# Practices, training and skills needs of digital teachers. A comparative research

Maria Chiara DE ANGELIS[1], Emanuela PROIETTI[2], Stefania CAPOGNA[1]

[1]*Link Campus University, Roma (RM)*

[2] *Università degli Studi Roma Tre, Roma (RM)*

## Abstract

*The European Commission (2013) recalls the educational agencies to a great challenge: developing appropriate digital skills in learning-teaching practices through lifelong wide learning policies, aimed at recovering the digital gap in comparison with the international players, which hold the leadership in this sector. With the reviewed European framework Key competences for lifelong learning (2018), the European institutions underline the need to develop attitude and skills throughout life, so that citizens can have a personal development and an active participation in society, but, above all, to face demands of an ever-changing world of work. The essay intend to review both social and organization innovation and pedagogical-methodological approaches. The essay is part of a wider qualitative and quantitative research realized by Universities and VET providers participated in research, coming from Italy, England, Finland, Romania and Spain. It focuses on the most important results gathered by an exploratory comparative survey, concerning practices, training and skills needs of teachers.*

Keywords: Digital Innovation, ICT, Learning And Teaching Process, Educational Agencies, Digital Skills

## Introduction

The rapid evolution and digitalisation of society means that schools are having to adjust the ways in which they communicate with and teach students. Teaching methods and practices are having to adapt to these changes and must take into account how important technology is for the younger generations. These "digital natives" (Prensky, 2001) require technology to be part of their learning process and this means there is a growing stronger need for teachers to increase their digital awareness. In the past, Information and Communication Technology (ICT) education and training facilities and teaching staff have typically had "technology" and "incorporating" approaches, with the result that teachers appreciate and use technology, but rarely bring it into class. In recent years, there has been a growth towards a more intrusive breakdown of traditional teaching schemes, in particular with small scale interventions. To this extent, the essay intends to review both social and organization innovation and pedagogical-methodological approaches.

The essay is part of a wider qualitative and quantitative research realized by Universities and VET providers, coming from Italy, England, Finland, Romania and Spain.

In this essay, we focus on the most important results gathered by an exploratory comparative survey which aimed: to detect experiences, training and skills needs of teachers involved (with the purpose of detecting strengths, areas for improvement and development prospects, encouraged by the changes observed in the new educational paradigm, through a multi-dimensional and multi-perspective approach); to reconstruct the digital innovation trend in educational agencies (meso level), supporting the accompanying demands of educational agencies.

Survey questions arise around four main issues: what is the daily practice of teaching in relation to the technological equipment provided by the school? How does the use of technologies and personal resources in daily professional practice and teaching work? What is the state of the experience and skills most widely used today among our teachers? What are the most relevant practices carried out?

For this purpose, it was designed a structured questionnaire which represents a so-called standard detection technique among the most prevalent in social research. This involved a long process of processing the applications to guarantee simplicity, adequacy, clarity, uniqueness.

The questionnaire is organized around five thematic macro-sections, with questions aimed at taking a socio-demographic profile, practices, attitudes and beliefs of teachers involved: school data; teachers profile; teachers practice in ICT, with a specific focus on use of digital tools and technologies in teaching and learning process; training needs of teachers, with a specific section dedicated to the self-assessment of the teacher's digital skills according to the DigCompEdu Framework; personal opinion of teacher in relation to the use of ICT in teaching and professional practices.

## State of the art

The development of Internet and its widespread penetration has profoundly changed every dimension of our public and private life, from work (Accornero, 1997; Cocozza, 2014), to affective relationships (Sennet, 2001); from communication (Boccia Artieri, 2012; Morcellini, 2013), to our perception of time and space, to the way we innovate and produce knowledge (Foray, 2006).

The sharing and communication systems made possible and disseminated by the network are presented as high-socio-relational technologies, which redefine the space-time dimension and set the stage for new opportunities for progress.

This research stems from the basic conviction that only starting from an awareness of the real state of the art of digital practice at school it is possible to act in a perspective of improvement and accompaniment of teaching professionalism in its relationship with digital use in daily educational practices. The aim is to understand if, and in what way, digital innovation is integrated in teaching practices that participate in the construction of that "organizational texture" (Cooper, Fox, 1990; Gherardi, 2006), identifiable with the whole of people, practices, objects, technologies, emotions, rituals, through which the actors create, unveil and share knowledge every day.

