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Proficiency Based Curriculum

WP 4 - LEARNING – OER Learning for e-Enabling (Critical Skill 2)
Lead Participant: ZHAW

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GLOSSARY

Affinity groups

Are groups of people gathered by specific interest. One or more of the group members creates it and there are administration responsibilities from the ones who created it. These groups have internal rules of operation. The duration of these groups can be determined initially by the creators or can fade off after some time without interaction among the members.

Autonomous learning

The learner is autonomous in searching and choosing learning offers and activities appropriate to his/her self-defined needs. It covers the use of well-structured classes and curricular in professional development as well as *ad hoc* activities to cover short-term information needs that resolve a newly arising problem.

Curriculum

It is broadly defined as the totality of learners' experiences that occur in the educational process. The term often refers specifically to a planned sequence of instruction. In EAGLE it refers to the definition of the learning goals, the activities learners can perform and the options EAGLE system offers to provide evidence of progress to students.

Digital Competences

It 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. (European Commission, 2010)

Information Literacy

It is defined 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[1]

IST

Information Society Technologies are technologies that enable individual to communicate and participate in collaborative digital networks.

EAGLE user expert

It is defined in terms of a person with the necessary competences needed to actually build knowledge using the EAGLE platform.

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1 ACRL Framework for Information Literacy for Higher Education, Draft 1, Part 1, February 2014

Learner's agency
It is the learner's capacity to act independently and to make her or his own free choices.

Open education
A global movement that aims the democratization of education worldwide.

Open Educational Resources
OERs are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share them under an open licences such as Creative Commons or GNU General public licence. (UNESCO, 2015)

Open learning
It is an emergent way of understanding how digital technologies shape the way we learn. It has a socio-constructivist understanding of individuals' development and is mainly grounded in emergent theories such as connectivism that aim to explain learning in the digital age.

1 INTRODUCTION

This document is presented as deliverable D4.4. It reflects the work done in the Task 4.4, included in WP4, and as such it presents the goals, activities, and results of this task.

The production of different material in Section 2 serves as mediators in communication with the technical team as well as with the rest of the consortium and ultimately with the users in the UX validation process.

1.1 Task 4.4 in WP4

EAGLE's main objective is to equip Public Administration (PA) employees in rural local government (RLG) with a holistic solution for continued professional development (CPD) based on Open Educational Resources (OER) and Open Source (OS) tools, supporting the development of critical transversal EAGLE competences such as: change management, information literacy and other digital competences.

To accomplish EAGLE goals Task 4.4 (T4.4) plays a central role in WP4 having two principal goals. The first goal is to develop a learning concept adapted to the EAGLE target users and context. The second one is to present a learning design for the acquisition and development of enabler competences to facilitate the appropriation of EAGLE technology and pedagogy by EAGLE target users. In order to do that T4.4 uses inputs of other WP4 tasks and it will provide valuable information to other EAGLE WPs. The Figure 1 shows these connections.
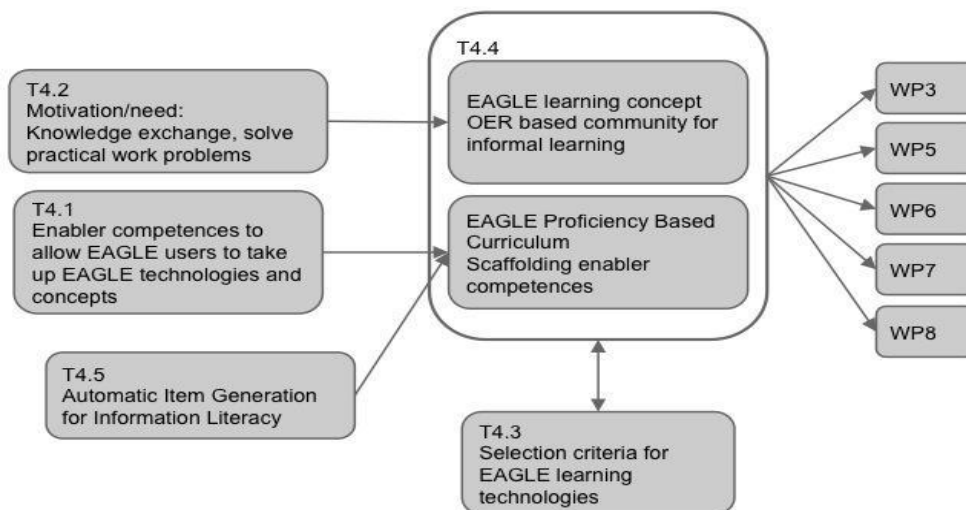
Figure 1 Relation of Task 4.4 with other WP4 tasks and EAGLE WPs

The development of the EAGLE learning concept is based on EAGLE target users' needs and motivations based on inputs from D4.2, and on principles of open and connected learning to support the use, reuse, collection and sharing of different types of OERs.

From D4.1 are derived the enabler competences used to define the proficiency based curriculum. In this document the focus is on digital literacy and individual change management (part of lifelong learning) as core competences for the adequate appropriation of EAGLE technology.

The definition of the EAGLE learning concept is a central input for selecting the learning technologies and tools needed to support this concept, therefore task 4.3 is developed in parallel to the work presented in this document.

The results presented in this document will inform the platform development team (WP5) and will suggest potential impact in organizational strategies for the integration of the concept and technology into the EAGLE target context (WP3). It will also have impact on the work done in WP6, since they will design and evaluate some learning scenarios using OERs, in the same manner as some impact in the work of contextualization and community building (WP7). Further validation strategies and methodologies will be designed in WP8 based on the results of this task.

1.2 EAGLE Educational Innovation

EAGLE's main objective is to equip employees in Rural Local Government (RLG) with an holistic training solution based on *creating*, *sharing*, *discussing* and *using* Open Educational Resources and Open Source tools, considering the motivation and competencies of the EAGLE target group.

EAGLE Open Learning Platform (OLP) development implies a complex multidimensional process, since it aims to implement technology to support practices that may not be endemic within the end user population. Therefore, at project inception, it is unlikely that the organizational policies and culture are adequate for supporting the proposed pedagogy[2]. This last point is of particular importance since these policies and culture are based not only in the current practices and its conceptualization, but also in the historical appropriation of the meaning of 'learning' in an institutional work context. These policies also have a substantial impact on the use and access to technologies required to enable open learning practices. Thus, there is a complex interrelation and mutual influence of four dimensions involved to evaluate the sustainability of an educational innovation and its potential to transform the learning practices within organizations. These four dimensions are pedagogy, technology, individual learning culture and organizational policies. They need to be adequately aligned to enable the transition from a single experience to a sustainable transformation of the learning practice. As shown in the Figure 2, sustainable educational practice is only possible when these dimensions work together: Pedagogy, technology, organizational policy and individual culture.

At the beginning, an educational innovation it is expected that these dimensions are not completely aligned, since one or more of these dimensions should be introducing something new. When introducing a new element in the system, it is difficult to know how the other dimensions would be affected.

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[2] This is already evidenced in the results presented in D2.2

Figure 2 Representation of the educational innovation dimensions

In order to explore the potential of educational innovation to become a new practice, it is necessary to align the four dimensions so that new learning experience can take place and its potential can be truly tested by both learners and their organization (Figure 3).
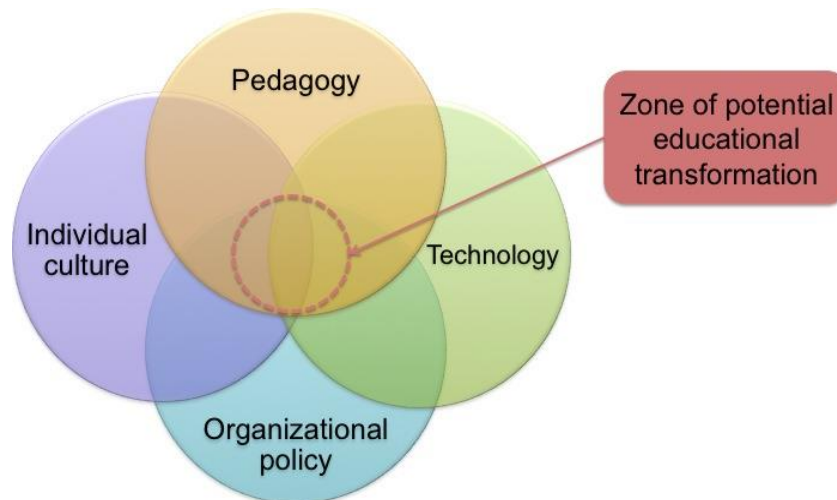
Figure 3 Zone of potential educational transformation

Within the EAGLE project, some elements of the pedagogical and technological dimensions were predetermined during the conception of the project. However, the use of openness in a broad sense, open educational resources, open source and open pedagogy, lay the foundation for the educational and technological development.

Based on the inputs from D4.2 and the information collected from EAGLE target stakeholders in WP2, the initial situation of EAGLE is depicted in the Figure 4. This representation makes visible the gap between the institutional and individual culture, when focusing on learning to solve practical daily work problems and to enhance knowledge in topics of personal interests.

EAGLE pedagogy has a small intersection with this individual learning culture since it has been developed taking into consideration the information collected about their current informal learning practices. Although the practices that wants to be supported by EAGLE technology are not recognized as supported by any technology from the EAGLE target users.
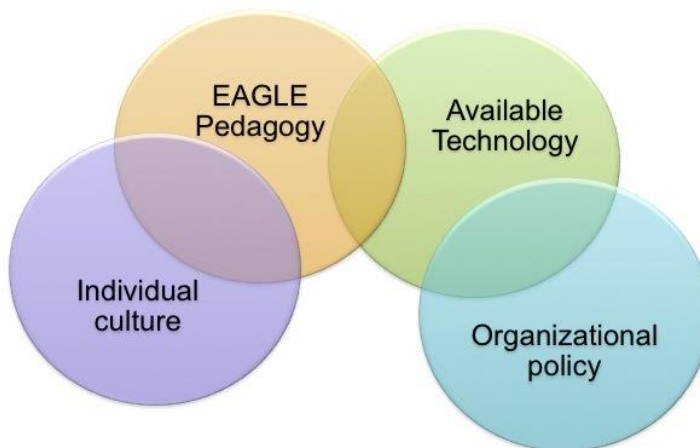
Figure 4 Representation of initial EAGLE situation

At organizational level there are some technologies such as desktop computers and internal messaging systems that are included in the current policies of the organization, there are even some of the EAGLE stakeholders that have access to social media tools (Ireland). However none of these tools are currently used for supporting learning processes or for professional development. From a technological perspective, the technology developed in EAGLE aims to be completely aligned with EAGLE pedagogy. However, this would also depend on the open source available tools and the infrastructure allowed by the organizational culture and policies.

Due to the situation described, an incremental process was adopted to progressively intersect their individual and institutional culture with the EAGLE pedagogy and technology. Considering that the EAGLE project includes the development of the technology that would support EAGLE pedagogy, the cooperation between WP4 and WP5 (development team) is crucial to ensure and progressively increase the intersection between pedagogy and technology. In the same manner, the cooperation between WP4 and WP8 is equally important since the appropriate design of the data collection and analysis for the validation process, at various different stages, is required to identify the core elements that could reduce the gap between the dimensions and find potential intersection points to tailor the introduction of the pedagogical and technological design to the current culture of the users.

Another consideration to be taken into account is the potential impact, as disruptive experience, of the integration of mobile devices when using the EAGLE platform. Defining which devices EAGLE target groups will use can not be predetermined, due to the fast pace of technological development, e.g. currently mobile technologies are moving from smartphone and tablets toward mixed devices such as smartphone/watches and laptop/tablets. Institutional policies must be evaluated in regard to the bring-your-own-device (BYOD) approach and the existence of technical infrastructure (servers for cloud services, VPN services, etc.).

1.3 EAGLE and User-Generated OERs

One of the core goals of the EAGLE project is to encourage users to use, collect, share, create and adapt OERs as a cost-effective way to support their own learning process. The characteristics of OER creation (tools, conditions and competences required) will depend on the definition of OER used.

In the literature there are two types of OER (Camilleri et al., 2014), the "BIG OER" also known as Institutionally-Created OER (IC-OER) and the "little OER" also known as User-Generated OER (Weller, 2010).

The most popular understanding of OERs is the IC-OER that is an evolution of the "learning object" concept coined by Wayne Hodgins in 1994, it was born and grown in the formal education contexts (Camilleri et al., 2014). It is a high quality educational resource created with the goal of making it accessible to people who cannot afford high quality education around the world. Consequently, one of the main efforts is in the construction of repositories that can collect those IC-OERs created in different parts of the world and make them available to everyone, everywhere. That's why the quality standards are of most importance (Camilleri et al., 2014; Clements et al., 2015; Schuwer et al., 2014) and they are mainly set by pedagogical components. Specific tools and competences are needed to satisfy those standards and in consequence its production is very complex (Schuwer et al., 2014) and expensive (Schuwer et al., 2010). Because of their high standards its production is mainly the responsibility of (Higher) educational institutions as part of their social responsibility of democratization of knowledge.

