



Title

Digital competence training proposals in the UOC context: A transforming vision

Author(s)

Montse Guitert

Open University of Catalonia, Director of the digital literacy area, Computer Science,
mguitert@uoc.edu
Telecommunication and Multimedia Studies.
Barcelona, Spain

Teresa Romeu

Open University of Catalonia, Lecturer of the digital literacy area, Computer Science,
tromeu@uoc.edu
Telecommunication and Multimedia Studies.
Barcelona, Spain

Marc Romero

Open University of Catalonia, Director of the digital literacy area, Computer Science,
mromerocar@uoc.edu
Telecommunication and Multimedia Studies.
Barcelona, Spain

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Abstract / Summary

Digital competence has become a key concept in the Knowledge society and it is a more complex concept than just the use of ICT since it includes methodologies and attitudes and must be related to new literacies.

Because of the evolution of the Internet, the concept of user has drastically changed. Nowadays, users are not only receivers of information but they can generate their own Knowledge. Being aware of that, the Digital Literacy Area of the UOC has developed training proposals keeping in mind digital competence and which are analysed in-depth in this paper (basing on their content analysis and on a students' survey in one of them). These proposals have been designed taking into account Martin &

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Grudziecki's three levels of digital literacy. In fact, training in digital competences is understood as a methodological training that provides students those necessary attitudes to promote the conscious and critical use of digital technologies for professional and academic purposes, and all of that respecting the principles of ethical responsibility during the search, elaboration, presentation and dissemination of information. This collaborative methodological training is conducted as a means to allow the adaptation of individuals to social changes and thus transforming the way they learn and, consequently, their profession.

Body

1. - Conceptual framework for digital competence

As Iilomäki, Kantosalo, & Lakkala (2010) have stated in recent years, "digital competence has become a key concept in the discussion of what kind of skills and understanding people should have in the knowledge society." (Iilomäki et al., 2010, p.1). They defined the concept of digital competence that came from computer science, emphasizing technology-related concepts: "These concepts have also been used widely among educators, both researchers and practitioners as well as policy makers. Concepts related to library science have emphasized information searching skills. These skills have also become more popular among educators because of the complexity of information in the Internet. Literacy studies have raised the idea of new forms of literature based on digital technologies. Media studies and media education have connected digital skills to media literacy" (Iilomäki et al., 2010, p.4).

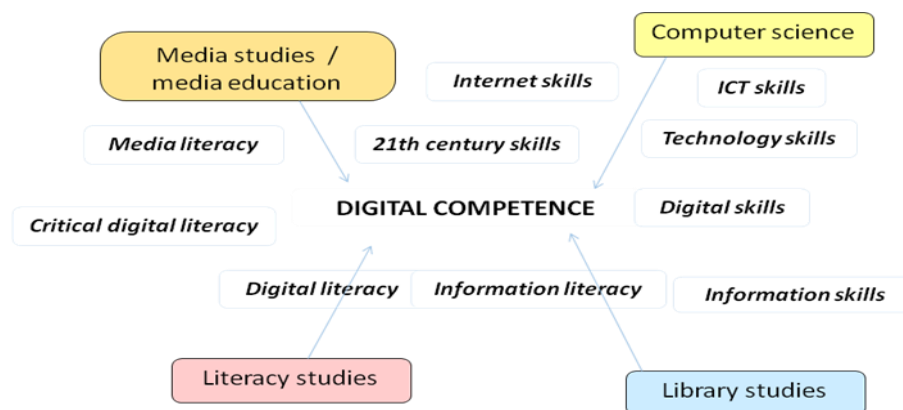


Figure 1: Digital competence, background disciplines and related concepts. (Iilomäki et al., 2010, p.1)

Considering these authors, we introduced the concept of new literacies regarding the literacy in the use of digital technologies.

If we go back to its origins, we can refer to Computer literacy that was defined in the early 1960s. According to Neil (1977): "it was considered to be a component of computer science education most often equivocated with programming skills" (Pérez, Coffin, & Murray, 2010, p.129). Over the years, due to the generalization of computer use beyond computer science and the expansion of the Internet, Computer literacy has been understood as one of the literacies regarding the use of technologies, but more concepts appear. The ICT Literacy Panel (2007) defines ICT literacy as the "use of digital technology, communication tools, and/or networks to access, manage, integrate,



evaluate and create information in order to function in a knowledge society” (ICT Literacy Panel, 2007, p.16), providing a cognitive perspective to the use of technology.

