

EDITORIAL PREFACE

Special Issue on “School Revolution? Let’s Start from Teachers’ Digital Literacy and Competences!”

Antonio Cartelli, University of Cassino and Southern Latium, Cassino, Italy

After the huge investments of the last decades on the development of digital learning technologies and the many experiments for the introduction in everyday school of innovative educational teaching-learning practices, many studies and researches have showed that the desired transfer of technology within schools and other educational settings didn’t have the expected success.

Otherwise stated, the rich amount of research and experiences that scholars and school teachers have made on the use of technological learning environments for the improvement of teaching efficacy, and the good results that in more than twenty years have been obtained in the creation of good practices in everyday school teaching, only rarely have spread more widely within the school systems of the individual nations and of the entire Western context, to structurally change the way of teaching and learning.

Decision makers and scholars have now realized that the bottleneck is largely determined by people difficulties and cultural settings, and especially the teachers’ level of acceptance of the technologies as instruments for the creation of higher quality educational processes, together with their use as cognitive prostheses for the development of new learning procedures, which is still too low to conduct a total review of the everyday school life. The first and more relevant effect of the above statement can be found in the level of acceptance of digital technology and networking in the school, it is in fact surprisingly lower than the corresponding level of acceptance and use of digital technologies in everyday life. The main consequence for this difference is the deepening of the gap between the school world, with the experiences that pupils and more generally young people have within it, and the domestic and real world.

The events described above took place notwithstanding the efforts made all over the world by many institutions, who promoted studies and researches for the analysis of the phenomena

described above. The European Union, for example, provided guidance to its member states by the recommendation concerning the “Key competences for lifelong learning” (European Parliament, 2006). In that document it was stated that digital competence (the fourth among them) could be defined as the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society. Digital competence is thought in that document as a transversal key competence which, as such, enables us to acquire other key competences (e.g. language, mathematics, learning to learn, cultural awareness). It is related to many of the 21st Century skills which should be acquired by all citizens, to ensure their active participation in society and the economy. After this first step the same European Commission funded other research projects concerning the features of digital competences and the possible strategies for their improvement. The DIGCOMP project (European Commission, 2013), among them, aimed at contributing to the better understanding and development of digital competence in Europe. This project, which was carried out between January 2011 and December 2012, had the following objectives:

- To identify the key components of digital competence in terms of the knowledge, skills and attitudes needed to be digitally competent;
- To develop digital competence descriptors feeding a conceptual framework and/or guidelines that can be validated at European level, taking into account available relevant frameworks;
- To propose a roadmap for the possible use and revision of a digital competence framework and descriptors of digital competences for all levels of learners.
- The main result of the project consists of two different interrelated outputs:
- A self-assessment grid that proposes the areas of digital competence and descriptors for three proficiency levels;
- A framework identifying, for each area, all the related competences, and providing for each competence a general description, descriptors on three levels, examples of the knowledge, attitudes and skills, and examples of applicability for different purposes.

These two outputs have provided a different level of granularity of the same construct.

The self-assessment grid could be used as a tool for each citizen to describe their own level of digital competence to third parties and to understand how to improve their own digital competence. It could also be used as a communication tool, as it presents the model in a concise and easy-to-grasp way.

The framework could be used by curricula and initiative developers who wanted to build the digital competence of a specific target group, and could be inspired by or gain ideas from this model. The level of abstraction of the competences that are foreseen in the framework allows stakeholders to refine and specify sub-competences in the terms they consider most appropriate for the target groups or context. The framework could also be used as a reference tool to compare existing frameworks and initiatives, in order to map which areas and which levels had to be taken into account by an existing framework (or certification scheme, or syllabi).

Major features of the framework in the DIGCOMP project are reported in Table 1.

It has to be noted that, as for the recommendation featured in the “key competences for lifelong learning” the DIGCOM project, funded by the European Commission, tried to face the problem of the digital competences for citizenship, to hit the target of satisfying the needs of the European society, and more generally of modern societies, which are increasingly based on information and knowledge, that is:

Table 1. Overview of the digital competence framework

Dimension 1 Competence areas	Dimension 2 Competences
1. Information	1.1 Browsing, searching and filtering information 1.2 Evaluating information 1.3 Storing and retrieving information
2. Communication	2.1 Interacting through technologies 2.2 Sharing information and content 2.3 Engaging in online citizenship 2.4 Collaborating through digital channels 2.5 Netiquette 2.6 Managing digital identity
3. Content creation	3.1 Developing content 3.2 Integrating and re-elaborating 3.3 Copyright and licenses 3.4 Programming
4. Safety	4.1 Protecting devices 4.2 Protecting personal data 4.3 Protecting health 4.4 Protecting the environment
5. Problem solving	5.1 Solving technical problems 5.2 Identifying needs and technological responses 5.3 Innovating and creatively using technology 5.4 Identifying digital competence gaps

