ASL – Adult Self-Learning: Supporting Autonomy in a Technology-Mediated Environment

Digital Social Learning and Online Participatory Learning

Ecoistituto Desk Research Report

IO1: Definition of an operative model for teaching – learning low qualified adults in an online enviroment

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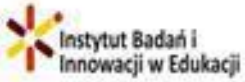

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Executive Summary

This desk research has been developed by Ecoistituto within the project Adult Self-Learning: Supporting Autonomy in a Technology-Mediated Environment (Acronym: ASL) . [ASL project, Application form, p. 74].)
This research analyzed adult learning in the light of contemporary societal transformations.

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1. Contemporary societal transformations

It has been estimated that 47 percent of US jobs, 57 percent of jobs across the OECD, and 77 percent of jobs in China are susceptible to automation over the forthcoming decades, a substantial proportion of which are concentrated in the service sector (Frey & Osborne, 2017).

As a consequence, many current professions and jobs will undergo changes and new ones will arise. For example, smartphones and the internet are mainly used today for social purposes, but it is expected that in the near future they will be used for increasing the productivity of workers, and that they will create new job opportunities (Leonardi, 2015; Kwahk & Park, 2016; van Zoonen, Verhoeven, & Vliegenthart, 2016).

However, although many manual works will be automated, it is undoubtedly true that professions such as barber, janitor, farm worker, house cleaner, cook, gardener, repairman, carpenter, caregiver, etc., will remain largely stable, since these jobs require complex manual abilities as well as specific intellectual skills.

Nowadays, the category of complex manual jobs employs about 19 percent of workers in OECD states, and it is considered likely that the figure will remain at roughly this level (Halal, Kolber, Davies & Global, 2016).

A recent report by the World Bank (2016) argues that the number of jobs directly created by digital technologies is fairly modest, but the number of jobs enabled by them can be significant, as the 10 million jobs created in online stores in China by the country's booming e-commerce demonstrates (World Bank, 2016). The same report underlines that the lives of the majority of the world's population will remain

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largely untouched by the digital revolution. In fact, data shows that only around 15 percent of the world's population can afford access to broadband internet, meaning that, at least in the short term, advanced internet services will remain unavailable, inaccessible, and unaffordable to the majority (Figure 1).