Taking into account the evolution and the relevance of the mass media, there was a need to emphasize the concept of literacy through encompassing the use of the different media. Applying mass media to education, Media literacy has been defined by the Association for Media Literacy as the literacy that “helps students to develop an informed and critical understanding of the nature of the mass media, the techniques that they use, and the impact of these techniques. Ultimately, it aims to foster an understanding of various media, which includes knowledge of their strengths and weaknesses, biases and priorities, role and impact and artistry and artifact.” (Jun & Pow, 2011, p.57)

With the changes media technology has brought to our society and the incursion of the World Wide Web, the definition of the term has also evolved considering not only the use of media but also the creation of multiple media by the user (student in our case). Accordingly, “Media literacy implies having access to, understanding of, and creating/expressing oneself using media.” (Horton, 2007, p.6), taking into account this trichotomy that understands a more active role of the student as a media content generator, the term digital literacy “better describes literacy in the digital age and stresses the balance of demystification and creation of media in the context of digital media convergence.” (Jun & Pow, 2011, p.57)

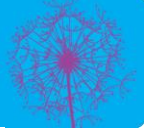
According to Gilster (1997), digital literacy is:

“The ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers. The concept of literacy goes beyond simply being able to read; it has always meant the ability to read with meaning, and to understand. It is the fundamental act of cognition. Digital literacy likewise extends the boundaries of definition. It is cognition of what you see on the computer screen when you use the networked medium. It places demands upon you that were always present, though less visible, in the analog media of newspaper and TV. At the same time, it conjures up a new set of challenges that require you to approach networked computers without preconceptions. Not only must you acquire the skill of finding things, you must also acquire the ability to use these things in your life.” (Gilster, 1997: 1-2)

Bearing in mind this definition, the evolution of digital literacy is easily palpable and for the consideration of critical thinking in the use of technology, going beyond this use itself. Taking into account that Gilster’s definition is previous to the apparition of the Web 2.0 (O’Reilly, 2005), it does not consider the role of the user as a content generator. Martin (2008) offers a more updated and skills-oriented definition of digital literacy according to the new user’s role:

“Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process.” (Martin, 2008, p.166-167)

Due the coexistence of different literacies linked to the use of digital technologies, some authors (Kist, 2005; Lankshear & Knobel, 2011; Leu & Kinzer, 2004, among others), refer to the new literacies as the literacy of the use of digital technologies in all its perspectives. These new literacies include technological literacy (Dakers, 2006), informational literacy (Rader, 2003), communication literacy and multimedia literacy (Lankshear & Knobel, 2003). However, from our perspective, Digital literacy integrates all of them.



Taking into consideration the complexity of digital literacy, Martin & Grudziecki (2006) defined three levels or stages for its development, as shown in figure 2:

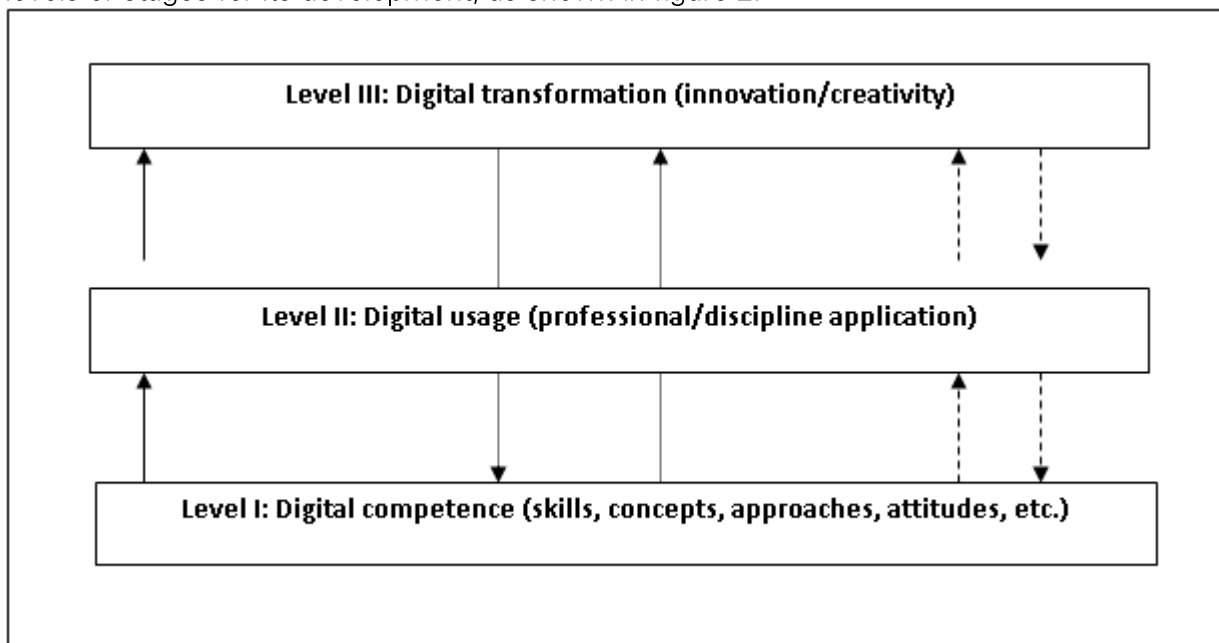


Figure 2: Levels of digital literacy. Martin & Grudziecki (2006)