- To build workforces which have ICT skills to handle information and are reflective, creative and adept at problem-solving in order to generate knowledge,
- To enable citizens to be knowledgeable and resourceful so they are able to manage their own lives effectively, and are able to lead full and satisfying lives,
- To encourage all citizens to participate fully in society and influence the decisions which affect their lives,
- To foster cross-cultural understanding and the peaceful resolution of conflict.

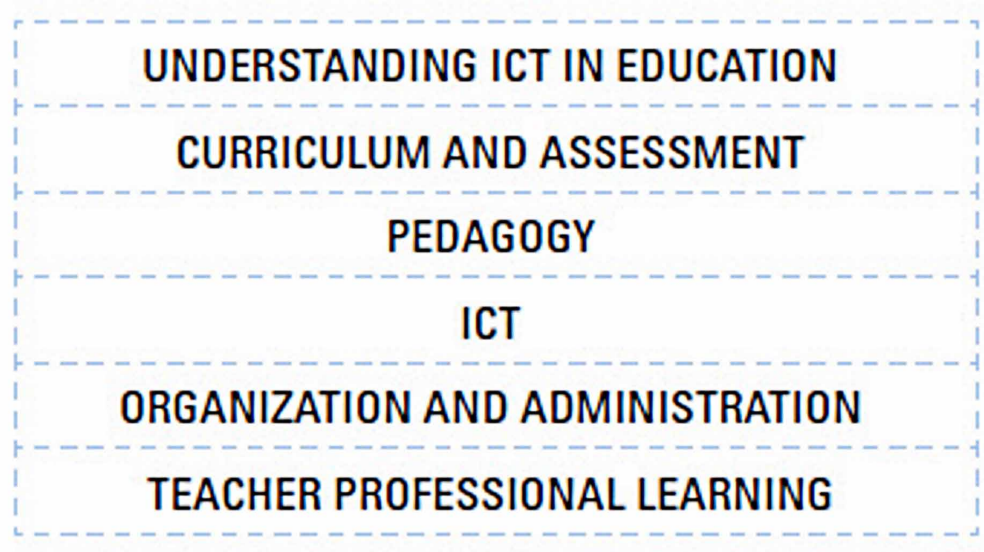
The UNESCO, while working on the same target, decided to focus on the teachers to induce changes and improve the qualities of country's educational systems. In the UNESCO aims there was the belief that teachers need to be equipped to achieve the above goals, so that UNESCO, in partnership with industry leaders and global subject experts, has created an international benchmark which sets out the competencies required to teach effectively with ICT: the UNESCO's ICT Competency Framework for Teachers (UNESCO, 2011).

UNESCO's Framework emphasizes that it is not enough for teachers to have ICT competencies and be able to teach them to their students. Teachers need to be able to help the students become collaborative, problem solving, and creative learners through the use of ICT so they will be effective citizens and members of the workforce.

As a consequence the main elements which have been considered in the ICT competency framework for teachers are the ones reported in Figure 1.

The framework is arranged in three different approaches to teaching (three successive stages of a teacher's development). The first is Technology Literacy, enabling students to use ICT in order to learn more efficiently. The second is Knowledge Deepening, enabling students to ac-

Figure 1. Elements to be considered in the UNESCO ICT competency framework for teachers



quire in-depth knowledge of their school subjects and apply it to complex, real-world problems. The third is Knowledge Creation, enabling students, citizens and the workforce they become, to create the new knowledge required for more harmonious, fulfilling and prosperous societies. Figure 2 synthesizes the main features of the framework.

On the wake of the discussions reported until now the editorial management board of the International Journal of Digital Literacy and Digital Competence thought that the time for a call for papers devoted to teachers had come, and a special issue investigating in more detail the nature of the barriers that still prevent the acquisition of adequate digital literacy and competences by teachers, whether existent, could be done.

