Project no. 619347

EAGLE- EnhAnced Government LEarning

Objective ICT-2013.8.2 Technology-enhanced learning;

c) Holistic learning solutions for managing, reaching and engaging

learners in the public administrations

Small-scale Collaborative Project (STREP)
FP7-ICT-2013-11

www.eagle-learning.eu

Deliverable. 4.1

Learning Needs Specification and Construct Map Design

WP 4 – LEARNING – OER Learning for e-Enabling
Lead Participant: LIST

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	Document Title	Document Type
EAGLE logo	**Learning Needs Specification and Construct Map Design**	**Report/Public**
Contract Number **619347**		Version **1.00**

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Glossary

Attitude	'Attitudes' are conceived as the motivators of performance, the basis for continued competent performance. They include values, aspirations and priorities. "cognitive and relational capacity" (e.g., flexibility, pragmatism, initiative, engagement, commitment...). If skills and knowledge are the components [of a competence], attitudes are the glue, which keeps them together
Competence	demonstrated ability to apply knowledge, skills and attitudes for achieving observable results
Construct map	describes all skills and knowledge related to a specific competence and assigns them to different levels of proficiency
Knowledge	is the body of facts, principles, theories and practices that is related to a field…"; it is the outcome of the assimilation of information through learning
Learning need	a competence shortfall (gap) between current and expected competence to perform a task or an activity
Skill	it means the ability to apply knowledge and use know-how to complete tasks and solve problems. …skills are described as cognitive (...) or practical (…)

1   Introduction

EAGLE's main objective is to equip employees in rural local government with a holistic training solution based on Open Educational Resources (OER) and Open Source (OS) tools, supporting the development of critical transversal EAGLE competences such as:

- Information literacy (IL) Information literacy is a set of skills, knowledge, and attitudes requiring learners to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." (based on ACRL 2000 standards)
- ICT/Digital literacy (DL): While ICT literacy can be used in a similar way than digital literacy, it usually focuses a bit more on the mastery of technical skills, collected in frameworks for end-users and ICT professionals. Digital literacy takes into account the social software perspective (Dalsgaard 2006), where consuming and producing are interwoven operations, including related aspects of attitude, self-image, criticality, identity and reputation management, e-safety etc. This understanding is very important for the EAGLE approach, therefore in this document is adopted the term digital literacy for the critical transversal competences addressed.
- Change management (CM): Change management competences are those competences necessary to implement the transition of individuals, teams, and organisations to a desired future state (Kotter, 2011). It incorporates the organisational tools that can be utilised to help individuals make successful personal transitions resulting in the adoption and realization of change.

Work package 4 (WP4) for which this deliverable has been prepared, aims to design a proficiency-based curriculum for local government employees at different levels, in order to enable them to learn at workplace in an self-managed way, using an OER-based learning environment for enhancing their work practice. For that purpose the curriculum will be focused in the development of the above mentioned competences.

The present deliverable is a key element of the Human Performance Technology (HPT) model adapted to WP4 (see Figure 1). The utilisation of this model considers that the EAGLE Open Education Platform will be appropriated by the users depending on their own understanding of learning at the workplace, their individual and cultural relation with the new technology at hand and their own competences regarding Open Education and OER usage among other factors. Hence, the EAGLE project includes an educational intervention to support the development of the required competences to the integration process.

FIGURE 1 HPT IN EAGLE - WP4 ADAPTATION

The HPT model is designed to support improvement of productivity and competence in a technology enhanced practice situation. In line with the UX validation process followed by EAGLE (see WP8), the HPT model also considers the progressive adaptation of the intervention in subsequent iterative process conformed by three stages: a) performance analysis, where the current situation in terms of gap of competences required and the cause of these gap is analysed; b) design and implementation of the intervention, where the initial design and the reflection for further adaptations is carried our; and c) evaluation of the intervention, where specific elements of the intervention are validated directly with the users in the real context.

This deliverable D4.1 is providing specifications associated to the expected competences EAGLE users should have to use the OEP for enhancing their work practice. This input will be useful to determining the initial gap to be covered by the proficiency-based curriculum (see Task 4.4). The competences are described in terms of proficiency levels, each of which has associated skills and knowledge. The detailed description of the proficiency levels associated to each competence is called "proficiency map" and are developed for the defined competences in the three critical areas defined (IL, DL and CM competences)..

A special case is presented in IL, since one of the objectives in EAGLE is to provide self-assessment activities through formative assessment for IL using Automatic Item Generation (AIG) technology. Only one of the three competences was selected to apply this technology, due to the complexity to generate items automatically as well as the necessity to develop task models, which represent a necessary step for item generation and are the next refinement level of the construct maps. Developing such task models (see T4.5), already require a much more detailed definition of the competency constructs. Construct maps, as an extended version of the proficiency maps, are only developed for Information Literacy. Therefore, we define construct maps as understood from the assessment perspective.

According to Wilson (2009),

> *"a construct map is a well thought out and researched ordering of qualitatively different levels of performance focusing on one characteristic".*

WP2 has provided deep insights into the requirements, which need to be fulfilled in order to develop the EAGLE learning approach. For this deliverable, D2.2 (Requirements documentation and recommendations with accessibility guidelines) and D2.3 (Engagement Scenarios, Synthesis and Analysis) as well as the personas of WP8 have been used to derive important input to define proficiency levels and construct maps.

Hence, the objectives of this deliverable are to:

- Establish an excellent overview of different competency frameworks (i.e., information literacy, digital literacy, change management)
- Select most appropriate frameworks and reuse and adapt them to the context of EAGLE (working context, media and platform features)
- Define construct map as base for AIG.
- Instantiate construct maps for IL and proficiency maps for digital literacy and change management competences.

This report is structured as follows: First, separate sections elaborate on the three relevant competences for EAGLE by introducing most common existing frameworks and selection the best ones for EAGLE along several criteria (Section 2, 2.3). For change management competences the change management model developed in WP3 is summarised, because it is used to derive the relevant competences (Section 4). Afterwards, Section **Fehler! Verweisquelle konnte nicht gefunden werden.** defines the underlying concepts construct map and learning need. Section 6 provides for each of the transversal skills a few examples to show how both concepts are instantiated.

More details about the comparison and analysis of competence frameworks as well as the full set of proficiency and construct maps can be found in the appendixes of this document.

2 State of the Art – Information Literacy Frameworks

In the context of the European project EAGLE we aim to support the development of so-called 21st Century skills for the public administration (PA), in particular through formative assessment of information literacy skills of PA employees. We therefore need to use an information literacy framework that defines relevant skills for staff in rural government. We need to analyse existing frameworks and understand how to use them to support the assessment of government workers.

Info literacy has developed since the 1970's (Zurkowski, 1974) and has been a constant topic for research in the American library environment since the American Library Association (ALA) started working on it in 1989 (Edward K. Owusu-Ansah, 2005). ACRL 2000 defines information literacy as "a set of abilities requiring individuals to 'recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information". Despite a lot of work carried out in the domain and the variety of frameworks which have been proposed, there is no significant discrepancy between definitions (Edward K. Owusu-Ansah, 2005).

We therefore aim to:

- analyse existing information literacy frameworks and their evolution
- understand the way in which they can be applied to specific working environments, and
- propose elements regarding the reuse and adaptation of information literacy frameworks to establish a reference in the context of EAGLE

A literature review evaluates the frameworks according to different criteria and selects the most appropriate one (Section 2.1). A conclusion is provided in Section 2.2.

2.1 Literature review information literacy

The literature review was done using common Web search and a more specific search in Information literacy and librarian journals (e.g. Journal of Information literacy) between 1989 (spread of the ALA definition in the US) and September 2014.

According to Jinadu and Kaur (2014), no new models were deemed popular after 2000. Most models are based on the same "basic" models, from one of the "oldest" work of Bruce to the world renowned ACRL framework.

The seven following frameworks, standards or models have been considered for a deeper analysis.

- The ACRL Information Literacy Competency Standards for Higher Education (ACRL, 2000)
- The Seven Faces of Information Literacy (Bruce, 1997, 1998, 1999)
- The Australian and New Zealand Information Literacy Framework (ANZIL,2004)
- The International Federation of Library Associations and Institutions (IFLA) (Lau, 2006).
- The JISC i-Skills model (JISC, 2008)
- The SCONUL Seven Pillars of Information Literacy (SCONUL, 2011)
- The CILIP Information Literacy Skills (CILIP, 2012)

Other frameworks have been reviewed but because they are very specific or not as much relevant as the previously mentioned, it was decided not to cite them in this document. In the following, short description of the frameworks, standards, or models is provided. Examples and the evaluation of each of them can be found in the Appendix A.

2.1.1 The ACRL standard

The American Library Association (ALA) has formulated the most frequently cited definition (within and outside the USA): (ALA, 1989) "Information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information".

Recently the ACRL (ACRL Task Force, 2012) has decided that information literacy encompasses the digital literacy, media literacy, and visual literacy.

Later, the American Association of College and Research Libraries (ACRL, 2000) defined that an information literate student has to master five standards. He:

- determines the nature and extent of the information needed;
- accesses needed information effectively and efficiently;
- evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system;
- uses information effectively to accomplish a specific purpose;
- understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally

The ALA and ACRL views focused on the personal skills of an information literate student and not on the content.

2.1.2 Bruce's seven faces of information literacy

As an Australian pioneer, Bruce has defined the information literacy as " people's ability to operate effectively in an information society. This involves critical thinking, an awareness of personal and professional ethics, information evaluation, conceptualising information needs, organising information, interacting with information professionals and making effective use of information in problem-solving, decision-making and research. It is these information based processes which are crucial to the character of learning organisations and which need to be supported by the organisation's technology infrastructure." (Bruce, 1999).

Bruce has defined seven faces of (or ways of experiencing) IL:

- information technology,
- information sources,
- information process,
- information control,
- knowledge construction,
- knowledge extension,
- and the wisdom experience.

These experiences are linked to workplace processes of: environmental scanning; provision of in-house and external information resources and services; information processing (packaging for internal/external consumption); information/records management and archiving; corporate memory; research and development; professional ethics/codes of conduct.

Each face comprises information use, information technology and a unique element.

2.1.3   Australian and New Zealand Information Literacy Framework (ANZIL)

The publication of the ANZIL framework (ANZIL, 2004) has pushed the research line of holistic focus of IL. Based on the US ACRL standard (sometimes adapted, sometimes left intact), this standard has kept the US definition (ACRL, 2000) and considers that an information literate person:

- recognises the need for information and determines the nature and extent of the information needed
- finds needed information effectively and efficiently
- critically evaluates information an d the information seeking process
- manages information collected or generated
- applies prior and new information to construct new concepts or create new understandings *(new standard compared to ACRL)*
- uses information with understanding and acknowledges cultural, ethical, economic, legal, and social issues surrounding the use of information

Contrary to ACRL, the Australian standard is talking about an information literate person (rather than student) and has added a new standard (Standard 5). We emphasise that this standard is very close to ACRL but to the fact that ACRL provides more resources for learning and assessment, ACRL is still considered to be more useful.

2.1.4   International Federation of Library Associations and Institutions (IFLA)

The IFLA does not provide a specific definition and considers the ALA definition as relevant. The IFLA standards include three basic dimensions, close to common frameworks (ACRL, ANZIL, SCONUL, etc.) (Lau, 2006):

- access
- evaluation
- and use of information.

2.1.5   JISC i-Skills standard

Contrary to previous frameworks or standards mentioned earlier, the Joint Information Systems Committee, renamed JISC, has chosen to highlight the "i-skills" term.

It encompasses many terms like information skills, information literacy but also e-literacy, knowledge management and research skills.

The JISC (2005) has defined i-Skills as the ability to:

- identify,

- assess,
- retrieve,
- evaluate,
- adapt,
- organise,
- and communicate information
- within an iterative context of review and reflection.

This 8 steps cycle defines skills necessary to achieve each step.

2.1.6   SCONUL Seven pillars of Information literacy

The UK Society of College, National and University Libraries (SCONUL) defines information literate people as able to "demonstrate an awareness of how they gather, use, manage, synthesise and create information and data in an ethical manner and will have the information skills to do so effectively" (SCONUL, 2011).

This model defines seven pillars:

- identify
- scope
- plan
- gather
- evaluate
- manage
- present

Each pillar is broken down into several abilities (skills) and attitudes or behaviours.

Similar as JISC, SCONUL considers information literacy is a concept close to digital, visual and media literacy, information skills, etc. but highlight the information literacy term rather than i-skills.

2.1.7   CILIP Information Literacy skills

The UK Chartered Institute of Library and Information Professionals (CILIP) has defined 8 information literacy skills (CILIP, 2012). For CILIP, "Information literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner"[1].

These skills required to be information literate require an understanding of:

- A need for information
- The resources available
- How to find information
- The need to evaluate results

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[1] **http://www.cilip.org.uk/cilip/advocacy-campaigns-awards/advocacy-campaigns/information-literacy/information-literacy**

- How to work with or exploit results
- Ethics and responsibility of use
- How to communicate or share your findings
- How to manage your findings

Each skill is described with a definition, a detailed note and examples.

2.1.8 Miscellaneous studies and frameworks

Following the previous conclusions of the lack of workplace matching with IL Higher Education/librarian standards", three main projects or studies have been reviewed to highlight specific workplace competencies that could be used to adapt the previous mentioned standards.

2.1.8.1 The iKnow project: Information skills in the 21st century workplace.

Three main interesting findings from the iKnow project at the Open University needs to be highlighted.

First, according to a literature review and test with clerical jobs (relevant for EAGLE's end users), several, six core IL competencies have been defined as relevant for the workplace:

- the ability to conduct effective searches for information;
- an understanding of how to locate information quickly and effectively;
- a knowledge of how to measure the quality of the information found;
- the ability to deal with large amounts of information;
- knowledge of how to manage information in the workplace, in accordance with legislation;
- Knowledge of how to keep up-to-date with information (Reedy, Mallett & Soma, 2013).

These competencies needs to be present in the IL standard selected for EAGLE.

Second, the iKnow project has highlighted that the most effective duration of learning courses in the workplace must be defined in terms of minutes. "Bite-size learning objects" are in terms of hours within education, but for EAGLE's users specific constraints, activity may "not exceed ten minutes" (Reedy and al., 2013).

Third, as the Open University, manager of the iKnow project has a commitment to the provision of Open Educational Resources, it may be possible to reuse and alter the iKnow content for EAGLE's OER objectives.

2.1.8.2 The Project Information Literacy

- According to interviews of US employers (including government staff – potentially similar to EAGLE's end users) (Head et al, 2013), the four information competencies that lacked when they hire graduates are:
- engaging team members during research process;
- retrieving information using a variety of formats;
- finding patterns and making connections;
- exploring a topic thoroughly.

If not explicit in the IL standard selected for EAGLE, these competencies should be added.

2.1.8.3 Project Sails

This project provides student assessment skills sets for students according to the ACRL standard[2].

There are eight skill sets based on ACRL framework. In each skill set, only outcomes and objectives with active test items are listed.

- Developing a Research Strategy
- Selecting Finding Tools
- Searching
- Using Finding Tool Features
- Retrieving Sources
- Evaluating Sources
- Documenting Sources
- Understanding Economic, Legal, and Social Issues

These skill sets may provide relevant self-assessment statement for EAGLE. SAILS is an objective assessment but the competencies are well defined (easy to understand).

2.1.8.4 Social Media literacy

While more and more Web 2.0 tools are used to support the learning process[3], specific literacy competencies are also necessary to take advantage of social media (e.g., Wankel, 2011). While it can be perceived as one media (just as video or text), a number of particular skills have been defined in relation with social media.

Overall, the social media literacy is defined as a conjunction between ICT literacy, ethics, communication, and information literacy. Social media literacy has been defined as "having the proficiency to communicate appropriately, responsibly, and to evaluate conversations critically within the realm of socially-based technologies" (Tillman, 2010). Social media literacy is also covered my several frameworks on digital competence (i.e. ICT literacy) and therefore we refer to Section 3 for additional details.

Tillman details the "complexities" of social networks as a set of competencies which compose social media literacy.

TABLE 1 - TILLMAN'S DEFINITION OF THE "COMPLEXITIES" OF SOCIAL NETWORKS TILLMAN DETAILS THE "COMPLEXITIES" OF SOCIAL NETWORKS (2010)

1. Impression management – Establish different social accounts or blogs to manage different personas and topics, or between professional and personal interests, and share them respectively with your targeted audiences.
2. Monitoring and reputation management – Listen through search and other tools, and

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[2] https://www.projectsails.org/SkillSets
[3] E.g., https://www.thinglink.com/scene/317912066432172032

participate when needed to manage and maintain your online personal or business brand to reflect the set of values that you believe.

3. Critical thinking content consumption – In the absence of traditional media fact-checking or with the presence of media agendas, always critically analyze content that is shared and published by others – whether from citizens, brands or governments. Consider the content before you share.

4. Responsible "conversationalism" – Use common sense when communicating online since conversations become content that are frequently indexed, difficult to delete if replicated, and thus forever searchable.

5. Social media outpost management – It isn't necessary to participate in every social network, but select the ones that are best suited for your objectives and then commit; claim and own your brand or persona on those platforms that you're not going to be active on to secure it.

6. Information management – Establish approaches and routines as well as adopt tools to help manage the flood of content streams encountered on a daily basis – to balance the noise to quality ratio of information consumed.

7. Technology management – Determine which are the best technologies for your communication and consumption needs, and assess whether an upgrade or platform change makes sense. All technologies become obsolete and ultimately technology is the means not the end.

Critten (2012) summarises Tillman's definition as Reputation Management (i.e., privacy and personal branding), Communication skills, and Critical thinking, whereas the last item being a classic part of information literacy frameworks. Rheingold (2010) insists on the combination of various social media literacies, namely Attention, Participation, Collaboration, Network awareness, and Critical Consumption. Communication skills in this context are particular to the social media environment.

2.2 Conclusion of literature review

According to the previous state of the art of seven standards, frameworks or models, the ACRL standard appear to be the most relevant for EAGLE's objectives, meaning the definition of the IL competencies of civil servants and its assessment and learning.

Nevertheless, as mentioned in several analyses and as highlighted in Part 3 (I-know Project and Project Information Literacy), slight changes are necessary to address the specificities of EAGLE's workplaces. Other sources (for example, Li, 2010; Lloyd, 2010) might also be useful to better fit with civil servants IL competencies.

Four main criteria have been considered to assess the most relevant frameworks for EAGLE's needs:

- **Content validity:** refers to the extent to which the standard represents all facets of the information literacy content aimed.

- **Face validity:** to be relevant in a workplace context as aimed in EAGLE project[4], competencies and other type of content needs to be framed in jargon-free language.
- **Civil servant's scope matching:** to be usable by civil servants, the standard's content must be specific enough to match the day to day information processes servants have to achieve.
- **Assessment objectives:** in order to ease the "translation" of the IL competencies into assessment, the standard should ideally provide list of outcomes, open items, etc.

If a definition is a quick way to understand the main features of a standard, one has to keep in mind that since decades, there are controversies surrounding definitions. Many papers (for example Owusu-Ansah, 2003) have questioned the validity of every definition and we may never find a consensus.

A synthesis is provided in the next table.

TABLE 1. STANDARDS' ASSESSMENT SYNTHESIS ACCORDING TO FIVE CRITERIA.

Standard's name Date Country	Content validity	Face validity	Civil servant scope matching	Assessment facilitator	Total per standard
ACRL 2000	+++	++	+	+++	9
Bruce's Seven faces 1999 Australia	++	+	+	+	5
ANZIL 2004 Australia and New Zealand	+++	++	+	++	8
IFLA 2006 International	++	+	+	+	5
JISC I-skills 2005 UK	++	++	++	+	7
Sconul 2011 UK	++	+++	++	+	8
CILIP 2006 UK	++	++	++	+	7

Legend: +++ High performance regarding the criteria. ++ Medium performance. + Low performance or criteria not addressed at all.

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[4] Meaning equally understood by Eagle's researchers and end-users like public administration managers and civil servants.

Because of the cost and difficulties of creating new learning and assessment resources we investigated the possibility to reuse an existing information literacy framework instead of developing one specifically for EAGLE. We however ran into a significant difficulty: whereas information literacy is widely publicised as a core skill for 21st Century workers, most existing frameworks to support learning are focused on academic and research environments. We could however, reuse existing examples and guidance to adapt an existing approach to build an information literacy framework for the context of learning in public administrations. Still we had to investigate whether it was still possible to reuse an existing framework as a basis for the EAGLE information literacy framework so as to be able to reuse existing learning material of such frameworks.