- The digital divide covers “a wide range of topics, encompasses skill levels from basic visual recognition and manual skills to more critical, evaluative and conceptual approaches, and also includes attitudes and awareness.” (Martin & Grudziecki, 2006, p.255). We have adapted the author’s terminology regarding this level since it helps citizens (students in our case) to overcome the digital divide, providing them not only elemental skills on the use of digital technologies but also critical thinking towards its use.
- Digital usage is defined as “the application of digital competence within specific professional or domain contexts” (Martin & Grudziecki, 2006, p.257).
- Digital transformation is the level that “is achieved when the digital usages which have been developed enable innovation and creativity, and stimulate significant change within the professional or knowledge domain. This change could happen at the individual level, or at that of the group or organization” (Martin & Grudziecki, 2006, p.259).

The European Commission has evolved the conception of learning to the concept of competences; digital competence being one of the most important ones. Digital competence is a key element in lifelong learning, so it is important that citizens become digitally literate. However, it is not a well-defined concept and because of its evolving nature, it will probably never become one. According to Ilomäki, Kantosalo, & Lakkala (2010), it is the most recent concept used to describe technology-related skills. It consists of a variety of skills and competences, and has a wide scope covering media and communication, technology and computing, literacy and information science.

As an interpretation and summary of connecting the different approaches, Ilomäki, Kantosalo, & Lakkala (2010) suggest that digital competence consists of:

- Technical skills to use digital technologies
-



- Abilities to use digital technologies in a meaningful way for working, studying and for various activities in everyday life
- Abilities to critically evaluate digital technologies

Additionally Janssen & Stoyanov (2012) present digital competence as a set of areas, attitudes and concepts as shown in figure 3:

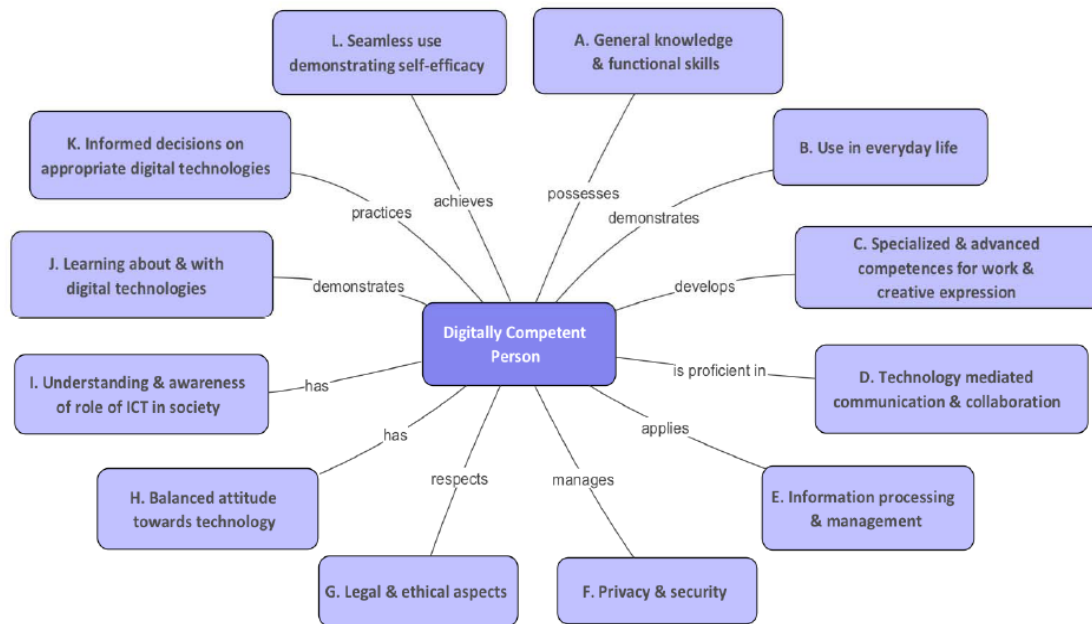


Figure 3: Mind map of digital competence areas. (Janssen & Stoyanov, 2012)

For Janssen & Stoyanov, the twelve areas identified are highly complementary and different levels of proficiency can be easily identified for each of them. They state that Digital Competence “clearly involves more than knowing how to use devices and applications – which is intricately connected with skills to communicate using ICT as well as information management skills. Besides, the sensible and healthy use of ICT requires particular knowledge and attitudes regarding legal and ethical aspects, and privacy and security, as well as an understanding of the role of ICT in society and a balanced attitude towards technology.” (Janssen & Stoyanov, 2012, p.24).