The use, collection and sharing of IC-OERs have great potential to support professional development in any knowledge field, however their creation and/or adaptation usually falls on the motivation, competences and resources of organizations and professionals working out of the field of Education. This is the case of PA employees in RLG, hence the creation or adaptation of the IC-OER are not in line with the motivations and professional competences of EAGLE's target users, therefore the creation of IC-OERs as a main initial activity within the EAGLE platform is highly debatable.

On the other hand there is the little-OER or User Generated OER (UG-OER) (Weller, 2010), which is a rather low-quality digital object created by non-educators in specific contexts to explain or illustrate something to someone or to a group of people. Its creation does not imply complex pedagogical underpinning or tools. It is rather "low quality", compared with the IC-OER, which seems to be an advantage in terms of its appropriation from the users' perspective.

Evidence seems to indicate that high quality content encourages a somewhat passive acceptance rather than uptake and adaptation. EAGLE aims to encourage active participation of users in the creation of digital objects for knowledge creation, which implies that users must feel that any contribution is good enough to be shared within the community. In that concern, Weller (2010) also point out:

> *"...low production quality of little OERs has the effect of encouraging further participation. The implicit message in these OERs is that the consumer can become a producer – they are an invitation to participate precisely because of their low quality."* (page 5)

The professional competences and motivation required to create an UG-OER are in line with PA employees that conform the EAGLE target users[3].

Another characteristic of the UG-OER is that they tend to be peer-produced/reviewed and are most likely to be crowd-sourced, since they encourage aggregation rather than adaptation. It means that the collaborative aggregation of several UG-OERs has the potential to end up in a more structured UG-OER useful for a broader purposes than for the one for what has been created. This potential collaborative construction of digital artefacts is in line with the open learning principles explained in chapter two of this document.

The suitability of UG-OER to the EAGLE target users does not imply forgetting about a further integration of IC-OERs into the EAGLE project. Weller (2010) remarks that although UG-OERs represent a model that encourage participation and may be more sustainable than IC-OERs, open education may need a good balanced mixture of these two types of OERs to comprehensively reach its goal of democratizing education in a broad sense.

In the rest of the document we will use the term EAGLE-OER to denote the UG-OER that will be supported for creation and adaptation. The IC-OER will be used when referring specifically to the high quality resources. The term OER with no prefix will be avoided as it can present ambiguity.

1.4 Document structure

Section 1 gives an overview of WP4 and T4.4's contribution to it. It also outlines EAGLE considerations in regard to the educational innovation process and the definition of EAGLE-OER.

Section 2 develops a conceptualization of EAGLE pedagogy and the potential learning design for the acquisition and development of critical competencies. Some key points elaborated in this section are: reconceptualization of learning and assessment in the openness and game mechanics to scaffold digital competences development.

Section 3 illustrates how the conceptualizations previously discussed might be developed in practice within the EAGLE platform in order to develop the competencies and motivations required for interaction within the system/platform.

The final section describes how the validation process is foreseen and future steps need to be taken for the incremental implementation and validation of the project. Two potential options are analysed.

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[3] To the date of this document the authors have not found any report in the literature about a project aiming at the production of IC-OER by non-educators. At the contrary, there is an extensive list of current and emergent projects aiming at developing competences in teachers/instructors/trainers to enable them to produce and adapt IC-OER with adequate standards so that costs of production can be reduced in the institutions involved.

2 FOUNDATIONS OF EAGLE LEARNING PEDAGOGY

The conception of EAGLE pedagogy considers the characteristics and complexities of workplace learning in the network society (Castells, 2004). Framed in socio-constructivist basis (Vygotsky, 1978), it is designed to support the construction of 'digital' communities of practice to support informal learning among professionals (Chunngam et al., 2014). It use principles of emergent theories such as connectivism (Siemens, 2005) that attempt to explain learning in the digital society[4].

Within this framework, learning implies building connections so that to belong to a community that actively exchanges experiences, knowledge, ideas, etc. Dialogic and reflexive processes as well as collective construction of meanings and objects are core elements of learning. Knowledge is constructed and embedded within the connections, hence activating and reinforcing connections within a community is fundamental. In the following sections it will be explained the implications of this approach in the EAGLE learning design.

2.1 A community for informal learning

EAGLE learning solution is oriented towards bringing support to already existent informal learning practices recognized in an initial contact with the EAGLE target users[5]. One of the most evident differences between formal education and informal learning practices is the setting where the practice is performed. In informal learning there is no structured path for learning, because there is no instructor, trainer or teacher who sets it and leads the process. In the absence of a teacher, the duple 'teaching and learning' disappears and with it the erstwhile teacher's responsibilities which now lay completely on learner's side. Learner's agency becomes the main driver of learning process. Setting goals and selecting the way to reach them, including selection of (educational) resources, are the responsibility of the learner.

Informal learning is a natural process that is usually not recognized by the learners as a learning because it is embedded in daily personal and professional practices. It usually driven by the presence of a problem for which a solution is not reachable with the current knowledge and expertise of the person, although personal interests derived from a particular experience of internal curiosity can also drive it. The act of 'asking others' is an instinctive way of looking for missing knowledge or answers, these others can be represented by human entities such as friends, family, colleagues, on any other considered a more knowledgeable one; or it can be also represented by an object either digital or not such as books, journals, newspapers, legal documents, online discussion boards, databases, libraries, web pages or a combination of them such as digital social networks. Chunngam et al. (2014) describes communities for informal learning as a group of users who learn from each other (either online or face-to-face), gathered by common interests and lead by the exchange of daily practices (good and bad ones), knowledge, problems and experiences with the goal of improving their work performance by

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[4] In this document 'connectivism" is considered an emergent theory that significantly contribute to understand learning in the digital age from a socio-constructivist perspective. The current discussion in the scientific community about the legitimation of 'connectivism' as a new learning theory falls out of the scope of this document.

[5] Assumptions based on inputs from D2.2 and D4.2 to be validated in further steps in WP8

enhancing their knowledge. They also remark the importance of the social structure as support for "knowledge flows" between members.

Information Society Technologies[6] (IST) have tremendously increased the possibilities to find the appropriate information missing in any domain and at any level required. Virtually any person could find any kind of information to resolve any type of problem or fulfil any doubt or interest. But in order to use this potential it is needed to manage the overwhelming amount of information already existent and the constantly growing process permanently occurring. At the same time, the IST have changed the landscape of Internet from being the biggest information highway to be a permanent knowledge construction environment, where information is no longer static and located in a server but distributed among constantly growing digital objects (resources, devices and people) constantly circulating in this knowledge network. In that concern, from a connectivist perspective, Siemens (2005) explains that learning is a process of connecting specialized nodes or information sources. So making, maintaining and nurturing connections is fundamental to facilitate continual learning. The permanent and growing global knowledge construction facilitated for the IST describes the epistemology of connected societies. Different epistemologies account for different pictures of where and how and by whom knowledge is produced, shared, transformed, valued, exchanged, discussed, consumed and discarded.

2.2 Reconceptualization of learning in openness

There is a dynamic between the changed nature of what we call 'learning' (and 'teaching') and the changed nature of the role and identity of the 'learner' moving toward a knowledge-construction epistemology, where construction also implies transformation, discussion, valorisation, deconstruction, recreation, etc. To re-conceptualise this term within the EAGLE construct the fundamental question of how we define "learning" in this context needs to be addressed.

When acknowledging the epistemology of connected societies, individuals experience changes in the way they learn that are reflected, among others, in the following transformations:

- From being subordinated to delivered learning material to becoming managers of their own personal educational resources.
- From passively receiving information to actively co-creating knowledge.
- From the external setting of learning goals to self-regulation of learning needs.

These transformations are embedded in the intrinsic characteristic of connected societies of being mobile and globally networked. Any individual who has access to the global networks with a smartphone or any other device that allows Internet connection. Individuals of the network society are constantly redefining their networks and the roles they play in them. Cyberspace and phone-space enable the creation of communities and cultures and these in turn support the creation of roles and identities. From a social and human perspective, Townsend (2000) address that the phone-space is an inseparable part of individuals' life, since it represents a link with self-created and cultivated networks with friends and colleagues impregnated of personal life's history.

From a technological perspective Cyber-physical systems[7] are emerging as such technologies embedded in daily life artefacts such as wearable technologies, which most probably will even increase the connectedness, mobility and flexibility of future societies.

Within this context, 'learning' is perhaps an inadequate term for some of the processes within the ubiquitous and connected knowledge construction, since it has such a historical load conceiving teaching as its main complement that binds it inevitably to a knowledge consumption epistemology, where the learner is limited to the passive role of consumer. It is for that reason that many of the informal learning practices evidenced in the EAGLE target users, are not recognized as learning practices by themselves and therefore not valued as important for their professional development.

The understanding of learning has been governed by behaviourists and cognitive (individual socio-constructivist) theories during the industrial society, which despite of considering the social dimension as an important aspect for individual learning, has understood learning as an individual process of knowledge acquisition or participation (Sfard, 1998). The emergence and rapid uptake of Web 2.0 technologies in our society has put into question this understanding of learning, and has opened new possibilities for old constructs such as socio-constructivist theories (Cole & Engeström, 1993; Engeström, 1987; Scardamalia & Bereiter, 2006; Vygotsky, 1978) in combination with new emergent approaches, such as connectivism, that contributes to the understanding of 'learning' in the digital and networked society (Kop & Hill, 2008).

EAGLE frames learning within the knowledge construction metaphor (Hakkarainen & Paavola, 2007), where knowledge exists beyond the individual's mind and it is extended within socially constructed artefacts - either material or conceptual (Bereiter, 2005), spread among the collective that has created them in a distributed cognition (Cole & Engeström, 1993) or embedded in the connections within a network (Siemens, 2005). For EAGLE, the use of emergent technologies that allow users to be consumers, creators and curators within a social space represents a shift on the nature of knowledge, having specific and multiple impacts on the nature of learning in 21st century society.

Summing up, EAGLE learning is a process of connecting specialized nodes or information sources and it may reside in non-human appliances such as digital devices or digital spaces. Learning and knowledge rest in diversity of opinions, therefore maintaining and nurturing connections are needed to facilitate continual learning and perceiving connections between fields, ideas and concepts is a core skill. Decision-making is a learning process in itself. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. Thus EAGLE learning is driven by a combination of individual and social interests where the learning needs are fulfilled by nonlinear and dynamic processes of knowledge construction within and outside the network.

2.2.1 EAGLE pedagogy

Whilst learning can be considered a universal construct, pedagogy is both culturally and contextually dependent. Pedagogy is concerned with the design of processes and contextual conditions for intentionally fostering the occurrence of the learning phenomenon. Pedagogy is

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[7] http://cyberphysicalsystems.org/

also dependent, of course, on the meaning of "learning" as a phenomenon. Fundamentals of pedagogy design are:

- Design of learning: is the outline of the systematic series of actions that describe the learning process, including its enablers, stages, actors involved, conditions, etc. i.e. How people activates the learning phenomenon?
- Design for learning: is the organization or structure of the context and mediating artefacts that enable the learning process. The design for learning is subordinate to the design of learning. What people need to enable the learning process?

It means that for the same understanding of learning, there can be manifold learning designs or pedagogies tailored to the context, culture and conditions where it will be applied.

EAGLE solution focuses on professional development, specifically on learning at the workplace. As (Tynjälä, 2008) points out, understanding workplace learning is complex since the already manifold individual learning has impacts on group and community learning, and is also reflected in organizational development, inter-organizational and even regional learning, When adding the complexity of dealing with constantly changing work demands, current pedagogies or learning solutions in this field are put into question. As Littlejohn and Margaryan (2014) points out "While learning a standard curriculum may be helpful for some (limited) work tasks, perpetual change at work means that set curricula are no longer an effective means of professional learning" (Littlejohn & Margaryan, 2014, location 346). She also remarks that although researchers in this field acknowledge the transformational power of technology at work, they have given limited consideration to the impact of technology on learning. Thereby, use of technology to support professional learning at workplace is an area in an early stage of exploration

The EAGLE project's goal is to provide a novel type of technology-enhanced professional development solution, making use of the emergent understanding of learning previously described and looking at technology as an intrinsic element in the 21st individual's life. In EAGLE's target group, desktop technologies are the most present at work, while mobile technologies are assumed as embedded in the personal and social life of individuals in the current digital society. Within this context, EAGLE aims at supporting informal learning practices at workplace, based on building an online community of practice to allow EAGLE users to use, create, collect, adapt and share different types of resources for supporting their autonomous knowledge construction processes.