We can conclude that it is possible to apply the ACRL 2000 framework by selecting skills and adapting outcomes and assessment items. The adaptation consists in 1) reformulating the underlying tasks, 2) extending the existing framework to embed additional skills related to the work environment and which cannot be separated in this context from information literacy (e.g., the variety of media that support information as well as selected communication skills necessary for social media literacy), 3) defining the position and role category it is aimed to, and 4) selecting or creating adequate media and information sources.

2.3   Selected framework: ACRL 2000

The following list shows the EAGLE information literacy competences with the short description from the perspective of the selected ACRL 2000 standards. Competences not directly related to EAGLE approach, are classified as indirect competences. Direct competences are essential for acquiring the direct EAGLE skills. The descriptions in Table 2 are provided in a way that they match the EAGLE context, i.e., by only mentioning the relevant outcomes of the standard and not to refer to higher education anymore, as targeted by the ACRL 2000 standards.

TABLE 2 - ACRL 2000 STANDARDS FRAMEWORK

COMPETENCE	DESCRIPTION	RELEVANCE FOR EAGLE
STANDARD 1: DETERMINES THE NATURE AND EXTENT OF THE INFORMATION NEEDED		
1.1 DEFINES AND ARTICULATES THE NEED FOR INFORMATION	To formulate questions based on information need, to explore general information sources to increase familiarity with the topic, to define or modify the information need to achieve a manageable focus, to identify key concepts and terms that describe the information need	Direct
1.2 IDENTIFIES A VARIETY OF TYPES AND FORMATS OF POTENTIAL SOURCES OF INFORMATION	to recognise that knowledge can be organized into topics that influence the way information is accessed, to identify the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book), to differentiate between primary and secondary sources, recognizing how their use and importance vary with each discipline	Direct
1.3 CONSIDERS THE COSTS AND BENEFITS OF	to determine the availability of needed information and makes decisions on broadening the information seeking process	Direct

ACQUIRING THE NEEDED INFORMATION	beyond local resources (e.g., interlibrary loan; using resources at other locations; obtaining images, videos, text, or sound), to consider the feasibility of acquiring a new language or skill (e.g., foreign or topic-based) in order to gather needed information and to understand its context, to define a realistic overall plan and timeline to acquire the needed information	
1.4 REEVALUATES THE NATURE AND EXTENT OF THE INFORMATION NEED	to review the initial information need to clarify, revise, or refine the information need and question to answer, to describe criteria used to make information decisions and choices	Direct
STANDARD 2 ACCESSES NEEDED INFORMATION EFFECTIVELY AND EFFICIENTLY		
2.1 SELECTS THE MOST APPROPRIATE INVESTIGATIVE METHODS OR INFORMATION RETRIEVAL SYSTEMS FOR ACCESSING THE NEEDED INFORMATION	to investigate the scope, content, and organisation of information retrieval systems, to select efficient and effective approaches for accessing the information needed from the information retrieval system	Direct
2.2 CONSTRUCTS AND IMPLEMENTS EFFECTIVELY-DESIGNED STRATEGIES	to identify keywords, synonyms and related terms for the information needed, to select a controlled vocabulary specific to the discipline or information retrieval source, to construct a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books), to implement the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages, protocols, and search parameters, to implement the search using investigative protocols appropriate to the discipline	Direct
2.3 RETRIEVES INFORMATION ONLINE OR IN PERSON USING A VARIETY OF METHODS	to use various search systems to retrieve information in a variety of formats, to use various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration, to use specialized online or in person services available at the institution to retrieve information needed (e.g., interlibrary loan/document delivery, professional associations, institutional research offices, community resources, experts and practitioners)	Related to digital competence framework
2.4 REFINES THE SEARCH STRATEGY IF NECESSARY	to assess the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized, to identify gaps in the information retrieved and determines if the search strategy should be revised, to repeat the search using the revised strategy as necessary	Direct
EXTRACTS, RECORDS AND MANAGES THE INFORMATION AND ITS SOURCES	to select among various technologies the most appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments), to create a system for organizing the information, to differentiate between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources, to record all pertinent citation information for future reference, to use various technologies to manage the information selected and organized	Related to digital competence framework

STANDARD 3: EVALUATES INFORMATION AND ITS SOURCES CRITICALLY AND INCORPORATES SELECTED INFORMATION INTO HIS OR HER KNOWLEDGE BASE AND VALUE SYSTEM		
3.1 SUMMARIZES THE MAIN IDEAS TO BE EXTRACTED FROM THE INFORMATION GATHERED	to read the text and selects main ideas, to restate textual concepts in his/her own words and to select data accurately, to identify verbatim material that can be then appropriately quoted	Direct
3.2 ARTICULATES AND APPLIES INITIAL CRITERIA FOR EVALUATING BOTH THE INFORMATION AND ITS SOURCES	to examine and compare information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias, to recognise the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information	Direct
3.3 SYNTHESIZES MAIN IDEAS TO CONSTRUCT NEW CONCEPTS	-	Not relevant
3.4 COMPARES NEW KNOWLEDGE WITH PRIOR KNOWLEDGE TO DETERMINE THE VALUE ADDED, CONTRADICTIONS, OR OTHER UNIQUE CHARACTERISTICS OF THE INFORMATION	to determine whether information satisfies the research or other information need, to use consciously selected criteria to determine whether the information contradicts or verifies information used from other sources, to determine probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions, to integrate new information with previous information or knowledge, to select information that provides evidence for the topic	Direct
3.5 DETERMINES WHETHER THE NEW KNOWLEDGE HAS AN IMPACT ON THE INDIVIDUAL'S VALUE SYSTEM AND TAKES STEPS TO RECONCILE DIFFERENCES	-	Not relevant
3.6 VALIDATES UNDERSTANDING AND INTERPRETATION OF THE INFORMATION THROUGH DISCOURSE WITH OTHER INDIVIDUALS, SUBJECT-AREA EXPERTS, AND/OR PRACTITIONERS	to participate in discussions or electronic communication forums designed to encourage discourse on the topic (e.g., email, bulletin boards, chat rooms), to seek expert opinion through a variety of mechanisms (e.g., interviews, email, listservs)	Direct and related to digital competence framework
3.7 DETERMINES WHETHER THE INITIAL QUERY SHOULD BE REVISED	to determine if original information need has been satisfied or if additional information is needed, to review search strategy and incorporates additional concepts as necessary, to reviews information retrieval sources used and expands to include others as needed	Direct
STANDARD 4: INDIVIDUALLY OR AS A MEMBER OF A GROUP,		

USES INFORMATION EFFECTIVELY TO ACCOMPLISH A SPECIFIC PURPOSE		
4.1 APPLIES NEW AND PRIOR INFORMATION TO THE PLANNING AND CREATION OF A PARTICULAR PRODUCT OR PERFORMANCE	To organise the content in a manner that supports the purposes and format of the product or performance (e.g. outlines, drafts, storyboards), to articulate knowledge and skills transferred from prior experiences to planning and creating the product or performance, to integrate the new and prior information, include quotations and paraphrasings, in a manner that supports the purposes of the product or performance, to manipulate digital text, images, and data, as needed, transferring them from their original locations and formats to a new context	Direct and related to digital competence framework
4.2 REVISES THE DEVELOPMENT PROCESS FOR THE PRODUCT OR PERFORMANCE	to reflect on past successes, failures, and alternative strategies	Indirect
4.3 COMMUNICATES THE PRODUCT OR PERFORMANCE EFFECTIVELY TO OTHERS	To choose a communication medium and format that best supports the purposes of the product or performance and the intended audience, to use a range of information technology applications in creating the product or performance, to communicate clearly and with a style that supports the purposes of the intended audience	Direct and link to digital competence
STANDARD 5: UNDERSTANDS MANY OF THE ECONOMIC, LEGAL, AND SOCIAL ISSUES SURROUNDING THE USE OF INFORMATION AND ACCESSES AND USES INFORMATION ETHICALLY AND LEGALLY		
5.1 UNDERSTANDS MANY OF THE ETHICAL, LEGAL, AND SOCIO-ECONOMIC ISSUES SURROUNDING INFORMATION AND INFORMATION TECHNOLOGY	to identify and discuss issues related to privacy and security in both the print and electronic environments, to free vs. fee-based access to information, to censorship and freedom of speech, to demonstrate an understanding of intellectual property, copyright, and fair use of copyrighted material	Direct
5.2 FOLLOWS LAWS, REGULATIONS, INSTITUTIONAL POLICIES, AND ETIQUETTE RELATED TO THE ACCESS AND USE OF INFORMATION RESOURCES	to participate in electronic discussions following accepted practices (e.g. "Netiquette"), to use approved passwords and other forms of ID for access to information resources, to comply with institutional policies on access to information resources, to preserve the integrity of information resources, equipment, systems and facilities, to legally obtains, stores, and disseminates text, data, images, or sounds, to demonstrate an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own	Direct and related to digital competence framework
5.3 ACKNOWLEDGES THE USE OF INFORMATION SOURCES IN COMMUNICATING THE PRODUCT OR PERFORMANCE	to select an appropriate documentation style and uses it consistently to cite sources, to posts permission granted notices, as needed, for copyrighted material	Direct

3 State of the Art – Digital Competence (ICT Literacy) Frameworks

There are a different terminologies associated with competences related to the use of computers and digital technologies. There is also a variety of meaning and uses, differing in the academic context as well as in policy documents or in practice.

Usually those terms are a combination of a technological descriptive term like ICT, digital, Web 2.0, or Internet combined with "literacy" or "competence".

While ICT literacy can be used in a similar way than digital literacy, it usually focuses a bit more on the mastery of technical skills, collected in frameworks for end-users and ICT professionals: "ICT literacy is still mainly based on the development of operational and technical skills and knowledge" (Ferrari 2012, 17). Basic ICT literacy relates to office applications like word processing, spreadsheets, and presentation technologies. Usually these kind of skills are already covered by existing vocational trainings in the public administration.

Digital literacy in our understanding takes into account the social software perspective (Dalsgaard 2006), where consuming and producing are interwoven operations. This understanding is very important for the EAGLE approach, focusing on OER and has to be captured by the selected framework.

Literacy itself is a deictic concept due to the rapid change in technological development (Leu (2000). Standards and frameworks have to be sustainable and adaptable in that way, that new technologies can be included without challenging the literacy. The core of the nature of the literacy should be defined in a way that it remains constant on a midterm scale. This criterion is of special importance for EAGLE as the development of the EAGLE service depends on the technical developments in the near future and the specific conditions in the public administrations. As Ferrari points out, the term literacy tends to be built on the decoding / encoding paradigm of information theory respectively on reading and writing. (Ferrari 2012, 19), neglecting the more and more important aspects of collaborative production and sharing. While the technical development is progressing constantly, people have to develop new literacies with every new media (e.g. Internet Literacy, Visual Literacy, Web 2.0 literacy). Replacing literacy with the broader term of competence we follow a more future oriented approach. In this sense we use the term "competences" preferably.

Digital competences are perceived as one of the eight key competences for lifelong learning in the European Union, being a transversal competence with a special impact. It helps people to acquire other key competences. Being digital competent means to have a profound understanding of the nature, role and, opportunities for ICT.

The European Parliament and the Council provides the following definition:

> "Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet" (2006).

The EAGLE project follows this understanding of digital competence but would enhance the phrase "the use of computers to retrieve, assess, store …" to a broader perspective on technologies where besides computers also mobile devices and other tools can be used as means for digital empowerment.

Thus we are looking for a framework that is general enough to adapt to future working and technological needs.

With this focus on digital competences we hopefully:

- focus on competences relevant to EAGLE
- avoid conflicts with traditional forms of trainings (like word processing training)
- are able to provide a framework that is complex enough to fit the different proficiency levels throughout our EAGLE communities
- are flexible and adaptable enough to cover future developments of the EAGLE service

To avoid redundancy, we are going to focus on competences that are not covered by the transversal competence of information literacy (see previous section). The selected ACRL standard for information literacy already takes a very technological perspective into account, but is leaving out the social / collaborative skills.

The framework to be selected for the digital competences has to fulfil this gap and put more emphasis on sharing, collaborating practices and alike.

The digital competences defined and extended are part of the pedagogical/curriculum design of EAGLE, but not necessarily with a focus on assessment like for Information literacy. We therefore focus on the first three main criteria to select the best framework, similar to the previous section on Information literacy.

- **Content validity:** refers to the extent to which the standard represents all facets of the digital competences content aimed.
- **Face validity:** to be relevant in a workplace context as aimed in EAGLE project[5], competencies and other type of content needs to be framed in jargon-free language.
- **Civil servant's scope matching:** to be usable by civil servants, the standard's content must be specific enough to match the upcoming work with EAGLE platform.

3.1   Literature review Digital Competence Framework

Being one of the 21st Century skills, digital competences are highly discussed, but elaborated frameworks describing in depth skills, knowledge and attitudes related with the certain competences are few.

The four following frameworks, standards or models have been considered for a deeper analysis.

- ETS iSkills (ETS 2007)

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[5] Meaning equally understood by Eagle's researchers and end-users like public administration managers and civil servants.

- California ICT Digital Literacy Assessments and Curriculum Framework (2008)
- ECDL (European Computer Driving License) e.g. Online Collaboration (2012)
- The DIGCOMP Standard (Joint Research Centre of the European Commission, 2013)

Other frameworks have been reviewed but because they are very local or not as much relevant as the previously mentioned, they are not cited in this document.

3.1.1 ETS iSkills Framework

The iSkills framework was designed and developed to conduct assessments in the field of ICT literacy for Students in Higher Education. Their definition of ICT literacy combines the competences of accessing, managing, integrating, evaluating and creating information by the use of digital technologies. It emphasizes the combination of cognitive skills and technology skills. The assessment is mainly developed for the transition phase of students in higher education, entering university or workplace.

Competences are classified into three proficiency levels. Due to the fact that certification is the aim of ETS iSkills the core of the framework is the development of scenarios, presented to test takers. Within those scenarios they have to fulfil tasks to show their proficiency in the defined competences.

Conclusion: The advantage of the ETS iSkills is its orientation towards assessment and certification (including Mozilla Batch Integration). Its focus on students, a strong overlap with Information literacy and less collaboration could be count as disadvantages.

3.1.2 California ICT Digital Literacy Assessments and Curriculum Framework

The purpose of the California ICT Digital Literacy Assessments and Curriculum Framework is to provide a standardized approach for assessment, diagnosis, and continuous improvement of basic information and communications (ICT) digital literacy skills for students and the workforce.

Several standards has been developed, capturing the ability to use digital technology and communications tools, and/or networks to access, manage, integrate, evaluate, create and communicate information in order to function in a knowledge society.

For each standard so called performance indicators are defined and related outcomes presented.

Conclusion: It is a very broad approach, but again it has a strong overlap with Information literacy and less collaboration.

3.1.3 ECDL Foundation

ECDL (European Computer Driver Licence) Foundation provides the biggest program for certifying computer skills. The modular system differentiates on three proficiency levels (basic, standard, advanced) and focusses mainly on classical ICT competences (like computer skills, online searching and browsing, word processing, IT security and so on).

In the sense of digital competences in our definition "Online Collaboration" would be one of the highly interesting modules for EAGLE. This module focuses on concepts and skills

relating to the setup and use of online collaborative tools, such as storage, productivity applications, calendars, social media, web meetings, learning environments, and mobile technology. Due to the fact that ECDL provides a certification the definition of competences and skills is defined as a set of task, the test takers have to fulfil.

E.g. "Recognise the importance of intellectual property rights and the appropriate use of content when using online collaborative tools" (ECDL 2012, 4).

Conclusion: Very interesting framework for the use of different ICT for different purposes. It addresses competences that are covered by traditional forms of trainings (like word processing training).

3.1.4 DIGCOMP Framework

The DIGCOMP framework is the result of the DIGCOMP project by the Joint Research Centre of the European Commission in 2013. It is based on a data collection phase with literature review, comparing 15 different frameworks for digital literacy (Ferrari 2012), case study analysis, online survey and stakeholder consultation (including workshops, interviews, reviews by experts, presentations at seminars and conferences).

The project was dedicated to develop a framework for digital competence for all levels of learners.

It identifies five competence areas information, communication, content creation, safety and problem solving and within a set of 21 competences. All 21 competences are explained at three proficiency levels. The framework also provides examples of knowledge, skills and attitudes applicable to each competence. Those competences are useful in different social situations, like leisure, learning and employment.

There is also a framework to measures these competences in the EU (European Commission 2014) available. Results from May 2014 show content-creation and problem solving are less common through European citizens than information and communication skills, both important competence area within the EAGLE project.

Conclusion: Highly elaborated and very well defined framework, suitable not only for assessing but also for measuring or curriculum development.

3.2   Conclusion of literature review

Due to its profound and detailed analysis, its wide application area the DIGCOMP framework provides the most solid basis for the EAGLE development.

TABLE 3. DIGITAL COMPETENCES FRAMEWORK SYNTHESIS ACCORDING TO THREE CRITERIA.

Standard's name	Context	Content validity	Face validity	Civil servant scope matching	Total per standard
ETS iSkills	Education	++	++	+	5
California ICT Digital Literacy	General	++	+	++	5
ECDL Foundation	General	++	+++	++	7
DIGCOMP	General	+++	++	+++	8

Legend: +++ High performance regarding the criteria. ++ Medium performance. + Low performance or criteria not addressed at all. References

3.3   Selected Framework: DIGCOMP

The following list shows the DIGCOMP competences with the short description. Competences not directly related to EAGLE approach, are classified as indirect competences. Direct competences are essential for acquiring the direct EAGLE skills.

TABLE 4. DIGCOMP FRAMEWORK.

COMPETENCE	DESCRIPTION	RELEVANCE FOR EAGLE
1.1 BROWSING, SEARCHING AND FILTERING INFORMATION	To access and search for online information, to articulate information needs, to find relevant information, to select resources effectively, to navigate between online sources, to create personal information strategies	Related to information literacy framework
1.2 EVALUATING INFORMATION	To gather, process, understand and critically evaluate information	Related to information literacy framework
1.3 STORING AND RETRIEVING INFORMATION	To manipulate and store information and content for easier retrieval, to organise information and data	Related to information literacy framework
2.1 INTERACTING THROUGH TECHNOLOGIES	To interact through a variety of digital devices and applications, to understand how digital communication is distributed, displayed and managed, to understand appropriate ways of communicating through digital means, to refer to different communication formats, to adapt communication modes and strategies to the specific audience	Direct
2.2 SHARING INFORMATION AND CONTENT	To share with others the location and content of information found, to be willing and able to share knowledge, content and resources, to act as an intermediary, to be proactive in the spreading of news, content and resources, to know about citation practices and to integrate new information into an existing body of knowledge	Direct
2.3 ENGAGING IN ONLINE	To participate in society through online engagement, to seek opportunities for self-development and empowerment in	indirect

CITIZENSHIP	using technologies and digital environments, to be aware of the potential of technologies for citizen participation	
2.4 COLLABORATING THROUGH DIGITAL CHANNELS	To use technologies and media for team work, collaborative processes and co-construction and co-creation of resources, knowledge and content	Direct
2.5 NETIQUETTE	To have the knowledge and know-how of behavioural norms in online/virtual interactions, to be aware of cultural diversity aspects, to be able to protect self and others from possible online dangers (e.g. cyber bullying), to develop active strategies to discover inappropriate behaviour	partly direct
2.6 MANAGING DIGITAL IDENTITY	To create, adapt and manage one or multiple digital identities, to be able to protect one's e-reputation, to deal with the data that one produces through several accounts and applications	indirect
3.1 DEVELOPING CONTENT	To create content in different formats including multimedia, to edit and improve content that s/he has created or that others have created, to express creatively through digital media and technologies	Direct
3.2 INTEGRATING AND RE-ELABORATING	To modify, refine and mash-up existing resources to create new, original and relevant content and Knowledge	Direct
3.3 COPYRIGHT AND LICENCES	To understand how copyright and licences apply to information and content	Direct
3.4 PROGRAMMING	To apply settings, programme modification, programme applications, software, devices, to understand the principles of programming, to understand what is behind a programme.	Direct
4.1 PROTECTING DEVICES	To protect own devices and to understand online risks and threats, to know about safety and security measures	indirect
4.2 PROTECTING DATA AND DIGITAL IDENTIY	To understand common terms of service, active protection of personal data, understanding other people privacy, to protect self from online fraud and threats and cyber bullying	indirect
4.3 PROTECTING HEALTH	To avoid health-risks related with the use of technology in terms of threats to physical and psychological well-being	indirect
4.4 PROTECTING THE ENVIRONMENT	To be aware of the impact of ICT on the environment	indirect
5.1 SOLVING TECHNICAL PROBLEMS	To identify possible technical problems and solve them (from trouble-shooting to solving more complex problems).	Direct
5.2 IDENTIFYING NEEDS AND TECHNOLOGICAL RESPONSES	To assess own needs in terms of resources, tools and competence development, to match needs with possible solutions, adapting tools to personal needs, to critically evaluate possible solutions and digital tools	Direct
5.3 INNOVATING AND CREATIVELY USING TECHNOLOGY	To innovate with technology, to actively participate in collaborative digital and multimedia production, to express oneself creatively through digital media and technologies, to create knowledge and solve conceptual problems with the support of digital tools	Direct
5.4 IDENTIFYING DIGITAL COMPETENCE GAPS	To understand where own competence needs to be improved or updated, to support others in the development of their digital competence, to keep up-to-date with new	direct

	developments.	27

We elaborate the DIGCOMP framework by assigning skills and knowledge for the different proficiency levels and adapt it to the special needs of EAGLE. We try to stick close to the original wording of the DIGCOMP framework.

