ACML

Adult Community Media Lab

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IO3 – Competency Framework

Premise

This document elaborates the results of the laboratories activities carried out by partners.

It reports the main skills and competence emerged for adult digital literacy.

Digital education

Experts emphasized the importance of digital education. Indeed, the nature of learning has changed significantly in the last decades. As with most things in our society, new technology is used to improve learning both in terms of the engagement with and the effectiveness of teaching, with the aim of ultimately ensuring better results for learners.

The main factors, due to the digital technology, that are changing the teaching-learning strategies are:

1. Full-Time Access To Didactic Materials

One of the most important benefits of using digital learning is that materials are always available to learners—24 hours a day, 7 days a week. This gives learners complete flexibility over when and where they study, enabling them to take control over the best times to study for themselves as well as how much, and access to a global community.

2. Facilitates Collaboration

Working along with others is an important part of the working life in many businesses in 2022. Education can also benefit from digital learning as a collaboration tool, by bringing people together through video conferencing, enabling learners and teachers to use shared documents, or simply by helping to prepare students for the world of work.

3. More Resources

Resources such as recorded lectures or additional reading can be easily shared, giving learners the opportunity to maximize their learning, and to go over subjects that they find more

challenging as well as get extra information relating to subjects that they wish to understand better.

4. Personalized Learning

Digital learning can help enable personalized learning, in that everybody has specific techniques and learning methods that suit them. Digital learning can help students and teachers to get a better understanding of the most effective teaching methods for them, helping the delivery of teaching and learning to be more effective.

Skills

According with the World Economic Forum (Schwab, 2017) the expected evolution of workforce skills demand over the 2018–2022 is as follows:

- Creativity, originality and initiative
- Analytical thinking and innovation
- Active learning and learning strategies
- Technology design and programming
- Complex problem-solving
- Critical thinking and analysis
- Leadership and social influence
- Emotional intelligence
- Reasoning, problem-solving and ideation
- Resilience, stress tolerance and flexibility

The table 1 reports the skill framework that emerged from the partners' work

Skill	Digital technology
Curiosity: ability to be constructively inquisitive	**Search on the web**: competence to formulate the appropriate query
Open-mindedness: capability to formulate new ideas	**Collaborative tools**: capability to collaborate in a digital environment
Critical thinking: capacity to consider things from a fresh perspective and different angles	**Computational thinking**: competence to formulate and solve problems by breaking them down into simple steps

Imagination: ability taught to generate and refining ideas	Brainstorming tools: capacity to use applications specifically designed to help spark and then gather and organize ideas
Problem-solving: ability to identify and solve problems	Integrated approach: capacity to combine data literacy, design thinking, and computational thinking.

Table 1. The competency framework

Digital competence portfolio for adult learners

Partners worked together to define a digital portfolio for adult digital literacy.

This portfolio should be related to three main basic scopes:

- Digital technology understanding - this encompasses knowledge about the multifarious dimensions of the digital revolution and the impact on school activities.
- Digital-based educational processes - these comprise both theoretical and practical knowledge of online educational models as well as teaching-learning practices that can support the implementation and running of e-learning and distance learning programs.
- Some sectorial knowledge - this includes knowledge in specific fields such as social learning, social telerehabilitation, and social networking tools.

A basic competence for adult learners concerns the use of social media and online technologies. Online tools can be useful for communicating and interacting with teachers and other learners at distance. However, using digital tools is not sufficient to master digital applications. New concepts and competencies are needed, for example, adults should be taught to use social media, and should know what the positive and negative social impacts of digital technology are. In this way, they can, for instance, they can experiment peer-learning activities aimed at helping them in the use of digital devices and applications as well as at improving cybersecurity. Indeed, a low level of skills in using digital technologies has been associated with an increased likelihood of being cyber-victimized. Adults with low digital competence are a target for cybercriminals.

According to the analysis of the anti-cybercrime programs in place, the suggestions from experts, and partners in-field experience, the basic competencies involved in cybercrime prevention initiatives should include:

- Basic theoretical knowledge and practical skills orientated to the design, implement, and manage cybercrime prevention programs.
- Theoretical and practical skills to design, implement, manage, and evaluate tools and solutions in order to respond to the growing demand for cyber safety.
- Thorough knowledge of learning models and their underlying psychological theories, in particular, of those models based on *social engineering*. Social engineering is the term used for a broad range of malicious activities accomplished through human interactions. It uses psychological manipulation to trick users into making security mistakes or giving away sensitive information.
- Thorough knowledge of social media policies and legal aspects.

- Competence to deal with the impact and identification of cyber risks.
- Capabilities to use digital resource for learning purposes.

Table 1 synthesizes the basic scopes and competencies required by an adult in order to stay safe online.

Basic scopes	Basic competencies and skills
Cyber threats understanding	• Carrying out systematic review of social media use • Deep knowledge of the different forms of cybercrime • Expertise on social media • Awareness of the roles of online resources • Familiarity with assessment of the sources • Knowledge of the internet world and dynamics
Educational processes	• Educational models (in general) • Educational practices • Peer learning model • Community learning • Collaborative learning • Digital social learning
Sectorial knowledge	• Legal implications • Social media application policies and statutes • Use of free software • Use of filters and blocks • Use of online collaborative tools • Creation and use of wikis, blogs, forums, and apps • Use of messenger apps • How the internet works • Digital dependencies

Adults should also possess competencies to contrast the abusive use of the internet. Indeed, individuals who use the internet excessively are not addicted to the internet per se but, rather, use it as a medium to fuel other addictions. A gambling addict who chooses to engage in online gambling is merely using the internet as a place in which they can enact their (addictive) behavior. This said, the excessive use of the internet can lead to degenerated behaviors and produce serious consequences. Online gambling, for example, does currently represent a very real and established risk. Over the last decade, the increasing evidence that people are engaging in gambling and

developing, as a consequence, more gambling-related problems has been highlighted by numerous authors. Nowadays, we can observe the ever-increasing growth of casino games on social media platforms.

Suggestions and recommendation

- Invest in teaching staff professionalization, e.g., integrating their competence.
- Define and experiment more appropriate teaching-learning strategy based on transformative learning. Indeed, individual learning styles (e.g., visual, auditory, kinesthetic) impact learners' preferences and results, 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.
- Invest in Computational Thinking (CT). According to Wing, thinking computationally is a fundamental skill for everyone, not just computer scientists. Indeed, CT is a method of analytical thinking that encompasses many skills, such as designing algorithms, decomposing problems, and modeling phenomena. It can take place without a computer since it is "a way of solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science" (Wing, 2006, p. 35).
- Enhance competences in psychology and anthropology. It is important to understand human behavior to design effective new integrated products. For instance, when designing new services, developers need to pay attention to the characteristics of classes of users, e.g., elderly or disabled people. Lack of domain knowledge and less usable interfaces may discourage the use of ICT based services.
- Introduce ethics. The construction of algorithms that take decisions needs to introduce and discuss ethical implications. There is a responsibility in the implementation of automatic decision systems. For instance, robot ethics encompasses ethical questions about how humans should design, deploy, and treat robots. Indeed, machine morality encompasses questions about what moral capacities a robot should have and how these capacities could be computationally implemented.
- Define a smart learning environment for mechatronics education should be a technology-enhanced teaching-learning system that simulates the real world, allows access to different types of resources, provides collaborative functions, and can be easily adapted for work-based learning.