The concept of texture expresses the complexity that characterizes every organization and refers to the more fluid and immaterial aspects, which constitute the social reality of the organization made up of values, multiplicity of objectives and belonging, within which the actors share objects, values, visions, practices and emotions (Gherardi, Strati, 1997). Here then, the basic assumptions - which are the background of the work - are the concepts of practice, artefacts, beliefs and emotions.

Social changes and digital skills are not limited to technical aspects, but are extended to cultural ones, so it is essential to create the awareness necessary to face the changes generated by digital technologies. This principle also applies in the educational field.

The objective of the research is to understand the "translation in practice" (Callon, 1975; 1984; Latour, 1987; 1999), at national level, of the digital innovation process, so supported by European policies (OECD, 2013). The incipit of the work starts from the refusal of all sorts of technological determinism to recognize the centrality of the human factor and the complexity of dynamics, which accompany every process of "translation in practice" in the encounter between subjects and objects. This last one animates the space of "socio-material interactions" (Landri, Viteritti, 2010; Pinch, Bijker, 2003; Sørensen, 2009), characterizing every organizational learning and innovation process. With a blended approach, qualitative and quantitative, the research has tried to retrace the complex techno-social dynamics, which characterize this transformation process.

## Methodology

In a first phase, Link Campus University proposed a Codebook for national quantitative research for elaboration and sharing same indicators research aimed at identifying experience, skills and training needs of teachers, in all countries involved. Each country conducted a national research, through an online survey platform, shared to allow the comparison of national trends. The field research involved partner countries from March 2018 to May 2018. The analysis of data concerned complete cases only, i.e. consider only questionnaires totally filled in. This has to be done in order to make all comparable across questions. The survey involved school teachers of all levels.

It is likely that those who participated in the survey are self-selected towards a positive propensity to use the technologies because the contact was done via telematic means (social networks, institutional mailing lists and public contacts available on the network) and participation was done through surveys

online. It is also necessary to read the data, considering the specificities of each partner - Universities and VET providers - and the consequent possibility of reaching and involving a specific target of teachers.

Furthermore, in some cases some response options vary from country to country, always taking into account the cultural background of reference.

The analysis, therefore, carried out can be considered a quantitative exploratory analysis. Therefore, it has no claim of statistical representativeness. Moreover, these values should be interpreted with care since they are influenced by countries' specific contexts and trade-offs. In education, there is often no simple most- or least-efficient model: data able to explain if, and how, digital technologies are incorporated into teaching; this can be considered a useful contribution to be read in terms of trends and possibilities.

## Results and discussion

The online survey involved 2652 teachers for any level or kind of school, so distributed: 366 FIN, 693 ES, 937 IT, 255 UK and 401 RO. Among those who have compiled the entire questionnaire, they are from: Spain/Catalonia: 425; Italy: 776; Romania:  291; UK: 255; FI: 291).

The groups of teachers belong to four school types: Secondary school, VET, Primary and Early. The majority of teachers who participated at survey belong to VET (61%) and Secondary (37%).

The characteristics of participants are as follows: female gender are more represented, and have an age comprised between two ranges: 41-50 and 51-60; except for English respondents who are represented by a higher percentage of male teachers (59%). 58% aged between 31-40 years and 19% 41-15 years.

The age of the subjects confirms what emerged by Eurydice research on statistical sample studied.

The data are congruent with the profiles of teachers emerging from the results of TALIS research (2013): most of the teachers are women and the age is included in the range observed by this survey for all the nationalities involved. The highest percentages of female respondents are Romanian teachers (female: 90.7%, male 9.3%).

The most represented teaching areas are Literacy, Numeracy and Science. English teachers have a representation of 12% for the following disciplines: Literacy by 17%, Numeracy-related teaching by 16%, PSHE, Special Education and Learning approaches by 12%. Romanian teachers respondents are represented by the following disciplines: Science 35%, Social Science 21,3%, Numeracy 17,2% and Literacy with 16.2%. Catalan teachers who participated at the survey are represented by these disciplines: Literacy 34,4%, Science 33,4% and Numeracy with 27,1%. Finnish teachers works in these disciplines: Arts 37,05%, Science 35,84%, Physical Education 34,04%. Italian teachers are represented by the following disciplines: Literacy 30,7%, Science 29,6%, Numeracy 29,1% and History 24,9%.