EAGLE pedagogy is then concerned with setting the conditions for an incremental appropriation of the technology and learning concepts by PA employees in their daily work and life, so that to reach a sustainable transformation of the learning practices at the workplace.

2.3 EAGLE Open and mobile pedagogy

In Open learning refers to learning in a Web 2.0 world surrounded by social media and collaborative tools (Ehlers, 2013), characterized by mobile and connected people. Open learning embraces social and connected learning and 'open' stem from 'no borders' or 'without limits' in relation to the connections people can establish in the 'openness' of internet. When the use of Web 2.0 technologies come into play and there are no restrictions in terms of who is taking part in the learning process (with whom are learners allowed to connect), then social

learning overlaps with open learning adding the connectedness and the scaffolding role of building a network

Social learning has been conceptualized as societal learning in general, as processes of interaction that lead to concerted action for change, as group learning, and as the learning of individuals within a social context. Buckingham & Ferguson (2012) remark that social learning goes beyond engaging with books and online content involving also relationships, which add additional emotional aspects to the learning process, since it involve confidence, trust and engagement.

Nowadays affective aspects such as motivation and trust are not only linked with people but also with other actors such as mobile devices. In terms of the EAGLE learning experience the use of mobile devices must be considered as well as the more conventional desk based configuration of access. The personas (see WP8) typify the multiplatform access that is required by EAGLE learning platform. However, the rapid expansion of mobile device use may mean that this may become the most common access point for EAGLE. As such user mobile habits and the affordances of the device itself[8] may determine particular pedagogic design insights or limitations.

2.3.1 Mobile Learning

Mobile learning is not a different modality, way or type of learning; it should be understood as the learning aspects of societies whose mobility (and connectivity) is afforded by digital technologies and is pervasive, ubiquitous, not-worth-mentioning and taken-for-granted, even intrusive. On the one side, the design of learning needs to consider mobility and connectivity as intrinsic characteristics of the learners and their society. On the other side, in order to adequately integrate the learning process in this mobile life, the design for learning needs to consider mobile technologies (and behaviour) as part of the individual identity of the learner, so that it can be understood as an integrated part of the personal (learning) environment. This is a big challenge for the mobile learning design, since from the design itself, the epistemology of mobile learning must be reflected in the pedagogical design, in the design of educational experiences as well as educational artefacts.

Mobile devices are possibly one of the main actors in enhancing the access to knowledge creation and sharing, which foster and facilitate the rapid epistemological changes of the mobile knowledge society. They support the creation of a learning system where technology becomes a participant in the learning process. Learning is than defined through interactions between individuals, humans or nonhumans system (Sharples et al., 2010). But the context where the learning process occurs impregnates its inherent epistemology for the learners, so learning culture depends on the context. The integration of mobile devices alone in the learning context will not spontaneously generate epistemological changes - mobile devices must be articulated with other factors, so that to enable the transfer of informal learning practices to formal setting, in EAGLE case, to workplace.

An important aspect to consider when talking about mobile learning context is that unlike Learning Management System (LMS) or Virtual Learning environment (VLE), a social learning platform that considers mobile learners, cannot limit the learning context to the platform to

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[8]It is planned to do this study in cooperation with the WP8

support digital and virtual activities. Building a learning platform to support mobile experiences implies consideration of user-generated context (Cook, 2010), a concept named to emphasize the role of learners themselves in shaping their own context, "the context within which communication takes place is augmented by users to suit the needs of the individual and/or the conversational community" (Cook et al., 2011, p. 186). This broadening of the conceptualization of the mobile learning context has a profound, pervasive but subtle impact on work, jobs, businesses and the economy; on perceptions of time, space and place; on the individual, their identity and the nature of communities; on knowledge, knowing, understanding and learning and consequently leads to a changed conceptualisation of 'context'. Traxler (2011) remarks that when talking about mobile learning, context is dynamically defined, local to each occasion of activity or action; rather than context and content being two separable entities.

If digital technologies – and computer technologies are in this respect very different from mobile technologies – are to produce epistemological revolution(s) then again talking about 'learning' is very problematic because 'learning' becomes fluid, partial and socially and culturally specific, and cyberspace and phone-space multiply and fragment where places, cultures and societies can be found.

In order to inform this debate and the inherent implications for EAGLE when designing mobile learning pedagogies, six archetypes are described in the next subsection.

2.3.2 Mobile learning archetypes

The six archetypes are presented in Table 1. In the first three archetypes, the production and distribution of knowledge and learning are still essentially under the control of the established mechanisms, professions and institutions of learning and the technologies of knowledge and learning are those of mass production, or later mass customisation, within the knowledge factories of the late twentieth century, namely universities, colleges and schools. This essentially is the epistemology of these three archetypes. When these closed manufacturing and stock control systems of learning (e.g. a university LMS or CMS containing registered learners and content) are recognised as no longer adequate or appropriate for connecting people to the learning they want to experience, because of the abundance of content and communities that they can access to generate, share, consume, transform ideas, information, opinions, identities and images, and often/mostly on their mobiles, we move to an account of epistemology that is more like market gardening, cottage industry, barter economy and recycling within the community.

Within this context, the old institutions lose their monopoly and have to adapt. Mass customisation and learner analytics are part of this response. Mass customisation can inform us about developing one application for that fits all and (social) learning analytics can inform us about characterizing learning interaction with the system. Although this two fields have been developed in formal education, EAGLE project should understand the how this concepts and technologies can influence informal learning. This process of knowledge production and consumption clearly happens differently across different cultures and societies, where what is being traded in one culture or society may be a valued commodity and in some other culture may be of little value or worth.

Table 1 Mobile learning design archetypes

Mobile Learning Design Category	Specification, Design and Implementation Implications
1. A 'conventional' mobile learning design - take into account the various technological or HCI considerations and what we know about the motivation of our users. Basically e-learning ported onto mobiles	Design desktop e-learning system (Moodle, Facebook, LinkedIn) and then adapt interface for generic or specific mobiles (phones, tablets etc.) Assumes connectivity & browser Device independent
2. A 'conventional' mobile learning design, but using mass customization technologies and learner analytics	Moodle or LinkedIn behaving like Amazon put on a mobile. Recommender system technology Assumes connectivity & browser Device independent
3. A 'conventional' mobile learning design, using mass customization technologies and learner analytics, but exploit the specifics of mobiles and move away from device-independence to a mobile specific implementation – take or use geotagged images, audio, video	Moodle or LinkedIn behaving like Amazon put on a mobile, Context - and location-awareness, recommender systems, personalization, image capture added to above Device dependent
4. A design based on a recognition that everyone's expectations of using mobiles for learning are not formed by earlier experiences of using computers for learning but are formed by their experiences of using mobiles for shopping, socializing, finding out. In fact everything	Assumes a personal relation/experiences with mobile devices Device dependent since everyone's experiences are device dependent
5. A design based on a recognition that any closed system (e.g. a university LMS or CMS containing learners and content) is no longer adequate or appropriate for connecting people to the abundance of content and communities that people can access to generate, share, consume, transform ideas, information, opinions, identities and images, and often/mostly do on their mobiles	EAGLE encapsulates tools and skills for the curation, as well as creation, of content, contexts and communities e.g. MobiMOOC, a free open community MOOC. Conceptual implications of Connectivism as theory need to be analysed in the light of the design of learning proposed by this archetype. Could be device dependent or not.
6. A design based on a recognition of the different cultures, online, ethnic, organisational, whatever, that our learners belong to, and the specifics of people who live/work in rural areas and in public administration and how they use mobiles	For example, adaptive systems, patterns recognition Device dependent since different communities and cultures have device experiences.

Some epistemological commodities are durable and last forever, others go stale or perish and lose their value quickly. This is one problem with the large-scale production of learning, namely that it reacts only slowly to changes in the marketplace and often produces learning that has gone out fashion hence the need for new and more dynamic processes to manufacture and deliver it.

In an initial stage, EAGLE's archetype is situated in the option three transiting to option four within the table. Results from the requirements elicitation process (WP2) point at the assumption that there is not currently an adequate mind-set within the PA culture to attempt to progress into the more disruptive archetypes five and six. The further development of these archetypes will allow to make informed decision to enable the transformation of the PA learning culture.

2.4 Self-assessment in open learning - evidence of progress

2.4.1 Reconceptualization of assessment in openness

The term 'assessment' is an intrinsic part of formal education and strongly connotes the presence of an external authority. Its role is to determine if students have achieved the learning goals defined by an expert or authority who also defines by when and how the student should learn. This external authority also decide how the student's performance will be assessed, students are under the scrutiny of the expert. In consequence the term assessment not only implies the existence of an authority, but it has also emotional implications, rather negative resonance. Boud and Falchikov (2006) argue that because of this tendency to have negative emotions to be assessed, workplace learners tend to reject it or prefer to avoid it. In the same manner than 'learning' connotes the job of the 'students', 'assessment' connotes a job for teachers. Because of the usually direct relation between 'student' and 'learner, employees can resist to be identified as a learner in workplaces.

As explained in the previous section, one core characteristic of open learning is the level of autonomy given to the learner that suggests greater flexibility and freedom when defining personal learning goals. This gives rise to the question of how to assess progress in such autonomous processes against the formal backdrop where 'learning progress' is historically associated to external evaluation of externally given learning goals by external designers of the learning process (teachers/instructors)? Same as in the case of 'learning', the term 'assessment' seems to don't be adequate for the open learning space, since in this context learning goals are susceptible to change with the progress of the learner, due to a process of knowledge refinement..

When a novice in a topic sets a personal learning goal, this goal is adapted to her or his knowledge in the topic at this particular moment, but when the expertise in this topics changes and links to other topics are created, the initial learning goal can be changed before it is certainly reached, because the new level of expertise of the learner allow her or him to refine the goal or even change it completely. This learning goal changes itself demonstrate progress in the learning process and the own learner can only assess it. Another important way how open learners can evidence their learning is when they are able to perform tasks that previously were not reachable or understandable for them (change in the competences to perform determined tasks). Again this is something that can be only evaluated by the learners themselves, since an

external viewer cannot know if a task is not performed because lack of competences or alternatively because of lack of motivation to do it. Within this context the term "evidence progress" seems to be more appropriate than assessment to enable learners to value their progresses in the open learning context. EAGLE learning platform aims to provide different options to enable EAGLE users to evidence their own progress.

In a social and connected space, not only the individual progress is important, but also the possibility of assessing the expertise of the other people is a fundamental aspect of social and open learning. It also implies the need from others to know one's own expertise. This transparency is an important key element of open learning communities to build trust, which is a critical factor that may allow the progress of the entire community or limit it.

The critical use of 'learning' to describe the experience of socially constructed knowledge as an autonomous process, and the need for adopting new terms to refer to it, is of most importance for EAGLE, since it has been already evidenced the strong link established in PA in RLG between the term learning and the term training, both also strongly associated to the knowledge consumption epistemology, demanding the existence of external regulatory authorities.

2.4.2 Evidence of progress in EAGLE pedagogy

As previously explained, in informal learning settings assessing is a process done by the learner him or herself in order to have evidence of her or his own progress. (Ferguson, 2010 citied by Buckingham & Ferguson, 2012) distinguishes two different characteristics of this process in social learning, which can be also applied to open learning:

- An analytical and distinct process that helps the learner to decide on the next steps of his/her learning process
- A process of transparency where expertise of others is explored and valued, and the one's own is exposed, as a fundamental aspect of social and open learning

The analytical and distinct process is basically relevant for the deliberative informal learning described above. Within EAGLE, the introduction of AIG for Information Literacy is explored as an opportunity to build bridges between the current learning culture of EAGLE target users (need for external regulatory authority) and the proposed EAGLE solution (Open learning space).

The second characteristics related with valuing other's expertise set the bases for the building trust dilemma, where trust in needed to progress in an open learning space but at the same time it is needed to progress to be able to build trust. This topic is implicit in some decisions made to define the EAGLE pedagogy.

EAGLE pedagogy has embedded the idea of "evidence progress" and aim to make use of emergent approaches for social learning analytics (Buckingham & Ferguson, 2012) and already existent open learning initiatives to provide EAGLE users substantial and intelligent feedback as a result of their interaction with the different components of the EAGLE learning system (features, tools, objects, people, etc.). This way users can 'evidence progress' in their interaction with the system and also within a specific topic.