Bearing in mind the quick changes of digital technologies, “digital competence requires the ability to learn about and with digital technologies, to choose the right technology and to do so confidently.” (Janssen & Stoyanov, 2012, p.25).

Subsequently, Ferrari (2012) defines Digital Competence as “the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment.” (Ferrari, 2012, p. 3-4). And Ala-Mutka, (2011) illustrates this competence with the following figure:

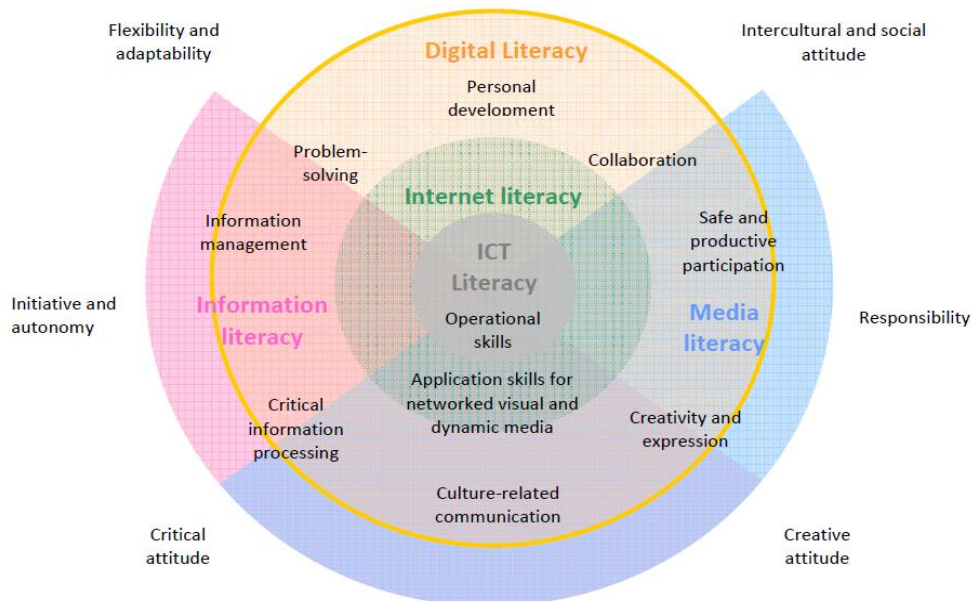


Figure 4: Digital Competence landscape for 21st century. (Ala-Mutka, 2011, p.44)

This author shows how traditional definitions make the concepts overlap, and, according to the author, aims to show the following main points:

- ICT literacy is typically the narrowest digital concept, and mainly concentrated on technical knowledge.
- Internet literacy adds those considerations and abilities to tool-related knowledge and skills to successfully function in networked media environments.
- Information literacy and media literacy concepts largely overlap, but a critical attitude is important in both of them.

It is interesting to highlight that Martin (2006) admits that a multitude of literacies may be confusing and inconvenient, but “it represents the reality of social life, where perspectives and situations vary immensely and are constantly changing. Literacies point to perceptions of need and empowerment in society, and a changing society will inevitably continue to create new ones.” (Ala-Mutka, 2011, p.50)

Right after, we will present the UOC’s Digital Literacy Area (DLA from now on) basing on the theoretical framework presented and our experience gathered from UOC’s origins. The UOC is a fully online university founded in 1995.

2. - The Digital Literacy Area in the UOC scenario

The UOC has always considered, since its foundation, that it was necessary to develop knowledge about the use of information and communication technologies. Because of that, a subject was designed in order to train our students in that field. From that subject, DLA was created.

In fact, DLA was created in order to develop ICT training proposals for all university degrees. Moreover, DLA’s training activity goes beyond that of providing citizen access to the Digital Society through ICT based training courses and programs. 5 lecturers and approximately 80 consultants form



part of DLA and it offers digital literacy to attend to different personal and professional needs, overcoming the digital divide and giving our students skills for ICT use in their personal and professional contexts.

In that sense, when the UOC made "strategic decisions about the implementation of the new Degrees within the framework of the EHEA" (Guitert & Romeu, 2009, p.4), DLA defined the University's core competence; Use and application of ICT in the academic and professional environment, developing training proposals to provide students the acquisition of this competence at all levels of the university.

The Digital Literacy Area provides the UOC a series of courses and programs in order to promote students' acquisition of digital competence. We hereafter show our activity that is situated in the three levels defined by Martin & Grudziecki (2006).