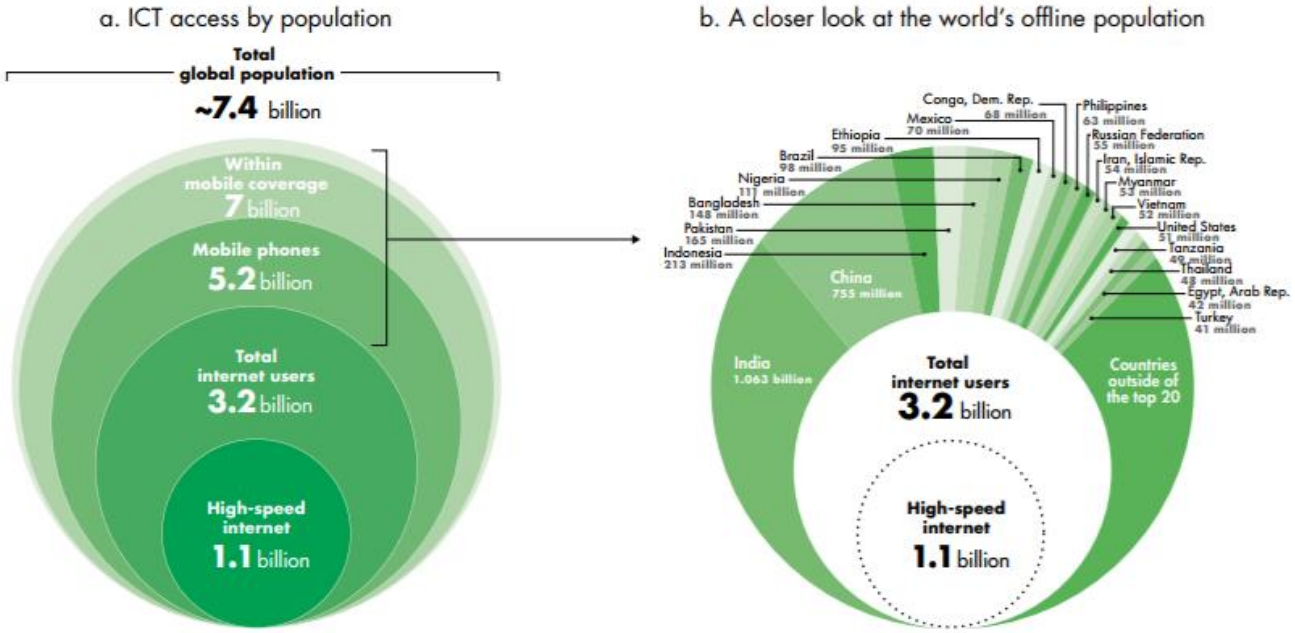

Figure 1. **Internet access by world population (source: World Bank, 2016, 8)**

As a consequence, we can expect that in developing countries the impact of digital technology does not appear to be immediate, but in the next few decades the effects of the digital divide, both physical and cultural, could be really disastrous, and will only serve to reinforce existing inequalities. In fact, the digital divide will prevent access to essential services, media, and information that will be ever more sophisticated and require broadband connection as well as digital skills.

There is broad consensus that education will play a crucial role in minimizing the negative impacts of the spread of digital technology.

2. Educational issues

Experts and professionals are persuaded that investments in lifelong learning by government, industry, and professional bodies can mitigate the negative effects of technology on the labor market. Modular educational programs should be created which are constantly updated in response to changing skill demands.

From our research, the principal educational questions related to changes in the labor market can be summarized as follows:

- What are the most important skills needed to succeed in the workforce of the future?
- Which of these skills can be taught effectively via online systems through a self-learning and social learning approach?
- Which skills present teaching challenges?
- What new types of credentialing systems should support non-formal and informal learning programs?
- How can traditional educational models be improved through digital technologies?

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Figure 2 presents the skills for the future, many of which involve digital competencies and innovative attitudes.

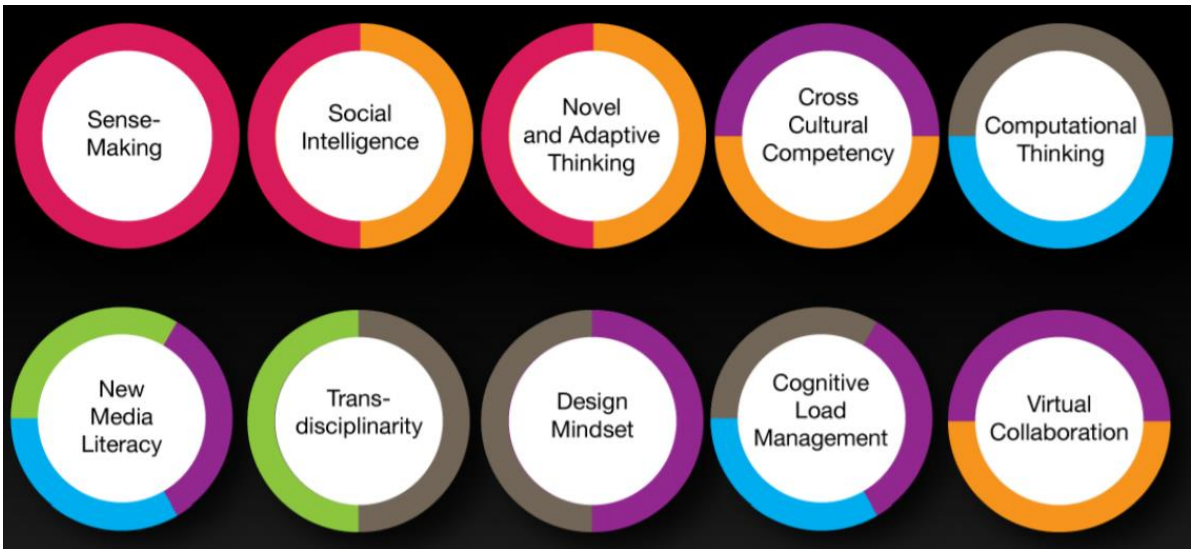

Figure 2. **Ten skills for the future (source: Tracey Wilen-Daugenti)**[1]