One already existent initiative being explored is the concept of 'open badges[9]' where a reward system is introduced made up of several competencies that are user defined and created. Open badges are digital images with metadata hard coded into them. They are used to give recognition of informal learning and created by organisations or groups of users that want to give recognition for particular skills or achievements. The badge can then be displayed on a digital space such as LinkedIn or Facebook. Mozilla inaugurated the open badge concept, the data a badge can incorporate it is shown in the Figure 5.
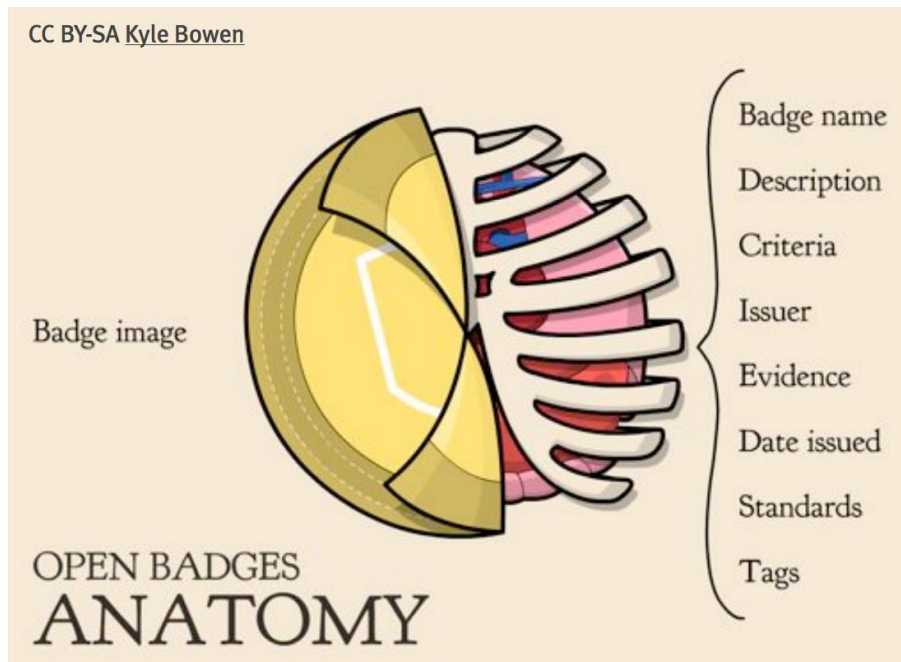

Figure 5 Metadata a badge can incorporate

Originally Badges are described by Mozilla as:

"visual representations of achievements, learning, skills, interests, competencies". They can be used to augment traditional formal learning but can also be used for informal learning pathways. They can represent hard & soft skills, peer assessment, and stackable lifelong learning events as in an e portfolio.

Mozilla Open Badges are not proprietary — they use free software and an open technical standard. That means that any organization can create, issue and verify digital badges, and any user can earn, manage and display these badges all across the web.

Open Badges help knit your skills together. Badges can build upon each other, joining together to tell the full story of your skills and achievement.

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[9] http://openbadges.org

With Open Badges, every badge is full of information. Each one has important data built in that links back to the issuer, the criteria it was issued under and evidence verifying the credential — features unique to Open Badges"[10].

Mozilla badges initiative is completely in line with EAGLE open philosophy and goals. Figure 6 shows how a profile enhanced with badges looks like.
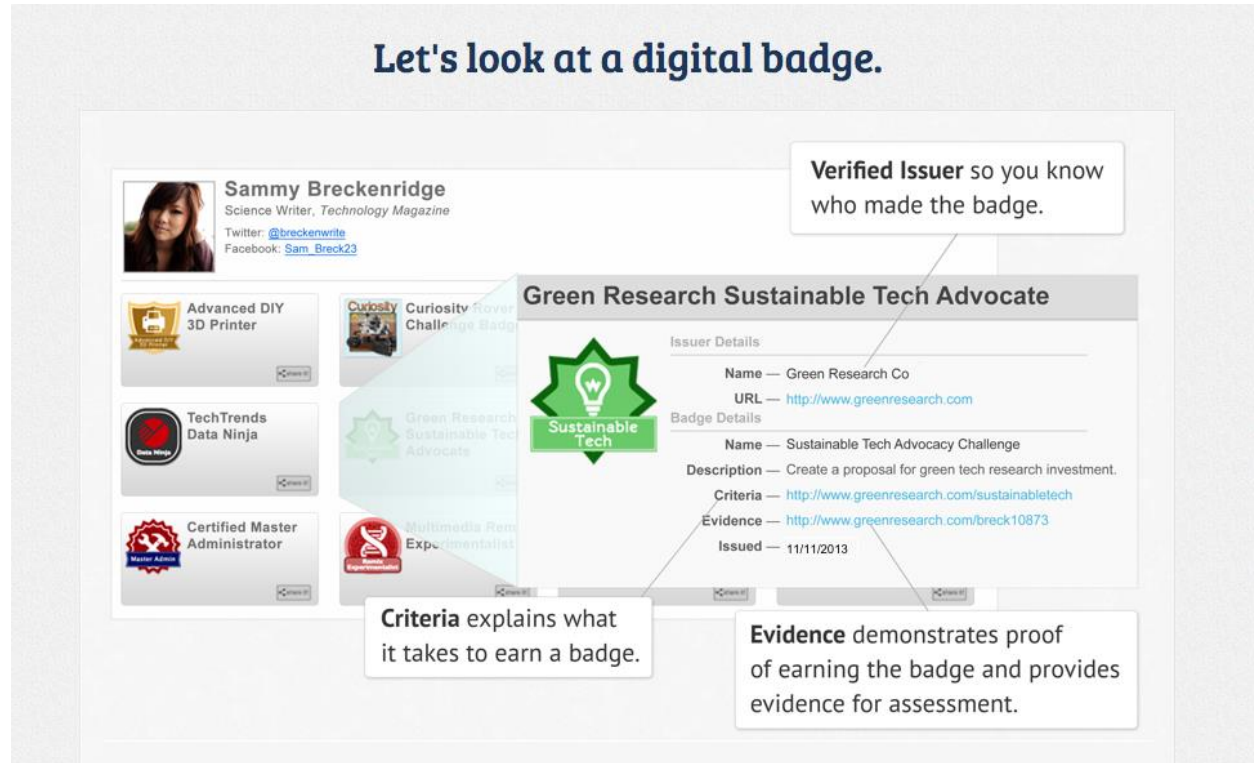
Figure 6 User's profile enhanced with Mozlila badges.

Beside of the Mozilla initiate, there other open learning initiatives that have also extensively adopted the badges philosophy as a way of evidence progress from users perspective, some of these initiatives are; Connected courses (http://connectedcourses.net/) and Rhizomatic learning (http://rhizomatic.net/). To date there are available tools that enable users to create their own badges (e.g. https://www.openbadges.me/ or https://credly.com/).

Gamification offers great possibilities for implementing this approach, where assessing and being assessed is framed differently and motivation plays a key role in encouraging participation. In the next section will be explained the foundations of Gamification that will serve as bases for its implementation in EAGLE learning concept, which is explained in the section three.

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[10] From http://openbadges.org/about/ accessed 27 May 2015

2.5 Gamification and EAGLE evidence of progress

Gee (2003) notes that well-designed video games incorporate analysis of the development of participants' relevant knowledge and skills, so that their experience is constantly customized to their current level, effort and growing mastery, they are aware of on going achievements, and they are provided with information at the point when it can best be understood and used in practice. This leads to the concept of Gamification, explored in this document as one of the potential solutions for evidence progress in the EAGLE open learning pedagogy.

Gamification is the concept of applying game mechanics and game design techniques to engage and motivate people to achieve their goals (badgeville.com). Although this has been defined as people engaging digitally in order to register achievement and status (Burke, 2014), it can also be applied to interactions between people within a digital space. Murray (1997) defined the qualities of digital environments, which are relevant to the use of Gamification within the EAGLE project. She noted that digital environments are procedural, participatory, encyclopaedic, and spatial, and that this engagement affords three characteristic (but not unique) pleasures: immersion, agency, and transformation (of identity). She defines interactivity as the combination of the procedural and the participatory property, which together afford the pleasure of agency. The importance of analysing participation/interaction in order to support certain dispositions or behaviours is outlined below.

Gamification has been claimed to tap into individuals' needs in terms of competition, achievement, status, altruism, community collaboration, and many more besides. In terms of the EAGLE project we need to decide which attributes of Gamification can be applied in order to add value and motivation to user engagement in order to support the development of dispositions within the environment and to create a sense of identity as an EAGLE user. It is also important to validate this technique with the target audiences who, although not necessarily engaged in the variety of gaming cultures and activities may actually be motivated by aspects of game mechanics described below. Game mechanics typically involve getting points towards badges (achievement/status/competence) for activity and getting points for completing levels or challenges. Crucial to this is the aggregation of activity into categories within the user profile so that as people engage in activity their score/ranking or esteem or skill level within the system is seen to increase. As points are accumulated the user "levels up". Crucial for EAGLE is that we develop a reward system that is congruent with the work and professional culture of the end users. When this is transferred to a learning environment one can highlight a differentiation between:

- Interaction with the environment
- Interaction with individuals - people
- Interaction as a community builder
- Interaction to complete a learning challenge as an individual
- Interaction to complete a learning challenge as a group
- Recognition of existing expertise
- Validation of expertise by the community
- Validation of expertise by acquiring competency/status

Different possible game mechanics that EAGLE could adopt are shown in Table 2

Table 2 - Game mechanics

Game mechanic	Description
Achievement	Achievements are a virtual or physical representation of having accomplished something. Achievements can be easy, difficult, surprising, funny, accomplished alone or as a group. Achievements are a way to give users a way to brag about what they've done indirectly as well as add challenge and character to a game. Achievements are often considered "locked" until you have met the series of tasks that are required to "unlock" the Achievement. Badges can be earned from completing tasks/missions in gamification platforms. Achievement in EAGLE could also be linked to activity within the system or degree of different functions within the system. (See metrics)
Cascading Information	Participants are given information as they progress through levels in order to achieve tasks. This mimics just-in- time learning.
Community Collaboration	Learning that requires the combined expertise of several members requires greater skills than an individual task and should have higher rewards. Competencies such as project leadership and soft skills could be evidenced.
Countdown	Where participants are only given a certain amount of time to complete an activity. Not completing means a reduction in skills/points/badges not achieved
Discovery	This concept encourages users to visit all parts of an environment whether they need to go there or not. Rather like a progress indicator on profile completion.

Free Lunch	This is where the participant gets something for nothing, so points towards an expert user badge just by engaging or where by being invited to join a work group or interest group their status is improved.
Levels	Levels are a system, or "ramp", by which users are rewarded an increasing value for a cumulation of points. Often features or abilities are unlocked as users progress to higher levels. Leveling is one of the highest components of motivation for gamers. In EAGLE this could be for digital engagement or challenge completion/ task completion or community participation, creation of artefacts etc.
Progression	A means of itemising activity/ progress indicators are used to show progress towards a goal or badge.
Quests or challenges	These can be used to encourage people to join groups, get certain numbers of participants within the environment or to actually solve real problems with others.
Reward schedules	This is used to decide on the time period by which points are awarded for interaction with the system. So you can have points for interaction and points for just time spent.
Status	Status is the rank or level of a user. Users are often motivated by trying to reach a higher level or status. Rewards such as Badges and Points are used to elevate Status by showcasing the talents, expertise, and accomplishments of users.
Win state/goal	Win states for various activities have to be clear. So there would be different win states for environment/digital interaction to users social interaction and to status interaction.
Viral project	A project or challenge that requires interaction with a group or requires large numbers to solve.
Use	Badges can be awarded for use of different features of the environment. For example market place concept (see appendix 7.1).

There are three overarching types of interactions in any learning environment

- Interaction with the digital environment (Basic actions that require use of the digital environment and tools within it)
- Social interaction (related to connectedness and associations, users' interaction)

- Status interaction (competency and skills acquisition and resource creation and sharing)

These interactions can contribute towards a value system that allows participants evidence progress. They can be related to metrics that can support the use of game mechanics. Engagement metrics and task completion/ levelness are key metrics for each of the three strands of broad activity. Standard Engagement Metrics are:

- Unique visitors
- Page views per visitor
- Time spent on site
- Total time spent per user
- Frequency of visits
- Depth of visit
- Participation
- Conversions

Other metrics to consider are:

- Influence: Gamification can give you influence over your users' actions. Influence can be instantaneous if you have built Gamification content that you can push to users instantly to give them some offer, challenge etc. as result of an user's action.
- User Generated Content (UGC): User Generated content could be pictures, video or other media uploaded or it could be something as simple as comments on a page.
- Virality: it represents users talking more about your brand, through social networks, direct contact online and word of mouth. With Gamification, virality can be that you've incentivized a user to share with their friends or invite friends in for a specific activity as part of the gameplay[11]. An interesting features that can provide information to this metric is the possibility to mention an specific user embedded in the message content (e.g. @mention in Twitter or +mention in Google+)

Deeper metrics would be based on user profiles and badges earned for various activities. We need to define how the core activities of EAGLE relate to a badge/reward framework for the three main types of interaction outlined.

