Digital Competences in the Educational Sphere
A Case Study From Italy

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Abstract *Digital skills are one of the most contested key competences in the educational sphere. On the one hand, they have become essential to guarantee standards of educational quality and progress, on the other hand they tend to further hamper educational inequalities among the contemporary highly-diversified student population.*
This paper ties into these premises with a case study located in Turin, Italy based on 19 teachers and educators from all school levels (primary, lower-secondary and upper-secondary education) to highlight the transformation of needs and challenges related to the different phases of the life cycle of students.
Three main issues were investigated from a comparative perspective among the study participants: (1) the coherence of their knowledge regarding opportunities and the challenges of digitalization; (2) their skills to implement digital instruments in their working context; and (3) their attitude towards the transfer of potential benefits that enhance learning outcomes through digital instruments.
Findings suggest that high-quality and effective staff formation represents one of the most critical issues when talking about digitality in the educational sphere. A chronic lack of time for training, the ongoing work in emergency conditions, the heterogenous institutional endowment with technical devices (PCs, digital infrastructure, etc.), and the suspicion towards the benefits of digitality in the classroom are some of the major barriers to the forwarding of digital competences as a set of skills, knowledge and attitudes within the educational context.

Keywords *Digital Gap; Teacher Training; Peer-to-peer Education; Cooperative Learning; Lifelong Learning Competencies*

1. Literature Review, Scientific Debate and Public Policy

The issue of digital competence is of growing interest for public policy as their possession confers very useful qualities and characteristics, both individually and collectively, and thus qualifies as one of the new possible declinations of the broader theme of inequalities. The European Recommendation of 23 May 2018 on lifelong learning introduced digital competence as a basic skill that European citizens should be equipped with. The very recent DigComp 2.2 European framework (which inherits and incorporates the previous DigComps from 2013 onwards) has taken this approach further and recalls the need for educational policies to train people how to exercise active citizenship, both in a traditional and a digital sense. DigComp 2.2 also revises the concept of digital competence in five areas: literacy, communication and cooperation, digital content creation, security, and problem solving.

The scientific community and European policies share the meaning of digital competences as a universe of technological skills (Save the Children, 2021), made up of a hard aspect (digital hard skills) and a soft aspect (digital soft skills), that range accordingly from practical skills (such as using a computer, accessing and using a connection, mastering the various devices) to relational and character skills. The latter allows an effective, aware and responsible use of digital tools, and accordingly involves all areas in which these skills can be deployed: digital identity, digital use, digital safety, digital security, digital emotional intelligence, digital communication, digital literacy, and digital rights. What has inspired European directives, recommendations and guidelines over the last twenty years has been the idea that educational credentials are at the heart of a process of cultural construction of the European space, and that lifelong learning, based on knowledge and competences, is the only effective tool for active citizenship, greater inclusiveness, and improved employability.[1]

Moving now towards a reflection upon social practices, despite the immersive condition present in the technologies that pervade the biographies of adolescents, even the generation of digital natives is in reality neither as technologically aware as one would expect, nor are they subject to specific training

1 See the Council Recommendation of 22 May 2018 on key competences for lifelong learning; the Council Recommendation of 22 May 2018 on promoting common values, inclusive education, and the European dimension of teaching; and the Council Recommendation from 28 June 2011 on policies to reduce early school leaving.

in formal, informal and non-formal educational contexts. In fact, we can witness scientific awareness of the difficulties that digital natives encounter in the processes of identity definition, socialization (Pellai, 2018) and in the development of socio-emotional and character skills (Maccarini, 2022). In this regard, the 'spoon and tablet' metaphor has been used (Prensky, 2001) to indicate a socialization process in which growth spurts are measured both through the use of common objects (the spoon) and through the mastery of technologies of information and communication with the related devices. What is important to point out is the fact that the condition of digital natives neither cancels any possible digital divide, nor does it automatically render the individuals themselves necessarily digitally competent.