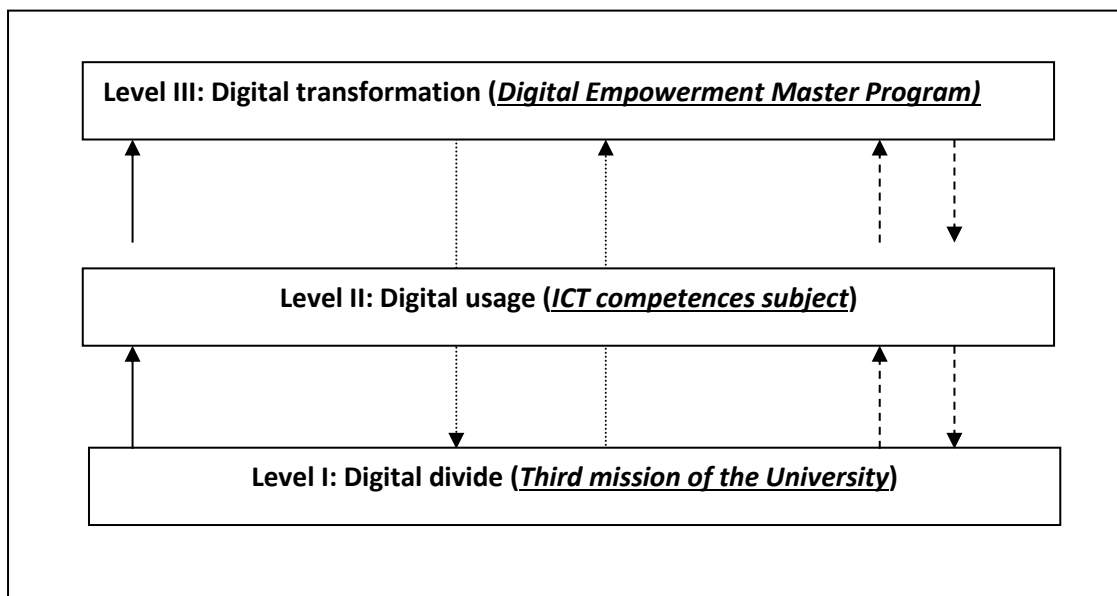


Figure 5: DLA's levels of Digital Literacy in the UOC scenario. Adapted from Martin & Grudziecki (2006)

2.1.- Digital divide: DLA's training proposals in the third mission of the University

According to our vision of Martin and Grudziecki's three levels of digital literacy, the first one provides the overcoming of the digital divide and it includes training actions focused on the society. DLA's training actions in this level are based on the idea that "every citizen must be equipped with the skills needed to live and work in this new information society", trying to achieve the University's third mission that is defined as "the generation and use of knowledge and other skills of the University outside of academic environments, expanding beyond its two traditional missions (training and research) to new groups and collectives." (Moreno & Albázar, 2010, p.85).



According to Romeu (2011), DLA's programs in the digital divide level provide citizens the basic digital competences needed to live and work in the current society, giving them the basic skills to achieve a better level of personal development through access to technological knowledge.

Our training programs in the digital divide level are based on the following competences map, addressing the different skills regarding the use and application of ICT (Romeu, 2011):

Technology basics	Use of the functions of a computer and its operating system. Knowledge of concepts, features, applications and the combination of software. Computer peripheral.	Digital attitude
Navigation and communication in the digital world	Planning and management of the information searching process. Application of Information searching tools and resources. Selection and recovery of information.	
Text processing	Use of text processing tools to create, process, elaborate and present information to be printed or published on the web.	
Numerical information processing	Creation, management, presentation and interpretation of numerical data with spreadsheet tools.	
Data processing	Creation, management, consulting and presentation of information through databases	
Multimedia information processing (pictures, audio and video files)	Design of graphical presentations; integrate multimedia resources to web projects.	
Online social and professional collaboration	Web 2.0 Social and professional networks. Team working as a competence and methodology to boost online communication and participation through online collaborative tools.	
Time planning	Planning and management of time in online activities.	

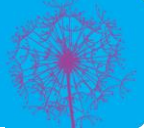


Table 1. DLA's competence map (Romeu, 2011)

As shown in table 1, our area addresses not only the use of technological tools but also the critical and attitudinal side of the use of ICT that, from our perspective, is essential for the development of citizens in the Digital Society. Bearing this fact in mind, DLA's training actions in the framework of the third mission of the university can be illustrated with the following examples:

- Face-to-face workshops: Our area offers workshops that provide citizens the basic skills in the use of ICT to search, create and promote their own digital identity.
- ICT training to professionals in the winery and metallurgical sectors.
- Moreover, ICT training to unemployed citizens in collaboration with the Catalonia Occupation Service.

2.2.- Training proposal in digital usage: ICT competencies subject

From its beginning and due to the fact of being a fully online university, the UOC has been a precursor in compulsory training activities regarding the use of ICT in its degree programs. The UOC has defined the competences of its training programs keeping in mind its differences from face-to-face universities: a different profile of student (adult students with family and professional obligations) and the specificities of its own pedagogical model, being an online university, Catalan and open to the world.

