool?	Centralized data is published for all schools. For the rest, the tool is a voluntary instrument, although there is peer pressure and public pressure. By participating, schools get access to the more elaborate management information.
Is the questionnaire / online tool related to any educational policy-action (regional/national/European)?	Yes, there are strong policy components: • Certain policies found a place within the system (e.g. "teaching time") • The framework provides the Dutch councils and Ministry with information. Decisions can be made on correct, up-to-date, undisputed data • Information can be extracted to initiate new policies • Repetitive questioning of schools is diminished (by government, councils, research institutes, Inspectorate). Reduction of administrative workload for schools • Process of school-inspection can be improved
Which is the % of educational organisations/individuals targeted within your region /country?	100%, pro-active initiatives to make all schools participate and help them to use the tool.
Is there a process for updating the questionnaire / online tool? If yes, how and how often?	Focus on steady system, continuously evaluated, enhanced and updated.

Are there any related publications, evaluation reports, online resources, etc.?	• The ranking in the national media stopped. • Sites of municipalities refer parents to www.scholenopdekaart.nl • Administration and pupil system's refer to our benchmarks • There is a direct online connection from our platform to the website of the Inspectorate • Partnerships with research institutes.
Any additional info you feel is relevant and important?	Additional Presentation with visualizations available.

LIKA Info provided by Jan Hylen	
What is the complete title and the web address(es) of the questionnaire / online tool?	Ledning, Infrastruktur, Kompetens, Användning - LIKA (Management, Infrastructure, Expertise, and Use) http://lika.skl.se/
What is the organisation leading the initiative? Who are the contact persons?	SALAR (Swedish Association of Local Administrations and Regions) is leading. Contact person is Ms Johanna Karlén, johanna.karlen@skl.se
Who are the developers / stakeholders involved in its development / implementation?	It is developed by a consultancy company called Governo on behalf of SALAR. Stakeholders involved in the development is also the National Agency for Education, and the Committee for Digitization
What is the background? Is it based on any conceptual framework? Are there any precursors?	The background is an agreement between the government and SALAR. SALAR should develop a framework to help schools and municipalities to develop strategies for driving change management and ongoing evaluation. In addition, it should support efforts to evaluate, plan and prioritize digitizing operations in schools. No precursors
What are the starting / ending dates of its development / implementation?	Starting date for development – autumn 2013. Starting date for implementation 27 August 2014.
What is the format of the questionnaire (online database /paper/ other)?	Online database
What is it about (please give a short description, mention educational sectors covered, geographical coverage, explain if it a self-assessment tool / self-reflection tool / external evaluation tool / other? etc.)? What is the focus (e.g. ICT integration; innovation; openness; pedagogical practices; other)?	It is about management, infrastructure, expertise, and use. It is supposed to be used by schools. It is open to all schools in Sweden (or abroad). It is supposed to guide the school in how to prioritize actions (competence development, infrastructure development, pedagogical development etc.). The tool gives automatic feedback which says – "perhaps you should start in this area … by doing this …". The tool is complemented by a blog with Q&A, videos where the project manager gives her view on how to take next steps after finishing the questionnaire, exchange of experiences between schools using the tool, etc. http://lika.sklblogg.se/
Who fills in the questionnaire and when?	The head master. Whenever.
How many questions are in the entire questionnaire? How many are mandatory? What is the scale(s) used?	78 questions in all. None is mandatory. The scale has five steps: "Not planned", "Planned", "Started", "Almost done", Achieved"
Is it possible to save the results to access them later? Can you compare your own results to your earlier ones?	Yes. Yes
Who has access to the results? How s/he can use them? Does the questionnaire / online tool allow you to compare your organisation/yourself to others?	It is up to the user to decide who has access to the results. It can be only me, or my school or if I choose so I can anonymously share my schools results with the rest of the country. The school's results cannot be compared to others online, but offline
How many educational organisations/individuals have already filled in the questionnaire / online tool?	During the pilot phase (Spring 2014) schools from 18 municipalities used the tool
Are there any consequences (e.g. incentives, sanctions…) for educational organisations/individuals to fill in or not this questionnaire / online tool?	No. It is totally voluntary
Is the questionnaire / online tool related to any educational policy-action (regional/national/European)?	No
Which is the % of educational organisations / individuals targeted within your region /country?	100% of the schools in the country

Is there a process for updating the questionnaire / online tool? If yes, how and how often?	Not as far as I know
Are there any related publications, evaluation reports, online resources, etc.?	There are online tutorials to help schools to use the tool. Also there is the blog already mentioned http://lika.sklblogg.se/
Any additional info you feel is relevant and important?	

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