Experts unanimously indicate that critical thinking and creative thinking are crucial factors for the success of the future workforce.

Nevertheless, current data on the composition of the labor market seems to contradict the experts' opinion, at least in the short term. At present, workers who are really creative and innovative often encounter various difficulties to be hired, since they are considered to be problematic to manage and, therefore, less reliable. Indeed, many organizations discourage leaders from being strategic and thinking beyond what the organization is currently doing, since greater rewards are harvested by simply doing what has always been done well. In this regard, what David Perry, the popular executive recruiter, observed in 2009 remains valid:

> *Let me emphasize that creativity is not appreciated by most HR people. HR - and rightfully so - are the last bastion of risk avoidance in a company. Thinking outside the box doesn't apply. They want you in the box.*[2]

Furthermore, there are also some managers who restrain innovative initiatives that they don't understand whilst, in many public institutions, ineffective information systems that don't meet the emerging needs and societal changes complicate the life of workers who are creative and critical thinking.

From our research, it emerges that acquiring skills in computational thinking could be more fruitful for promoting novel attitudes to thinking. Computational thinking is a method of thought that is used in computer sciences (Grover & Pea, 2013), but experts argue that it can also influence the way people solve any type of problem.

Computational thinking can be understood as the mental activity of formulating a problem in such a way as to admit a computational solution (Wing, 2014).

[1] Careers 3.0 Future Skills Future Work, slide presentation; available at https://www.oecd.org/site/eduimhe12/Tracey%20Wilen-Daugenti.pdf; last accessed on 10.11.2017.

[2] https://www.theglobeandmail.com/report-on-business/strategies-for-the-job-hunt/article1200249/; last accessed on 22.11.2017.

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In this regard, learning coding may help to improve the way in which any kind of problem is tackled in an increasingly digitalized world.

In the near future, computational thinking could provide the skills necessary in the sphere of work, but will also bring great social benefits since it can favor the design of innovative solutions for people's livability. Computational thinking enables complex problems to be tackled in efficient ways, as well as provide for the upscaling of good solutions.

3. Shifting people into new professions and jobs

There is a broad consensus that the digital revolution is moving towards the reshaping of traditional professions and jobs. Experts encourage people, especially the young, to focus on skills that they want to acquire because, whilst obtaining a professional degree, for example as an architect or engineer, is clearly important, skills are the essential prerequisite to finding and maintaining a job.

In this regard, it is demonstrative that an emerging profession is that of coach in all its multifarious variations, such as personal coach, professional coach, career coach, executive coach, etc. Indeed, coaching is a process that aims at improving individual or organizational performance, empower leadership capability, and support professionals to meet their professional and personal goals (McNally, K., & Lukens, R., 2006).

At the moment, to deal with the impact of digital technology on current jobs and professions, experts suggest paying attention to digital technology that will open new opportunities.

Moreover, online learning is considered to be a crucial means by which to sustain the skilling and re-skilling of workers. Researchers and experts argue that online learning not only reduces costs and improves access but also offers the possibility of increasing the quality of the teaching/learning experience and of the evaluation of learning achievements. Accordingly, investments in online learning are hoped for, since this would create new professional skills and facilitate the transformation of current learning programs. However, experience seems to demonstrate that the human guidance in educational processes cannot be eliminated.

We found a lot of evidence pointing to the fact that new educational skills should be created to involve learners in a collaborative online environment.