4   State of the Art – Change Management Frameworks

In recent years, not only has the work of public administration been increasingly penetrated by information technology (IT), but new forms of collaboration and inter-organisational public service networks have emerged. These require new skills and techniques for all civil servant groups in public administration.

Because of the increasing importance of lifelong learning, the competency approach is enjoying a worldwide boom, as it can make learning which has taken place outside of formal education processes more visible (Gnahs 2007, p. 16; Van der Klink, Schlusmans, and Boon, 2007, p. 231). In Europe in particular, the competency concept has become important in establishing comparability between educational degrees issued in different countries (Winterton, Delamare-Le Deist, and Stringfellow 2006). When applied in professional life, the competency approach takes into account what a person really can do in a working context, regardless of how this knowledge was acquired. Instead of paying attention exclusively to formal qualifications and degrees, which differ throughout Europe, skills, techniques, expertise, and know-how are becoming more important (European Institute for Public Administration, 2005; Winterton, Delamare-Le Deist, and Stringfellow, 2006). There is no comprehensive, systematic framework of relevant change management competences, specifically designed for e-Government. Since this is a broad understanding of e-Government transformations, it is far more than the IT-related skills and competences, to which e-Government often is reduced to.

In order to address this problem, one of the main EAGLE's objectives is to develop a change management competency model for local government and provide guidance for implementation of a learning-enhanced work process using the introduction of the Open Learning platform as a test case. Given the challenges when it comes to e-Government competences – no agreed and established job profile, an understanding of e-Government in practice that is at best mixed and rather incomplete, the dynamic development in the field, and the different development of e-Government in the project countries – we are going to propose a change management framework and specify these new competencies, especially as they relate to non-IT experts.

4.1   Different approaches to e-government and EAGLE definition

E-Government is a means for the modernisation of public administrations. The EU Commission defines e-Government as:

> *"the use e-Government is the use of Information & Communication Technologies (ICTs) to make public administrations more efficient and effective, promoting growth by cutting red tape".*

The United Nations (UN), (Division for Public Economics and Public Administration) provides a definition of e-Government which refers to "virtually all information and communication technology (ICT) platforms and applications in use by the public sector".

In the framework of EAGLE project, e-Government should be understood as the reorganisation of working and participation processes of government and management making intense use of information technology. But the view on only single aspects of e-

Government does not meet the requirements of the future. E-Government is neither only the application of technology nor only the change of organisational structures, it means the use of ICT, and particularly the Internet, as a tool to achieve better government. Additionally, it means implementing and managing changes within the public administration organisation and requires new skills (e-Skills) of the public servants.

With regard to e-government public administration competencies, not only new knowledge is necessary, but also new skills and techniques, which are methodologically difficult to determine. Determining these competencies in a way which is closely tied to real-world working conditions is methodologically difficult, and this is even more so the case when attempting to draw conclusions about future competency requirements. Although an early determination of future competency requirements is generally methodologically difficult, there is a great need for such an effort so that public administration can anticipate these developments and incorporate them in its human resource planning.

The European Commission has undertaken various initiatives (e.g. EU Services Directive) to promote e-government initiatives. The results remain selective, what can be considered problematic in the European context with a single internal market (see the Digital Single Market in European Commission 2010). Besides the different legal frameworks and administrative traditions among the EU member countries (Pollitt&Bouckaert, 2004), one obstacle constraining the implementation of a more coherent European e-government seems to be the heterogeneous approaches to e-government in the member countries. As a consequence, there is no consistent understanding of the competences associated with e-government. Often, there is not even an established understanding of e-government competences at all (Schuppan 2010, pp. 353-370).

To date, in practice, the topic is – if at all – still being addressed in a very IT-dominated fashion. The same is true for the scientific community in public management and in administrative sciences (Gronlund, 2010, pp. 13-24), which often very unilaterally still perceives e-government as an IT subject (Elovaara et al., 2004; Kaiser, 2004; Mundy et al., 2001, pp. 457-459). Nevertheless, in practical projects and in the everyday work of public administration, it is becoming increasingly apparent that new competences are required which go beyond the simple use of an IT application, or even IT specialist and tool knowledge (OECD, 2003).

4.2   Literature review on change management competences

Articles which specifically address competencies relevant to e-Government have only been published since about 2000. However, to date the subject has, for all intents and purposes, not been present in international academic conferences. An evaluation conducted for this deliverable of more than 400 conference contributions from 2003 to 2008 has shown that merely one article (Leitner, 2006) was presented on the subject. All in all, it can be stated that there are only a few contributions which address the issue of competency requirements for e- Government, especially in its transformational dimension. At most, some indications can be found which are limited mainly to executives, even though networked collaboration leads to a high degree of changes at the working level. A consideration of competencies which are closely related to workplace demands and work processes effectively does not yet exist (Schaper, 2003).

New public Management requires managerial knowledge and related methods in particular. Nevertheless, e- Government sets new standards in this respect because it demands a new kind of interdisciplinary knowledge. This means that it is no longer sufficient to only possess specialist knowledge of management or IT, knowledge which often exists in public administration. Rather, because of new service structures, new interdisciplinary knowledge and additional social and other competencies are often required.

The methods used to determine competencies include workplace analyses and observations as well as expert surveys (Lantz and Friedrich, 2003, pp.185–194; Schaper, 2003). Future-related competency statements can be also derived from new production and service structures as well as processes, at least to a certain extent. These are then complemented and made more specific through case analyses of innovative projects. This means that no "best method" exists for the deduction of competency requirements for change management.

4.3   EAGLE Change Management competency framework

The question of changing and newly arising competences in the context of change management for e-government faces some significant challenges from practice:

- There is no agreed and established job profile for "e-Government public personnel", to which to draw upon.
- The understanding of e-Government in practice is at best mix and rather incomplete
- Given the dynamics in the field of open education and e-learning and the time lag to adjust competence level, it is necessary to reflect upon future competence requirements.

To address this problem EAGLE will support local government to apply basic country-specific change management across the organisation to create a learning-enhanced work process. Once the learning-enhanced work process has been defined, the newly gained change management skills can be applied for the change of introduction of the EAGLE learning platform. The introduction of the EAGLE OER/OS learning platform will then be used as a test case for change. This introduction provides an opportunity to gain change management skills and knowledge, and to identify time and resources for learning. The EAGLE Change Management competency framework presents competences for managerial and organizational levels, needed to apply basic change management across the organization and create a learning-enhanced work process.

The proposed EAGLE Change Management competency framework is developed based on: EAGLE requirements analysis (WP2 - Deliverable 2.1), EAGLE Change Management model (WP3 - Deliverable 3.1), as well as research of existing literature. Based on analysis of available resources, an initial set of e-Government change management competences and skills has been derived, in order to validate and facilitate the results in the next steps of the EAGLE project.

The following list shows the EAGLE change management competences with the short description. We classified competences for needed to apply basic change management across the organization and create a learning-enhanced work process as:

- Direct competences – related to the management level

- Direct individual competences – related to the individual level
- Indirect competences – general competences not directly related to EAGLE approach

For the individual level, needed competences and skills will relate to training, IT literacy, and motivation. For Change Management, we will focus on the management competences and skills.

TABLE 5 – EAGLE CHANGE MANAGEMENT COMPETENCE FRAMEWORK

COMPETENCE	DESCRIPTION	RELEVANCE FOR EAGLE
1.ADAPTABILITY	Adjusting own behaviors to work efficiently and effectively in light of new information, changing situations and/or different environments.	Direct individual
2.CREATIVE THINKING	Questioning conventional approaches, exploring alternatives and responding to challenges with innovative solutions or services, using intuition, experimentation and fresh perspectives.	Direct individual
3. CONTINUOUS LEARNING	Identifying and addressing personal individual strengths and weaknesses, developmental needs and changing circumstances to enhance personal and organizational performance.	Direct individual
4. DEVELOPING OTHERS	Fostering the development of others by providing a supportive environment for enhanced performance and professional growth, develop and coach others and constructively review the work of others in order to improve and advance the skills, knowledge and performance levels.	Indirect
5. IMPACT AND INFLUENCE	Make an impact, persuade and influence individuals or groups in order to gain support and action for ideas, proposals or initiatives put forward in order to achieve a specific objective or result for implementing Open Educational Practice (OEP).	Indirect
6. TEAM LEADERSHIP	Leading and supporting a team to achieve results, build cohesive and productive work and project teams in order to achieve the required outputs, either as a work unit or as a component within the organization.	Indirect
7. TEAMWORK	Working collaboratively with team members, stakeholders and others to achieve common goals and positive results.	Indirect

8. ENLIST THE STAKEHOLDERS IN ORDER TO EASE THE CHANGE'S ACCEPTANCE	Building and actively maintaining working relationships and/or networks of contacts of stakeholders to further the organization's goals in developing and implementation of OEP in organisation.	Direct
9. ANALYSE THE INITIAL SITUATION (CULTURE, PEOPLE MANAGEMENT, STRUCTURE, TECHNOLOGY, INFRASTRUCTURE, PROCEDURES, OEP) IN TERMS OF ORGANIZATIONAL CONTEXT	Understanding the workings, structure and culture of the organization as well as the political, social and economic issues, for implementation of OEP in organization.	Direct
10. ORGANIZE A COLLABORATIVE DECISION-MAKING PROCESS WITH KEY STAKEHOLDERS ABOUT WHAT CHANGE IS NEEDED ON EACH ORGANIZATIONAL DIMENSION	Collect data and information, analyze organizational environment related to e-learning and OEP implementation and translate information into knowledge for planning and decision-making in order to determine the approach to create Strategy (Acton plan) which will be adopted to achieve the target situation according to its specific context	Direct
11. DETERMINE THE FUTURE OEP TARGET SITUATION	Creating a Vision of Openness and Strategy for implementing OEP, supporting, promoting and ensuring alignment with the organization's vision and values.	Direct
12. PLANNING AND ORGANIZING STRATEGY FOR IMPLEMETATION OF OEP IN ORGANIZATION	Creating an Action plan for implementing OEP Strategy, Defining a team, tasks, key priority actions that need to be undertaken to achieve objectives of Strategy for implementation OEP, while ensuring the optimal use of resources to meet those objectives	Direct
13. SUPERVISION OF THE IMPLEMENTATION OF THE ACTION PLAN	Ensuring the effective, efficient and sustainable use of Public Service resources and assets: human , technical, property ,financial resources, and business information in order to achieve desired changes related to introducing new ways of learning and sharing knowledge in the organization.	Direct
14. FINAL EVALUATION OF THE CHANGE MANAGEMENT SUCCESS	Measure and upgrade work, methods, procedures and systems in order to improve the implementation of Strategy for OEP in organisation.	Direct
15. COMMUNICATE THE KEY MESSAGES ABOUT THE CHANGE IMPLEMENTED TO	Creating and adopting the key messages according to the challenges, risks and concrete changes for	Direct

THE DIFFERENT TARGET AUDIENCES WITHIN AND OUT OF THE ORGANIZATION	the different target groups.	

One example of a detailed proficiency map for a change management competence can be found in Section 6.6, whereas a complete set proficiency maps of all direct competences can be found in Appendix B4.

5   Construct maps and proficiency maps

This section introduces the two main EAGLE concepts in this deliverable (i.e., construct maps and proficiency maps). We elaborate on related theories and models in order to derive the EAGLE concepts, which are used to define construct maps and proficiency maps.

If construct maps are increasing in popularity in educational science since the beginning of 2000, these representations are not new. The idea of construct maps to provide visual representations between a construct and data from a measurement model can be traced to work dealing with Rasch model, during the eighties (Wyse, 2013).

Many researchers (see Wyse article for references) also named construct map as "Wright map," "item-person map," and "variable map", "item map", "Reckase chart" or "domain score chart" according to different measurement models but with the same goal to represent a construct through a continuum of data.

Before going deeper in the history of construct maps and displaying concrete examples, a definition is necessary to understand the scope of this concept.

According to Wilson (2009),

> *"a construct map is a well thought out and researched ordering of qualitatively different levels of performance focusing on one characteristic".*

Constructs where there is a set of unordered elements are not candidate for a construct map.

The Figure 2 below is a generic construct map of the construct X where "the left side of the map indicates qualitatively distinct groups of *respondents*, ranging with an ordering of knowledge and skills mastery levels on X domain. The right side of the map represents qualitative differences in *item responses,* ranging from responses indicating low mastery to those reflecting high mastery of X domain" (Wilson, 2009).

The construct measured could display many levels of scope and granularity. Following Wilson's example (2008, p.31), one could define the construct "ease of physical functioning" with only three responses to items (not limited at all vigorous activities, not limited at all to moderate activities, not limited at all to ease activities) but it's also possible to define construct with deeper granularity for responses to items. Wilson (2008, p. 34) published the following five proficiency levels dealing with the "effort management" construct:

- Students who engage in evaluation
- Students who engage in planning
- Students who engage in self-regulation
- Students who engage in monitoring
- Students who do not engage effort management activities
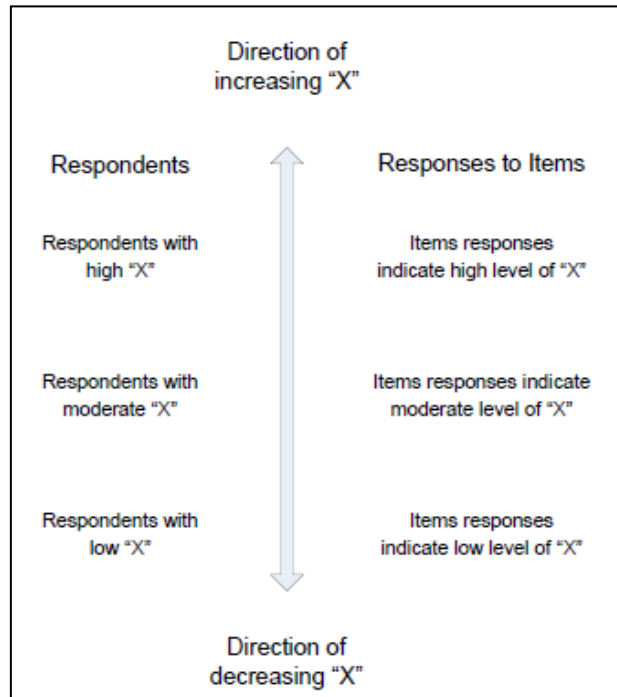
FIGURE 2. GENERIC CONSTRUCT MAP OF CONSTRUCT X.

According to Leighton and Gierl (2007), at each level of the construct map (high, moderate and low for the previous figure), on the right side, "information is given regarding the mastered skills, unmastered skills, and typical errors associated with students' cognition. Each level of the map serves as a diagnosis of student understanding that can be associated with individuals selecting a particular response".

According to several researches publications (for ex. Wilson, 2008), typical errors are not mandatory to be added to a construct map. In the context of EAGLE, we will decide at a later stage in the project whether errors should be included in EAGLE construct maps. It depends on the working situation whether errors can be identified or not. A construct map example with typical errors is displayed in Annex B8.

A construct map has to be general enough to be interpretable within a curriculum and specific enough to guide the development of the other automatic item generation (AIG) related models.

Note that item responses or labels (summaries of responses) are displayed but they are NOT the location of actual items generating the responses (Wilson, 2008). According to the intelligence construct map below (Luecht, 2008), the construct map highlights the knowledge and skills children master at different ages, but the items to assess the "arrange weights" skill (9-10 years old) are not displayed.
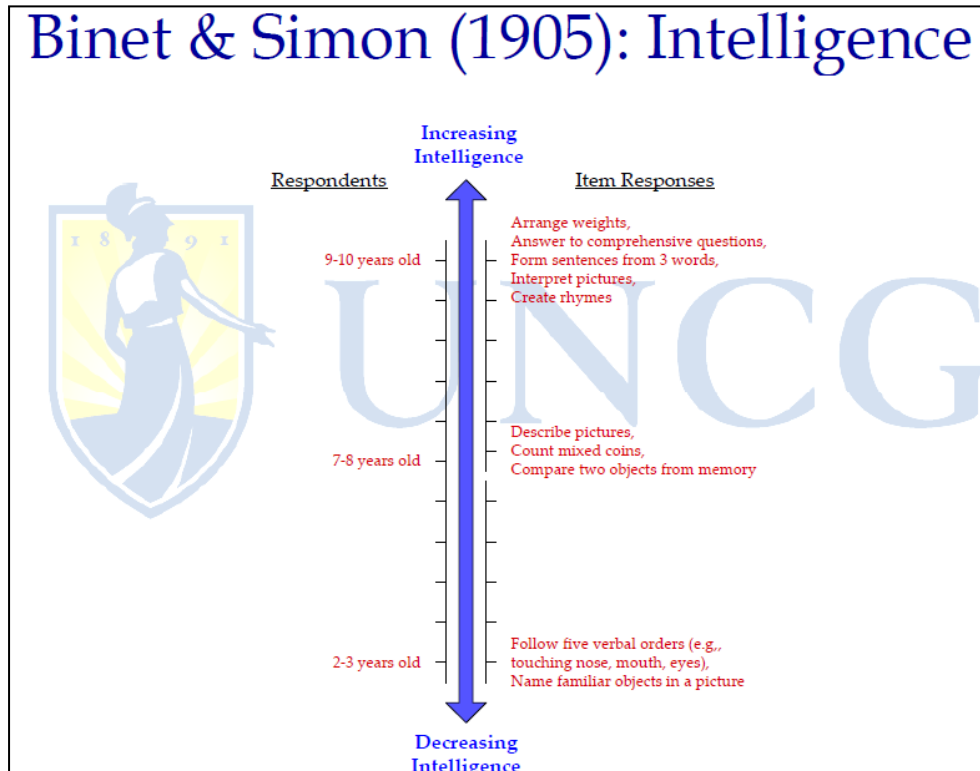
FIGURE 3. INTELLIGENCE CONSTRUCT MAP FOR 2 TO 10 YEARS OLD CHILDREN. LUECHT (2008).

Since 2000, several authors (for example Wilson, 2008; Mislevy & Haertel, 2006; Luecht, 2013) suggested methods to define construct map as an initial step to make assessment development process more efficient.

By designing Assessment Engineering (AE), Luecht (2013) integrated two of the main approaches: the Mark Wilson's notion of construct mapping and the Bob Mislevy's evidence centred design (ECD) framework. In EAGLE, we will follow the AE guidelines because of its relevance for AIG.

5.1 The concept of an EAGLE construct map

In EAGLE, we consider a construct map as an ordering of three qualitatively levels of performance focusing on civil servants' competencies for using EAGLE platform to enhance learning at the workplace.

To ease its use, the graphical representation proposed in Figure 2 and Figure 3 are revised by using a tabular form. A complete example is available in Section 6.4.

	A	B	C	D	E	F	G
1	Construct Map						
2	Competency claim						
3			Anderson's categories and processes		Anderson's knowledge dimensions		
	level of profiency	Skill	Cognitive categories	Cognitive Processes	Knowledge type	Knowledge	Responses to item
4	High						
5	Medium						
6	Low						

FIGURE 4. EAGLE CONSTRUCT MAP EMPTY TEMPLATE.

Each line and column of this template will be explained in the following section using the cell positions.

The focus of the construct maps in EAGLE are the competencies of civil servants, broken down into knowledge, skills and attitudes (KSA).