Social network analysis (SNA) (Wasserman & Faust 1994) has the potential to provide sensitive metrics relevant for the knowledge building process, e.g. indicating a determined degree of interactivity and reciprocity.. On an individual level, the visualization of the user's digital network on the EAGLE platform could allow them to understand their own relationships with the community and improve it. The network around a person indicates the person's access and control in the distribution of information as well as the influence within the network, e.g. SNA can detect connections or 'brokers[12]' across clusters or sub-networks to engage diverse information (Burt et al. 2013)

Buckingham & Ferguson (2012) highlight that the adoption of social and open learning implies the move from "pushing" information to the learner, characteristic of formal (traditional) education, and the more flexible situation when learners "pull" resources and information as

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[11] http://en.wikipedia.org/wiki/Gameplay

[12] Defined as persons who act as bridges between clusters

they need them. When pulling information learners generate information within the system that allow the use of ongoing analytics that can support the development of individual dispositions such as creativity and curiosity, collaboration skills and attitudes and resilience. As Buckingham and Ferguson (2012) explain these analytics can build transferable learning dispositions and skills.

EAGLE needs to evaluate the context and culture as well as the incremental capacity of the institutions and stakeholders involved, in order to select the most applicable game mechanics for the design of the competences-based curriculum, and for general use in the EAGLE OLP. This may also depend on the nature of the user's pre-existing and developing digital habitus.

The concept of 'digital visitors' and 'digital residents' (White & Le Cornu, 2011) is currently being analysed to evaluate its potentialities to provide decision making criteria to select the appropriate technologies to be presented to the target users. This could be very useful in an incremental development of the EAGLE OLP.

White (2008) makes a distinction between digital visitors and digital residents. A resident is someone who lives out a large proportion of their life online, increasingly in a mobile and interactive way whereas a visitor is someone who uses the web as a tool when they need it, hence visitor. White notes that whilst age is a significant factor determining behaviour residents and visitor behaviour can occur in any demographic and it is not a polarity. In some instances residents may behave like visitors when entering specific domains for specific purposes. Residents are not necessarily "at home" with all digital environments. He notes that:

> *"It is not always easy to spot who is in each category as the level of sophistication with which a Visitor might use any single service might well be greater than that of a Resident. This Visitor, Resident distinction is useful when considering which technologies to provide for online learners."*

Given that mobile usage is much more lightweight, opportunistic, multimodal and interleaved with real life than desktop usage, potential distinctions between desktop vs. mobile residents and visitors must be explored. This is an important element to be explored within EAGLE target group.

2.5.1 EAGLE categorization of User expertise

The main goal of implementing an EAGLE proficiency-based curriculum is to enable the target users to take up and become "expert users" of the EAGLE OER-OLP. An EAGLE expert user is defined in terms of a person with the necessary competences (skills, knowledge and attitudes) needed to actually build knowledge using the EAGLE platform.

As that knowledge is embedded in the connection and interactions across the personal network and the community, user expertise will initially be defined in EAGLE through the acquisition or prior knowledge of existing competences frameworks as defined in D4.1 (competences and associated proficiency maps relevant to the use of EAGLE platform, namely Information literacy, digital literacy and change management).

One of the tasks of the EAGLE platform and user engagement with it will be to determine the antecedent expertise of users in these key skill areas. Users will be able to progress through certain activities or enter the platform based on their current level of expertise. Beside of the "user expertise", that can also be recognized as "open learner expertise" or "knowledge builder

expertise", it is the "topic expertise" related to professional or subject expertise. Other expertise frameworks may also be considered around pre-existing recognition of prior topic related knowledge. Over time different users may acquire different identities as experts in particular areas of operation or as experts in open learning.

In educational context the term "expert" is usually associated to an expert in a named topic or practice related to a knowledge field, in this case, comments or posts by this author could be highly rated, referenced, viral, etc. But this user, recognized by the community as "topic expert", could probably be a "novice Knowledge-builder". Especially in EAGLE target group this could be a regular case, given the recognized knowledge-consumption epistemology in the context of PA in RLG. On the other hand we can have an "expert knowledge builder", in terms of someone who knows how to make the most of an open learning system for covering his/her own learning needs and support others' learning process, but not being a recognized "topic expert" in any specific subject or practice.

Based on this expertise distinction, EAGLE pedagogy define two initial levels of expertise to be implemented in the EAGLE-OLP, "topic expertise" related to the mastery of an specific subject or professional practice and "user expertise" related to the ability to make use of open learning facilities to build knowledge. The final term to be used for the "user expertise" (e.g. knowledge-builder or open-learner or EAGLE-user, etc.) must be determined through validation with the EAGLE users, being of most important their identification with the term selected.

One can imagine a progression from a "novice user" being able to search and collect OERs (make a collection), have basic interactive options like commenting in OERs, posting in existent threads, rating and recommending different elements of the system (authors, OERs, posts, etc.), but not being enabled to create a thread in a forum or create an UG-OER. This user would have to develop competency to add meaning to the digital objects to be created and expertise to use authoring tools, which implies a certain level of digital literacy proficiency. In the same manner, an "intermediate user" could create new threads but maybe not a new forum, and only an "expert user" could be a community manager, because this would require expertise/competences (skills and knowledge) for creating a "topic oriented learning-community", moderating it, selecting the community tools, defining the topic/goals of the community, and whether it will be temporary or long term, etc.

 The nomenclature "Topic expert' would follow a similar path so that he or she can be recognized as such in a community and by the system. When users are recognized as a 'topic expert' by the community they could be eligible as "validator[13]" of a topic or a creator of topic related badges and/or can be enabled to add or modify entities in the EAGLE topics classification systems.

2.5.2 EAGLE user identities and individual profiles.

Individual profile is the data that uniquely describes a person or a thing and contains information about the subject's relationships. On the other hand, user's identity is mainly shaped by the users when selecting a picture that identifies them, a description of themselves or their goals in the community, and also selecting which information provided by the system will be public to be viewed by the entire community. Part of using an open learning system adequately is knowing

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[13] A role defined in the user's role document generated in WP5.

and assuming the implications of making their information public in the sense of creating trust and reputation within the community so that they are encouraged to care about their digital identity by themselves.

A user-defined profile might include pre-existing topic expertise, digital literacy levels and UG-OER development experience. This profile would be added to as they develop their use of the EAGLE platform. Those who are experienced in open learning may also add this to a profile, for example, if they have set up and moderated an online community, the system should provide at the beginning scaffolds to help users to value the importance of providing this information. This experience and their degree of efficiency by self-assessment might give them a level equivalent to the EAGLE user levels previously described. The exact competencies related to levels are a metric yet to be determined but the nomenclature for this could be around the novice, intermediate, expert paradigm, considering that proficiency maps developed in D4.1 recognize low, intermediate and high proficiency levels. As mentioned previously this could relate to:

- Interaction with the digital environment (Basic actions that require use of the the digital environment and tools within it)
- Social interaction (related to connectedness and associations, users' interaction)
- Status interaction (competency and skills acquisition and resource creation and sharing)

There are other elements associated to the user profile that are not directly represented by the system, that need to be explored, such as the possibility of a professional recognition based on Badges' system. The system could recognize prior knowledge in particular disciplines as part of profile completion. Equally it could develop open badges for activities carried out within the system (e.g. http://openbadges.org). It could be developed competencies that might be something like:

- Formal qualifications in change management
- Experience of change management projects.
- Coaching others within EAGLE on change management
- Verification by peers
- Test on principles of change management
- Professional accreditation of coaching skills or of change management.

Gamification metrics recognition will be located within the user profile and will be determined by the interactions and levels described above. These interactions with the system, social interactions with people and status related interactions will produce a profile which is dynamic and progressive around several categories of tool use and interaction and expertise validation. It will allow individuals to map their development in 'spiky' profiles and their emergent and developing status within the community. For example, it could illustrate "expert" level expertise in system learning and novice level knowledge in a specific knowledge domain. Gamification metrics and game mechanics could also allow/determine transition across levels.

Automatic Item Generation (AIG) it is based on the idea of automatically generated tests for self-assessment (Gierl & Haladyna, 2013). This approach and technology will be tested in the development of information literacy skills. One of the EAGLE challenges is how to integrate it to the EAGLE open pedagogy. The use of the AIG tools can be considered as part of the metrics to determine expertise levels, e.g. the creation of a test could be considered in the metrics as

related to certain level of "topic expertise", but this will depend on the level of AIG technology development. This must be aligned with T4.5 and WP6.

3 EAGLE learning design

3.1 EAGLE proficiency-based curriculum - implementation

The core curriculum for the learning design was defined within the task 4.1, when selecting the direct competences associated to EAGLE learner expertise. These competences were further elaborated in proficiency maps, which means each competence is associated to three proficiency levels (low, intermediate and high), where proficiency is composed of skills and knowledge associated of each of the defined levels. These competences and the associated proficiency levels represent the proficiency-based EAGLE curriculum. Since the proficiency maps are associated to specific competences, it seems to be more appropriated to use the term competence-based EAGLE curriculum to describe it. The aim of this curriculum is to design a learning environment that allows EAGLE users to acquire or develop further the enabler competences to become "EAGLE user experts".

The ACRL Standard (American Association of College and Research Libraries) was selected as the EAGLE's Information Literacy framework, while DIGCOMP was selected as Digital Literacy framework. These two frameworks have some overlapping competences, to solve this it was decided that the competences associated to the use of ICT (hard and soft competences) were framed within digital literacy and the other ones were framed as part of Information Literacy (IL). The IL were further developed in construct maps as base for the implementation of Automatic Items Generation technology (Gierl & Haladyna, 2013). As already mentioned in previous sections, the integration of this technology into the EAGLE pedagogy will be discussed with the responsible partners.

To sum up, for Information Literacy, in 4.1 the competences where selected as directly related with EAGLE

- Define and articulates the need for information
- Accesses needed information effectively and efficiently
- Evaluates information and its sources critically
- Understands many of the economic, legal and social issues surrounding the use of information

While for Digital Literacy the following competences were selected:

- Interacting through technologies
- Sharing Information and Content
- Collaborating through digital channels
- Netiquette
- Developing Content
- Integrating and re-elaborating
- Copyright and Licenses
- Programming
- Solving technical problems
- Identifying needs and technological responses
- Innovating and creatively using technology

- Identifying digital competence gaps

In regard to change management, D4.1 was focused on competences needed to manage the change of introducing EAGLE in the PA organizations, this kind of competences are required to the change managers at each organization and the development of these competences is part of the implementation of the Change management model developed in WP3. EAGLE learning design is more concern with the individual competence of managing professional changes, covering any EAGLE user. These competences are in line with lifelong learning competences; thereby the European Reference framework for lifelong learning competences (2011) is used as base of the curriculum development. The European Reference Framework propose eight key competences, from which the following ones have been defined as directly related with EAGLE:

- <u>Communication in the mother tongue</u>: related to establishing connection with others within the open learning system
- <u>Learning to learn</u>: related to self-direct the learning process, resources and progresses;
- <u>Sense of initiative and entrepreneurship</u>: related with decision making and setting personal goals and strategies to achieve them;
- <u>Communication in foreign languages</u>: related with the cross-country community building
- <u>Cultural awareness and expression</u>: related with the cross-country community building[14]

Digital competences are one of the key competences proposed by the European framework, but it is not included in the list above because it is already a critical EAGLE enabler competences. The other competences selected are embedded in the philosophy of social and open learning, and describe some of the attributes of an EAGLE expert user (knowledge builder or open learner). Currently the focus of the competence-based curriculum is in digital competencies, but the inclusion of other lifelong learning competences will be explored during the advancement of the project.

Based on the above-mentioned competencies and proficiency levels, coupled with the activities that will be supported by EAGLE learning platform (D4.3), the metrics and game mechanics will be defined so that to determine the attributes that will conform the EAGLE user profile.

Given that in EAGLE pedagogy the individual learning needs are defined by the users depending on their own expertise and interests, the EAGLE competence-based curriculum represents the framework for designing the metrics and game mechanics required to evidence progress to the user through specific attributes.

In the following section will be described the elements of the EAGLE social learning system where the EAGLE users will be able to put in practice the different types of interactions previously described in the section 2.5.1

3.2 Graphic representation of EAGLE learning system

The **Fehler! Verweisquelle konnte nicht gefunden werden.** shows a graphic representation of the different components of the EAGLE OLP, so that social and open learning can be

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[14] The cross-country community building is planned within the EAGLE project, it is expected that the integration of metrics related to this competences to evidence progress will be part of the incremental process of EAGLE development.

supported, and how these components are interrelated in order to support users to build their own social/open learning experiences the internal links aim to describe the data/information flow among the system's components.