Employment contracts are mainly permanents (about 90%), except for Catalan teachers, who are present with a lower percentage (63.8%). The data confirm the findings in the previous research TALIS research for Italians (81,5%), Finnish (82%, TALIS 76.9%), English teachers (93%-93,6% TALIS),  but not for Catalans (63,8%, TALIS 81,7%) and Romanians (92.8%, TALIS 69,5%).

In all surveys, the teacher's role is represented by high percentages around 95%, while for Finnish respondents is represented by 75%. The role of the Digital Coordinator is generally poorly represented, especially for English respondents who are represented by 3%, while Italian teachers by 29.8%, Romanian by 20.3%; Finnish by 13% and Catalan by 11.8%.

Starting from the national SWOT analysis a transnational one is proposed (Figure 1). It considers all common emerging elements and interesting issues from the data analysis, which can have a relevance at national level for all the countries involved.
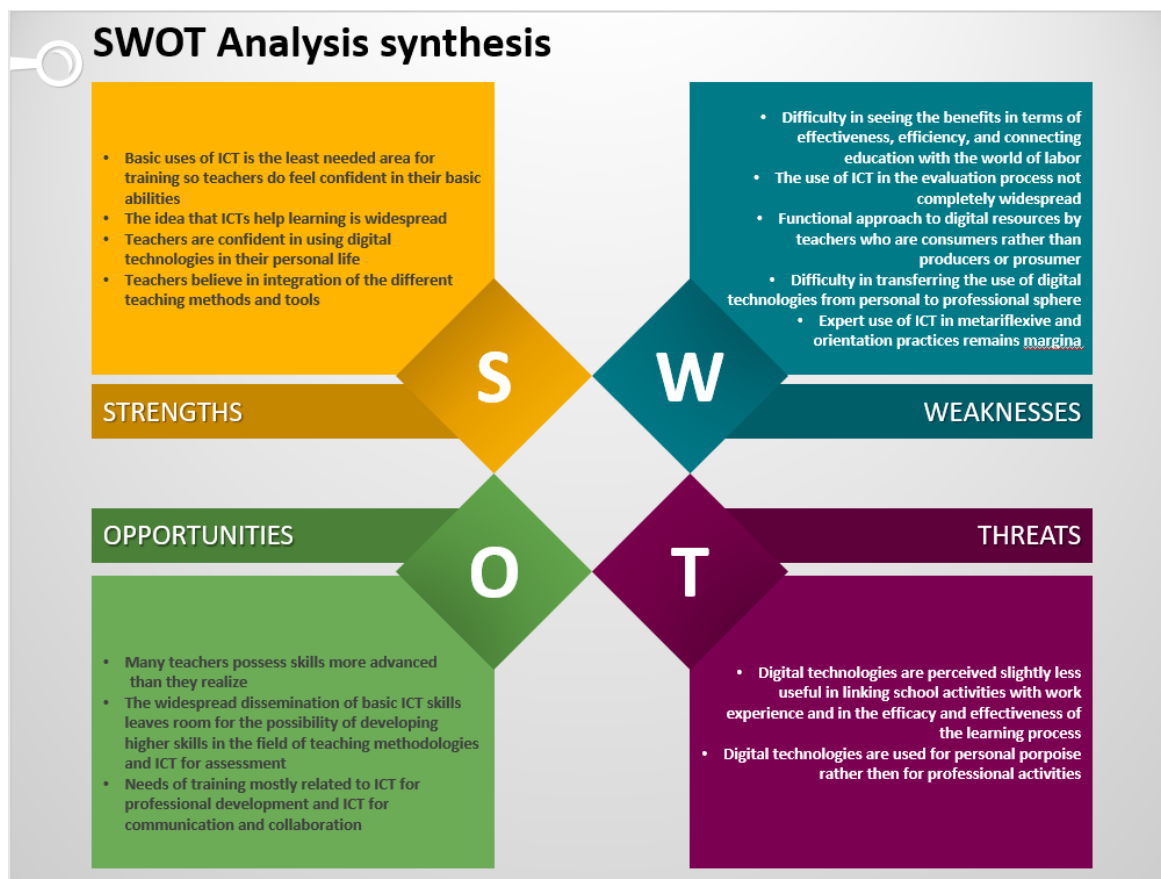
**Figure 1** – Swot Analysis synthesis

Without any claim of representativeness and generalization, the research results offer important and interesting ideas; also taking into account the initial bias due to the fact that teachers have participated freely in the online survey, introducing, presumably, an element of distortion that can be explained by a positive propensity to use digital in the educational field.