There is extensive evidence that inequalities in the use of technologies are linked to birth cohort, social and ethnic origin, and gender (Hargittai, 2002, 2004; Di Maggio et al., 2004; Pirone et al., 2008; Ala-Mutka, 2011; Lythreatis, 2022), but inequalities in the development of digital competences also exist among those who were born in a society steeped in technology – digital natives. For these reasons, we no longer speak only of a digital divide but of digital inequalities in a broader sense (Di Maggio et al., 2004; van Dick, 2005; Argentin et al., 2013). Digital competences retain an impact on educational processes, training and learning and are, therefore, in continuous exchange with other key competences. Their acquisition, development, reinforcement, and updating also constitute an effective tool to counteract digital educational poverty (Pasta & Rivoltella, 2022; Marangi et al., 2023; Gui, 2009), to be understood not only as the availability of devices and access to the net, but as the possession of new literacies necessary in the post-medial society. In a more specific focus, digital is one of the most contested key competences in the educational sphere (Green, 2014). However, the very concept of competence requires elucidation. The competence set on which the eight key competences indicated by the European Union are built consist of three elements: knowledge, skills, and attitudes.[2] Whereas *knowledge* refers to the set of concepts, facts, ideas, and theories that are already established and shared and which support learning and understanding processes, *skills* points to those competences necessary to achieve results using previous knowledge. Finally, the competence *attitude* translates into dispositions and beliefs to act and react to ideas in interactions with other social actors and in different situations.

2 See more at: https://education.ec.europa.eu/focus-topics/improving-quality/key-competences.

The relevance of digital competences has been pronounced in different areas. On the one hand, they have become essential to guarantee standards of educational quality and progress as specified in the 2021–2027 Digital Education Action Plan at European level and in the National Plan for Digital Schools for the Italian context. Moreover, they are crucial skills in the labour market. Indeed, according to the World Economic Forum's report "The Future of Jobs 2020", nine out of ten jobs in 2030 will require advanced digital skills, but 44 % of the European population aged 16–74 have low digital skills and 19 % have none (World Economic Forum, 2020). The Digital Economy and Society Index (DESI, 2022) shows that four out of ten adults lack basic digital skills. Furthermore, according to the same source, girls/women are little represented in tech-related professions and studies, with only one in six ICT specialists and one in three science, technology, engineering, and mathematics (STEM) graduates being women. Over 70 % of businesses have staff with inadequate digital skills.

The discussion on how to bridge the digital divide and enrich the skills portfolio of future workers obviously involves the fields of education (mainly compulsory) and vocational training courses (Kluzer et al., 2020; Barnes et al., 2017). In fact, the key role of learning digital skills during compulsory schooling has been emphasized in many quarters, resulting in the revision of teaching programmes and the updating of the teaching profession itself (Instefjord & Munthe, 2016; CECE, 2017).

In this framework it becomes important to clarify the relevance of the 'digital' issue in relation to ascribed and acquired variables. The topic is in fact relevant for public policy in general (and for educational ones in particular) as the digital gap constitutes one of the most pressing contemporary challenges: A gap related to birth location, gender, employment status, and social class (Hippe & Jakubowski, 2022; Barboutidis & Stiakakis, 2023).

Each of these elements is the subject of specific policies, highlighting broad, diverse investment in the development, updating and enhancement of the digital skills of all citizens (Ferrari et al. 2013; OECD, 2016).

The reason, however, that leads one to dwell in particular on digital natives stems from the fact that, in spite of their immersive condition in Internet technologies which characterizes their biographies, they are often not very aware of the risks and potential of technology: They possess a low level of critical thinking regarding sources and content conveyed by new media, and have a low awareness of ethical implications related to the use of social media and the Internet in general (Gkioulos et al., 2017; Fabbri, 2020). Furthermore, digital natives encounter difficulties in the processes of identity definition, social-

ization (Pellai, 2018), and the development of socio-emotional and character competences (Maccarini, 2022).