According to the European Committee for Standardization in its e-Competence Framework (e-CF[6]), we have the following definitions:

- *Competence*: demonstrated ability to apply knowledge, skills and attitudes for achieving observable results
- *Knowledge*: it means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field […]"
- *Skills*: it means the ability to apply knowledge and use know-how to complete tasks and solve problems. […] [S]kills are described as cognitive […] or practical […].
- *(not used on the construct maps: Attitudes*: "cognitive and relational capacity" (e.g. synthesis capacity, flexibility, pragmatism, initiative, engagement, commitment, etc.). If skills and knowledge are the components [of a competence], attitudes are the glue, which keeps them together.)

5.2 Method for defining EAGLE construct maps

The following steps are necessary to build the EAGLE construct maps:

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[6] E-competence Framework for ICT users: Part 3. Development guidelines. (2013). Available at ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA%2016624_3.pdf

- Define the construct, meaning the IL, ICT or Change civil servants' competency for using EAGLE platform to enhance learning at the workplace
- Break down the construct into competencies and its sub-dimensions (knowledge, skills and attitudes)
- Define the proficiency levels for the skills
- Define the cognitive categories and processes and knowledge type
- Define the responses to items (and common errors if possible)

Each step will now be detailed. According to each location, cell is recalled in the section title.

EACH STEP WILL NOW BE DETAILED. ACCORDING TO

	A	B	C	D	E	F	G
1	Construct Map						
2	**Competency claim**						
3			Anderson's categories and processes		Anderson's knowledge dimensions		
	level of profiency	**Skill**	**Cognitive categories**	**Cognitive Processes**	**Knowledge type**	**Knowledge**	**Responses to item**
4	High						
5	Medium						
6	Low						

FIGURE 4. EAGLE CONSTRUCT MAP EMPTY TEMPLATE.

5.2.2 Definition of the construct (B1)

To better define a construct, one should use a validated source (standard, framework, etc.). If not available, one should define the construct from literature review and Subject Matter Experts consultation.

According to Wilson (2009), one has to be "able to write down a brief (1-2 sentences) definition of the construct and if necessary write similar definitions of related constructs to help distinguish among them". It will be particularly useful for close concepts with overlapping meaning like information literacy, and digital literacy. This first step is essential and will determine the quality of the construct map (relevant for every user) and its outcomes (items).

As an iterative process, a construct map and the construct definition may be refined at every step.

5.2.3 Breaking down the construct into competencies (B2)

Following the step of the definition, the construct (for example IL civil servant's competency) has to be broken down in several competencies to ease its understanding. For each competency, we have to create a construct map.

For example, following the ACRL standard for the IL construct map, we may select a subset of the 22 competencies (named performance indicators in the standard), which would result in creating a total of 22 construct maps. Each competency will then be broken down into skills (named outcome in the standard). To complete the construct map, each skill needs to be related to one or several knowledge concepts.

A competency has to be defined as an *observable* behaviour with a target or an impact in a specific context. A competency may be expressed in the form of ONE verb. In order to ease assessment, it is recommended to describe competencies with only one verb.

5.2.4 Breaking down competencies into skills, knowledge (B4-4-6; F4-5-6) and their proficiency levels

Because skills are the most observable resource of a competency, it may be easier to start with the skill definition.

There is no fixed rule to start the definition of a proficiency level but because performance of PA is the goal, it may be better to start with the definition of the higher proficiency level of a skill. One other option suggested by Wilson (2009) is to "start with the extreme and then develop qualitatively distinguishable levels in between".
Then, knowledge and attitudes related to the skill will be derived logically.

The following procedure is suggested but may vary according to the way of thinking of construct map builders:

- Definition of the highest level of a skill X (B4)
- Definition of the knowledge related to skill X (F4)
- Definition of the Anderson categories of the skill X, high level (C4, D4, E4), provided in Figure 9
- Definition of the medium proficiency levels for skill X (B5)
- Definition of the knowledge related to skill X (F5)
- Definition of the Anderson categories of the skill X, medium level (C5, D5, E5)
- …
- Definition of the highest level of a skill Y
- …

Note that it is necessary to define at least 2 proficiency levels for a skill, but it may be not relevant or not possible to define 2 levels for corresponding knowledge.

5.2.5 Proficiency levels in construct maps (A4, A5, A6)

As long as construct map builders are able to specify two proficiency levels, a construct map remains valid. If two levels is a minimum, ideally one may aim three levels (beginner, intermediate, expert) in order to be enough accurate to distinguish competencies and low/high performers and to build effective learning and assessment materials.

### 5.2.6 Cognitive categories and processes (C4-5-6; D45-5-6)

As suggested by Pellegrino and colleagues (2013), the expression of competencies claims (and its subparts) in the form of verbs of cognition, is a good practice of construct mapping because it will ease the future item writing process.

To match the last developments, we will use the revised Bloom taxonomy (Anderson et al., 2001).

The detailed taxonomy, with examples and definitions, is available in Appendix B5 (Anderson & Krathwohl, 2001; Krathwohl, 2002).

This taxonomy tackles the ambiguity weakness of some construct maps by providing a list of verbs (compared to nouns in the original taxonomy) to specifically define each cognition levels.

Taking into account the specific context of EAGLE, a recent work from Churches (2009, p. 6) has to be mentioned. Churches has indeed updated the Anderson's taxonomy in order to "address the newer objectives, processes and actions presented by the emergence and integration of Information and Communication Technologies (ICT)". Moreover Anderson's list of verbs, the list of verbs provided by Churches could be used to populate EAGLE construct maps. The Figure 5 above lists the common 6 cognitive levels with related verbs where black verbs are "common" verbs and blue verbs are "digital verbs".
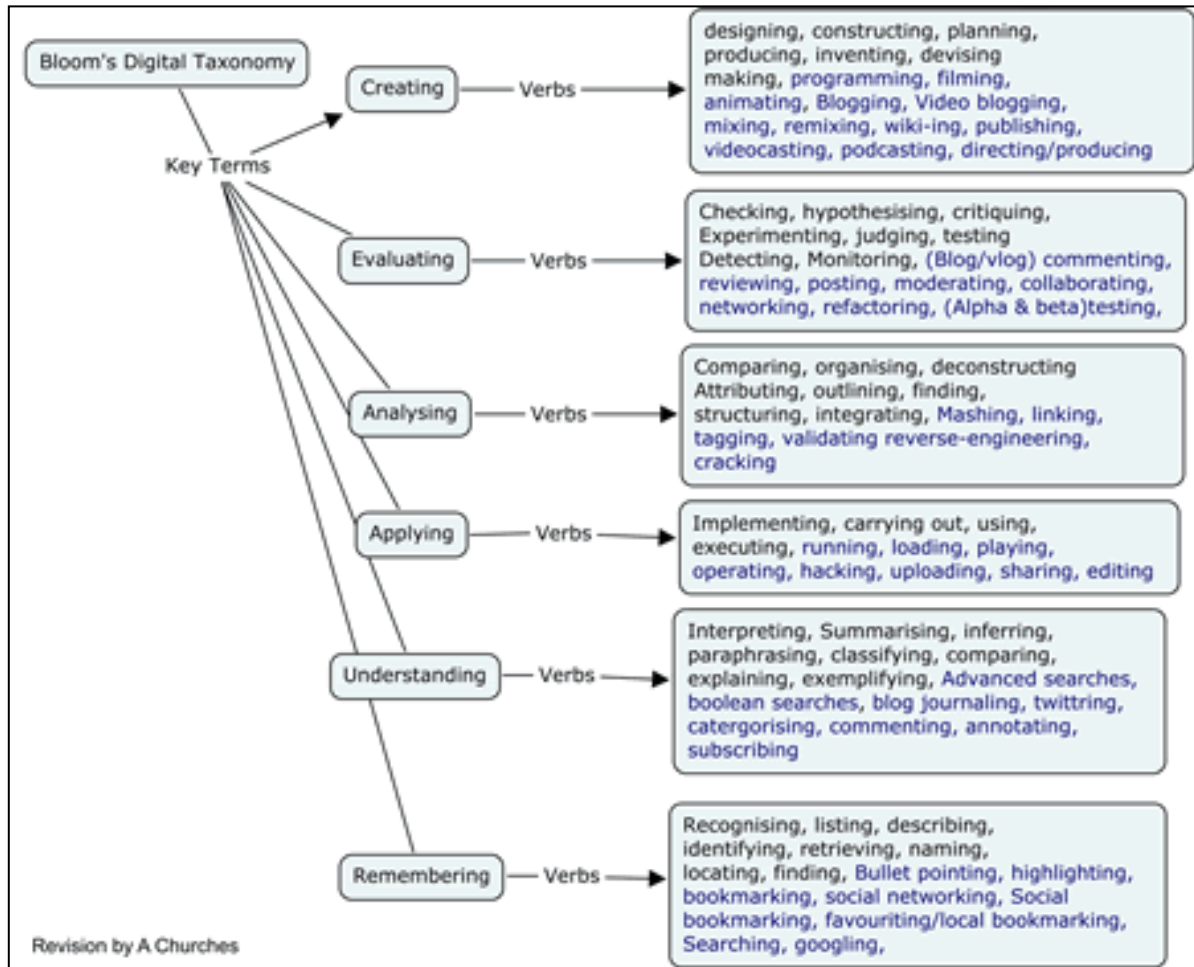
FIGURE 5. BLOOM'S DIGITAL TAXONOMY (CHURCHES, 2009[7]).

Note that when you define a construct map, it is not mandatory to define the lowest proficiency level with a skill of the lowest cognitive level (remembering).

Note that most of the processes involve judgments but it does not mean that these judgments are evaluative in a way it represents the 5th level (evaluate)

5.2.7 Knowledge types (E4-5-6)

According to Anderson and Krathwohl (2001), there are four main knowledge types: factual, conceptual, procedural and metacognitive knowledge, representing a range from concrete (factual) to abstract (metacognitive). Note that we have decided to ignore the metacognitive knowledge level, because the planned assessment approach is not able to address this level appropriately.

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[7] Churches, A. (2009). Bloom's Digital Taxonomy. Available at http://edorigami.wikispaces.com/file/view/bloom%27s%20Digital%20taxonomy%20v3.01.pdf/65720266/bloom%27s%20Digital%20taxonomy%20v3.01.pdf

Examples for the four levels are in appendix B5.

According to Ras (2009), factual knowledge refers to the basic elements that experts use in communicating within their discipline, understanding it, and organizing it systematically. Factual knowledge can be seen as elements and bits of information that can be isolated from their context.

Conceptual knowledge includes knowledge of categories and classifications and the relationship between them and among them – more complex, organized knowledge forms (Anderson & Krathwohl, 2001).

Procedural knowledge is knowledge about how to do things – which might range from routine exercises to solving novel problems (Anderson & Krathwohl, 2001). It can be expressed as a sequence of steps, collectively known as procedures. It includes knowledge of skills, algorithms, techniques, and methods (Alexander et al., 1991; De Jong & Ferguson-Hessler, 1996; Dochy & Alexander, 1995). It also includes criteria about when to apply certain procedures. Procedural knowledge can be seen as knowledge of different "processes", and factual and conceptual knowledge can be seen as "products" – factual and conceptual knowledge are input and output of the performed procedures that rely on procedural knowledge.

Metacognitive knowledge is the last knowledge category of Anderson and Krathwohl's knowledge classification schema. It is knowledge about "cognition in general as well as awareness of and knowledge about one's own cognition" (Anderson & Krathwohl, 2001). When people are aware of their own thinking, they will tend to learn better (Bransford et al., 1999).

5.2.8   Responses to items and common errors (G4-5-6)

The "responses to items" column deals with the "typical statements made by people at the corresponding levels" (Wilson, 2009). This column do not deal with actual items, items will be developed later.

This column will be filled during the definition of the task and item model templates.

For an EAGLE Information literacy construct map example (section 6.1.3), one has to define what an IL literate civil servant is able to do at each proficiency level. For example, with the statement "Civil servant is only able to use keywords related to the information needed", it means that the civil servant has only a low proficiency level.

Note that if skills are very detailed, it is possible to have a very close response to item.

Common errors are not mandatory but may be useful to future item writing (distractors, etc.) A common error for the previous example may be that a civil servant provides the search engine with a long sentence.

6 Analysis of expected EAGLE competences

For EAGLE there are three relevant higher order constructs: digital literacy, information literacy, and change management competencies. As mentioned in the introduction, for information literacy we define construct maps as understood from the assessment perspective. For ICT literacy and change management we define so called proficiency maps, a lightweight form of construct maps, which are sufficient to define the EAGLE proficiency-based curriculum (D4.4).

Competences not directly related to EAGLE approach, are classified as 'indirect' competences and those considered essential to enable users to make use of EAGLE are considered 'direct' ones. The analysis done in this section is the base for the selection of the direct competences regarding digital and information literacy. The change management competences where based on the Change management model provided by the D3.1. Examples for construct maps respectively proficiency maps of direct competences are provided next. The full set of maps can be found in the appendix.

6.1 Analysis of contextual situation

This section describes shortly the working context derived from the country reports of D2.2 with respect to information literacy and digital literacy as well as relevant information from the personas and the scenario from D2.3.

Several workshops and interviews have been conducted in the four different evaluation countries (Ireland, Germany, Luxembourg, Montenegro). In the following, we will summarise the working situation

Ireland – The workshops and interviews in Ireland revealed that the PA staff are most comfortable with searching information on the Web and also using social media to search information and share knowledge, compared to the other countries. The Web was considered as a source for learning and using social media is considered to be a way of learning. It seems to be daily practice to use Google, YouTube etc. for the purpose of searching information. Nevertheless, several forums have been established so that for example engineers can exchange information. The forums were deemed to be very useful. The forums alluded to are general-purpose message boards which appear when specific questions need to be answered. Nevertheless, the transfer to a repository to maintain the knowledge would be an asset. Searching information was a spontaneous resolution-based research based on issues arising on the job. Staff can subscribe to mailing lists where information of different departments is distributed. Using Google is preferred compared to access for example official Microsoft support pages. Unfortunately, a lot of information is available on PA website, but the staff prefers to have personal contacts instead of using those Web sites for finding relevant information.

Common software and OS as used in the PA of Ireland (OS Windows, Microsoft Office, Internet Explorer, of specific departmental software, for example financial database vs. library database software.

Concerning digital literacy, from the situation above described it is evidenced that PA workers in Ireland are familiar with technologies and concepts associated with Information

Society Technologies (IST), specifically used at the workplace for searching information and problem solving. Derived from D2.2 is that employees are familiar with sharing information practice, but they are more comfortable with personal contact probably due to organizational culture issues. It would be expected that Irish PA employees could present from medium to high proficiency levels related to EAGLE competences.

Germany – From all the German communes involved in the workshops and interviews, just one mentioned using Google or YouTube as a source for learning. The usage of forums is time-consuming with regard to contributing and retrieving relevant educational content. Forums are generally considered problematic because of missing legal certainty.

All communes offer cross-domain applications, e.g. office solutions (esp. MS Office), databases, document management and archive solutions. Nearly all communes offer a shared file and document storage (file server). All communes use special IT applications to fulfil the operative legal objectives. With regard to archiving solutions, only some communes use document and workflow management. Some archiving solutions are offered by regional ICT service providers.

Internal collaboration (e.g., Wiki, Blog) and social network software is not used. The use of external collaboration and social network solutions is strongly restricted. Policies concerning private email and private Internet use vary, but usually also tend to be restrictive.

Three approaches to information sharing have been reported is that a common local net drive for storing documents with no or very limited search features. Otherwise a DMS or registry software exists with rudimentary knowledge management features. Not at last there is the so-called "council information systems" (a system supporting the municipal council and the administration preparing and executing its decisions). None of these services has been intended for knowledge transfer or e-learning.

Employees want to acquire knowledge with reference to individual cases (doing case studies) and with the possibility to address specific questions to a human expert and enter into question-answer-dialogues. To meet this requirement, it is important to provide the possibility for personal exchange and interaction between learner and teacher/experts and among learners.

They were, however, concerned about the quality of OER, which was associated to the usual practice of contacting experts to get the information needed, they were not sure who, or how, was going to be ensured the OER quality. Another and related aspect is the missing legal certainty. Intransparency and lack of legal certainty of OER was a great concern for practically all respondents. In cases where legal certainty cannot be guaranteed for the offered content, the information may still be useful as long as it is clear what its reliability is.

Not at last also a challenge may result due to the lack of openness**.** Some respondents where concerns with privacy issues, they think that users of OER are afraid of expressing their need for / lack of knowledge towards colleagues in other communes because of competition among communes.

Luxembourg – Learning was described as an extensive activity of information search and information evaluation. Specific platforms (e.g. Legilux) or concrete solutions for a problem at-hand are very helpful and used to retrieve information for daily problems.

Different languages are used during daily work: For more formal topics (e.g. related to laws, regulations, etc.) French is preferred as language. For more practical topics German is the preferred language.

There exist online discussion forums but they are not accessed frequently since the information is considered to be outdated, which reflect that they think someone else should update it. There is no defined maintenance process or social responsibility to do it. For single services a FAQ is provided but it seems that not all information provided here is accurate. That is why one source of information is to access experts directly by phone. It seems that IST are at hand but not appropriated, in terms of 'taken', by the users. Appropriation of technology implies self-define its use for personal purposes, in this regards IST seems to be appropriated by Luxembourgish employees as ICT, or a place where to find information more than sharing and participating actively in its maintenance.

Several participants of the workshop pretended to use Google, YouTube to search for information for daily problem they have to solve. Nevertheless, this is much less daily practice as for example in Ireland.

Different kinds of information systems exist in Luxembourg. For example, the system EASY supports the PA to document and to store all kind of mailings or decisions taken during council meetings. The system SIGCOM provides access to all detailed plan for streets, canals, gas pipes, communication lines including all land register maps and photos of important spots.

What seems to be essential is that there is a need for qualitative control of OER to avoid low quality learning content (e.g. wrong information) and repetitions. The problem is that for some topics there is no expert who knows everything and who could validate the content. Some ministries have really good experts, but other ministries lack of expertise to answer very specific questions. Therefore, a PA staff must be able to judge the quality of the information provided. In addition, participants expressed to retain IPR of authored content and to be able to clearly identify other authors. It was also expressed that qualitative comments would want to be left on OER such that future learners might judge the quality of items better. This means that skills are needed related to IPR and skills to judge and rate learning content or information. Two digital competences (different levels of skills and knowledge) are related to these attitudes, 'copyright and licencing' and 'digital identity' either managing and protecting your own one or knowing how to interpret the others one, which implies also how would you like to get known in the digital space and how to recognize key characteristics of others.

Several times, the participants motivated the introduction of a validation committee, which validates content as it is added to the platform in order to maintain a certain quality and rigour regarding content. Also here, the members of such a committee need skills to validate information.

With regard to content creation, it was emphasised that the authored content needs to be labelled with regard to relevance (national, international) and topic. Competences are needed to create and maintain metadata

The participants expressed that a combination of varying media would be beneficial, i.e. video content with supporting text-based documentation, to support individual learner's needs. This means that content creation competences need to be addressed.

Even if the use of Web2.0 platforms is not integrated into daily work, the workshop participants stated that it would be very useful. Therefore, competences related to sharing knowledge as sustaining meaningful communication in an open-education space need to be considered as well.

Montenegro – The situation in Montenegro differs a lot from the three other evaluation countries. The use of ICT is limited to classical desktop software and the use of Internet platforms such as Dropbox, YouTube or social platforms is not possible. Database systems or other information systems are not used.

There are no web information systems at the national level that can enable sharing documents, online communication, sharing experiences (forum, chat, etc.) between municipalities or municipalities and HRMA and Ministries.

Another issue is that most of them only speak Montenegrin language. Even in some cases classical office software is used in Montenegrin language.

From D2.2 analysis, the described Montenegrin technological and cultural context reflect a work space where employees are required to have a very low proficiency level (skills and knowledge) associated to all the areas of information and digital literacy. It is not possible to make assumptions about their current proficiency levels when there is not information about their performance using other types of technologies or devices, other than the provided at workplace such as personal mobile devices, where search engines, Internet and social networks are available, or personal desk-tops where they are free of using different technologies for sharing, creating, consuming and/or socializing. Therefore, there is currently not enough information to determine the proficiency level Montenegrin PA employees can show at the current stage.

In order to be able to make assumptions about Montenegrin PA employees proficiency levels, it must be explored their digital practice in other professional and personal environments where they can reflect their relation and culture with ICT, including personal use of mobile devices.