4. Self-directed digital learning

Companies are looking for workers who professionalize themselves in order to meet the changes brought about by advances in technology. Lifelong learning is fast becoming a must for workers and a crucial requirement for their career development.

Although topical, Self-Directed-Learning (SDL) is not a new concept. Indeed, the most commonly followed definition of SDL, coming from Knowles (1975), is as a process in which individuals take responsibility for their own learning by taking the initiative in diagnosing their own learning needs, "formulating learning goals, identifying human and material resources needed for learning, choosing and implementing appropriate learning styles and evaluating the learning outcomes" (Knowles, 1975, pg. 18).

Nowadays, SDL is often put in relation to 'cooperative learning', 'collaborative learning', and social learning, which are included in the broad area of non-formal learning and sometimes of informal learning. Web based social learning is also spreading as a consequence of the application of the social network

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paradigm to educational processes (McIntosh, 2016).

The advent of the Internet has increased the interest of researchers and teachers in self-directed learning due to the massive amount of knowledge and support available online. However, the effectiveness of self-directed learning depends as much on the availability of effective and controlled knowledge sources as on the attitude of learners.

From our research, the success of self-directed digital learning appears to be significantly conditioned, at least in the early stages, by the guidance of trainers in the use of technology-enhanced materials for learning (Murphy, Snow, Mislevy, Gallagher, Krumm & Wei, 2014). To use self-directed digital learning environments, learners should be taught carefully. They have to know what it means to manage their own learning, and how to utilize the resources available online.

Furthermore, research is needed to understand the role of non-cognitive learners' attitudes in self-directed online learning environments, for example in relation to motivation, persistence, and resourcefulness.

We are persuaded that in the short term, and especially in the case of adult education, hybrid solutions should be preferred that integrate self-online learning with online collaborative guidance.

5. Transformative learning in online environments

Nowadays, online education has become an increasingly important part of tertiary education, and takes two primary forms. The first consists of for-credit courses offered by higher education institutions. The second form of online education consists of professional training and the preparation for certifications.

An online learning environment is characterized by the use of the internet to access learning materials and to interact with content, teachers, and other students. Online learning should allow time and space for independent learning, enabling learners to progress at their own learning speed.

The primary learning models in an online environment are blended learning and digital social learning.

Blended learning combines e-learning with traditional classroom methods (face-to-face learning), while digital social learning is an approach whereby an individual achieves their learning goals by accessing learning resources available online as well as by interacting on the internet with teachers and other learners.

Blended learning is a formal education program in which a student learns, at least in part, through online tools. Essentially, it is the combination of two historically distinct teaching-learning models: traditional face-to-face learning systems and distributed learning systems. In blended learning, computer-based technologies play a central role (Figure 2).

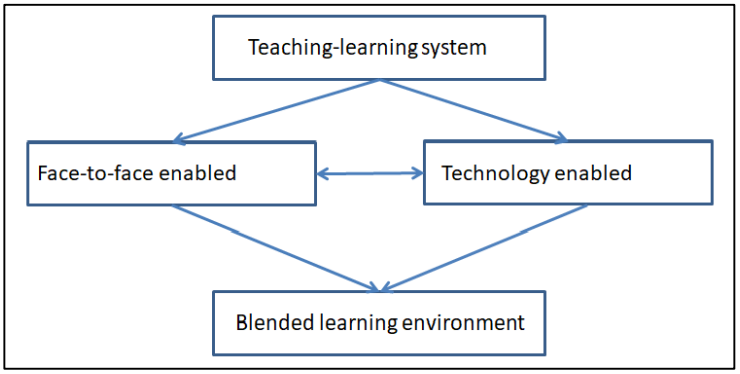

Figure 2. The blended learning model (authors' own elaboration)

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Over the last few years, as a consequence of the spread of digital technologies, digital social learning has been assuming a strategic role in the online learning environment. In an effort to alleviate critical aspects due to poor interactive capability and asynchronous scheduling, some e-learning platforms such as BlackBoard and Moodle have begun to incorporate digital social learning components (chatrooms and virtual classrooms). Nowadays, most of the platforms allow interaction between students (through user-generated posts/comments), and provide question asking/answering functions.

