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The Use of Digital Technologies for an Inclusive School: Some Suggestions From the COVID-19 Pandemic Experience

Domenica Farinella, Silvia Carbone

Abstract: During the Covid 19 pandemic, digital technologies were the immediate solution to school closures, becoming both the problem and the solution to a complex social and educational situation. This has highlighted several positive thrusts: a) the proactive capacity of some teachers who have developed forms of *bricolage*, especially in terms of inclusion for disadvantaged students; b) the need for teachers to reinforce collaborative network and to implement training courses of enhancing digital skills. We explore the impact of the digital technologies presenting the results of an exploratory qualitative research, involving 50 teachers from schools in Messina and its province, who participated in the training course 'Methods and techniques for an inclusive school'. Distance learning during the Covid 19 pandemic increased loneliness and alienation of teachers, in a context where educational reforms have already caused individualisation of work, forms of soft-privatisation and market-driven education. Faced with the risk of digital inequalities amplifying the traditional ones, especially for the most fragile categories (minors with disabilities, BSE and DSA), teachers have learnt to use digital technologies pro-actively and to build a caring relationship in the digital space. However, they emphasised a growing need for training and for embedding new technologies in bottom-up processes that foster collaboration and sharing, both with colleagues and with families and students.

Keywords: digital school, inclusive school, teacher training, socio-educational policies

1. Digital school, learning and social inclusion, a controversial nexus to the COVID-19 pandemic challenge

Since the mid-1990s, investment in digital technologies and platforms for educational purposes has increased in many European countries (Johnson, Adams Becker, & Hall, 2015) with the aim of promoting the use of ICT (Information and Communication Technologies) in education as part of the Digital Agenda for Europe policy framework. This trend reflects the idea of a positive relationship between technology, educational innovation and school performance: the combination of digital learning platforms and ICT could improve student learning (Edmunds & Hartnett, 2014; Lu & Law, 2012; Psycharis, 2013) as well as simplifying teachers' work (Johansson & Glauman, 2014). It will also support them in creating collaboration, and the sharing and development of learning materials (Gueudet et al., 2016). Nonetheless, several critical perspectives have suggested that there is no link between improved school performance and the use of digital technologies. Van Dijk, Poell and de Wall (2018) report that the platformization of education is increasingly shifting the education system away from democratic and public values and toward a privatized techno-commercial architecture (Cone et al. 2022). The rhetoric of the digital 'disruption' of education that produces "Ed-tech speech" hides the interests of certain social groups, specifically Ed-tech companies (Selwyn, 2015), according to the neoliberal strategies of education reform addressed to the edu-business profitmaking, that has increased educational inequalities (Ball & Grimaldi, 2021; Van Dijk, 2006). Many teachers find that these digital tools increase their workload rather than optimize it (Underwood & Stiller, 2014); they complain of a lack of information and training, as well as difficulties arising from the mediation of digital platforms that do not always facilitate participation and collaboration (Lochner, Conrad, & Graham, 2015). They argue that the trend is pushing for two dangerous intertwined drifts: (i) the learnification of education (Biesta, 2004; Lean & Barner, 2023) associated with the uncritical adoption of managerial language in education that dehumanizes students as individuals and debases the idea of education as public knowledge. (ii) the individualization of work, in which the educational experience is reframed into the perspective of the autonomous learner and the autonomous teacher who, faced with the pluralization of learning models, must forge their own path (Grimaldi & Ball, 2021; Steinberg and Schmid, 2023). Moreover, the 'individual' is then represented as "an aggregated body of (sub)individual unities […] characterized by economic, personal or psychological criteria (the disadvantaged, the special educational needs, the 3–6 years, the digitally unskilled teachers, etc.)", on which are imposed "individualized disciplinary, enhancing, therapeutic or

prudential measures (meticulous distances, targeted training, tailored summer courses, etc.)" (Taglietti et al., 2021: 436).

In 2007, the Ministry of Education in Italy launched the 'National Digital School Plan', which focused on the promotion of interactive whiteboards in schools and in the so-called 2.0 classrooms. In 2015, the plan was updated and framed.as part of the so-called "Buona Scuola" (Good School) positively connoting the digital transition. In 2023 the latest upgrade was introduced. Around the Digital School is consolidated what Pitzalis et al. (2016), echoing Van Zanten (2004), called the 'epistemic community'. This is a multifaceted set of stakeholders and practitioners (university researchers, teachers, trainers, educational agencies, Ed-tech corporations, publishers) that convey an optimistic view with regard to the introduction of digital technologies in education.

There is no doubt that the educational relationship has been increasingly shaped in terms of its spatial, temporal and practical dimensions by electronic and digital innovations (Greenhow & Lewin, 2015; Carbone, 2023), in a shift from a transmissive or highly directive didactic approach to an interactionist/constructivist didactic approach, centered on dialogic exchange, the negotiation of meanings and the collaborative construction of knowledge (Ribolzi, 2002). However, research with regard to the introduction of technology into everyday school life, reveals a much more complex scenario than optimistic rhetoric (Gui, 2019), underlining the possibility that digital inequalities could exacerbate pre-existing inequalities (Pitzalis and Porcu, 2024). Innovations tend to be reappropriated, redirected and redefined by the daily practices of students and teachers in the classroom within spaces now of conflict, now of negotiation, with unexpected outcomes. For example, in the case of digital whiteboards, it was highlighted how they may be appropriated by students for recreation or to break the asymmetry of the teacher-student relationship by taking control of the f the teacher's desk (De Feo & Pitzalis, 2016). This happens because the school does not exist in abstract. On the contrary, it takes shape in the socio-materiality of practices that are always situated: that is, there is an intimate connection between the material, spatial and social dimensions of educational practices. This connection cannot be postulated because it is continuously co-constructed and (re) signified (Pitzalis et al., 2016).