Figure 2. Structure of the ICT competency framework for teachers

THE UNESCO ICT COMPETENCY FRAMEWORK FOR TEACHERS			
	TECHNOLOGY LITERACY	KNOWLEDGE DEEPENING	KNOWLEDGE CREATION
UNDERSTANDING ICT IN EDUCATION	Policy awareness	Policy understanding	Policy innovation
CURRICULUM AND ASSESSMENT	Basic knowledge	Knowledge application	Knowledge society skills
PEDAGOGY	Integrate technology	Complex problem solving	Self management
ICT	Basic tools	Complex tools	Pervasive tools
ORGANIZATION AND ADMINISTRATION	Standard classroom	Collaborative groups	Learning organizations
TEACHER PROFESSIONAL LEARNING	Digital literacy	Manage and guide	Teacher as model learner

The main questions to be answered by the contributions submitted to the editorial board could be synthesized as follow (without excluding possible other questions):

- Under which pedagogical perspective should teachers' acquire digital literacy and competences and use them daily into the schools, to let students embrace a systemic and collaborative vision of problems?
- How teachers' digital literacy had to cross over and through other literacies and account for cultural issues, social contexts and peculiarities of the knowledge domain?
- How could people take advantage of the digital skills and competences that teachers usually acquire during their daily life – like those involved in the use of smart phones and social networks - and transfer them into schools settings, practices and processes?
- How decision and policy makers would take care of the training needs of educators and teachers and concretely support the acquisition of adequate technological, methodological and managerial skills?
- How teachers' digital literacy and competences would interact with the maturity level of the structures they operate in (schools and learning eco-systems at large) and, more generally, would influence their transformation?

The call has had good answer and many papers have been collected, so that there will be more issues in the journal focusing on the problem of teachers digital literacy and competence.

In what follows a snapshot of the contributions reported in this issue is illustrated. In the paper by A. Antonio and D. Tuffley (Bridging the age-based digital divide), the need for the overcoming of the possible exclusion from the knowledge society of elders and rural populations is discussed. The results of a pilot study exploring the perceived digital literacy skills of a group of adults in a rural community are reported and it is shown that, despite the relatively low confidence levels reported by the participants, they are keen to learn how to use digital technologies. As a conclusion the need for the development of pedagogical strategies for teaching digital literacy skills to older adults, particularly those living in rural and remote areas, is presented.

In the paper titled "Mind the gap: digital practices and school" by E. Ferreira and others, the results from the project Net Children Go Mobile in Portugal are reported, and the gap between digital practices and school is analyzed. Among other results it is showed how the digital gap between the culture of the school and the culture of children's lives outside school is not about having more access to technology or more ICT training, it is essentially about having the competence of using critical thinking and a diverse set of skills in digital practices. The authors also discuss how the school has an urgent and decisive role to promote digital literacy and to prepare young people to adapt to a changing world.

In the contribution by A. Tavernise and others, titled "Implementing a new Class-Lab: guidelines for integrating innovative devices in pre-service teachers' practice", the positive effects of the integration of various multimedia teaching tools are discussed. It is reported that topics seems more interesting, learners look more motivated and feel that media provide them an advantage over the students in a traditional setting. In the study the authors discuss a case study on the integration of different technologies, involving a new advanced setting, by which teachers can interact with diverse specific technologies. More specifically, in this technology-enhanced environment, pedagogical agents in a virtual world, touch-screen technologies, and robotics are combined in order to make enjoyable the acquisition of technological skills, and the evaluation of the opinion from the pre-service teachers' involved in the experiment are discussed.

At last the paper by C. Petrucco and V. Grion, titled "An exploratory study on perceptions and use of technology by novice and future teachers: more information and less on-line col-

laboration?” is presented. The article discusses the factors that affect the choice of teachers to integrate technology in their teaching and presents the results of a questionnaire administered to 805 teachers attending professional development training courses in the Region of the authors (Northern Italy). The study reveals how teachers still have little consideration for the potential of interactive and collaborative technology, preferring to use technology for searching information and materials rather than for discussion and participation in on-line communities with their peers, in order to improve their teaching and constructing a collaborative style of working to share knowledge. The study also confirms the findings in the literature about the factors (internal and external) affecting the decision of integrating digital technology in education and proposes specific training activities useful to remove them.

Antonio Cartelli
Editor-in-Chief
IJDLDC

REFERENCES

European Commission. (2013). *DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe*. Retrieved from <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/digcomp-framework-developing-and-understanding-digital-competence-europe?search>

European Parliament. (2006). Recommendation 2006/962/EC of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning [Official Journal L 394 of 30.12.2006]. Retrieved from <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=URISERV:c11090&from=EN>

UNESCO. (2011). *Unesco ICT Competency Framework for Teachers*. UNESCO, Paris. Retrieved from <http://www.unesco.org/new/en/unesco/themes/icts/teacher-education/unesco-ict-competency-framework-for-teachers>