The first aspect to note is that - in a transverse way to the different national contexts, despite cultural differences, regulations and dissimilarities, which distinguish the educational systems of the partner countries - dynamics, trends and critically applicants are observed, as already revealed in the phase of qualitative research. The explorative quantitative survey of which it gives account in the present report confirms that experimentations and virtuous experiences and innovation are distributed to leopard spot in different territories and collide, in general, with common problems and widespread, which transcend the national border.

In answering the initial questions, regarding the first point (the daily practice of teaching in relation to the technological equipment provided by the school), the data show a sort of polarization of the practices among those who, faced with a certain degree of awareness, competence, been able to stimulate the creative work of students through online applications, and those who, showing a lesser mastery of use, let an approach still emerge broadly transmissive. An approach in which digital tools are used to replicate a traditional teaching model than to promote a student-centered learning logic. Participants in this survey show a largely positive view of the contribution that digital technologies can give to teaching in enhancing students' basic skills; in fostering in them the development of a responsible approach, but also in activating virtuous learning processes and self-evaluation processes. However, there are those who highlight the risks associated with the improper use of these tools (for example, cyberbullying or distraction).

With respect to the second point (use of technologies and personal resources in daily professional practice and teaching work), research confirms a positive view respect to the usefulness of digital

technologies in teaching, but, at the same time, it records a difficulty of teachers to transfer automatically the practical knowledge acquired in the extracurricular experience.

In this case, the phenomenon appears to be distributed evenly without letting any particular differences between the partner countries. On the other hand, the relevance of the professional community in guiding and supporting tertiary socialization paths can be glimpsed within which to develop new perspectives for action and new areas of expertise. The prevalence of individual experience through which the professional practice is represented and the paths of development of digital competence show the strength and persistence of a social/community based on the analogue dimension, where digital represents an alternative that, although valid under many aspects, exhausts to be incorporated into the relationship and construction processes of a renewed professionalism. In this path, absolutely non-linear, we perceive lost subjectivity when it seems to lack a professional community with which to share the weight of choices and strategies located in the context of belonging, as neither the disciplinary nor departmental dimensions seem able to support the change in act.

In relation to the third point (most widespread experiences and skills among teachers), there are two tensions that coexist, leaving pockets of more or less diffused resistance emerging that is based on a certain difficulty in interpreting and adapting the change that has taken place. The tension exists between exploitation and exploration (Holland 1975; Cyert, March, 1963; March 1991), showing a tendency to adapt the strategies and established practices (exploitation) on one side, and an attempt to experiment innovative solutions and develop new skills (exploration) on the other. Also in this case, the absence of an accompaniment system, which is able to provide new explanatory keys to the teaching professionalism, seems to emerge in a transversal manner. The teacher who is confronted with the potential offered by the network is asked more and more to abandon the role of speaker for that of tutor, mentor, coach; a role that requires new and more complex skills of a design, managerial, evaluative, communicative, relational and empathic nature, as well as the self-evaluation system used as reference highlights. But the analysis of the online training clearly shows that in all countries this is a terrain where the teacher is alone and forms self-socialization paths played mostly outside formalized contexts and paths.

Finally, regarding the last point (most relevant experiments carried out), with respect to teaching innovation spaces, it is confirmed that, while appreciating and using technology, many teachers are struggling to bring it into the classroom (OECD, 2013a: 2013b). This means that in spite of the easy access and use to various types of digital equipment, which are represented according to the category of the French sociologist Bourdieu (1980) the objectified capital available, these resources are not automatically translated into cultural capital for educational use, therefore incapable to bring real added value to educational practice.

## Conclusions

It seems possible to summarize the outcomes of the survey in some transversal priority elements: the absence of a stable digital policy at national level capable to direct educational institutions towards a new model of school; the persistence of episodic and localized approaches that are struggling to be valued in a systemic logic; the difficulty in addressing the issue of digital introduction in teaching in terms of planning and organization; the difficulty in intercepting and enhancing that nucleus of innovative teachers capable of doing research and experimentation, critically questioning the use of technologies for educational purposes.