That schools are directly involved in this social transition (towards the pervasiveness of technologies in education, in society, in services, in welfare, and at work) and are faced with new educational, curricular, and relational challenges is beyond doubt. School is the place where learning, mostly in a certified manner, comes to fruition, both of cognitive curricular skills (defined by teaching programmes and certified by credentials and marks) and of normative relational skills (deriving from secondary and normative socialization), and finally in relation to social and emotional skills.

Another crucial point, at the centre of national and European public policies, concerns the school-to-work transition. In society 4.0, the nexus between training and work is, even more than in the previous information society (Castells, 1996), a central element to prevent inequalities from increasing and to succeed in equipping young people with the knowledge and skills needed for the labour market (Brunello & Wruuck, 2019). Schools are accordingly at the centre of attention (and severely judged) when it comes to the training of young people, rendering them potentially attractive to businesses, service agencies, and international/national/local productive firms. But they are also guilty of failing to prepare their teachers to face the latest knowledge challenges, remaining anchored in outdated educational methods (Argentin et al., 2013; Ranieri, 2022; Cortoni, 2021). And this is particularly relevant in the Italian context (Esposito & Scicchitano, 2022). Indeed, as Unioncamere (Italian Union of Chambers of Commerce) data (2020–2025 scenario) shows for Italy, there has been an increase in the demand for digital, STEM, and innovation 4.0 skills, which employers require with an e-skill mix (the possession to a high degree of at least two e-skills), with an estimate of between 886,000 and 924,000 staff units. Regarding digital skills, both existing and new emerging professions will be in demand, such as those of data scientist, big data analyst, cloud computing expert, cyber security expert, business intelligence analyst, and artificial intelligence systems engineer.

This chapter ties into this overall premise with an Italian case study to highlight the transformation of needs and challenges related to the different phases of the life cycle of students, from primary school to upper-secondary school, in a period characterized by the post-Covid aftermath and highly heterogeneous educational contexts. These feature a high number of students regardless of their socio-cultural, religious, ethnic, and economic backgrounds who have had a heterogeneous range of teachers and educators with regard to age,

gender, experience, training and, therefore, very differentiated didactic and methodological traditions and attitudes towards learning. This first section has just set the contextual scene; in the following chapters we will present the case study (section two) and the findings (section three) that will be concluded with a summary and suggestions for further analysis.

2. The Case Study

The research was conducted within the framework of the Horizon 2020 project named KIDS4ALLL (Key Inclusive Development Strategies for LifeLong Learning) which aims to foster the development and implementation of the eight lifelong learning key competences in fifteen participating partner institutions from eleven EU and non-EU national contexts. The basic assumption of the project is that every individual should have access throughout their life to high-quality, inclusive education, as well as to qualification and retraining opportunities[3] that contribute to the building of key competences. This objective concerns all levels of education and training, but particularly involves certain categories of learners, who are more fragile and exposed to skills deficits, obsolescence or inadequacy. These categories include both students with a migratory background[4] and those with individual and family fragility factors (mainly linked to the possession of different capitals: social, cultural, human), from which the phenomena of early school leaving, poverty and social exclusion, and NEET (i.e. Not in Education, Employment or Training) situations may result (di Padova & Nerli Bellati, 2018).

The research for this contribution is operationally based on a model called inside a KIDS4ALLL project 'buddy collaboration', which provides for work in pairs or small groups (in a peer-to-peer manner) within formal, non-formal,

3 The Italian educational system distinguishes between "education, training and instruction" applied to compulsory (primary, lower and upper secondary school) and post-diploma study courses; it also provides for "qualification" to refer specifically to a process aimed at aligning future workers' knowledge and skills with the needs and demands of the labour market; to these are added specific professional updates and training modules.

4 This expression tries to overcome the contested labels of second-generations, see the European Migration Network Glossary: https://home-affairs.ec.europa.eu/networks/european-migration-network-emn/emn-asylum-and-migration-glossary/glossary/person-migratory-background_en.

and informal contexts aiming at knowledge and skills acquisition through apprehension and creative re-elaboration of learning contents related to the eight Life Long Learning (LLL) key competencies.[5] This study tested a method inspired by, but going beyond, the peer-to-peer orientation: It is a 'buddy method' in which pairs of students learn in an innovative way, using digital resources and a platform created ad hoc, the definitions and content related to one of the competencies indicated by LLL. They also acquire and revise these competences in a creative and original way, and then produce their own content and resources (textual, visual, audiovisual, etc.), which they pass on to other pairs of younger peers in a peer-4-peer process, with a pair of less experienced peers.