There are two main 'spaces' where the users' activities are evidenced (social and individual) and three 'areas' that represent the tools/resources EAGLE OLP offers to build those activities (search, authoring, collaboration, and other tools). The combination of these elements allows EAGLE users to have the opportunity to experience the different types of interactions described (2.5.1).
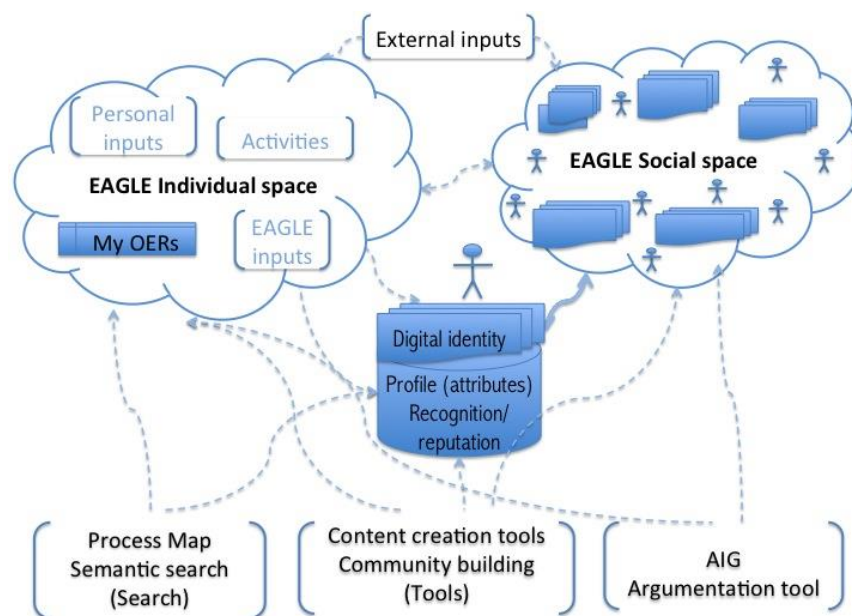

Figure 7 EAGLE Open Learning Platform - Graphic representation

This representation is focused on the user interactions the user does through or by means of the EAGLE OLP including external inputs, which are considered as representation of the interaction with external tools and resources that are part of each user context. It is not expected that the EAGLE users restrict their learning process to the use of the platform, at the contrary, it is expected that EAGLE system provide room for skilled users to integrate other tools and resources they consider needed for enhancing their learning experience, or simply offer the possibility to all users to make connection with external digital objects enhancing this way the knowledge in their networks.

The EAGLE OLP representation separates individual from social space as a matter of depicting the support for the interplay between these two dimensions of the users. As already described in previous sections socialization, as part of building connections, plays a fundamental role in open learning process, and from socio-constructivist theory of learning, cognitive development out of this connections comes when the individual (intra-psychological) processes are linked to

the social ones (inter-psychological) (Vygotsky, 1978). The continuous exchange between the two psychological levels allows the internalization, which is the development of shared knowledge within a culture. The internalization process leads to the contextualized appropriation of physical or conceptual artefacts and their associated socio-cultural meaning. Internalization is considered an integral part of the socio-cultural framework (Damianova & Sullivan, 2011), and it is what allows individual and social appropriation of new technologies in already known contexts and practices. Hence both social and individual levels are intertwined and should be supported in order to offer a consistent open learning experience. Because of its importance these two spaces will be described in more detail in the next two sections. The rest of the components of the EAGLE OLP are described in the Appendix 7.1

3.2.1 EAGLE individual space

The EAGLE individual space shown in the Figure 8 represents the options and features that aim to support individual intra-psychological processes (reflection, organization, evidence progress, etc.). These options are oriented to support autonomous learning processes. Different inputs associated with individual activities are recorded/gathered/organized/managed, with the aim to allow users to elaborate, collect, develop, draft, exercise, self-reflect, deconstruct, etc.
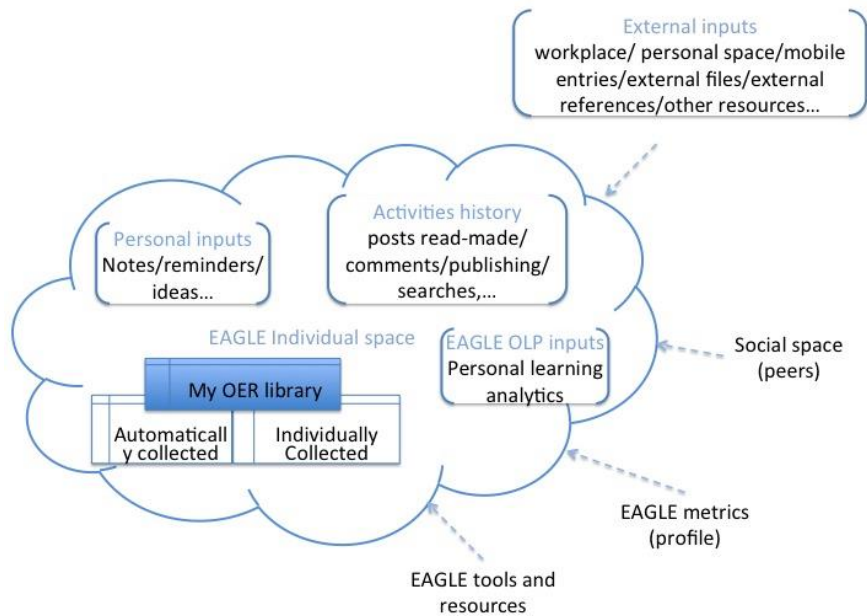

Figure 8 EAGLE OLP - Individual Space

All the inputs shown are bidirectional connections with the system, allowing collecting information about the interaction of the users with their individual space components. For example, referring to the game mechanics explained in section 2.5.1, when the user introduce inputs in the individual space s/he will get a point for 'use' that option, which will enhance the 'EAGLE user expertise' attributes, aiming to motivate the user to continue using the components that support autonomous learning processes. To wish badge are added this points will depend on the type of entry the user use, e.g. when introducing a new resource in her/is personal

collection of resources (my library), the user can get points in the 'curator' badge, because is using a curation tool, if on top of the addition of a resource the user 'tag' this resource, then a 'progression' will be shown in the curator badge. This actions from the user can trigger other types of mechanics such as "quest or challenges", where the system can ask the user for instance to find other user that have used the same tag and share with her/him the collected resource. The achievement of this challenge will also show progress in the attributes related with sharing objects.

3.2.2 EAGLE social space

Social interactions are at the core of network and community building process, hence it is needed to provide as much as possible options that enable socialization, so that to increase the possibilities of engaging the user in networking and social knowledge construction.
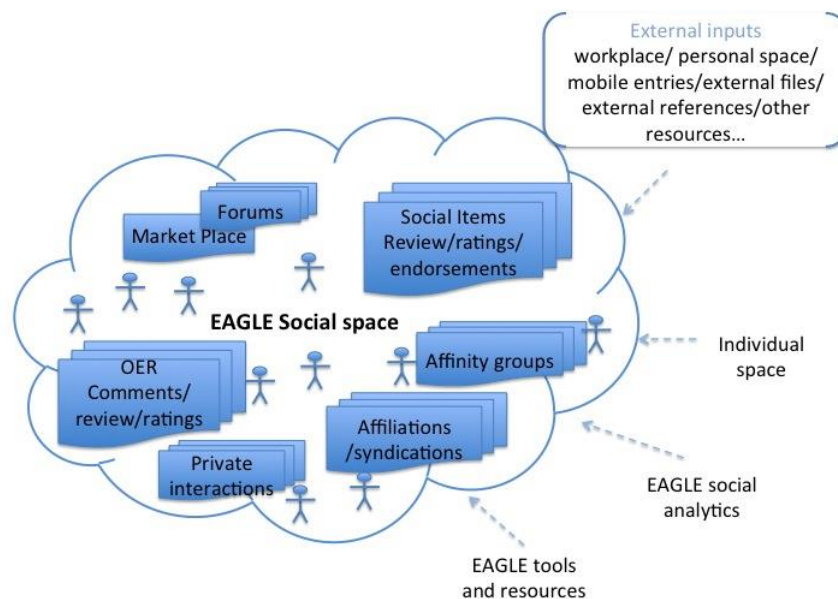

Figure 9 EAGLE OLP - social space

As depicted in the Figure 9 the social space represents different options how users can interact with each other. EAGLE OLP offers different tools that either directly mediate the social interaction or create resources to function as mediators. The plurality of options to create social interaction will open more opportunities for the users to connect, access and contribute to the knowledge construction process. Beside of openness and learners' autonomy, open learning also requires diversity and connectedness to ensure knowledge construction. As more the socialization options available the higher the opportunity of connecting diversity of people with different variety of knowledge levels and perspectives, increasing the possibility of engaging the user and triggering personal interests and motivation.

Although these options are presented as separate ones in the graphic representation, the differentiation between them can be sometimes diffuse and be blurred at the edges from the user's perspective. For example participating in a Forum, can be an isolated option/activity but

can also be part of participating in a thematic sub-community. It is the role of the system data processing to determine the attribute to be enhanced in any of both cases. On the other side, there are some activities that have emotional connotations and cannot be easily differentiated by the system, e.g. when this post is done to add or to add a reflection or a counter argument, it belongs to the intentions of the user. It is to be explored the contribution from semantics analysis to enhance social learning analytics to enhance users learning process.

Based on the metrics can be collected from the different types of interaction and the competence based curriculum attributes for building expertise will be selected and explored in the practice with the users. It is important that the EAGLE users feel identified with the chosen user profile attributes, therefore is of most importance to analyze the user experience in real contexts and identify terms that can at the same time describe a key concept and be familiar to the culture and context where the user is embedded, or find the way to introduce completely new term that allow the appropriation of new concepts associated to the learning process.

3.3 Building expertise - EAGLE game mechanics

In this section will be presented the first exploration to the application of Gamification to EAGLE OLP. Further detailed developments of all the mechanics and metrics that will be implemented, need to be elaborated in collaboration with the developers (WP5) analyzing the real possibilities of its implementation, as well as with the users, analyzing the elements that can connect with their current culture and technology habitus. It is also important to determine the characteristics of the system for the first contact with the user and the elements that will be added during the incremental process of integration. This is to be explored during further iterations of the implementation phase, coordinating efforts with the UX validation process carried out by WP8.

Game mechanics typically involve getting points towards badges (achievement, status, competence) for activity and getting points for completing levels or challenges.

Possible activities (with possible metrics in brackets) within the EAGLE system are:

- Profile completion (completion/ partial)
- Lurk (how long: plus documents accessed and page visits, areas visited, profiles visited)
- Mobile access (device/diversity/location/ post from)
- Connect with other members (it could start with simple metric such as how many connections a user had and evolve toward the use of Social Network Analysis (SNA) metrics like advantage or brokerage (Burt et al., 2013))
- Contribute, posting, commenting, reviewing, rating, endorsing, across interests, across boundaries) (how often/ activity range and number and variety)
- Review, rate, endorse skills and expertise recognition (receive user ratings, reviews and endorsement, make ratings, reviews and endorsements, problems solved, enquiries responded to, links inserted to other resources) User defined quality.
- Communicate with private or groups messages
- Build networks (effectiveness/ traffic/quality/status in network, DNA roles based on the position within the network)
- Share resources (how many, how often, quality ratings and user endorsement, reused/passed on)

- Curate/collect/import resources (how many, how often accessed, organisation, member visits)
- Adapt, aggregate resources or UG-OERs (how many, across boundaries, across interest groups)
- Create (groups, resources, interest groups, enquiries, news items (notifications) geo tagged resources)
- Add and or modify features, remove unused features (suggestions for built-in features, actual integration of new OS tools to the EAGLE system)

These can be classified in four processes associated to open learning: Content creation/adaptation, community building, autonomous learning and mobile and flexible learning. The goals and activities associated to these processes are presented in the Table 3

Table 3 Activities related to four open learning processes

Process	Goal	Activities
Content creation/adaptation	Generate content to be shared within the community	Create/adapt informal objects/resources Create/adapt OERs Transform an informal object/source into an OER Co-creation/adaptation of OERs/resources* Localization - geo tagging
Community building	Networking:	Profile completion (completion/ partial) Connect with other members, Build networks, linking people Review, rate, endorse skills and expertise recognition Communicate with groups messages Communicate private messages Mentioning other community members in public or privet posts. Use Digital networks analysis to find the right people
	Participation/ collaboration	Posting, commenting, re-playing Review, rating, endorsing, across interests, across boundaries Add or modify features of the platform Using DNA visualization tools for enhancing the

		personal network
	Sharing content	Share resources in different ways • Links (URL) • Attachments • Embedment Create interest groups Use content analysis tools (semantic web?)
Autonomous learning management	Curation (Personal knowledge/resources management),	Lurk/observe Exchange/share resources (of any type including OERs) Collect/import resources Make collections - tagging
	Managing (learning) goals	Make notes, Set reminders (reading list) Set learning goals, enquiries, problems to solve Keep track of goals accomplished, enquiries and problems resolved.
Mobile and flexible learning	Fostering seamless/lifelong learning	Use EAGLE from different devices Access EAGLE from different locations Exploit tools and resources according to the device used

Each of the activities, when accomplished, should collect a metric that then has some effect on:
• The user attributes within their profile and;
• Their status as an EAGLE user (user expertise).