General considerations of contextual situation

As a general conclusion it is possible to say that all future EAGLE users are familiar and comfortable with the idea of searching information for solving practical work problems. The term "sharing" is not broadly used by the target group, since they are more familiar with the practice of looking for an answer by asking to a colleague or "searching for it" depending on the available technology. Although they differ in the available technologies they have at

hand, in all the countries was expressed preference for doing this practice person to person instead of using social technologies. It can say something about the internal culture of PA employees, but could be also related to the lack of some competences, in terms of skills and knowledge, needed to evaluate and select the adequate IST for sharing information and finding solutions to practical work problems.

There were three concerns associated to contacting people via IST for solving work problems, a) privacy issues in terms of being able to manage with whom my doubts/problems are shared, b) security issues in terms of being sure that the information is kept in a safe/controlled zone and c) quality issues in terms of being sure that the information received is of major quality and validated by experts. The last aspect was expressed as one of the major concerns in regards to using IST for learning at the workplace and it is directly related to the competence of "sharing information and content" (DIGCOMPT).

From D2.2 is not possible to derive information associated to the use of mobile technologies for searching, sharing or creating information. In the specific case where IST are neither allowed nor present in the infrastructure of the workplace (Montenegro), mobile technologies get of most importance to enable future EAGLE users to access the OEP platform. Organizational considerations in regard to internal normative of using mobile technologies at work must be analysed. This aspect falls also out of the scope of this deliverable.

This country analysis has focused on the evidenced, or suggested, performance level of PA employees, by looking at the use of available technology at their work places within their work culture. It is important to remark that the way how technology is appropriated by tis users, overall when used for learning or sharing knowledge, it is not only limited by their competences to use them, but also by the epistemology behind the culture or society they belong to. This epistemology defines how knowledge is created and determines also how it can be 'acquired'. In that regard, how technology is appropriated in the different countries, regardless the infrastructure (Ireland very rich and Montenegro very limited), suggests an epistemology where knowledge belongs to the experts and it needs to be transfer-received from them, rather than built or constructed through a social process. This is easier to see in countries with rich infrastructure where employees have the opportunity to use social technologies and it is evidenced a knowledge-consumption instead of a knowledge-building approach when using ICT.

Although there are minimum levels of performance and basic competences required to use ICT at a functional level, the set of competences required to adopt a knowledge-consumption approach is smaller than the one required adopting a knowledge-building approach, and the proficiency level of the shared set of competences also differs. In this deliverable the knowledge-building epistemology was considered for the selection of the desired EAGLE users competences.

6.2   Analysis of the EAGLE personas

In the following the five personas are summarised with regard to information literacy (D2.3).

Biljana – senior expert role of author and teacher

Her key tasks are researching information, looking up special information and writing technical reports. She likes the format of a Webinar and an OER. She is competent interacting in social spaces and using ICT for training purposes.

Gabi – employee, blue-collar worker

She uses Internet for private reasons in a simple way. She is willing to consume learning material/information during working time. She does not enjoy formal learning courses but training on practical skills. She is afraid of complex technical manuals. Website provides often too much information and too many options and she doesn't find what she is looking for. She is familiar with forums for sharing information of her personal interest, but she doesn't relate that to the work practice.

John – head of department, a change agent

He is consuming webinars and contributing to an online HR forum. He is willing to create OER's and he is a person who likes to share knowledge in general. To acquire skills in change management and management standards he prefers concrete examples and scenarios of use. He uses indistinctive mobile or desktop technologies.

Louisa – employee, beginner, leads customer service at IT call-in help desk

She authors training material (e.g., on ICT literacy) and plans to create OERs in the near future. She is an expert user of discussion forums. She is able to maintain website content, host a webinar and publish social media content.

Seamus – senior employee

He is mainly using simple Web browsing and online search. Nevertheless, he is willing to use a knowledge management system when it provides a better search function which is more suitable for PA topics. His motivation to use new system is rather low and doesn't like changes but he is willing to use some spare time to follow an online course when it is authored in an accessible way. He is more an information consumer than a producer.

The deliverable D2.3 also contains a scenario description which is analysed with respect to information literacy and digital literacy.

6.3   Analysis of EAGLE scenario

EAGLE scenario was developed in the D2.3, in this section is presented the scenario linked with specific aspect related to digital and information literacy

Complete Scenario

"In order to install a waste water management plant, Biljana and her colleagues have collected a huge amount of data waded through piles of laws and regulations, and had dealt with ever-changing European laws on waste water treatment policies and acceptable levels of contaminants [she has competences in searching and selecting specific information about laws and regulation, as well as monitoring and updating this information when needed]. *Biljana found similar experts using the EAGLE platform and created an expert group to discuss and validate learning material related to the installing such a plant.* [She recognizes expertise from different EAGLE users' profile. She select the appropriated tool and communicate adequately with the

experts using IST to reach her purpose – create validation team].*Together with John she spent time together to author learning material. The EAGLE platform proposed related OER examples from known and unknown PA staff* [Beside of the collaboration skills, both are competent in searching information with educational purposes in a open-education space, being able to identify relevant information from content and metadata]*. She created also a checklist with required competences and underlying procedures before starting such a waste water management project In addition, they added a list of experts and contact partners on the European level* [She is able to define core elements for creating OER such as learning goals]*. Before authoring the OER, she consumed specific OERs about authoring OERs available in the EAGLE platform (video clips, PowerPoint, screen shots)* [She recognized her own learning needs in regard to the use of the new technology and self-manage to cover them]*. John and Biljana submitted the OER to the validation committee.* [They create content managing metadata and licencing issues].

After a few days they received the report from the validation committee, who had undoubtedly checked the sources and reference material for ethical and quality issues including the CC license. After the OER was published a community of practice (CoP) was created for this topic, including facilities for file upload of additional material or relevant forms as well as a forum and a chat for subscribed members of the community" [they evaluate the options and resources offered by the EAGLE technology and select the most suitable combination of tools for creating a CoP associated to the topic. They manage to communicate effectively with the target EAGLE users related to the CoP topic]. *Other PA employees started to upload additional material. EAGLE shows information about OER authored as well as any updates to the material. After downloading and consuming the material, the users were asked to provide feedback about the material [*CoP members are able to identify suitable information for the topic and share it using IST to contribute to the social knowledge building. They also identify key information as metadata in the available resources so that get informed about updates]. *After authoring the OER the profile of Biljana and John was changed to "expert" for this topic and they configured their preferred communication options to get in contact with those who need help on the topic of installing a waste water management plant* [Both managed their digital identity and privacy preferences].

Also Gabi, as a worker, used the system to search for information on landscape maintenance or manuals about machines and technologies used [She is able to identify her learning needs and apply basic search criteria to find the information needed]. *Seamus could fulfil information requests sent by other colleague by simply searching and sending related case studies from other communities or best practice recommendations from higher administration levels to them* [He is able to analyse the information requested and by searching in other CoP select the appropriated resources to cover the needs]*. Louisa, for example, used the EAGLE platform to create an OER as a step-by-step guide on how to author, adapt or validate OERs* [She is able to detect a general need associated to the use of the EAGLE platform and create an OER to cover it].

6.4   Conclusions for Information Literacy – Construct Maps

In order to get an overview of all related competences with regard to information literacy in the PA, the deliverable D2.2 and D2.3 were analysed and competences were mapped to the

ACRL framework. In general, the construct maps defined below can be used in each country, no variants of construct maps were defined for each country. The competence map provides an overview of all competences for the PA.

The ACRL 2000 standard has been evaluated as the best fit standards to classify the competences related to information literacy in the public administration. Nevertheless, we have to admit that is has some weaknesses and needs adaptation (e.g., with regard to open content or the social dimension in information literacy).

Another important question to answer is from which perspective we define information literacy needs: Either they are defined from different typical working situations occurring today in the PA or competency needs which are described from the viewpoint of the EAGLE learning approach. We have chosen for the option related to the EAGLE approach to have a clear and narrow scope for relevant competences. This means that the selected competences are needed when the users engage in the EAGLE open learning environment. Nevertheless, acquiring all dimension of such a competency might infer that the users also need knowledge or skills which are not directly related to EAGLE (e.g., formulating a search query to use Google). We distinguish both competences by labelling them *direct* competences and *indirect* competences.

From the analysis of D2.2 and D2.3 we can derive direct and indirect competences and assign them to the ACRL2000 standards.

6.4.1 Example – Construct map – Define and articulates the need for information

The following table shows the complete construct for the skill "*Define and articulates the need for information*".

	A	B	C	D	E	F	G
1	Construct Map	IL					
2	Competency claim	Defines and articulates the need for information					
3			Anderson's categories and processes		Anderson's knowledge dimensions		
	level of profiency	Skill	Cognitive categories	Cognitive Processes	Knowledge type	Knowledge	Responses to item
4	High	Explores specific and authoritative information sources to deeply understand the topic	Understand	2.5 Infering	Factual Procedural	A.b Knowledge of specific details of the terminology of a topic/domain C.b Knowledge of search methods	
		Constructs an information search question with a clear focus that is specific enough	Understand	2.7 Constructing models	Procedural	C.a Knowledge of information search question definition	
		Lists all most important concepts/terms from the information search question, including relevant variants and if necessary refinement of concepts/terms	Understand	2.4 Summarizing	Procedural	C.a Knowledge of information search question definition	
		Recognizes the use and importance of primary and secondary sources	Evaluate	5.2 Judging	Procedural	C.c Knowledge of characteristics of primary and secondary resources	
5	Medium	Defines the need for information from general information to increase familiarity with the topic	Understand	2.5 Infering	Factual Procedural	A.b Knowledge of specific details of the terminology of a topic/domain C.b Knowledge of search methods	
		Constructs a information search question that is somewhat focused but lacks full development and specificity	Understand	2.7 Constructing models	Procedural	C.a Knowledge of information search question definition	
		Partially lists the most important concepts/terms from the information search question	Understand	2.3 Classifying	Procedural	C.a Knowledge of information search question definition	
		Distinguishes between primary and secondary sources	Understand	2.3 Classifying	Procedural	C.c Knowledge of characteristics of primary and secondary resources	
6	Low	Defines the need for information "from scratch", with no use of background material	Understand	2.5 Infering	Factual Procedural	A.a Knowledge of terminology of a topic/domain C.b Knowledge of search methods	
		Constructs an information search question that is broad and unfocused	Understand	2.7 Constructing models	Procedural	C.a Knowledge of information need definition	
		Lists zero or irrelevant concepts/terms from the information need	x	x	x	x	
		Can only locate information from local and print resources	Remember	1.1 Recognizing	Procedural	C.c Knowledge of characteristics of primary and secondary resources	

6.4.2 Example – Construct map – Understands many of the economic, legal and social issues surrounding the use of information

	A	B	C	D	E	F	G
1	Construct Map	IL					
2	**Competency claim**	Understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally					
3			Anderson's categories and processes		Anderson's knowledge dimensions		
	level of proficiency	**Skill**	**Cognitive categories**	**Cognitive Processes**	**Knowledge type**	**Knowledge**	**Responses to item**
4	High	Appropriately cites & references information that is paraphrased or quoted directly; understands the necessity to cite reference(s) to support claims	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules. Cc. Knowledge of the critria to determine which citation apply style	
		Uses the appropriate manual of citation style (APA, MLA, internal Eagle style, PA style, etc.) as outlined in the project requirements (appropriate to audience/reader(s))	Apply	3.1 Executing	Procedural Factual	CA.Knowledge of citation rules. Ab. Knowledge of citation styles.	
		Includes references, citations, and/or footnotes for all sources used	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.	
		Can articulate the value of information to a free and democratic society, and can use specific criteria to discern objectivity/fact from bias/propaganda.	Evaluate	5.2 Critiquing	Procedural	Cc. Knowledge of criteria for discerning objectivity/fact from bias/propaganda	
5	Medium	Cites & references appropriately the majority of information that is paraphrased; occasional failures to cite or support claims	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.	
		Generally adheres to proper citation style, but occasional errors occur	Apply	3.1 Executing	Procedural Factual	CA.Knowledge of citation rules. Ab. Knowledge of citation styles.	
		Includes references, citations, and/or footnotes for most sources used	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.	
		Is an ethical consumer and producer of information, and understands how free access to information, and free expression, contribute to a democratic society.	Analyze	4.3 Attributing	Procedural	Cc. Knowledge of criteria for discerning objectivity/fact from bias/propaganda	
6	Low	Lacks the ability to distinguish between personal statements, paraphrasing or quoting directly; does not support statements with citations to authoritative sources	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.	
		Numerous errors with citation style and format; may indicate lack of knowledge of appropriate format and/or inability to cite & reference various information mediums (books, blogs, journal articles, newspapers, encyclopedias, etc.)	Apply	3.1 Executing	Procedural Factual	CA.Knowledge of citation rules. Ab. Knowledge of citation styles.	
		Numerous exclusions of footnotes, citations, and/or references for information sources used for the project	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.	
		Does not distinguish information that is objective and biased, and does not know the role that free access to information plays in a democratic society.	x	x	x	x	

6.5   Conclusions for Digital Literacy

From the previous sections it is evidenced that the country situation greatly differs from country to country in terms of technology available and organizational rules that determine the use of IST at workplace. It consequently determines a broad spectrum in the current competences needed for the integration of EAGLE OEP to the work practice.

The analysis of D2.2, the personas and the scenarios shows that the selected competences from the DIGCOMP framework fit well the need of public administration. The competences associated to the three main general concerns mentioned in the contextual analysis, are covered in the areas of communication and safety. The areas of creating content and solving problems are derived from the analysis of the EAGLE approach, shown in the scenario and personas analysis.

It is to be remarked the importance of developing the competences on different proficiency levels, due to the fact that our target group is coming from a high level of digital literacy as in Ireland, to a very low one as in Montenegro, where access to Web 2.0 technologies at the work place is not available. In general, the proficiency maps for Digital competences defined below can be used in each country, but the e.g. the low proficiency level will become more important in one country than in another.

The following competences will be defined on different proficiency levels to be applicable in our target environment (numbered in relation to their description in the DIGCOMP framework:

2.1 Interacting through technologies

2.2 Sharing Information and Content

2.4 Collaborating through digital channels

2.5 Netiquette

3.1 Developing Content

3.2 Integrating and re-elaborating

3.3 Copyright and Licences

3.4 Programming

5.1 Solving technical problems

5.2 Identifying needs and technological responses

5.3 Innovating and creatively using technology

5.4 Identifying digital competence gaps

As for Information literacy, the Digital Competences were analysed in general terms, no special considerations or differentiation was made in terms of mobile use of EAGLE platform.

6.5.3   Proficiency maps for ICT literacy

6.5.3.1   Selected Framework: DIGCOMP

The following table presents an example. The whole proficiency tables for all direct competences can be found in the Annex.

Competence: *Identification of digital competence gaps*

3 sub-competences
  a) To understand where own competence needs to be improved or updated
  b) to support others in the development of their digital competence
  c) to keep up-to-date with new developments.

Attitude examples DIGCOMP:
  • Has a general level of confidence, meaning that s/he is willing to experiment with new technologies, but also to reject inappropriate technologies
  • Reflect own digital skills and development (the ability to be aware of oneself as a digitally literate person and to reflect on one's own digital literacy development)
  • Holds a positive attitude to learn about emerging digital technologies
  • Is able to broaden/update digital competences according to personal/professional needs
  • Is aware of the general trends within new media even if s/he does not use them

Understanding Gaps

Proficiency Level	Skills	Knowledge
High	Self-regulate his / her learning about digital technologies Self-monitor goals and diagnose deficiencies of digital competence required for reaching these goals.	Knowledge of self-regulated learning strategies Knowledge of required competences in a digital world
Medium	Learn how to work with any new digital technology by trying it out and use its internal guidance and help	Knowledge of wider context of digital tools in a digital age
Low	Aware of own limits when using technologies	Knowledge on the possibilities of technologies

Supporting

Proficiency Level	Skills	Knowledge
High	Support others in monitoring and diagnosing digital competence gap	Knowledge of digital competences
Medium	Transfer knowledge	Knowledge of knowledge transfer
Low	Provide information on help and training offers	Knowledge of support and training units

Keeping Up-to-date

Proficiency Level	Skills	Knowledge
High	Update knowledge about the availability of digital tools Adapts smoothly to new	Knowledge of the development and evaluation of technologies, its life-cycles, etc.

	technology into own environment	
Medium	Stay informed using a combination of active search and personalised, automated delivery of information Learn and integrate the new technologies that emerge	Knowledge how to keep up-to-date with technological developments
Low	Include more and more digital instruments in everyday work	Knowledge how to learn technologies on a basic level or how to get support

6.6 Proficiency maps for change management

The following table presents two examples of change management competences. The whole proficiency tables for all direct competences can be found in the Annex.

Competence: *Enlist the stakeholders in order to ease the change's acceptance* Definition: Building and actively maintaining working relationships and/or networks of contacts of stakeholders to further the organization's goals in developing and implementation of OEP in organisation.		
Proficiency Level	Skills	Knowledge
High	Designs strategies that position and promote ideas and concepts of changes to key stakeholders. Selects key stakeholders to involve at the different stages of the change management process	Knowledge of the initial situation (culture, people management, structure, technology, infrastructure, procedures, OEP) in terms of organizational context Knowledge to design communication strategies to promote ideas and concepts. Knowledge to identify importance of key stakeholders for the different stages of the change management process
Medium	Promotes ideas and concept of changes to key stakeholders	Knowledge to use varied communication systems, methodologies and strategies to

		promote ideas and concept of changes to key stakeholders
	Involves the selected stakeholders according their attitudes and behaviours towards change	Knowledge to communicate openly, builds trust and adapts content, style, tone and medium of communication to suit the stakeholders language, cultural background and level their power, legitimacy, and the urgency
	Selects the key stakeholders according to their power, legitimacy, and the urgency (time constraints and/or importance of relationship)	Knowledge to select key stakeholders to involve according to their levels of power, legitimacy and urgency
Low	Identifies areas of mutual interest as a means of establishing strategic relationships with diverse range of stakeholders.	Knowledge that a stakeholder is a person or group with an interest or concern in the intended change.
	Seeks information from others (e.g., colleagues, customers)	Knowledge to collect and analyse data from a variety of sources
	Maintains personal contacts in other parts of the organization with those who can provide information about diverse range of stakeholders	Knowledge to communicate and presents appropriate information in the effective manner, both orally and in writing

Competence: *Planning and organising strategy of the implementation of OEP*

Description: Creating an Action plan for implementing OEP Strategy, Defining a team, tasks, key priority actions that need to be undertaken to achieve objectives of Strategy for implementation OEP, while ensuring the optimal use of resources to meet those objectives

Proficiency Level	Skills	Knowledge
High	Develops strategic plans considering	Knowledge of different

	short term requirements as well as long term direction for implementing Open Educational Practices (OEP)	analytical tools and techniques used in strategic planning.
	Schedules work and deploys resources to deliver organization-wide results within the public administration division.	Knowledge of concepts, principles, and practices related to planning work and utiliyzing resources (staff, stakeholders and technical experts)
Medium	Determines where organization currently fits in the scale of maturity regarding e- learning.	Knowledge to use methods and tools to analyse initial organisational situation and determine level of implementation of e-learning and OEP in the public administration division.
	Organizes and prioritizes tasks so they can be performed within the budget and to achieve the most efficient use of time	Knowledge of OEP goal setting, objectives, targets related to achieving the tasks, functions and results/outputs required of the work-unit.
	Monitors the overall performance of the public administration division and uses the findings to identify opportunities for improvement.	Knowledge of performance management concepts, principles, and practices related to monitoring process.
Low	Identifies and acts on opportunities to partner with other units in the public administration to achieve desired results	Knowledge to identify and interpret OEP policies and procedures to organization units superiors, subordinates and employees
	Explains strategic choices and strategic plans to employees and stakeholders.	Knowledge how to communicate strategically to achieve specific choices and plans (e.g., considering such

		aspects as the optimal message to present, timing and forum of communication)
	Translates objectives into specific plans	Knowledge of organisational OEP goal setting and objectives

7   Conclusion

The aim of this deliverable was to provide a comprehensive overview of the three transversal competences, which have been selected for EAGLE. Based on a literature review of existing frameworks for information literacy, digital competence (ICT literacy), and change management, the best suitable frameworks were selected as a basis for defining the necessary skills and knowledge for each competence.