Focus groups and interviews were used to obtain participants' opinions of this method and obtain some useful information regarding educational policies.

In this framework, we developed a specific case study, located in the city of Turin. The data was retrieved from February to June 2021 from a total of 19 study participants (nine teachers, six educators, four transversal stakeholders) who were interviewed online in six focus groups (FG) and two interviews (I) (see Table 1).

Our research questions were formulated as follows:

a) Does the use of digital resources (the innovation by technologies at schools) promote the development of students' competencies in the in-school and out-of-school contexts?
b) Can the adoption of an innovative teaching-learning method that combines digital skills, collaborative skills, and creativity, applied to the development of specific lifelong learning skills, improve overall classroom outcomes and indirectly promote other student skills, both curricular and extracurricular?
c) Are teachers adequately trained in digital literacies so that they can bring truly innovative elements to their professional practice?

The participants of the focus groups were recruited through reasoned choice sampling that guaranteed the heterogeneity of perspectives starting from dif-

5 The KIDS4AIII project foresees that teachers and students use a platform with online resources for LLL competences, organized in learning units, and a synthetic manual presenting the same approach in paper and reduced form.

ferent education cycles (primary, lower and upper secondary), different territorial locations (urban, peri-urban, extra-urban) and finally diversified situations of hardship and fragility as an ethnic and social mix (Besozzi & Colombo, 2020).

The context in which the research was carried out offers an overview of various Italian metropolitan realities, in which compulsory schooling is characterized by investment in terms of cutting-edge projects and initiatives, even in the field of digital skills (Demartini et al., 2020). Furthermore, the city of Turin is recognized nationwide for its inter-institutional collaboration in promoting educational activities, as well as for a significant vitality and participation of civil society organizations (Davico & Staricco, 2019, 2020; Ricucci, 2020). For these reasons it can be used as a case study, with transferable elements to other contexts.

Table 1: Study Participants by Learning Context

Method	Learning context School level		Study participants	Notes
FG1	**FORMAL**	**Primary school**	4 teachers	From 4 primary schools in Turin city
(FG2)	**FORMAL**	**Upper secondary school**	3 teachers	From 3 different schools in Turin, 2 of which are vocational schools
(FG3)	**FORMAL**	**Lower secondary school**	2 teachers (former principals)	From different lower secondary schools in Turin
(FG4)	**NON-FORMAL**	**Association**	6 trained volunteers working with children enrolled in primary schools and pre-adolescents aged 11–14, and 1 educator	Turin urban associations

Method	Learning context School level		Study participants	Notes
(FG5)	NON-FORMAL	Parish club	3 Educators	All educators experienced Covid-related distance learning with students of different age groups
I1	NON-FORMAL	Association	1 Coordinator	1 policymaker
I2	NON-FORMAL	Association	1 Coordinator	1 policymaker
(FG6)	TRANSVERSAL	Psychologists	2 Psychologists	Both working with migrant children; thorough experience w/peer projects

The study sample has been composed and selected in accordance with several critical elements that emerged:

1. Teachers/educators working with students of a migratory background. The objective was to involve practitioners from formal and non/informal learning contexts as well as experts working transversally on issues that tackle the project contents. In accordance with the scope of the project, the investigation involved predominantly (but not exclusively) teachers and educators working and retaining long-standing experience in highly diversified formal and non-formal contexts (schools and associations) with an increased rate of students of a migratory background.
2. Formal context: school levels. The aim was to include all school levels (primary school, lower secondary education, upper secondary education) in order to cover all of the compulsory educational levels (in academic and scientific debates named as ISCED groups) which the project addresses. Accordingly, we set up three focus groups for each school level (primary, lower secondary and upper secondary), choosing, however, for upper sec-

ondary education, teachers from technical and vocational schools[6], as research in the local and national Italian context confirms that these school tracks or paths are preferably chosen and frequented by a high number of students with a migratory background, compared to the high school/grammar school tracks (Palmas, 2002; Cavaletto et al., 2015; Ricucci & Premazzi, 2020). The comparison with teachers and educators working with students of different ages, as it has been previously mentioned, had the purpose of highlighting the transformation of needs, critical aspects and challenges related to the different phases of the life cycle of students.