DLA's training actions in degree programs are developed through the subject "ICT competencies" (ICTC from now on), which is a transversal subject that is part of a block of basic training in the degrees at the UOC. Its objective is that students begin in a gradual and integrated way with the acquisition of transversal competences at the UOC, «Use and application of ICT in an academic and professional environment» and «Online team work». These competences are outlined as: Search and selection of information online, Processing and development of digital information, Presentation and dissemination of digital information, Basic notions of digital technology, Work planning in a virtual environment, Management of a digital project, Communication strategies in the Net, Teamwork in an online environment and Digital attitude (Pérez-Mateo, Romero, & Romeu, 2014).

The methodological approach is project-based learning (Railsback, 2002); concretely, developing a collaborative digital project is contemplated. To develop it, students form groups of 4 participants, having their own group space which integrates different tools. Among these, the wiki stands out as the tool that links all the process of creation of the project. The development of the project is planned in 4 phases (Starting, Structuring, Development, Concluding), each of which put forward a set of interrelated activities (figure 5).

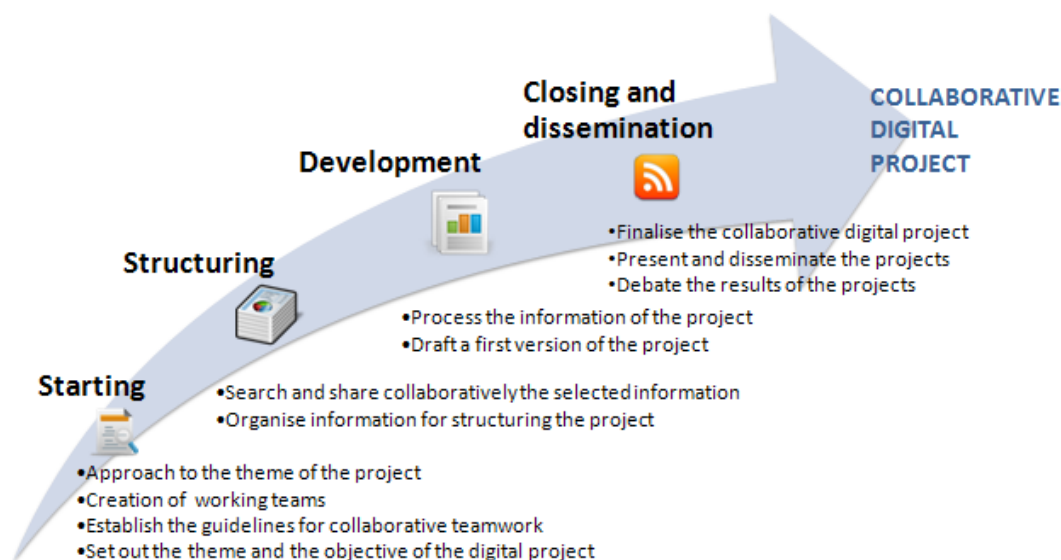


Figure 5: Methodological proposal for a Collaborative Digital Project. (Pérez-Mateo et al., 2014).

The starting phase provides an environment to create working teams and perform the initial searches. This assists the students in setting out the theme of the project. The second phase involves making a deeper search for information to structure the project. Subsequently, the project is developed: the processing and the development of the gathered information are carried out. Through this step, the first version of the project is achieved. Finally, the closing and dissemination of the project are done; sharing and discussing the final version of the project.

The approach to be carried out is not only oriented to the use of technological instruments but also to the putting into practice of key methodologies and skills for working in a virtual environment. The teacher orients and facilitates in an ongoing way this process of construction. This assessment is based on continuous evaluation (group and individual), thereby assuring the progressive acquisition of competences in each phase. The assessment is not only performed by the teacher: students also assess their own and their partners' work.

The resource «Collaborative Digital Project » involves the implementing of a consistent methodological proposal with respect to project work, being applicable to groups of students of varying profiles. Such a resource represents a methodological advance for the completion of the subject. Its objective is to introduce students to a methodology for project work and provide guidelines to develop the project in a collaborative way.

In order to improve ICTC and make it more adapted to the Digital Society's needs, our students complete a survey every semester which is done at the end of the subject and they rate the grade of acquisition of digital competences, among other items regarding the subject's characteristics. According to the results of the survey completed during the second semester of the 2012-13 course, our students perceive having a great level of acquisition of digital competences. Taking into account a scale of 1 to 3, almost 90% of students perceive they achieved a maximum level of acquisition of these competences, highlighting teamwork (86.78%), search and selection of digital information (87.86%), presentation and dissemination of information (86.78%) and acquiring a civil digital attitude (89.26%).