Figure 3 illustrates the digital social learning model.

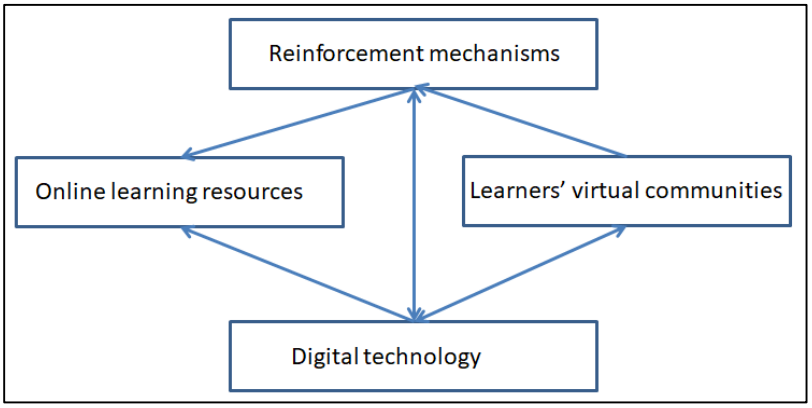

Figure 3. The digital social learning environment (authors' own elaboration)

The massive abundance of online content also suggests new forms of self-learning activities. Accordingly, new opportunities and challenges have arisen.

The presence on the internet of broad and disparate scientific claims necessitates selective retrieval tools and effective evaluation strategies. Learners should be supported in the selection of learning materials and trained on how to evaluate the internet content, e.g., what is the authority of the venue/website/institution that is the source? What are the motives that pushed the author of a content to write and publish it?

A search engine such as Google or Bing allows a user to search for information on the internet based on their query (which is in the form of natural language) in order to find content and rank them. They return the set of webpages that best match to the query. However, the process of accessing the semantic information from the text data available on the internet is not easy. Recent work conducted on Intelligent Information Retrieval has aimed to support conceptual search, but the results have not been particularly encouraging.

Finally, the growth of online education has not been without challenges in other areas, both technical and social.

Individual learning styles (e.g., visual, auditory, kinesthetic) impact learners' preferences and results (Daghan & Akkoyunlu, 2012), whilst there is evidence that people's experiences of digital education are patterned distinctly in relation to social class, race, and disability. As such, online learning environments do not unproblematically reduce differences between individuals (Selwyn, 2016).

Transformative learning is argued to represent a powerful approach to tackling the issues of online learning, deriving from the fact that such programs are designed and configured to the norm of an abstract, self-motivated, and high-level individual. The specific cultural background of learners can limit the benefits associated with online learning, but transformative learning can provide opportunities for learning through

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confronting, engaging, and reflecting, with the possibility to learn through exploring new meanings, roles, relationships, and actions, and arriving at new interpretations (Taylor & Cranton, 2012).

In the transformative learning perspective, learning is voluntary in that the learner must be willing to engage in critical self-reflection. Accordingly, learners should be self-directed to be aware of their beliefs and assumptions, as well as to actively participate in discussions related to their self-analysis.

6. New skills and competencies

New skills and competencies related to digital technologies are required to meet the ongoing societal changes.

Digital competence, creativity, entrepreneurship, and learning-to-learn are emerging as key factors for innovation, growth, and participation in society and economy.