3. Non-formal context: associations. Also, socio-cultural indicators were considered for the selection of experts from non-formal contexts. Therefore, focus groups and interviews were conducted with highly significant institutions in the local Turin context that put the education of young people at the centre of their concern.

The collected data has been analyzed according to a grounded theory approach: Qualitative data software analysis has not been used due to the number of interviews and focus groups.

3. Findings

The results that emerged from this small-scale study provide an overview of the needs, methods and lacunae of digital skills and digitalization exemplified by the Italian educational context. Indeed, the study sample provided corresponding considerations and suggestions that have been categorized into three thematic areas, according to the research questions specified above. Below are the results for each of these points, highlighting suggestions for a further debate in the field and ideas regarding educational policies.

6 The Italian school system has three levels of education: primary schools (from 6 to 10 years), lower-secondary school (from 11 to 13 years) and upper-secondary school (from 14 to 19 years). The latter is divided into different types of pathways: high schools/grammar schools, vocational schools, and technical schools, with different curricular programmes, different users, and different social reputations.

Innovation by Technologies: The Challenge of a LLL Competencies Platform

The data collection highlighted several relevant issues. The first concerns the problem of the differences in school equipment, regarding PCs, tablets, connections, and digital infrastructure. The activities carried out in KIDS4alll included the use of digital resources (both the platform and the learning units and, more generally, access to online resources, especially with regard to the Peer-4-Peer phase). It was maintained that technology and thus digital means had to be promoted as instruments preceded and supported by a well-thought-out pedagogic strategy, treading the path of so-called pedagogy 2.0, which interweaves physical and virtual environments and is based on participation and sharing (Persico & Midoro, 2013; Riva, 2019), and also on adequate technological equipment. This first element provides a double clue: on the one hand, the technical equipment of schools is not always sufficient for the implementation of innovative pedagogical and didactic measures; on the other hand, its availability does not automatically equate to the ability to use it (an aspect that will be examined in more detail in section 3.3).

Furthermore, the educational needs of pupils vary by age and in relation to the school they attend. Digital literacy, indeed, is the result of a cumulative and critical process, realized both through the school levels and according to the abilities of the students in relation to their age. Collected data show that primary schools are the most difficult level of education for the introduction and adoption of technologies. The "It's never too early" approach (Cederna, 2017, p.25 ff.) clashes with the priority given to educational, emotional, and relational needs: In primary school the educational action focuses on behavioural, emotional, and social aspects, rather than on the use of devices and technologies. Focus group interviews presented us with the idea that primary school teachers are, furthermore, the most resistant in relation to the use of technologies, and possess fewer skills in this regard, and precisely for the aforementioned reasons: In this educational cycle the Italian system gives priority to the more relational and educational aspects. The result is also confirmed by stakeholders. This aspect, linked to the students' young age, is independent of the age of the teachers (in fact our sample had teachers of different cohorts), however united they may be by the fact that they are not digital natives. The lack of an early education process towards technologies (both at home and at school) among teachers produces a delay in learning, improving skills and knowledge, which are key in the current digital times.

In the opinion of interviewees, participation and the use of digital technology grows in lower secondary school and reaches the maximum level in upper secondary school; here, however, there is a marked difference between teachers of humanities (with a low level of socialization towards new technologies and little inclined to train themselves in them) and those in the STEM fields who are more used to platforms and ICT tools as an integral part of the curriculum and of teaching methodologies. The use of platforms is also conditioned by the age of the pupils and their ability to use them independently, without teachers or with low supervision by teachers. Indeed, this independent use is accentuated with increasing age. In the primary cycle, however, the presence of adults and in particular a strong alliance and cooperation between school and family, giving continuity and effectiveness to educational interventions, are essential. But in disadvantaged contexts, the digital skills of families, as well as the supply of devices, are scarce or absent.