The conceptual work has its limitations in particular also because competences overlap (see construct maps for information literacy and digital competence) or because no competence framework or model exist (i.e., as for change management). Another difficulty was that the selected frameworks have not been developed for the working forces, but in most cases for the context of libraries, research, or higher education. That is why in some areas larger adaptations were necessary or skills/knowledge concepts were deleted from those standards. In order to keep the definition of the models feasible in terms of scalability, we decided to focus on so-called direct competences, which are competences necessary to engage in the EAGLE learning environment in the PA. That is why these models do not cover the areas of competences that are only related to daily work of the workforce in the PA. Furthermore, some standards or frameworks are currently under revision (see ACRL standards for information literacy) and construct maps should therefore be validated against the new versions later in the project.

The proficiency maps for the three critical EAGLE competences provided by this deliverable, coupled with the D4.2, are the core input for the definition of the EAGLE proficiency-based curriculum learning goals (D4.4).

In addition, as mentioned in this report, the construct maps for information literacy have a higher level of detail. The reason is that these construct maps will now be further detailed to derive so called task models and item templates (D4.5). The task model uses the cogntive dimension of the information literacy construct map to define the interaction between cognitive processes and the knowledge assets.The task models form a task model map and the basis to systematically derive item templates. The item templates are instantiated to generate test items for information literacy.

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A. Appendix – Competency Frameworks

1. ACRL Information Literacy Competency Standards for Higher Education

ACRL standard's excerpt

> **Standard One:** The information literate student determines the nature and extent of the information needed.
>
> **Performance Indicators**: The information literate student defines and articulates the need for information.
>
> **Outcomes Include:** Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need

Analysis of the standard according to EAGLE's objectives

Content validity

The ACRL standard is one of the richest IL standards: five standards (main competencies) are broken down into twenty-two performance indicators; broken down into several indicators as illustrated in the previous example. According to Johnston and Webber (2003), this standard is very technology oriented.

Face validity

Face validity is linked to the "superficial" understanding of the construct's content. For ACRL standard, its face validity could be assessed through the jargon-free vocabulary used: EAGLE's end users (civil servants) must understand every type of content displayed without any specific knowledge in information literacy.

Because this standard has been made by librarians, changes are necessary to ensure a perfect understanding from EAGLE's end users.

This standard has reduced a complex and long list of information competencies into "discrete units" (Johnston and Webber, 2003), in order to make easier the management (assessment included) of its content. But it's the other face of the coin, by reducing its complexity ACRL tends to promote a "mechanistic tick-the-box approach".

Civil servant scope matching

As mentioned, this standard has not been built for the workplace; students are the target of ACRL. Several changes must be handled to match the day-to-day activities of EAGLE's users but according to Lawal, Stilwell, Kuhn and Underwood (2014), the knowledge developed in educational context can be adapted to address problems in the workplace.

Assessment objectives

The formulation of the outcomes are relevant for EAGLE because easily reusable for self-assessment items.

2. Seven Faces of Information Literacy

First face: information literacy is experienced as using information technology for information awareness and communication.

Information use: background of the user's awareness.

Information technology: scanning. Centre of attention (foreground) of the user's awareness.

Analysis of the standard according to EAGLE's objectives

Content validity

The Bruce standard based on a phenomenographic line of research (approach that seeks to explore variation in how people experience world) contrasts with traditional skill and competency based approach and is much more difficult to apprehend but as an inspiration of ANZIL standard, it may well represent the information literacy scope.

Face validity

Again because of its specific approach, it may be hard for civil servant to understand easily (without long adaptation of the standard content) the faces.

Civil servant scope matching

This standard has been drawn from university experiences but Bruce has deepened the link between individual and generic workplace processes.

Workplace processes that correspond to the seven faces of information literacy

The seven faces of IL [Individual]	Workplace processes [Organisational]
The information technology experience	Environmental scanning
The information sources experience	Provision of inhouse and external information resources and services
The information process experience	Information processing; packaging for internal/external consumption
The information control experience	Information/records management, archiving
The knowledge construction experience	Corporate memory
The knowledge extension experience	Research and development
The wisdom experience	Professional ethics/codes of conduct

The following table illustrates the experiences lived from workers (Bruce, Hughes, 2012) and may be easily used for EAGLE's objectives.

Experiences of informed learning	Experiences of informed workers
1. Information Awareness	Using face-to-face and technology enabled processes to establish workplace relationships and professional networks representing multiple viewpoints and global access trends.
2. Sources	Selecting credible sources (textual, oral or pictorial) to engage in evidence based practice, independently or with information professionals.
3. Process	Applying information processes appropriate for organisational and professional practices for independent and collaborative information exchange, decision making, and knowledge creation.
4. Control	Making and managing connections between information use and workplace needs, including capturing and organising content for access and discovery.
5. Knowledge Construction	Enabling and constructing corporate memory by developing personal and collective understanding through purposeful planning, reflection, implementation, and evaluation activities.
6. Knowledge Extension	Applying new insights or solutions to advance individual understanding and team insight through evolving self awareness and collective engagement as catalysts for innovation and development.
7. Wisdom	Evolving explicit social benefits for individual, team, and organisational work, including making wise use of information to further corporate social responsibility.

FIGURE 6. EXPERIENCES OF INFORMED WORKERS (BRUCE, HUGHES, 2012).

Assessment objectives

Despite its focus on worker's experiences, specific content for assessment are not available to the best of our knowledge. Bruce and Hughes (2012) have provided some assessment examples for scholars but did not for workers.

3. Australian and New Zealand Information Literacy Framework (ANZIL)

Standard One definition: The information literate person recognises the need for information and determines the nature and extent of the information needed

Learning outcome: 1.1 The information literate person defines and articulates the information need

Example of skills and knowledge: explores general information sources to increase familiarity with the topic

Analysis of the standard according to EAGLE's objectives

Content validity

Very close to the ACRL standard, the ANZIL framework is logically also very rich, maybe even more detailed because of its additional standard (new information for new concepts). According to its editor Bundy (Anzil, 2004), it may be more people oriented than the ACRL.

Face validity

Again, because the ANZIL framework is based on the ACRL, same conclusions could be drawn: this framework provides easy list of units to manage but may be overly mechanistic.

Civil servant scope matching

As the ACRL, the target of this framework is for education and made by academics and librarians. Because it addresses an information literate person and not a student, fewer changes should be necessary to match with EAGLE's workers activities.

Assessment objectives

Close (but inferior) to ACRL standard, the Australian standard is well equipped for assessment purposes. For example, the standard considers that "various descriptors of attributes, knowledge and skills can be used to phrase learning outcomes and assessment criteria. Grade descriptor rubrics that describe qualitative differences between levels of information literacy attainment can be constructed to guide students and educators" (ANZIL, 2004; p26).

4. International Federation of Library Associations and Institutions (IFLA)

Component 1: Access: the user accesses information effectively and efficiently

Sub-component: defines or recognizes the need for information

Analysis of the standard according to EAGLE's objectives

Without no significant differences compared to previous frameworks, this standard is still very basic and because of its low diffusion, no or few complementary resources (learning or assessment objects) are available.

5. The JISC i-Skills model

Step 1: Identify an information need

Skill: Determines the nature and extent of the need

Analysis of the standard according to EAGLE's objectives

Content validity

As similar as other framework, the i-Skills standard lacks several specific workplace competencies. Time management and information overload, networking and team working should be added to the i-skills framework if it's selected for EAGLE's workplace context.

Face validity

According to a research project in a workplace (Hepworth, 2006), several findings (page 12, 13, 14) have highlighted the necessary adjustments of the original model to match with workplace vocabulary. A specific part of this study is actually named « The relevance of i-skills in the workplace".

Civil servant scope matching

As a result of the same research project cited above, Hepworth and colleagues have shown that the classic information cycle must be adapted into a non-cyclical model in order to match relevant workplace skills. This adapted i-skills model, illustrated below could be relevant to match with the workplace context of EAGLE.
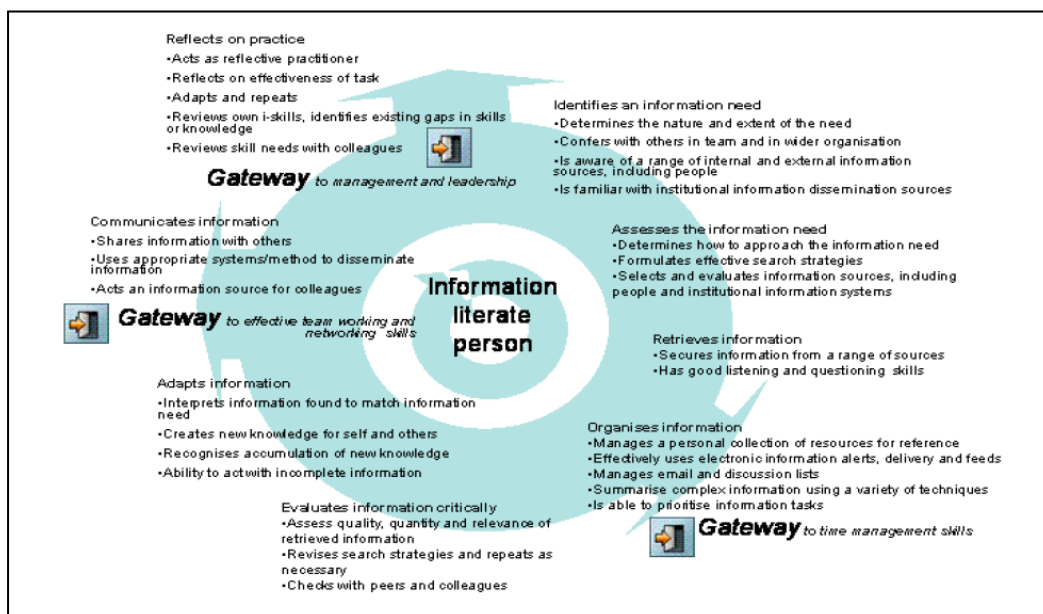
FIGURE 7. JISC I-SKILLS ADAPTED MODEL (HEPWORTH., 2006)

Assessment objectives

Several projects have been managed to create content related to the i-skills models with specific learning objects and assessment packages. For example the National Learning network provides content and assessment items for literacy and communication skills[8].

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[8] **http://www.nln.ac.uk/**

Other i-skills projects with learning and assessment objects are available at
http://www.jisc.ac.uk/publications/generalpublications/2005/pub_sissdocs/pub_sissdocs_improving

6. The SCONUL Seven Pillars of Information Literacy

Analysis of the standard according to EAGLE's objectives

Content validity

Close (but inferior) to the ACRL, the SCONUL standard is a thorough standard with skills and abilities defined.

Face validity

Because of its multiple lenses (research, digital literacy and OER), SCONUL standards might be slightly more understandable from IL novice people. Nevertheless, because it has been made by librarians, some adaptations might be necessary to fit with workplaces specificities.

Civil servant scope matching

According to the EAGLE's workplace context and the OER creation objective, as above mentioned the SCONUL model has the advantage to provide an "Open Educational Resources" enclosed below[9] and a digital literacy lens of its seven pillars.

TABLE 6 SCONUL 7 PILLARS THROUGH AN OPEN CONTENT 'LENS'

Identify	Scope	Plan	Gather	Evaluate	Manage	Present
Understands:	Understands:	Understands:	Understands:	Understands:	Understands:	Understands:
Concept of 'openness' in relation to educational resources and practices **That new open** content is constantly being produced **The benefits** to be gained	**What** material can and should be shared **The issues** of IPR/copyright status and Creative Commons licenses in relation to re-use **The characteristics**	**Where** to locate and publish suitable content **How to search** for content which is available for use/re-use **The differences**	**Where** to locate content for share/re-use **The limitations** of libraries in providing access to digital OER content **What** makes content accessible	**Issues of quality**, relevance, accessibility and format **How to assess impact** and discoverability of open content	**Principles** of designing for reuse **The content lifecycle** and the passage of time on digital content **Interoperability** and open standards for use and reuse **The importance**	**The needs** of the intended audience; their unique situated characteristics **Pedagogic approaches** to the structure, activity and context for delivery of open content

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[9] Seven Pillars of Information Literacy: Open Educational Resources Lens. Available at
http://www.informationliteracy.org.uk/information-literacy-definitions/sconul-seven-pillars-of-information-literacy/

from creating, sharing and reusing content **Impact** of local policy, infrastructure and support in creating a culture of sharing and openness **How to assess** whether using open content or making your own content open will meet your needs	of different types of open content and how these may affect where they are published or aggregated **Who** else must be involved in locating and/or developing content **Where specialist** services and support can be found	between different platforms where open content is located, recognising advantages and limitations	**The importance** of folksonomies in locating open content **The importance** of source files e.g. SWF in enabling reuse/remixing of content		of timing of availability for maximum impact	**The audience** for open content is distributed and self-selecting
Is able to:	**Is able to:**	**Is able to:**	**Is able to:**	**Is able to:**	**Is able to:**	**Is able to:**
Recognise decision to make one's content open may involve others as well as self **Recognise** a need for new skills in locating, creating, reusing, sharing content and identify the skills gap **Assess** how open content could enhance the	I**dentify** material suitable for intended audience **Articulate** reasons for using and making content open **Assess** when content should not be made open **Identify** platforms and search tools for locating good quality digital content	**Use external** sources e.g. Jorum; YouTube etc to extend discovery **Identify appropriate** search techniques to use as necessary **Assign** rights to any new or remixed content	**Apply** metadata tags to add value to content **Organise** content into suitable chunks for learning **Deposit content** in repository or other suitable location(s)	**Assess** the suitability of the content for the intended audience **Determine** and articulate what prior knowledge of the subject is required of the audience **Maximise** discoverability of open content by other practitioners' and audiences of learners	**Identify** how text-based materials can be best transformed into digital formats **Manage** multiple versions and version control **Alter format** of content to meet audience needs **Recognise the need** to refresh or withdraw open content at the end of its lifecycle	**Design** and apply open educational practices around open content in a taught context **Articulate the level of** personal engagement with a distributed, self-selected audience

learner experience						

Assessment objectives

Despite the lack of public assessment items (compared to ACRL standard for example), the structure of the skills and the attributes or behaviours of the SCONUL standard seems relevant for Eagle because easily reusable for self-assessment items.

7. CILIP

Skill 2 : Understanding availability
Be able to identify what resources are available for exploitation, where they are, how to access them, the merits of individual resource types, and when it is appropriate to use them.

Note: As suggested, this requires an understanding of types of resource (paper-based, electronic/ digital, human etc.) and when to use each; what are the merits of individual resources types; what are the differences between them.

Examples: a journal article may be available in print, as a part of an e-journal or as a record in a database of full-text articles

Analysis of the standard according to EAGLE's objectives

Content validity

The CILIP standard has a medium size compared to ACRL or SCONUL frameworks but may be enough to represent all facets of the content aimed.

Face validity

Similar as other frameworks like ACRL or SCONUL, the vocabulary is basic but sometimes close to librarian or higher-education studies. However the detailed notes and concrete example provided for every skills may facilitate a major understanding

Civil servant scope matching

The CILIP standard considers an information literate student, therefore the matching with EAGLE's workplace context may be easier than other student-focused or educational standards.

Assessment objectives

Maybe because of its lower diffusion (compared to ACRL or SCONUL standards for example), it seems there are no public learning or assessment objects available, to the best of our knowledge.

8. The CILIP Information Literacy Skills

Skill 2 : Understanding availability
Be able to identify what resources are available for exploitation, where they are, how to access them, the merits of individual resource types, and when it is appropriate to use them.

> **Note**: As suggested, this requires an understanding of types of resource (paper-based, electronic/ digital, human etc.) and when to use each; what are the merits of individual resources types; what are the differences between them.
>
> **Examples**: a journal article may be available in print, as a part of an e-journal or as a record in a database of full-text articles

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The CILIP standard has a medium size compared to ACRL or SCONUL frameworks but may be enough to represent all facets of the content aimed.

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Assessment objectives

Maybe because of its lower diffusion (compared to ACRL or SCONUL standards for example), it seems there are no public learning or assessment objects available, to the best of our knowledge.

B. Appendix – Construct maps

1. Construct map example with common errors

The following construct map) is a construct map for student understanding of Earth in the solar system (Wilson, 2009). As one can see, on the left side is defined the proficiency levels of the student, and on the right side is defined the ability a student has to master for each level and the common error he can do if he is not fully competent (level 5, 8th grade).

Level	Description
5 8th grade	Student is able to put the motions of the Earth and Moon into a complete description of motion in the Solar System which explains: • the day/night cycle • the phases of the Moon (including the illumination of the Moon by the Sun) • the seasons
4 5th grade	Student is able to coordinate apparent and actual motion of objects in the sky. Student knows that • the Earth is both orbiting the Sun and rotating on its axis • the Earth orbits the Sun once per year • the Earth rotates on its axis once per day, causing the day/night cycle and the appearance that the Sun moves across the sky • the Moon orbits the Earth once every 28 days, producing the phases of the Moon COMMON ERROR: Seasons are caused by the changing distance between the Earth and Sun. COMMON ERROR: The phases of the Moon are caused by a shadow of the planets, the Sun, or the Earth falling on the Moon.
3	Student knows that: • the Earth orbits the Sun • the Moon orbits the Earth • the Earth rotates on its axis However, student has not put this knowledge together with an understanding of apparent motion to form explanations and may not recognize that the Earth is both rotating and orbiting simultaneously. COMMON ERROR: It gets dark at night because the Earth goes around the Sun once a day.
2	Student recognizes that: • the Sun appears to move across the sky every day • the observable shape of the Moon changes every 28 days Student may believe that the Sun moves around the Earth. COMMON ERROR: All motion in the sky is due to the Earth spinning on its axis. COMMON ERROR: The Sun travels around the Earth. COMMON ERROR: It gets dark at night because the Sun goes around the Earth once a day. COMMON ERROR: The Earth is the center of the universe.
1	Student does not recognize the systematic nature of the appearance of objects in the sky. Students may not recognize that the Earth is spherical. COMMON ERROR: It gets dark at night because something (e.g., clouds, the atmosphere, "darkness") covers the Sun. COMMON ERROR: The phases of the Moon are caused by clouds covering the Moon. COMMON ERROR: The Sun goes below the Earth at night.
0	No evidence or off-track

FIGURE 8. CONSTRUCT MAP OF THE UNDERSTANDING OF EARTH IN THE SOLAR SYSTEM (WILSON, 2009).

2. Complete set of construct map for Information Literacy

Construct map – Defines and articulates the need for information

The following table shows the complete construct for the skill "*Define and articulates the need for information*".

	A	B	C	D	E	F
1	Construct Map	IL				
2	**Competency claim**	Defines and articulates the need for information				
3			Anderson's categories and processes		Anderson's knowledge dimensions	
	level of profiency	Skill	Cognitive categories	Cognitive Processes	Knowledge type	Knowledge
4 High		Explores specific and authoritative information sources to deeply understand the topic	Understand	2.5 Infering	Factual Procedural	A.b Knowledge of specific details of the terminology of a topic/domain C.b Knowledge of search methods
		Constructs an information search question with a clear focus that is specific enough	Understand	2.7 Constructing models	Procedural	C.a Knowledge of information search question definition
		Lists all most important concepts/terms from the information search question, including relevant variants and if necessary refinement of concepts/terms	Understand	2.4 Summarizing	Procedural	C.a Knowledge of information search question definition
		Recognizes the use and importance of primary and secondary sources	Evaluate	5.2 Judging	Procedural	C.c Knowledge of characteristics of primary and secondary resources
5 Medium		Defines the need for information from general information to increase familiarity with the topic	Understand	2.5 Infering	Factual Procedural	A.b Knowledge of specific details of the terminology of a topic/domain C.b Knowledge of search methods
		Constructs a information search question that is somewhat focused but lacks full development and specificity	Understand	2.7 Constructing models	Procedural	C.a Knowledge of information search question definition
		Partially lists the most important concepts/terms from the information search question	Understand	2.3 Classifying	Procedural	C.a Knowledge of information search question definition
		Distinguishes between primary and secondary sources	Understand	2.3 Classifying	Procedural	C.c Knowledge of characteristics of primary and secondary resources
6 Low		Defines the need for information "from scratch", with no use of background material	Understand	2.5 Infering	Factual Procedural	A.a Knowledge of terminology of a topic/domain C.b Knowledge of search methods
		Constructs an information search question that is broad and unfocused	Understand	2.7 Constructing models	Procedural	C.a Knowledge of information need definition
		Lists zero or irrelevant concepts/terms from the information need	x	x	x	x
		Can only locate information from local and print resources	Remember	1.1 Recognizing	Procedural	C.c Knowledge of characteristics of primary and secondary resources

Construct map – Accesses needed information effectively and efficiently

The following table shows the complete construct for the skill "Accesses needed information effectively and efficiently".