Ultimately this should relate to the EAGLE user's profile including:

• Skills
• Knowledge
• Competences
• Achievements

All of the activities outlined in Table 3 require existing digital skills or skills to be developed and acquired, that are in line with the competence-based curriculum described in the section 3.1 and the proficiency levels defined in the document D4.1. Thus, and for example, digital literacy proficiency can be a profile attribute that could be rewarded as different activities are practised and competencies are achieved.

Within EAGLE we can also clearly distinguish between "in system" Gamification and "reward" including user endorsement and review and the "development of skills and attributes related to people's jobs and lives".

Metrics that contribute to status as an EAGLE user might produce points that relate to different levels of expertise and a particular nomenclature. In Gamification this could be represented by using names for status such as described in the Table 4 below. These may have cultural overtones. The actual naming of status would need further thought and subsequent validation. (See Appendix B for a more detailed example of a profile activity aggregator)

Table 4 Example of status in the EAGLE user profile

Activities	EAGLE Status 1 (points level)	EAGLE Status 2 (points Level)	EAGLE Status 3 (points Level)	EAGLE Status 4 (points Level)	EAGLE Status 5 (points Level)
Interaction with the environment by doing things: e.g Profile complete; connections made; posts made; posts read, places explored. OERs used/ accessed,	Watcher*	Pathfinder	Explorer	Discoverer	Magi

*Note the terms in table 2 above are placeholders.

3.3.1 Rewarding skills and attributes through gamification in EAGLE.

The nomenclature related to the development of skills and attributes and the levels therein would be closer to either the "processes" or "goals" in the Table 3 above. So an attribute might be "Collaborator" which is equivalent to the collaboration/participation goal and a contribution to the process of community builder.

So on the user profile multiple activities completed through the system pertaining to collaboration /participation would increase the "Collaborator" attribute on the profile whilst activity in all the areas related to Community building might unlock a "community builder" competency badge. Of additional value in each of these attributes and corresponding categories leading to higher status would be "user endorsement". Equally, a lack of engagement with specific activities might prompt the user to "increase their networking score by performing an activity". Should they not know how to achieve an action they could be directed to UG-OERs or ask a question to other users or community managers/moderators (it is to be explored the need to train some EAGLE community managers/moderators for the initial stages of the process). This in itself would earn points under other categories.

An example of how this might work for the Networking goal is given in Table 5 below.

Table 5 EAGLE user profile for "Networking"

Goal	Activity (example)	Functions (what does user actually do) - operational	Metrics	Digital literacy Competencies from 4.1	Profile Attribute	EAGLE Status/ Level
Networking	Profile completion (completion / partial)	Completes profile by answering questions/completing self assessments/ Skills/ goals/ Digital literacy assessment. Interests.	How far each section is completed. Number of profile matches (connections to people with similar skills) System metric (friends). Number of potential connections outside own country with similar skills/interests) Number of Connections initiated by user.	Interacting through technologies Sharing Information and Content Collaborating through digital channels Netiquette Developing Content	1st level. Networker 2nd Level Community builder.	Contributes to "Watcher" status

The pedagogic concept of the EAGLE systems is based around creating and rewarding the interactions between the EAGLE inhabitants and actors. In order to do this, it is necessary to design the optimal mechanics for the connections and transactions between them and amongst groups through interaction with the system; this must be based on a clear analysis of the possible connections and their pedagogic implications. In this regard there are several ways to treat these interactions in order to aggregate them into the user profile "scorecard". Possible

treatments of metrics for this are outlined in Table 6 below. This table places a pedagogic value on interactions rather than just recording actions.

Table 6 Possible treatments of metrics

recency	fades to zero after certain period of time
frequency	more is better
exclusivity	adequacy of one-to-one or narrowcast or broadcast*
relationship	fostering peer-to-peer as richer than expert-novice
media	use of diversity of media is presumed desirable
mobile	accessing from different devices and locations presumed desirable

*Note: in open learning broadcast is better than any other, but other levels of exclusivity can help to build up the necessary trust in the community to broadcasting. The trust building process needs to be carefully analyzed.

A further reward system might also be developed where users are given problems to solve or challenges involving competencies to complete. However this may move into a formal accreditation system. Users may choose to create their own OER reward systems using open badges.

There is also the possibility of introducing group knowledge creation metrics:, e.g. network density, productivity of the group in terms of numbers of resources produced, group interactivity (how active are the members in debates, how many unanswered posts, numbers of authors per resource). This could rise group attributes that could be aggregated to the user profile as follow:

- connector – connecting different subgroups
- representative – gives information to the outside
- gatekeeper – influence what information comes into the group
- specialist – provides group with needed information
- lurker – passive member

3.4 First Steps in developing the EAGLE Community

The first step for building the EAGLE community is to get the people to be connected, 'connecting' is itself an activity that can be done without having contact in the community (LinkedIn), connecting only to be connected and to build a network. While people are getting connected they are already demonstrating EAGLE competencies such as: profile construction, observe that when an activity is done there is a reaction from the system, which adds something to the profile (badge about "connecting people"), endorsement to other people, enhancing the profile, exploring other's people's profiles, making a post in a general forum, creating an affinity

group, etc. Each action will have a reaction from the system, motivating this way the discovery of other unknown system options.

As a starting point it would be possible to ask people to select their current concerns, and the system should translate them as interests. Folksonomy can be used to connect topics and personal interests.

A real selection of the top 5 topics of each country will help to open meaningful discussions in general forums and foster the creation of sub-communities of affinity groups. This would also be the point at which tutorials could be used on how to engage with activities. This could be done via presenting in an EAGLE forum.

4 Moving toward practical implementation

4.1 Human Performance Technology as reference model

The Human Performance Technology (HPT) model (Tosti, 2006) was selected to establish a consistent framework for the validation process across the WP4 tasks. It 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, also aligned with agile development processes, the stages are shown in the Figure 10.

The utilisation of this model considers that the appropriation of EAGLE OLP by the target users will depend on their individual and cultural understanding of 'learning at the workplace', their individual and cultural relation with technology and their digital and open learning competences. Hence, WP4 will use the HPT model to analyse the effect of the EAGLE learning design in the appropriation of EAGLE technology and how this impact in the performance of EAGLE users. The design of the educational intervention (competence-based EAGLE learning design) will be validated, evaluated and re-designed to ensure the integration of the EAGLE open learning pedagogy to the work practices.
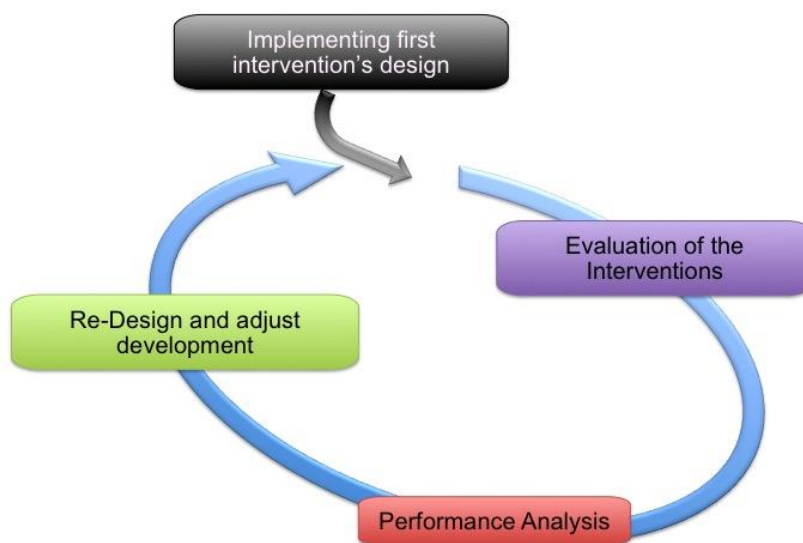

Figure 10- WP4 Validation process based on HTP phases

The internal components of the stages above presented are articulated within the WP4 tasks and WP8 as shown in the Figure 11.

Legend: DPA: Desired Performance Analysis, GA: Gap Analysis, CoA: Contextual Analysis, CPA: Current Performance Analysis, CaA: Causal Analysis, EID: Educational Intervention Design, IEI: Implementation of Educational Intervention.
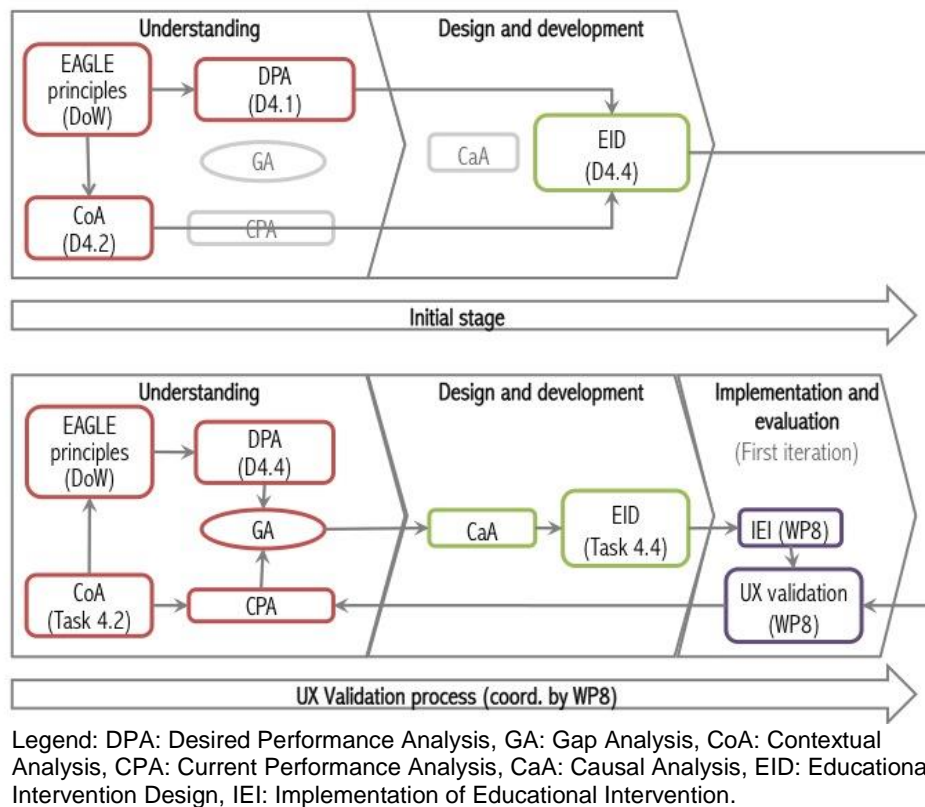
Figure 11- Implementation of HPT process in WP4

Intense cooperation with WP5 (developers) and WP8 (responsible for the EAGLE UX validation process) are of great importance for the adaptation of EAGLE learning design to the EAGLE context, culture and conditions.

4.2 Potential strategies for integrating EAGLE pedagogy

There are two potential strategies that can be applied for the development and integration of the EAGLE pedagogy to the EAGLE context.

Option A:

Starting from building a community and finding the top 5 topics of interests per each stakeholder, start local communities at the beginning with the options of getting suggestions from all EAGLE users and partners. The steps to follow would be:

- Starting from networking and profile building activities (define the basics functionalities the platform must have to start and the basics profile attributes to evidence progress)
- Determine top 5 topics of interest for the target users (there is some information from the workshops that can be used to have an initial idea, the possibility of complementing this information with an online survey should be explored)

- Explore the possibilities of having local community builders in each of the participant stakeholders (probably would be needed to provide training to them)

Option B:

Starting from testing isolated functionalities with volunteer users, the strategy to be implemented to integrate EAGLE must be designed after the platform is designed.