Innovation in a Teaching/Learning Methodology for LLL Competencies

In general, teaching and learning of curricular disciplines in all cycles of Italian school occur primarily in face-to-face or, at most, laboratory settings; non-curricular skills (such as social and emotional skills, interpersonal skills, soft skills, etc.[7]) are not the subject of explicit teaching-learning programs in the Italian school system. In any case, even in contexts where teachers use collaborative methods, the peer-to-peer approach and cooperative learning[8] are never really extensively used (Shekhar & Shailendra, 2021; WEF, 2019). The opinion of the respondents is unanimous on this point: Although the use of peer-to-peer and cooperative learning is limited, they are considered necessary for innovation in teaching-learning processes. The opinions of all participants agreed that this approach can be an innovative and dispensable method for all students of all

7 More details on the differences between skills at: https://www.oecd-ilibrary.org/education/oecd-skills-studies_23078731?page=2

8 Cooperative learning has been described as "learning together" (Johnson & Johnson, 1975) and "education of young people by young people" (Shiner, 1999). Both definitions generally refer to a series of instructional activities that recognize children and adolescents as social actors who interact with adults in a mutually constitutive way. Students are thus rendered protagonists in the educational scenario that looks back on traditional teaching methods, which considered them as mere receptors of the educational action.

ages and backgrounds, but is especially effective with students who have experienced inclusion difficulties, disadvantaged conditions, and/or fragmented school biographies (Fabiano, 2020; Rivoltella, 2015).

The use of the Buddy Method is positively evaluated by all experts, both for the development of digital literacy and awareness and for the expression of other competencies, especially cooperative skills. Overall, teachers, volunteers and educators are aware of the growing complexity of the contexts in which they operate. Most of their skills were built in the field through the 'learning-by-doing' method. But there was a lack of training and updating due to the work overload of educational staff. This is mainly due to the elaboration and implementation of strategies to carve out the many benefits of learning in multi-ethnic classes and related challenges to teach within highly heterogeneous educational contexts. Both require constant efforts on diverse levels: From an administrative and professional point of view, and thus related to the successful implementation of the curriculum, and the transmission and cultivation of knowledge. On the other hand, also with regard to the rather relational and affective aspect: For keeping in dialogue with both students and families. However, starting from a common appreciation of the method, the teachers also add a critical note: It is definitely necessary to introduce and implement innovative methods such as the Buddy Method, but without neglecting traditional methods that were considered by the interviewees to be essential and fundamental to the implementation of the programme planned for each class and type of school (Cohen, 1988).

This divide between teachers (who work inside schools) and other educational practitioners (who work inside and outside schools) points to a particular position of the teaching profession, firmly anchored in a vision that only superficially does not reject innovation, but in reality, remains wedded to the frontal mode of teaching and the formal execution of ministerial programmes. This element applies to teachers at all levels of education, although it is particularly emphasized by those teaching at the lower and upper secondary levels, but to a much lesser extent at the elementary level, where the age of the students requires a greater inclination to innovate and discover less conventional methods. The reason for this resistance on the part of some teachers can be attributed to the difficulty of using methods and tools other than the more usual ones, resulting in a kind of bureaucratic ritualism in the performance of their teaching duties. In order to encourage experimentation, teachers should be continuously trained in less conventional pedagogical experiences and practices, as will be discussed in more detail below. Moreover, and this is another

element that emerged from focus groups, those of the teaching staff who are most resistant to change are also those who display a higher degree of insecurity in their role – due to a climate of widespread distrust of their work on the part of families, civil society, and the media – and fear losing control over groups of students.