In conclusion, the evidence emerged reveal the difficulty for teachers to interpret and integrate the opportunities offered by digital technologies in the educational context where we observe the permanence of a predominantly transmissive teaching orientation that direct/guide the use of digital technologies in an instrumental and practical way compared to the object of knowledge.

## References

Accornero, A. (1997). *Era il secolo del lavoro*. Bologna: Il Mulino.

Boccia Artieri, G. (2012). *Stati di connessione*. Milano: Franco Angeli.

Bourdieu, P. (1980). *Le Sens pratique. Structures, habitus, pratiques*. Éditions de Minuit, Paris. Trad. it. (2005). Il senso pratico. Roma: Armando Editore.

Callon, M. (1975). *L'opération de traduction symbolique. Incidence des rapports sociaux sur le développement scientifique et technique*. Paris: MSH.

Callon, M. (1984). *Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay*. The Sociological Review, Vol. 32 (1), pp. 196-233.

Carretero Gomez S., Vuorikari R., Punie Y. (2017). *DigComp 2.1: The Digital Competence Framework for Citizens. With eight proficiency levels and examples of use*. Luxembourg: Publications Office of the European Union.

Cocozza, A. (2014). *Organizzazioni. Culture, modelli, governance*. Milano: Franco Angeli.

Cooper R., Fox S. (1990). *The texture of organizing*. Journal of Management Studies, 27 (6).

Cyert R., March J. (1963). *A Behavioral Theory of the Firm*. Englewood Cliffs, NJ: Prentice-Hall.

European Commission (2010). *A Digital Agenda for Europe*. COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. Brussels, 19.5.2010. COM(2010)245 final.

European Commission (2013). *Adult and continuing education in Europe. Using public policy to secure a growth in skills*. Luxembourg: Publications Office of the European Union.

European Commission (2018). *COUNCIL RECOMMENDATION of 22 May 2018 on key competences for lifelong learning (Text with EEA relevance) (2018/C 189/01)*. Official Journal of the European Union.

Foray, D. (2006). *L'economia della conoscenza*. Milano: Il Mulino.

Gherardi S. (2006). *Organizational Knowledge: The Texture Of Workplace Learning*. Oxford: Blackwell.

Gherardi, S., Strati, A. (1997). Il tessuto organizzativo di un dipartimento universitario. In Moscati R., *Chi governa l'università?* Napoli: Liguori.

Holland, J. H. (1975). *Adaptation in Natural and Artificial Systems*. Ann Arbor, MI: University of Michigan Press.

Landri, P., Viteritti, A. (2010). *Tracing socio-materiality in education. Paper for Conference Theorising Education*. First International Theorising Education Conference, Stirling Management Centre, University of Stirling, UK, June 24-26.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Cambridge: Harvard University Press, MA.

Latour, B. (1999). *On recalling Ant*. The Sociological Review, *47* (1_suppl), 15–25. Oxford: Blackwell Publishers.

March, G. J. (1991). *Exploration and Exploitation in Organizational Learning*. In Organization Science, Vol. 2, No. 1, Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March (1991), pp. 71-87.

Morcellini, M. (2013). *Comunicazione e media*. Milano: Edea.

OECD (2013a). *An International Perspective on Teaching and Learning. TALIS 2013 Results*. Paris: OECD.

OECD (2013b). *Education at a Glance 2013: OECD Indicators.* Paris: OECD.

Pinch, T.F., Bijker, W.E. (2003). The Social Construction of Facts and Artifacts. In Scharff R., Dusek V. (edd.). *Philosophy of Technology: The Technological Condition: an Anthology*. Malden: Wiley-Blackwell, pp. 221-232.

Prensky, M. (2001). *Digital Natives, Digital Immigrants, Part II: Do They Really Think Differently?* On the Horizon, 9(6), 15-24.

Redecker C., Punie Y. (2017). *European Framework for the Digital Competence of Educators. DigCompEdu*. Luxembourg: Publications Office of the European Union.

Sennet, R. (2001). *L'uomo flessibile*. Milano: Feltrinelli.

Sørensen, E. (2009). *The Materiality of Learning Technology and Knolewdge in Educational Practice*. Cambridge: Cambridge University Press.