	A	**B**	**C**	**D**	**E**	**F**
1	Construct Map	IL				
2	**Competency claim**	Accesses needed information effectively and efficiently				
3			Anderson's categories and processes		Anderson's knowledge dimensions	
	level of profiency	**Skill**	**Cognitive categories**	**Cognitive Processes**	**Knowledge type**	**Knowledge**
4	High	Be able to search and retrieve information from the most relevant methods (PA specific systems, search engines, file and document storage, information systems, etc.)	Evaluate	5.1 Checking	Procedural	C.b Knowledge of available information sources and search engines in EAGLE and outside EAGLE. C.b Knowledge of metadata schemas of information resources. C.b Knowledge of PA systems (e.g. council information system (DE), Circallux, Legilux, Easy (L), etc.). C.b Knowledge of different search engines (Google, Bing, Yahoo, etc.). C.b Knowledge of file and document storage use (file server or professional document management systems). C.b Knowledge of social media platforms.
		Considers adaptations and upgrades of the information according to its cost-benefit analysis	Analyze	4.1 Differentiating	Procedural	C.a Knowledge of time necessary to fulfill a learning need according to the type of information. C.c Knowledge of cost/benefit analysis of the production or adaptation of an information (OER, etc.)
		Accesses information using effective, well-designed search strategies and relevant information sources (considering the variety of types of information)	Apply	3.1 Executing	Conceptual Procedural Factual	B.a Knowledge of types of information (books, articles, primary, secondary, in-person, audio, discipline specific, etc.). C.b Knowledge of different search strategy across platform, media formats and information types. A.b Knowledge of differences between push (notification services) and pull (active search).
		Selects the most relevant type and format of information sources according to the need	Understand	2.5 Inferring	Conceptual Procedural	B.a Knowledge of formats and types of information (Media types, file types, etc.) B.a Internal information sources (EAGLE repositories, PA specific repositories and file servers, FAQ, expert forums, mailings lists and notification services) B.a External information sources (Youtube, Web/Google, social media, forums etc.) C.c Knowledge of criteria for selecting relevant information sources.
		Uses advanced commands for search engines (boolean and operator symbols like + and	Understand	2.7 Explaining	Procedural	Cc.Knowledge of criteria for determining an accurate search equation and

5	Medium	Be able to choose several information search methods	Evaluate	5.1 Checking	Procedural	C.b Knowledge of available information sources and search engines in EAGLE and outside EAGLE. C.b Knowledge of metadata schemas of information resources. C.b Knowledge of PA systems (e.g. council information system (DE), Circallux, Legilux, Easy (L), etc.). C.b Knowledge of different search engines (Google, Bing, Yahoo, etc.). C.b Knowledge of file and document storage use (file server or professional document management systems). C.b Knowledge of social media platforms.
		Chooses to acquire an information according to its cost-benefit analysis	Analyze	4.1 Differentiating	Procedural	C.a Knowledge of time necessary to fulfill a learning need according to the type of information. C.c Knowledge of cost/benefit analysis of the production or adaptation of an information (OER, etc.)
		Accesses information using simple search strategies, retrieves information from limited and similar sources	Apply	3.1 Executing	Conceptual Procedural Factual	B.a Knowledge of types of information (books, articles, primary, secondary, in-person, audio, discipline specific, etc.). C.b Knowledge of different search strategy across platform, media formats and information types. A.b Knowledge of differences between push (notification services) and pull (active search).
		Recognizes the different formats and types of information	Remember	1.1 Recognizing	Conceptual	B.a Knowledge of formats and types of information (Media types, file types, etc.) B.a Internal information sources (EAGLE repositories, PA specific repositories and file servers, FAQ, expert forums, mailings lists and notification services) B.a External information sources (Youtube, Web/Google, social media, forums etc.)
		Uses basic commands for search engines (mainly boolean AND OR) and appropriate keywords but without refinement or speech marks for phrases	Understand	2.7 Explaining	Procedural	Cb.Knowledge of basic search engine techniques
		Refines the search but does not use relevant database limiting features or alternative keywords	Evaluate	5.2 Critiquing	Procedural	Cc.Knowledge of criteria for determining an accurate search equation and refine it C.c Knowledge of database features for refining a search.

6	Low	Uses a single and known search method whatever the need	Apply	3.1 Executing		
		Accesses information without cost-benefit analysis	Apply	3.1 Executing		
		Accesses information randomly and by chance	Apply	3.1 Executing		
		Considers any type and format of information whatever the need	x	x	x	
		Uses poorly constructed search strategy (mainly based on keywords and related terms for the information needed)	Understand	2.7 Explaining	Factual Procedural	Aa. Knowledge of basic search strategy he executes C.b Knowledge of the information search method based on keywords
		Does not refine the search or does not refine it appropriately	x	x	x	

Construct map - Evaluates information and its sources critically

	Document Title	Document Type
EAGLE	**Learning Needs Specification and Construct Map Design**	**Report/Public**
Contract Number **619347**		Version **0.1**

	A	B	C	D	E	F
1	**Construct Map**	IL				
2	**Competency claim**	Evaluates information and its sources critically				
3			Anderson's categories and processes		Anderson's knowledge dimensions	
	level of profiency	Skill	Cognitive categories	Cognitive Processes	Knowledge type	Knowledge
4	High	States source currency or publication date and accurately assesses the appropriateness in the context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of currency criterion
		Articulates author's credentials accurately, in context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of authority criterion
		Identifies evidence of source credibility accurately, in context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of credibility criterion
		Describes the relevance of the source with specific examples from the text, in context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of relevance criterion
		Reviews information retrieval sources and search strategies used to revise initial queries	Understand	2.5 Inferring	Procedural	C.a Knowledge of information retrieval sources
		Extends initial synthesis to construct new hypotheses that may require additional information	Create	6.1 Generating	Metacognitive	D.b Knowledge of synthesis
		Synthesizes information from other sources with own ideas in a cohesive and clear manner.	Understand	2.4 Summarizing		
		Summarizes relevant information from the original text in their own words	Understand	2.4 Summarizing		
		As a learner, evaluates learning material with specific criteria and provide innovative feedback to improve the material.	Create	6.1 Generating	Procedural	C.c Knowledge of the quality of content crierion (appropriate for the audience, clear learning objectives, relevant and accurate content, sensitive to the socioeconomic, cultural and linguistic differences of learners). C.c Knowledge of the effectivess as a teaching-learning tool criterion (task based learning, options for individualized training, compliant with various learning and teaching styles, adaptable to the socioeconomic, cultural and linguistic differences of learners, compliant with andragogy principles). C.c Knowledge or the ease of use criterion (ease of competences aimed by the material, appealing presentation of the material, flexibility of the use of the material, support of self-directed learning).

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Version
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5	Medium		States source currency or publication date, but inaccurately assesses the appropriateness in the context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of currency criterion
			Articulates author's credentials accurately, without context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of authority criterion
			Identifies evidence of source credibility accurately, but without context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of credibility criterion
			Describes the relevance of the source, in context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of relevance criterion
			Reviews search strategy and incorporates additional concepts as necessary	Understand	2.5 Inferring	Procedural	C.a Knowledge of information retrieval sources
			Recognizes interrelationships among concepts and combines them into potentially useful primary statements with supporting evidence	Understand	2.5 Inferring	Conceptual Procedural	B.c Knowledge of interrelationships among concepts. C.c Knowledge of criteria for combining concepts.
			Synthesizes information from other sources, but does not blend it well with own ideas.	Understand	2.4 Summarizing	Metacognitive	D.b Knowledge of synthesis
			Summarizes relevant information from the original text, but uses phrases from the original text as well as their own words.	Understand	2.4 Summarizing	Procedural	
			As a learner, evaluates learning material with specific criteria quality of content, effectiveness as a teaching- learning tool,, ease of use)	Evaluate	5.2 Critiquing	Procedural	C.c Knowledge of the quality of content crierion (appropriate for the audience, clear learning objectives, relevant and accurate content, sensitive to the socioeconomic, cultural and linguistic differences of learners). C.c Knowledge of the effectivess as a teaching-learning tool criterion (task based learning, options for individualized training, compliant with various learning and teaching styles, adaptable to the socioeconomic, cultural and linguistic differences of learners, compliant with andragogy principles). C.c Knowledge or the ease of use criterion (ease of competencies aimed by the material, appealing presentation of the material, flexibility of the use of the material, support of self-directed learning).
			As a member of validation committee, partially evaluates information (learning material, etc.) created by PA staff with regard to different criteria (legal certainty, validity of content, CC licence, IPR, etc.) with respect to open content	Evaluate	5.2 Critiquing	Procedural	C.C Knowledge of information validation criteria (legal certainty, validity of content, CC licence, IPR, etc.)

6	Low	States source currency or publication date, but does not assess the appropriateness in the context of the topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of currency criterion
		Provides an inaccurate analysis of author's credentials.	Understand	2.5 Inferring	Procedural	C.a Knowledge of authority criterion
		Provides inaccurate evidence of source credibility.	Understand	2.5 Inferring	Procedural	C.a Knowledge of credibility criterion
		States the relevance of the source, but without context of topic/thesis statement.	Understand	2.5 Inferring	Procedural	C.a Knowledge of relevance criterion
		Determines if original information need has been satisfied or if added information is needed	Understand	2.5 Inferring	Procedural	C.a Knowledge of information retrieval sources
		Uses computer and other technologies for studying the interaction of ideas and other phenomena	Understand	2.5 Inferring	Procedural	C.b Knowledge of techniques to study interaction of ideas
		Uses information wholesale	Apply	3.1 Executing		
		Presents information from the original text verbatim without quotation marks.	Apply	3.1 Executing		
		As a learner, evaluate learning material with basic criteria (satisfaction, length, etc.)	Evaluate	5.2 Critiquing		
		As a member of validation committee, evaluate information (learning material, etc.) created by PA staff with regard to subjective criteria	Evaluate	5.2 Critiquing		

Construct map – Understands many of the economic, legal and social issues surrounding the use of information

	A	B	C	D	E	F
1	Construct Map	IL				
2	**Competency claim**	Understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally				
3			Anderson's categories and processes		Anderson's knowledge dimensions	
	level of profiency	**Skill**	**Cognitive categories**	**Cognitive Processes**	**Knowledge type**	**Knowledge**
4	High	Appropriatly cites & references information that is paraphrased or quoted directly; understands the necessity to cite reference(s) to support claims	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules. Cc. Knowledge of the critria to determine which citation apply style
		Uses the appropriate manual of citation style (APA, MLA, internal Eagle style, PA style, etc.) as outlined in the project requirements (appropriate to audience/reader(s))	Apply	3.1 Executing	Procedural Factual	CA.Knowledge of citation rules. Ab. Knowledge of citation styles.
		Includes references, citations, and/or footnotes for all sources used	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.
		Can articulate the value of information to a free and democratic society, and can use specific criteria to discern objectivity/fact from bias/propaganda.	Evaluate	5.2 Critiquing	Procedural	Cc. Knowledge of criteria for discerning objectivity/fact from bias/propaganda

5	Medium	Cites & references appropriately the majority of information that is paraphrased; occasional failures to cite or support claims	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.
		Generally adheres to proper citation style, but occasional errors occur	Apply	3.1 Executing	Procedural Factual	CA.Knowledge of citation rules. Ab. Knowledge of citation styles.
		Includes references, citations, and/or footnotes for most sources used	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.
		Is an ethical consumer and producer of information, and understands how free access to information, and free expression, contribute to a democratic society.	Analyze	4.3 Attributing	Procedural	Cc. Knowledge of criteria for discerning objectivity/fact from bias/propaganda
6	Low	Lacks the ability to distinguish between personal statements, paraphrasing or quoting directly; does not support statements with citations to authoritative sources	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.
		Numerous errors with citation style and format; may indicate lack of knowledge of appropriate format and/or inability to cite & reference various information mediums (books, blogs, journal articles, newspapers, encyclopedias, etc.)	Apply	3.1 Executing	Procedural Factual	CA.Knowledge of citation rules. Ab. Knowledge of citation styles.
		Numerous exclusions of footnotes, citations, and/or references for information sources used for the project	Apply	3.1 Executing	Procedural	CA.Knowledge of citation and referencing rules.
		Does not distinguish information that is objective and biased, and does not know the role that free access to information plays in a democratic society.	x	x	x	x

3. Complete set of proficiency maps for Digital Competence

Competence: Interacting through technologies

2 relevant Sub-Competences
- a) Interacting: To interact through a variety of digital devices and applications
- b) Managing: To understand how digital communication is distributed, displayed and managed

Attitude examples DIGCOMP:
- Is confident and comfortable in communicating and expressing through digital media
- Is aware of the code of conduct appropriate to the context
- Is aware of the risks linked with online communication with unknown people
- Is actively engaged in online communication
- Is willing to select the most appropriate communication means according to the purpose

Interacting

Proficiency Level	Skills	Knowledge
High	Adapt communication modes and strategies to the specific audience	Knowledge of the benefits and limits of different means of communications
Medium	Understand and apply appropriate ways of communicating though digital means including social media.	Knowledge of a wide variety of digital communication means (email, chat VoIP, video-conferencing systems, SMS, blogs, microblogging, comment section in blogs etc.)
Low	Use different simple technological means to interact with others (e.g. Mail, chat, SMS)	Knowledge of different digital communication means

Managing

Proficiency Level	Skills	Knowledge
High	Create knowledge management strategies for different communication channels (e.g. set up RSS feed reader)	knowledge how to set up strategies to organize communication and to overcome information overload
Medium	able to filter the retrieved communication (e.g. sorting out emails, deciding whom to follow on micro-blogging sides)	knowledge how to organize communication with different digital means
Low	able to find and contact peers using digital communication	Knowledge how to find and contact peers with different digital means

Competence: Sharing information and content

3 Sub-Competences
  a) Sharing: To share with others the location and content of information found, to be willing and able to share knowledge, content and resources
  b) Spreading: to act as an intermediary, to be proactive in the spreading of news, content and resources
  c) Citing: to know about citation practices when sharing information and content with others

Attitude examples DIGCOMP:
- Takes a proactive attitude in the sharing of resources, content and knowledge
- Has his/her own informed opinion about sharing practices, benefits, risks and limits
- Has an informed opinion on authoring practices
- Is aware of copyright issues

Sharing

Proficiency Level	Skills	Knowledge
High	share information, content and resources with others actively using different digital environments (e.g. Social Media portals)	knowledge of content to be publicly shared knowledge of social media portals and online communities
Medium	share information, content and resources in a secure and known environment (e.g. Intranet)	knowledge of data storage and management for official purpose
Low	share files and content through simple technological means (e.g. attachments in emails)	knowledge of simple technological means for file and content sharing

Spreading

Proficiency Level	Skills	Knowledge
High	Use (analyse, evaluate, apply) social media to promote work results	knowledge of content to be publicly shared knowledge of social media portals and work related online communities
Medium	Understand how to participate in social media sites and online communities	knowledge of social media portals social media portals and work related online communities
Low	Remember social media sites and online communities and use it occasionally as an additional resource for information	knowledge of social media portals social media portals and work related online communities

Citing

Proficiency Level	Skills	Knowledge
Proficiency Level	Skills	Knowledge

High	Recognize if a resource violates quotation or copy right laws Confident in applying property and sharing rights in most cases Able to refer to correct standards and regulations	knowledge of quotation rules and copyright laws including OER regulations
Medium	Confident in applying property and sharing rights in most cases (including CC and similar concepts)	knowledge of quotation rules and copyright laws
Low	Use (understand, apply) basic quotation rules and copyright laws (e.g. from traditional media like books)	knowledge of quotation rules and copyright laws

Competence: Collaborating through digital channels

To use technologies and media for team work, collaborative processes and co-construction and co-creation of resources, knowledge and content.

Attitude examples DIGCOMP:
- Is willing to share and collaborate with others
- Is ready to function as part of a team
- Seeks new forms of collaboration that are not necessarily based on a previous face-to-face
- Engagement
- Is pro-active in collaborative problem solving

Proficiency Level	Skills	Knowledge
High	Create different collaboration strategies regarding the task using advanced collaboration services (e.g. tagging systems, wikis) Evaluate contributions of others Apply understanding of different roles needed in diverse forms of online collaboration to work at distance with others seamlessly	Knowledge on the content creation process considering group dynamics and technological means
Medium	Collaborate with others using	Knowledge of a variety of online

	different technologies (online collaboration tools)	collaboration tools
	Gives and receives feedback	Knowledge of the dynamics of collaborative work and of giving and receiving feedback
Low	Collaborate with others using traditional technologies (e.g. email, track change mode in word)	Knowledge of basic collaboration with others

Competence: Netiquette

To have the knowledge and know-how of behavioural norms in online/virtual interactions, to be aware of cultural diversity aspects.

Attitude examples DIGCOMP:
- Considers ethical principles of use and publication of information
- Has an advanced sense of suitable behaviour, finely tuned to media context, audience and legal provisions
- Reveals flexibility and adaptation to different digital communications cultures
- Accepts and appreciates diversity
- Has a safe and sensible attitude in digital activities

Proficiency Level	Skills	Knowledge
High	Apply the various aspects of online etiquette to different digital communication spaces and contexts. Develop strategies to discover inappropriate behaviour	Knowledge of ethical issues in digital media Knowledge that different cultures have different communication and interaction practices
Medium	Respect while producing content EAGLE terms of usage and collaboration Handle rule violations by others appropriately	Knowledge of EAGEL participation rules Knowledge of conflict resolution
Low	Be aware that comments or content published should be in no way offensive	Knowledge of rules of appropriate online behaviour

Competence: Developing content

2 sub-competences
    a) Creating: To create content in different formats including multimedia with a special

focus on OER

b) Expressing: to express creatively through digital media and Technologies

Attitude examples DIGCOMP:
- Is not content with commonly used forms of content creation but explores new ways and formats
- Sees the potential of technologies and media for self-expression and knowledge creation
- Values the added value of new media for cognitive and creative processes
- Is critical about knowledge production and consumption with media and technologies
- Creates with confidence media content and expressions
- Engages with creative content

Creating

Proficiency Level	Skills	Knowledge
High	Evaluate and create digital content in different formats regarding the aim and the meaning of the content and the different target groups	Knowledge which software fits to what kind of content Knowledge of the production of meaning through multimedia
Medium	Produce digital content in different formats including multimedia elements and social software formats (e.g. text, images, audio and video files, screen captures, wikis)	Knowledge of software /applications to create content in different forms
Low	Use office applications to create content in different forms (e.g., text, presentations, images, spreadsheets)	Knowledge of office applications

Expressing

Proficiency Level	Skills	Knowledge
High	Create knowledge representations (e.g. mindmaps, diagrams) using digital media	Knowledge which software fits to what kind of content Knowledge of the production of meaning through multimedia
Medium	Apply a variety of media to express him/herself creatively (text, images, audio, movie)	Knowledge of software /applications to create content in different forms
Low	Apply traditional office applications to present his / her ideas	Knowledge of office applications

Competence: Integrating and re-elaborating

To modify, refine and mash-up existing resources to create new, original and relevant content and knowledge.

Attitude examples DIGCOMP:
- Is critical in the selection of content and resources to be re-elaborated
- Judges and appreciates the work of others
- Awareness of existing repositories (e.g.: Open Educational Resources - OER)

Editing

Proficiency Level	Skills	Knowledge
High	Re-Design and improve content for different purposes and different audience using different media formats Remixes different existing content into something new	Knowledge how to contribute and use resources from public knowledge domains (e.g. OER) Technical Knowledge on integrating different data without just copy and paste
Medium	Analyse content and edit it in order to enhance the final output Use appropriate licences for authoring and sharing content	Knowledge of software /applications to create content in different forms Knowledge of licences and reference practices
Low	Use edit functions to modify content in simple, basic ways using daily office applications	Knowledge of office applications

Competence: Copyrights and licenses

To understand how copyright and licences apply to information and content

Attitude examples DIGCOMP:
- Takes a critical stand towards legal frames and regulations
- Behaves independently and assumes responsibility for own behaviour and choices

Proficiency Level	Skills	Knowledge
High	Licences own digital product	Knowledge of different ways of licencing intellectual property production (copyright, creative commons, copyleft and public domain knowledge)
Medium	Considers licences regulation principles of use and	Knowledge on copyright and licence rules

	publication of information Finds information on copyright and licence rules	
Low	aware that there are copyright and licences to be considered	Basic Knowledge on copyright and licence rules

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Competence: Programming

To apply settings, program modification, program applications, software, devices, to understand the principles of programming, to understand what is behind a program.