Innovation for Teachers and Educators' Training

Regarding the digital competencies of teachers and others working in education, focus groups and interviews underlined the deficit of competence and the sense of efficacy among teachers and some educators became clear: They are technically inexperienced and possess a low know-how in using platforms, additionally experience a chronic lack of time for training, often working in emergency conditions. This element is particularly noticeable among the older cohorts of educators and teachers, who incidentally make up the majority of staff in Italian schools and associations. The provision of continuous training for teachers, volunteers and educators was considered of the utmost importance by all interviewees. The previous experience of teachers with digital learning tools is minimal in primary schools and rather better in lower and upper secondary schools; educators often have no experience in this regard. Even among digitally experienced staff, the digital competence in actual usage varied greatly. The disciplinary field, in the opinion of interviewees, is decisive, especially in upper secondary schools, where the digital application is almost exclusively in the hands of the teachers of scientific and technical subjects. The data confirms the need for professional updates and specific interventions to bridge the digital divide; to this we could also add the need for a structural adjustment within the schools, in terms of technological equipment (Unesco 2023).

Psychologists interviewed refer to the growing demand among teachers for digital skills and emphasize the need to increase the awareness of how best to use digital tools, not only among students, but also among teachers and educators. Following this aspect, all of the interviewees unanimously confirmed the need to use both the peer-to-peer and peer-4-peer methods even in teaching staff training: A cooperative approach could act positively to bridge the digital divide among generations, with experienced teachers supporting those who are less digitally literate or do not understand the implications of digitality for education. This would also include children helping teachers to improve their digital skills, as happened during the first pandemic. Teachers and educators

also reported that online learning can offer more opportunities for one-to-one or few-to-one student-teacher relationships, increasing intimacy and personalization. Finally, digitization offers schools the opportunity to create new networks by connecting with other schools or institutions in different parts of the world; it is an opportunity to open up and get to know new cultures and people.

4. Conclusion

The digitization of schools and other educational contexts involves and challenges various actors and contexts. Teachers, educators, and students are all recipients and initiators of digitization interventions, in the name of innovation in schools, educational methods, and learning content. However, not all teachers, educators, and students travel this path at the same speed: There are variables, both at individual and context level, that impact significantly.

Furthermore, individual skills in technology, acquired either through specific training courses or from practice are very different and difficult to standardize and homogenize for all teachers at all schools' level; teachers' training on this is linked to individual initiative, greater or lesser proximity of the subject area with new technologies and cohort effects. As far as students are concerned, the paradox of digital natives has been highlighted and confirmed by this study: Skilled in the use of social networks and instant messaging but unfamiliar with digital resources for educational purposes and for the expansion of knowledge, digital natives are often inadequately equipped in relation to critical skills for a responsible and conscious use of technology.

Other issues must be added relating to the technological resources available to individual schools or, more generally, to learning contexts. A crucial issue deals with the social positioning of students and their families, with cultural and economic resources that may facilitate or, conversely, hinder the development of digital competence; and finally we have to mention – as emerged in our study – the characteristics of teaching staff as a whole, equipped differently in digital technology but also capable of planning interdisciplinary and multidisciplinary educational interventions in which technologies constitute a shared resource.

Findings suggest that high-quality and effective staff training represents, on the one hand, one of the most critical issues when talking about digitality in the educational sphere and, on the other, the most urgent and useful topic to be focussed on and in which investment remains necessary. A chronic lack of

time for training, ongoing work in emergency conditions, heterogenous institutional endowment with technical devices (PCs, digital infrastructure, etc.), and doubts regarding the benefits of digitality in the classroom are some of the major barriers to improving digital competences as a set of skills, knowledge, and attitudes within the educational context. In this sense, the funds deriving e.g. from the EU programme "Next Generation" offer the opportunity to better equip schools, organize and implement training and refresher courses for teachers, and carry out interventions in disadvantaged areas to support socio-economically vulnerable individuals, adults and minors (Zancajo et al., 2022). In the future, therefore, it will be interesting to evaluate the outcomes and by-products. Likewise, a comparative study within the Italian context and among similar city contexts may offer useful indications in terms of a policy-transferability and best-practices sharing perspective.

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