The two options have technical and organizational implications that are explained in the following sections

4.2.1 technical implications

The following technical implications are associated to each of the options

Options A:

Basic functionalities associated with community building and networking must be ready to be used by the EAGLE users at the moment of the first contact with the EAGLE OLP. These functionalities are:

- register,
- profile,
- connection(s) options,
- basic interaction options (private message,
- general/topic forum),
- share resources (pics, videos, docs, ppt, audio, etc.),
- create basic resources (mobile pic or video, a screencast, modify a presentation) and
- the minimal game mechanics need to enhance the profile from the user's interaction with the system.

Option B:

The development of the functionalities to be tested need to be decided depending on technical and organizational criteria of EAGLE project, these criteria need to be defined by developers team (WP5 and coordination of the project. Tests with Mobile functionality must be done in real/natural conditions to validate the design correctly.

4.2.2 organizational implications

The following organizational implications are associated to each of the options

Option A:

It would be needed to explore the possibility to provide progressive training to a community manager in each of the associated stakeholders. It is recommendable the implementation of developmental approach and participatory methods. Users need to be involved in the experience of evaluating EAGLE OLP functionalities within a real use of the platform.

Participant users need to be a stable group that build history and create a new culture during the experience of using EAGLE solution. It is expected that this group of users actively participate in the first stages of the community building process where new users will be

integrated during and after the EAGLE project execution. New features will be added to the platform incrementally, to open new possibilities to EAGLE users' competence development.

UX methodologies need to be carefully selected to collect real life experiences from EAGLE users and involve them in the development process. Triangulation of sources is recommended for a comprehensive qualitative analysis.

Option B:

A group of stakeholders is selected to test selected isolated functionalities of the platform. This group can be different when the functionality changes.

Guidelines and strategies must be outlined for further application, when the platform is launched.

5 Further Steps

The next step is to decide which option of implementation will be selected. This will define which game dynamic and metrics need to be defined. This decisions need to be taken in cooperation with WP8 and WP5.

Although the research questions are basically depending on the option selected there are some questions that should be explored when talking about integrating open learning to workplace:

- Trust building: trust is a central element in the process of community building. Is there a universal trust building strategy? how is the trust building process related with cultural dimensions (organizational, personal, regional, etc.).
- What are the adequate game mechanics that scaffold the autonomous development of "knowledge-builder/open learner expertise" in open learning pedagogies? are these mechanics culture dependent?
- What is the role of mobile devices in the selection of game mechanics and is building bridges between formal contexts and informal practices.
- What are the technological, organizational and pedagogical implications of different mobile learning archetypes associated to open learning cultures.

This are some of the research questions can be explored, the final decision of what research questions will be deeply studied and which methodology will be the most appropriated to it will depend on the decisions made in cooperation with WP5 and the coordination of the project about which development process will be selected.

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Appendices

Appendix A - Detailed description of EAGLE OLP components

In this section are described the elements represented in the EAGLE open learning schema

A.1 EAGLE user profile

The union of digital identity, constructed mainly by the user, and the system profile information, represents the EAGLE individual profile.
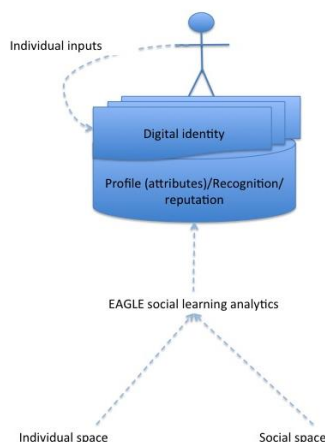

Figure 12 EAGLE learning system Profile

Digital identity

It is the data that uniquely describes a person in the digital space and contains information about the subject's relationships. This identity is mainly shaped by the own users when selecting a picture that identifies them, a description of themselves or their goals in the community, and also selecting which information provided by the system will be public to be viewed by the entire community. One important competence is to know and manage the implications of making their information public in the sense of creating trust and reputation within the community so that they are encourage to care about their digital identity by themselves.

Profile attributes – Reputation/recognitions

As explained in the section 3.3, different metrics and data are giving shape to attributes that will describe an EAGLE user. From this description they will build up their reputation and is how they will be recognized within the EAGLE community. There are other elements associated to the user profile that are not directly represented by the system, that need to be explored, such as the possibility of a professional recognition or equivalence with a professional certification based on Badges' system. The system could recognize prior learning in particular disciplines as part of profile completion. Equally it could develop open badges for activities carried out within the system (e.g. http://openbadges.org). It could be developed competencies that might be

something like:

- Formal qualifications in individual change management
- Coaching others within Eagle on change management
- Verification by peers
- Test on principles of community building
- Professional accreditation of coaching skills or of personal change management.

A.2 Elements of the individual space

Personal inputs

the user would have the option to record/storage/manage at any time and everywhere any idea, comment or reminder on the way. Users should also be able to add tags to the notes in order to so that to be able to organize/manage them and so find them easily later on. External inputs are also part of theses personal inputs, since external links, files, mobile entries, etc., could be part of a note so that the external resource is individually linked to a learning need/idea/activity (*evernote* like)

My OER library

this space is a library of OERs associated to the user. Some of the OERs will be automatically collected by the system when the user is an author or a contributor to them, or when a user is interacting with an OER (commenting, rating, favoring, etc.). The user could also collect OERs relating to of personal his or her own interest either via EAGLE search options or from external personal sources. Technical considerations need to be taken in regard to the external OERs, since the metadata system should be compatible with the EAGLE platform.

It could be an interesting option that users would be able to add personal tagging or annotations to the collected OERs, beside of the metadata of the OER itself (e.g. why this OER is collected or personal tag to manage it in an individual content structure). This practice would support metacognitive processes that would allow users to evidence their intention when collecting a determined OER.

My Activities

This area contains the history of the user collected by the system (it is be to be decided how long this history will keep these activities). Since the context is partially created by the activity, keeping the last activity can help the user to recreate part of the learning context previously built and shape it to the new surrounded conditions so that being able to resume the process can be resumed.

This option is also useful to give the user the chance to link or recall previous activities with new activities created. Supporting connection between the actors and the items involved in both linked activities, e.g. a user can decide to link a comment done in an OER to a discussion given in a forum, or bring an OER used in a thematic community where he or she was contributor, to use it as base for authoring a different OER to be used in another related topic.

EAGLE OLP inputs

Are the attributes defined from the game mechanics and the metrics. The actions performed by the user in the individual space are collected and processed by the system and transformed in these EAGLE OLP inputs.

All these options are fed with internal and external inputs as shown in the Figure 9; as external inputs from work and life, information from social space, personal inputs and information collected from tools offered by the system. Users should have the option to share items from their individual space either with a specific person or group or with the entire EAGLE community if they decided to do so.

A.3 Social Space

Thematic sub-communities

Users have the option to create groups where they can discuss a specific topic, problem or inquiry. In order to enhance the learning experience these groups can integrate different tools such as forums, Wikis, instant messaging, Blogs. They can also create a sub-community around a selected OER. Their creators decide the duration of these communities.

They are called sub-communities, since they are all part of the EAGLE community, constituted by all EAGLE users.

Forums

Are discussions boards users can use for specific or generic topics, they can be integrated to a sub-community or open being addressed to the general public of the EAGLE community.

Market place

It is a forum like space. The idea here is that there is a space for both the supply and demand of services within the learning environment. There could be various types of work and classes of service required. Equally there could be a knowledge bank back of problems /solutions and FAqs around particular themes and . Equally links to related OERs. A reward and value system could be implemented here but this needs to be implemented after consultation with communities. It is needed to be explored the type of rewarding that most suit the target community.

Types of exchange:

- Supply: certified expertise to others, training, expertise in OER development, coaching, and specific solution based expertise.
- Demand: User makes request for particular expertise, user has a time bound piece of work to complete, user requires consultancy, user requires training package, open request to solve a problem

Private interactions

The users should have the option to communicate privately with any other user, having also the option to add any other user to the private conversation.

Social items

It refers to any social interaction user does in the EAGLE community that represent socialization, it includes: reviews to posts, people, sub-communities, blogs entries; endorsements made to the profile of another user, comments added to an item generated by another user or to a personal one an own one as response to the comment of one to another user, etc.

OER comments/reviews

Users have the option to add comments and/or reviews to any OER that is part of the EAGLE community, regardless if this OER is part of a discussion forum, sub-community or other interaction space. It is to be decided if EAGLE users will have access to OERs that are part of closed (private) affiliation groups

Affiliation/syndications

Users have the option to be affiliated to a sub-community as members, regardless of their level of activity or interaction. It will depend on the level of privacy of the sub-community. They can also be affiliated to another user, which allow them to get notifications about the activities of this user (privacy issues are considered so that the followed user can decide which activities are public, group addressed or private). Users can also be syndicated to selected items, like OERs/forums/Blogs, so that they get notifications when any other user is interacting with this item. The system automatically syndicate any user with their own contributions, so that they get notified when someone interact with their community contributions
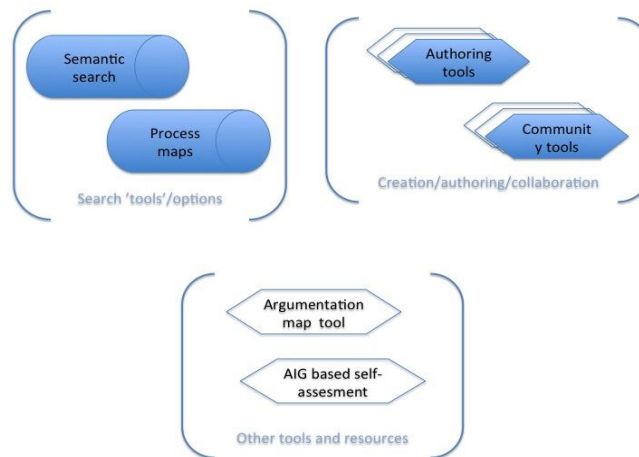
A.4 EAGLE tools and resources

Figure 13: EAGLE learning system tools and resources

Search tools edit this section

The process maps is a classification system that allow the users to navigate through predefined topics so that to find an OER associated to a process part within the PA system. It is currently

under discussions with the developments the possibility that the users, recognized as topic experts, have the permissions to add or modify information within the classification system, so that to allow the dynamic adaptation of the classification system in a sustainable way.

For other general searches a data management system based on ontologies, defined entities with its respective attributes will be created. This ontology data management system is not only allowing the dynamic reorganization of other classification systems (e.g.folksonomies) but it is a good base for the definition of the learner expertise metrics in terms of entities and attributes. This idea will be further developed together with the developers to evaluate the feasibility and to make more efficient the decision making process.

Authoring/Collaboration tools

In the task 4.3 many authoring tools were collected and are currently being evaluated, the main criteria for the selection of those tools was they support to open learning processes, it is also important that those tools cope with accessibility standards for online tools. .

Other tools and resources

AIG (Task 4.5) and Argumentation theory (WP6) are currently under evaluation to find the most adequate way to integrate them to the EAGLE OLP, considering their goals, technical considerations and pedagogical consistency.

Appendix B – Profile activity aggregator

The tables below serve as example of the EAGLE Gamification implementation. The nomenclature and levels definition need to be considered further.

B.1 User Status

Activity	EAGLE Status 1 (points level)	EAGLE Status 2 (points Level)	EAGLE Status 3 (points Level)	EAGLE Status 4. (points Level)	EAGLE Status 5 (points Level)
Interaction with the environment by doing things: e.g Profile complete; connections made; posts made; posts read, places explored. OERs used/ accessed, etc.	Watcher	Pathfinder	Explorer	Discoverer	Magi

B.2 Aggregation of User attributes that define the status and their levels,

Attributes Activity	1 Star (points level)	2 Stars (points level)	3 stars (points level)	4 stars. (Endorsement by peers) attribute badge against criteria	5 stars (Professional external recognition) Level 4 plus external validations.
Collaborator: Convenor of groups, solver of problems.	In own context	In more than one context/domain	Cross cultural	Endorsement for levels 1,2,3	External endorsement plus evidence leads to expert/Magi badge

Communicator: Number of connections: Conversations, contributions to groups, forums Knowledge broker between groups, connector/organiser/ crosses cultural boundaries at higher levels.	In own context	In more than one context/domain	Cross cultural	Endorsement for levels 1,2,3	External endorsement plus evidence leads to expert/Magi badge
Curator/Sharer/Source: Resource gathering and organising. In own context/ in more than one context/ cross cultural	In own context	In more than one context/domain	Cross cultural	Endorsement for levels 1,2,3	External endorsement plus evidence leads to expert/Magi badge
Coach: supports others to learn: answers questions, offers advice and guidance.	In own context	In more than one context/domain	Cross cultural	Endorsement for levels 1,2,3	External endorsement plus evidence of expertise leads to expert/Magi badge
Contributor Creates OERs : Reviews OERs.	In own context	In more than one context/domain	Cross cultural	Endorsement for levels 1,2,3	External endorsement plus evidence of expertise leads to expert/Magi badge