Attitude examples DIGCOMP:
- Is aware of the processes behind computational thinking
- Is aware he/she can apply settings to most of the existing software
- Is curious about the potential of ICT for programming and creation of outputs

Proficiency Level	Skills	Knowledge
High	Modifies source codes to adapt existing applications to personal needs Is able to code and programme e.g. websites with different content management systems	Knowledge of technological ecosystems (e.g. CMS, CRM systems) Knowledge of architectural principles behind web-based technologies
Medium	Apply advance settings Apply user-friendly (interface supported) programming tools e.g. for basic website creation	Knowledge how software works from the end-user perspective
Low	Change basic settings in applications	Knowledge of office applications

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Competence: Solving technical problems

To identify possible technical problems and solve them (from trouble-shooting to solving more complex problems).

Attitude examples DIGCOMP:
- Take an active approach to solving problems
- Is willing to seek advice when a problem arises
- Can think of alternatives when problems cannot be solved and things have to be done

Proficiency Level	Skills	Knowledge

High	Apply a widely diverse and well-balanced mix of digital and non-digital technologies for different Problems	knowledge for the solution of technical and theoretical problems
	Modify own working techniques dynamically by integrating new technologies	Knowledge how to keep informed and updated toward technological improvements and developments
Medium	Able to find help for technical problems online	Knowledge how to solve technical problems
	Able to find alternative ways to proceed when technology does not work	
Low	Seeks help for assistance if technology does not work	Knowledge of working environment

Competence: Identifying needs and technological responses

To assess own needs in terms of resources, tools and competence development, to match needs with possible solutions, adapting tools to personal needs, to critically evaluate possible solutions and digital tools.

Attitude examples DIGCOMP:
- Awareness of the value of traditional tools in conjunction with networked media.
- Is interested in new technologies.
- Critically evaluates possible solutions using digital tool

Proficiency Level	Skills	Knowledge
High	Plan, monitor and evaluate which tools to use for which purpose	Knowledge of the potential and limitations of digital devices, technologies and resources
		Knowledge of the range of things that can be done using technologies
Medium	Decide about whether and how to use technologies to pursue relevant goals	Knowledge of available technologies incl. strengths and weaknesses
Low	Use online resources for solving routine tasks	Knowledge of relevant or popular technologies

Competence: Innovating and creatively using technology

To innovate with technology, to create knowledge and solve conceptual problems with the support of digital tools

Attitude examples DIGCOMP:

- Is willing to explore alternative solutions that are offered by technologies
- Is pro-active in looking for solutions
- Is open to revise his/her values and attitudes according to the situation
- Sees the potential of technologies and media for self-expression and knowledge creation
- Values the added value of new media for cognitive and creative processes
- Is critical about knowledge production and consumption with media and technologies

Proficiency Level	Skills	Knowledge
High	Use specialized software to predict future needs (e.g for a project) Apply a well-balanced mix of digital and non-digital technologies for different problems	Knowledge how meaning is produced through multimedia and technology Knowledge how to find relevant knowledge for the solution of theoretical problems Knowledge how to explore the web, the market, online networks when searching for solutions
Medium	Exploits technological potentials in order to represent and solve problems (e.g. use applications to visualize a complex task and therefore present it in a different way)	Knowledge of technological potentials in order to represent and solve problems
Low	Use simple software provided that were not necessarily those that the software was created for	Knowledge of possibilities of usage of software

Competence: Identify digital competence gaps

3 sub-competences
    a) To understand where own competence needs to be improved or updated
    b) to support others in the development of their digital competence
    c) to keep up-to-date with new developments.

Attitude examples DIGCOMP:
- Has a general level of confidence, meaning that s/he is willing to experiment with new
    technologies, but also to reject inappropriate technologies
- Reflect own digital skills and development (the ability to be aware of oneself as a digitally literate person and to reflect on one's own digital literacy development)
- Holds a positive attitude to learn about emerging digital technologies
- Is able to broaden/update digital competences according to personal/professional needs
- Is aware of the general trends within new media even if s/he does not use them

Understanding Gaps

Proficiency	Skills	Knowledge

Level		
High	Self-regulate his / her learning about digital technologies Self-monitor goals and diagnose deficiencies of digital competence required for reaching these goals.	Knowledge of self-regulated learning strategies Knowledge of required competences in a digital world
Medium	Learn how to work with any new digital technology by trying it out and use its internal guidance and help	Knowledge of wider context of digital tools in a digital age
Low	Aware of own limits when using technologies	Knowledge on the possibilities of technologies

Supporting		
Proficiency Level	**Skills**	**Knowledge**
High	Support others in monitoring and diagnosing digital competence gap	Knowledge of digital competences
Medium	Transfer knowledge	Knowledge of knowledge transfer
Low	Provide information on help and training offers	Knowledge of support and training units

Keeping Up-to-date		
Proficiency Level	**Skills**	**Knowledge**
High	Update knowledge about the availability of digital tools Adapts smoothly to new technology into own environment	Knowledge of the development and evaluation of technologies, its life-cycles, etc.
Medium	Stay informed using a combination of active search and personalised, automated delivery of information Learn and integrate the new technologies that emerge	Knowledge how to keep up-to-date with technological developments
Low	Include more and more digital instruments in everyday work	Knowledge how to learn technologies on a basic level or how to get support

4. Complete set of proficiency maps for change management

Competence: Analyse the initial situation (culture, people management, structure, technology, infrastructure, procedures, OEP) in terms of organisational context

Proficiency Level	Skills	Knowledge
High	Identifies which elements can support overcoming barriers for the implementation of the OEP in organisation	Knowledge to identify which elements can be supportive for the implementation of e- learning in the organisation i.e. serve as a lever for the change management process.
	Determines the approach which will be adopted to achieve the target situation, according to organisation specific context	Knowledge to determine the level of coherence between the different organizational dimensions and intended level of change, in order to support implementation of OEP in organisation.
		Knowledge to balance multiple perspectives when setting direction or reaching conclusions (e.g., social, economic, partner, stakeholder interests..)
Medium	Identify initial situation regarding change management related to OEP (e.g. identify inconsistencies between what OEP requires and what is actually available).	Knowledge to analyze the different dimensions of the organizational setting (processes, technology, infrastructure, procedures, culture, vision, people) regarding to implementation of OEP.
		Knowledge of the OEP
	Identify key barriers (policy, organisational, individual, resource-related, knowledge-related, motivation-related) regarding to the implementation of OEP.	Knowledge to apply different techniques (like workshops, interviews), to analyse potential barriers towards the implementation of OEP in organisation
Low	Collects data through existing documents and contact persons.	Knowledge of the organizational context (processes, technology, infrastructure, procedures, culture, vision, people) of the Public Administration.
		Knowledge to collect all the relevant information and data from various resources needed to address the problem regarding to the implementation of OEP.

	Organizes, classifies and synthesizes collected data for addressing the problems analyzed.	Knowledge to identify (from the data collected) the most probable causes od the problem regarding to the implementation of OEP.

Competence: Enlist the stakeholders in order to ease the change's acceptance

Proficiency Level	Skills	Knowledge
High	Designs strategies that position and promote ideas and concepts of changes to key stakeholders.	Knowledge of the initial situation (culture, people management, structure, technology, infrastructure, procedures, OEP) in terms of organizational context
		Knowledge to design communication strategies to promote ideas and concepts.
	Selects key stakeholders to involve at the different stages of the change management process	Knowledge to identify importance of key stakeholders for the different stages of the change management process
Medium	Involves the selected stakeholders according their attitudes and behaviours towards change	Knowledge to communicate openly, builds trust and adapts content, style, tone and medium of communication to suit the stakeholders language, cultural background and level their power, legitimacy, and the urgency
	Selects the key stakeholders according to their power, legitimacy, and the urgency (time constraints and/or importance of relationship)	Knowledge to select key stakeholders to involve according to their levels of power, legitimacy and urgency.
Low	Identifies areas of mutual interest as a means of establishing strategic relationships with diverse range of stakeholders.	Knowledge that a stakeholder is a person or group with an interest or concern in the intended change.
	Seeks information from others (e.g., colleagues, customers)	Knowledge to collect and analyse data from a variety of sources.
	Maintains personal contacts in other parts of the organization with those who can provide information about diverse range of stakeholders	Knowledge to communicate and presents appropriate information in the effective manner, both orally and in writing.

Competence: Organise a collaborative decision-making process with key stakeholders about what change is needed on each organisational dimension

Proficiency Level	Skills	Knowledge
High	Creates an environment that promotes ideas and encourages changes or innovation.	Knowledge of organisational context and OEP.
	Determines Action plan for specific objectives related to each organizational dimensions (technology, infrastructure, procedures, vision/goals, people)	Knowledge how to prioritize and strategize a list of objectives for an Action plan according to actions, deadlines, resource, indicators, responsible persons.
Medium	Identify specific objectives (e.g. target situation) related to each organisational dimension (technology, infrastructure, procedures, vision/goals, people)	Knowledge to identify specific objectives (e.g. target situation) using current situation analysis related to each organisational dimension (technology, infrastructure, procedures, vision/goals, people).
	Defines consensus with stakeholders about priority objectives and actions (strategic, managerial, operational) related to each organizational dimension (technology, infrastructure, procedures, vision/goals, people)	Knowledge to communicate strategically, promote dialog and shared understanding, takes stakeholders' perspectives into account when communicating, negotiating or presenting arguments (e.g., presents priority objectives of OEP).
Low	Involves key stakeholders in decision-making process discussion of views on the change.	Knowledge to facilitates adequate information flow to enhance and ensure consensus about the priority objectives with key stakeholders
	Explains the process of OEP and benefits of the proposed change to key stakeholders.	Knowledge to present and explain the potential opportunities and consequences of proposed change to key stakeholders
	Recognizes problems to share information and resolve differences among key stakeholders.	Knowledge to identify differing points of view and emphasises points of agreement as a starting point to resolve differences

Competence: Determine the future OEP target situation

Proficiency Level	Skills	Knowledge
High	Leads the development of the vision for the organization	Knowledge to managing, leading and enabling the process of change and transition while helping others deal with their effects
	Provides direction of the vision to encourage alignment within the organization goals	Knowledge to institutes organization- wide mechanisms and processes to promote and support continuous learning and improvement.
	Defines a consensus vision about the OEP target situation with stakeholders	Knowledge to communicate strategically, promote dialog and shared understanding, takes stakeholders' perspectives into account when communicating, negotiating or presenting arguments (e.g., presents benefits of OEP from all perspectives).
Medium	Regularly promotes the organization, its OEP vision and values to clients, stakeholders and partners.	Knowledge to use varied communication systems, methodologies and strategies to promote OEP vision and the broad impact of change.
	Works with change management team to set program/operational goals and plans in keeping with the strategic vision direction	Knowledge of planning and organizing work according to vision and time management principles and processes
	Assesses the gap between the current OEP state and desired future direction and establishes effective ways for closing the gap in own sector.	Knowledge to analyze initial situation regarding change management related to e-learning and define target situation (vision)
Low	Effectively communicates and interprets goals the OEP vision to employees within area of responsibility.	Knowledge to communicate decisions or recommendations of OEP vision to employees within area of responsibility
	Promotes the significance and impact of employee contributions to achieving OEP vision goals.	Knowledge to support individual development and improvement of employees in order to promote new learning opportunities and development
	Seeks potential future directions for work area in line with OEP vision	Knowledge of OEP

Competence: Planning and organizing strategy for the implementation of OEP		
Proficiency Level	**Skills**	**Knowledge**
High	Develops strategic plans considering short term requirements as well as long term direction for implementing Open Educational Practices (OEP).	Knowledge of different analytical tools and techniques used in strategic planning.
	Schedules work and deploys resources to deliver organization-wide results within the public administration division.	Knowledge of concepts, principles, and practices related to planning work and utilizing resources (staff, stakeholders and technical experts).
Medium	Determines where organization currently fits in the scale of maturity regarding e- learning.	Knowledge to use methods and tools to analyse initial organisational situation and determine level of implementation of e-learning and OEP in the public administration division.
	Organizes and prioritizes tasks so they can be performed within the budget and to achieve the most efficient use of time.	Knowledge of OEP goal setting, objectives, targets related to achieving the tasks, functions and results/outputs required of the work-unit.
	Monitors the overall performance of the public administration division and uses the findings to identify opportunities for improvement.	Knowledge of performance management concepts, principles, and practices related to monitoring process.
	Identifies and acts on opportunities to partner with other units in the public administration to achieve desired results.	Knowledge to identify and interpret OEP policies and procedures to organization units superiors, subordinates and employees.
Low	Explains strategic choices and strategic plans to employees and stakeholders.	Knowledge how to communicate strategically to achieve specific choices and plans (e.g., considering such aspects as the optimal message to present, timing and forum of communication).
	Translates objectives into specific plans.	Knowledge of organisational OEP goal setting and objectives goal setting and objectives.

Competence: Supervision of the implementation of the action plan

Proficiency Level	Skills	Knowledge
High	Adapts the action plan to the reality (actions, deadline, resource, indicators, responsible).	Knowledge how to translate the OEP vision to action. Knowledge of actions, deadline, resource, indicators, responsible for an action plan.
	Triggers regular feedback about the implementation of the action plan (people, system).	Knowledge of strategies for giving timely, specific, limited feedback with reference to actions, deadline, resource, indicators, responsible for an action plan.
	Sets overall direction for how resources and assets are to be used in order to achieve the OEP vision and values.	Knowledge of public administration resources and assets: human, technical, property, financial resources, and business information.
Medium	Identifies gaps in resources that impact on the effectiveness of public administration division.	Knowledge of a wide variety of resource utilization. Knowledge of appropriate metrics that effectively and efficiently measure results.
	Assigns and communicates roles and accountabilities to maximize change management team effectiveness.	Knowledge of staff & line roles and accountabilities of change management team.
	Acts on audit, evaluation and other objective performance information of the change management team.	Understanding of the change management process and how to improve its efficiency and effectiveness.
Low	Ensures that information and knowledge sharing is integrated into all change management programmes and processes.	Understanding how to manage information and knowledge sharing through change management programme and process.
	Monitors work of change management team to ensure alignment with OEP strategic direction, vision and values for the public administration division.	Knowledge of indicators for monitoring the change management process.
	Provides feedback, supervision and coaching to change management team members.	Understanding of basic principles of change management process.

Competence: Final evaluation of the change management success

Proficiency Level	Skills	Knowledge
High	Determines the feedback objectives of the change management process.	Knowledge of criteria for defining OEP strategy in the change process.
	Plans feedback (deadline, responsible, scope).	Knowledge of a wide variety of sampling techniques for planning a feedback.
	Collects feedback from the sample (interview or questionnaire).	Knowledge of a range of interviews, techniques for collecting data.
Medium	Evaluates and implements improvement solutions in the change management process.	Knowledge of criteria for analyzing problems/issues related to the change management process.
	Identifies and resolves critical and complex improvement issues within the process of managing change.	Knowledge of criteria for solving problems/issues related to the change management process.
	Matches appropriate methods to identified improvement needs in the change management process.	Knowledge of variety of different work methods for continuous improvement of change management process.
Low	Identifies areas and ways in which work methods can be improved.	Knowledge of different work methods for continuous improvement of change management process.
	Determines the minimum requirements needed to be met for each task and process while implementing OEP strategy.	Knowledge of resources (human, financial, technical) needed to implement OEP strategy.
	Systematically evaluates and observes why similar activities take a different course in different situations, why agreed objectives are not met and why mistakes are made or reoccur.	Knowledge of effective means for evaluating the change management process.

Competence: Communicate the key messages about the change implemented to the different target audiences within and out of the organization

Proficiency Level	Skills	Knowledge
High	Determines the key messages according to the challenges, risks and concrete changes.	Knowledge of benefits of OER for PA.
	Identifies the different target audiences.	Knowledge of the target audience's language, cultural background and level of understanding.
	Adapts the message (medium, time, content) to the target audience.	Knowledge of a variety of techniques how to tailor information to audience.
Medium	Communicates the strategic direction in such a way that employees, at all levels, fully understand their role in achieving OEP goals.	Knowledge how to organize strategically communication within the team members.
	Ensures that important information from change management is shared with employees and others as appropriate.	Knowledge how to set up strategies to organize communication within and out of the organization.
	Delivers difficult or unpopular messages with clarity, tact and diplomacy.	Knowledge of a variety of interpersonal styles and communication methods.
Low	Maintains continuous open and consistent communication with others.	Knowledge of basic communication methods.
	Consistently delivers accurate, clear and concise messages orally and/or in writing to effectively inform an audience.	Knowledge of clearly conveying information and ideas to individuals or teams.
	Supports messages with relevant data, information, examples and demonstrations.	Knowledge of basic communication tools.

5. Bloom taxonomy

Process dimension

Categories & Cognitive processes	Alternative names	Definition and examples
1. Remember. Retrieve relevant knowledge from long-term memory		
1.1 Recognizing	Identifying	Locating
1.2 Recalling	Retrieving	Retrieving relevant knowledge from long-term memory
2. Understand. Construct meaning from instructional messages, including oral, written, and graphic communication		
2.1 Interpreting	Clarifying Paraphrasing Representing Translating	Changing from one form of representation to another
2.2 Exemplifying	Illustrating Instantiating	Finding a specific example or illustration of a concept or principle
2.3 Classifying	Categorizing Subsuming	Determining that something belongs to a category
2.4 Summarizing	Abstracting Generalizing	Abstracting a general theme or major point(s)
2.5 Inferring	Concluding Extrapolating Interpolating Predicting	Drawing a logical conclusion from presented information
2.6 Comparing	Contrasting Mapping Matching	Detecting correspondences between two ideas, objects, and the like (e.g. In learning a foreign language, infer grammatical principles from examples)
2.7 Explaining	Constructing models	Constructing a cause and effect model of a system
3. Apply. Applying a procedure to a familiar task		
3.1 Executing	Carrying out	Applying a procedure to a familiar task
3.2 Implementing	Using	Applying a procedure to an unfamiliar task
4. Analyze. Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose		

4.1 Differentiating	Discriminating Distinguishing Focusing Selecting	Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material
4.2 Organizing	Finding coherence Integrating Outlining Parsing Structuring	Determining how elements fit or function within a structure
4.3 Attributing	Deconstructing	Determine a point of view, bias, values, or intent underlying presented material
5. Evaluate. Make judgments based on criteria and standards		
5.1 Checking	Coordinating Detecting Monitoring Testing	Detecting inconsistencies or fallacies within a process or product; determining whether a process or product has internal consistency; detecting the effectiveness of a procedure as it is being implemented
5.2 Critiquing	Judging	Detecting inconsistencies between a product and external criteria; determining whether a product has external consistency; detecting the appropriateness of a procedure for a given problem
6. Create. Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure		
6.1 Generating	Hypothesizing	Coming up with alternative hypotheses based on criteria
6.2 Planning	Designing	Devising a procedure for accomplishing some task
6.3 Producing	Constructing	Inventing a product

Knowledge dimension

Major types and subtypes	Examples
A. Factual Knowledge. The basic elements students must know to be acquainted with a discipline or solve problems in it.	
Aa. Knowledge of terminology	Technical vocabulary, music symbols
Ab. Knowledge of specific details and elements	Major natural resources, reliable sources of information
B. Conceptual Knowledge. The interrelationships among the basic elements within a larger structure that enable them to function together.	
Ba. Knowledge of classifications and categories	Periods of geological time, forms of business ownership
Bb. Knowledge of principles and generalizations	Pythagorean theorem, law of supply and demand
Bc. Knowledge of theories, models, and structures	Theory of evolution, structure of Congress
C. Procedural Knowledge. How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods	
Ca. Knowledge of subject specific skills and algorithms	Skills used in painting with water colors, whole-number division algorithm
Cb. Knowledge of subject specific techniques and methods	Interviewing techniques, scientific method
Cc. Knowledge of criteria for determining when to use appropriate procedures	Criteria used to determine when to apply a procedure involving Newton's second lawn, criteria used to judge the feasibility of using a particular method to estimate business costs
D. Metacognitive Knowledge. Knowledge of cognition in general as well as awareness and knowledge of one's own cognition	

Da. Strategic Knowledge	Knowledge of outlining as a means of capturing the structure of a unit of subject matter in a text book, knowledge of the use of heuristics
Db. Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge	Knowledge of the types of tests particular teachers administer, knowledge of the cognitive demands of different tasks
Dc. Self-knowledge	Knowledge that critiquing essays is personal strength, whereas writing essays is a personal weakness; awareness of one's own knowledge level