In this context of changes, Digital Social Innovation (DSI) is a new field that conjugates digital technology and social innovation. It is an evolving and broad field:

A kind of social and collaborative innovation in which innovators, users and communities collaborate using digital technologies to co-create knowledge and solutions for a wide range of social needs and at a scale and speed that was unimaginable before the rise of the Internet. (Bria et al., 2015)

Recently (2018), the European Digital Social Innovation Index (EDSII) has been created (https://www.nesta.org.uk/feature/european-digital-social-innovation-index/). EDSII has been produced as part of the EU-funded DSI4EU project. It aims at ranking how different European cities support DSI to grow and thrive. At the moment, EDSII ranks 60 European cities on 32 indicators that have been identified as important for the creation, growth, and sustainability of DSI. These indicators are grouped into six themes: Funding; Skills; Civil Society; Collaboration; Infrastructure; and Diversity and Inclusion.

This paper focuses on DSI reporting the preliminary results of the project Digital Social Innovation: new educational competences for social inclusion (DSI), a two-year European project.

In 2018, the European Commission presented a proposal for a Council Recommendation on Promoting Common Values, Inclusive Education, and the European Dimension of Teaching (COM(2018)23) and a proposal for a Council Recommendation on Key Competences for Lifelong Learning (COM(2018)24). In addition, in April 2018, the Commission also presented two documents: Communications on Disinformation (COM(2018)236) and Communication on Artificial Intelligence (COM(2018)237).

These documents contain a new set of specific policy initiatives on continuous education and training in order to help people to maintain employability and overcome skills mismatches in a rapidly evolving labor market impacted by globalization and technological changes.

The European Commission Joint Research Centre (JRC) has had a primary role in identifying and designing the digital skills and competences necessary to face the ongoing societal changes.

JRC is the European Commission's science and knowledge service that develops studies on the labor market implications of the digital transformation.

JRC current research covers the following projects:

- Digital Competence for citizens (DigComp);

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- Digital Competence for Consumers (DigCompConsumers);
- Entrepreneurship Competence (EntreComp);
- Computational Thinking (CompuThink).

JRC claims that the development of digital competences breaks down the boundaries between education, work, and civic engagement. In this respect, digital competences are transversal to formal, non-formal, and informal learning contexts and apply equally to education and training systems, from primary to vocational education and training, and non-structured learning contexts.

7. Critical thinking

Critical thinking, problem-solving, and creativity can be viewed as components of innovation processes.

It has been observed that a creative process can be intentional or accidental (Runco & Pritzker, 1999) and closely tied to innovation (Van Holm, 2015). Accidental creativity and accidental innovation take place when a fortunate discovery occurs by accident, e.g., when one is not looking for it (Beale, 2007). Accidental creativity is addressed as serendipity, namely blind creativity, and plays a part in animals and machine creativity.

Any intentional or accidental creative process also implies an evaluation of the process results. Evaluation requires self-criticism and reflection. It is important for establishing if an idea is a *new one or it is just the re-adjustment of something done before.*

8. Soft skills

According to the Education Commission (2017), it has been predicted that by 2030, more than half of the nearly 2 billion youth worldwide will not have the skills or qualifications necessary to participate in the emerging global workforce.

In this perspective, it is strategic supporting the acquisition of skills that are important for the future jobs. They should include work readiness skills, soft skills, technical skills, and entrepreneurial skills. To meet the needs of the future labor market learning and training should be interactive, multicultural, engaging, constructive, and practical.

To tackle the challenges of the fourth industrial revolution, technical skills are fundamental. They concern knowledge and capabilities to perform specialized tasks and should include computer programming, coding, project management, financial management, mechanical functions, scientific tasks, technology-based skills, and other job-specific skills.

However, there are other skills, addressed as soft-skills, that play a relevant role. They encompass communication, critical thinking, creative thinking, collaboration, adaptability, initiative, leadership, social-emotional learning, teamwork, self-confidence, empathy, growth mindset, cultural awareness. Other qualities that could facilitate employability are innovation, creativity, industriousness, resourcefulness, resilience, curiosity, optimism, risk-taking, courage, and business acumen.

Research confirms the importance of the above qualities and new educational programs should be

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developed to incorporate social and emotional learning (SEL) and enhance learners' intrapersonal, interpersonal, and cognitive competence (Gibert, Tozer, & Westoby, 2017).

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