2.3.- Training proposal in the digital transformation level: Digital Empowerment Master Program

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The third level has the objective of training users to be able to anticipate, direct and deal with the ICT-related changes in their professional environment, to work in online teams and to integrate information, technology, creativity and innovation in order to solve problems in their own contexts. In this level, the Digital Empowerment master program (DE from now on) will be situated. This Master program has been designed to get started in 2014 and is situated at the base of citizen empowerment: "Empowerment of individuals and communities means increased control over life and coping skills" (Mäkinen, 2006, p. 381). Empowerment lets citizens create, take over and share knowledge, tools and techniques to change and improve the quality of their own lives and society. When the term "empowerment" is applied to ICT, people acquire skills to express themselves and participate in the Digital Society beyond social networks: "This can be called digital empowerment, which is not a direct consequence of having and using the technical facilities, but a multi-phased process to gain better networking, communication and cooperation opportunities, and to increase the competence of individuals and communities to act as influential participants in the information society" (Mäkinen, 2006, p. 381)

Considering this concept, the DE master program's aim is to help professionals, through advanced digital literacy, to transform their own lives and their professional activity in order to subsequently improve their organizations by the proactive and innovative use of Technology.

The DE program endeavors to be an applied Master to every student's profession providing them knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) to apply and make decisions regarding technology, information management, communication and multimedia resources. These are the knowledge areas of the program as shown in the following figure:

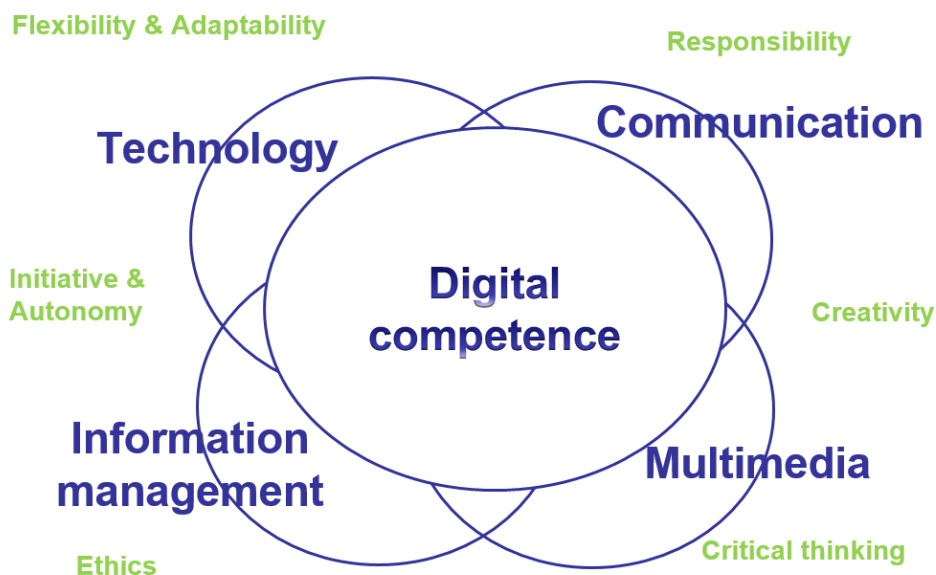


Figure 7: Definition of DE Master Program areas

The DE Master program seeks student acquisition in the following competences:

- To understand and value the impact of digital technologies on society and, more precisely, in organizations.
- To select and use digital technologies in individual and collaboration processes in order to improve and innovate in their own professional activity.



- To plan, manage and assess innovation projects and processes based on the use of ICT in professional activity.
- To make decisions and solve problems regarding the adoption of technological solutions oriented to efficient information management in the organization.
- To systematically search, access, select and assess digital information.
- To process, elaborate and disseminate information in different formats and multimedia (audio, pictures, video ...).
- To effectively use ICT to keep on being trained and long-life updated in order to fit adequately in a continuously changing professional and social environment.
- To be able to use the Internet effectively as a communication media using different tools and languages.

In fact, the DE master program promotes student's acquisition of the outlined competences through learning activities based on the following methodologies, using the following technologies and considering the following attitudes:

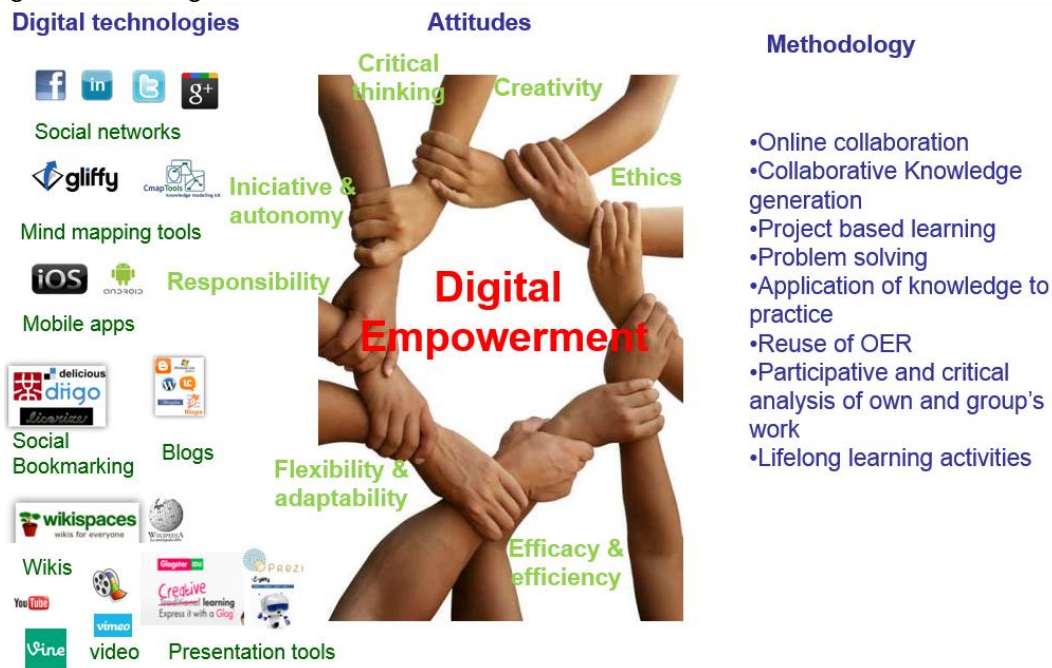


Figure 8: Digital technologies, attitudes and methodologies of the DE Master program.

The aim of the DE Master program coincides with a study conducted by Fitzgerald, Kruschwitz, Bonnet, & Welch (2013) that consisted in a survey and interviews with executives at 450 large companies of the United States. This research found that “companies now face a digital imperative: adopt new technologies effectively or face competitive obsolescence. While there is consensus on the importance of adopting digital technology, most employees find the process complex and slow. Many say their leaders lack urgency and fail to share a vision for how technology can change the business. Companies that succeed tend to have leaders who share their vision and define a road map, create cross-organizational authority for adoption and reward employees for working towards it.” (Fitzgerald et al., 2013)



52% of employees of the 450 companies did not know how to answer the question “Which are the most significant cultural barriers to Digital Transforming in your organization?” Therefore, authors state that there is a significant lack of familiarity with digital skills in several companies around the USA.

Bearing in mind this report and many others, we consider the need of a change in training in advanced digital competences in order to help professionals to make decisions regarding their digitalization of their companies. The knowledge that will be acquired in our Master program has to help professionals use digital Technology efficiently and to tweak their companies’ road map regarding digitalization.

3. – Conclusions

Given the proliferation of digital media in the current society, continuous professional training has become indispensable. Bearing this fact in mind, long and wide life training plays an essential role in defining profession and professional success, giving people adaptation skills and flexibility to the Digital Society requirements and changes.

If we take into consideration users’ change of role (from passive observer to active creator) due to current digital technologies, it is necessary to overcome tool-based training and promote competence-focused training. In fact, we understand training in digital competences as a methodological training that provides students those necessary attitudes to promote conscious and critical use of digital technologies for professional and academic purposes, and all of that respecting the principles of ethical responsibility during the search, elaboration, presentation and dissemination of information. This collaborative methodological training is conducted as a way to allow adaptation of individuals to social changes and thus transforming the way they learn and, consequently, their profession.

Following Gillen & Barton (2010), it is important to state those challenges in working towards a holistic understanding of what it means to work in developing digital literacies. In that sense, they distinguish necessary actions regarding training in digital literacies: 1) Enhancing cognitive development and assessment practices through curriculum interventions that make use of new affordances of digital technologies. 2) Supporting learning communities to work collaboratively in problem solving and the co-construction of knowledge. 3) Working collaboratively in a multidisciplinary team to create useful, practical tools. 4) Increasing authenticity and overcoming access issues.

Basing on Martin and Grudzecki’s three levels, we developed a definition of a Digital Literacy transversal area that offers training in different formats (degree subjects, workshops, seminars, ...). In fact, the UOC’s Digital Literacy Area outlines training proposals that allow students to apply ICT in their academic and professional contexts, taking into consideration all levels of digital competence: ICT training to help citizens overcome the digital divide and to understand basic utilities of ICT to apply them to an academic context.

Academic training to allow students use ICT in those activities related to abstract and critical thinking, allowing them to participate and take advantage of the digital society and to apply their knowledge in their academic and professional contexts.

And a third level which is totally applied to the transformation and innovation in the student’s professional field which is letting them create, share and innovate in the Digital Society from an advanced knowledge of digital technologies.



Bearing in mind that we are more experienced in the analysis of the second level, our further research will be focused on developing an in-depth analysis of the other levels, specially the third because of its transforming vision.

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