The Covid 19 pandemic, albeit in its singularity, provided a good vantage point for analyzing how educational practices can be changed through digital mediation. During the pandemic, Italian schools could no longer just limit themselves to introducing the use of technology in a complementary manner in the sense of digital tools supporting teaching activities (Maragliano, 2007). Rather, it made them its main elements. The Covid 19 pandemic therefore accelerated the transformation of the educational space, exacerbating

fractures and strengthening continuities (Cone et al., 2022). The pre-Covid 19 school was characterized by a unity of space and time, sanctioned by the materiality of the teacher's desk that generated an *effect de lieu* in practices (Pitzalis & Spanò, 2022: 27) that were informed by specific professional cultures shared by the community of teachers. School learning that folded and isolated itself within a private and domestic space as a result of the arrival of the pandemic led to the deconstruction of the classroom and the pedagogical universe that lay behind traditional learning methodologies characterized by the co-presence of the bodies of teachers and students and the materiality of the classroom (Pitzalis & Spanò, 2022). The result was a crisis of both everyday school routines, and of the meanings and symbols that sanctioned learning as a sharing of classroom experience. It also led to a consequent crisis of those cultures that had hitherto animated the construction of the teacher-pupil relationship. That is, teachers found themselves faced with the need to rethink their community of practice (Wenger, 1998), to mobilise new resources, to rethink the use of old ones, to carry out arrangements, re-interpretations, negotiations, and to link to the preponderant entry of a new actor that had previously been absent in the classroom, the parent.

The Covid 19 pandemic imposed a new spatialization and temporality with regard to an educational relationship that displaced the materiality of the classroom and forced the learning space to reconstruct itself in the materiality of the home and the immateriality of the virtual network, with difficult in balancing them. Williamson et al. (2020) called this new educational model "emergency remote education", to emphasize its transitional aspects. The challenge did not concern technology, *tout court*, but the overall ability to redesign learning in a changed educational setting that places the interaction between teacher and pupils, between pupils, and between teachers and teachers, within situations characterized by different spatial constraints and different communication modes (Laurillard, 2012). In the post-pandemic era, school had to come to terms with a rematerialization of the school that required the rethinking of the educational relationship in a reticular way, rearticulating in a complementary and non-conflicting way, learning spaces that had become pluralized: off-line vs. online, in-present vs. distant, technology-mediated vs. direct learning (Pitzalis & Spanò, 2022). This is an ongoing and open process.

International research (Parczewska, 2020; UNESCO, 2021) has shown that during the Covid 19-pandemic, the educational relationship between teacher and student was consolidated, e.g. in that teachers provided the necessary alarm bells when there were problems with connection or low productivity in terms of assigned tasks. Luo and Chag (2020) highlighted the advantages of the virtual classroom (linked to online learning and the greater flexibility in planning and study that emerged), and the disadvantages (the possibility

of continuous distractions and the lack of an in-presence educational relationship capable of accompanying and supporting students). Young and Clerke (2024) pointed out how students with disabilities suffered from inadequate socialization and the existence of technological barriers and the pivotality of parents in learning activities. Selwyn and Jandric (2020) noted the high differentiation in which distance schooling was carried out (e.g. across countries, in local communities and even within the same classroom), suggesting "one of the big lessons that we take from the first wave lockdowns is that digital inequalities are as entrenched and important an issue as ever. […] and issues of digital inequality along the familiar lines of class, race, geography, dis/ability and gender"

In Italy, many scholars have analyzed the teaching experience during the Covid 19 period. Santagati (2022) points out that many teachers recognised the transformation of the school space as a significant event going far beyond the change introduced by the digitisation of education (Santagati & Pandolfini, 2017). The sudden interruption of the physical space in terms of the educational relationship has affected the emotional-relational relationship between teachers and students and has made this relationship a kind of seesaw with an alternating and uncertain effect (presence/distance). A relevant need of teachers was to 'cover' the relationship gap brought about by the disruption of the face-to-face relationship, including learning to use technological tools to innovate teaching (e.g., through virtual museum visits or language video games) (Colombo et al., 2020).

Pitzalis & Spanò (2022) pointed out that there was a widespread sense of parcelling out the class, proposing the image of it as a puzzle in which some pieces were missing, and emphasized the crisis of "habitus" that characterized the work of teaching. Some research (Colombo et al., 2020, Argentin et al., 2022) found that distance learning generated a teacher individualization to the detriment of collegiality and cooperation with colleagues, producing a sense loneliness and alienation, and an intensification of work. Scarpellini et al. (2021) showed a link between distance learning and an increase in educational deprivation and social inequalities. Carbone & Calvi (2024) remarked that the emergency and the lack of planning in technology-mediated teaching caused tensions in relationships between students and teachers, hindering cooperation and sharing.

On the basis of these contributions, the aim of this article is to analyze, under the lens of the COVID 19 pandemic experience, the effects of the digital transition in schools in terms of social inclusion, by analysing: (i) What strategies did teachers put into practice to learn to mediate teaching through the use of IT tools?; (ii) How did they reassemble the social-materiality of the classroom following this virtualization experience? (iii) Because traditional

educational practices were no longer viable, were teachers able to create new practices?

2. Data and Methods

This research is part of the training course 'Methods and techniques for an inclusive school'. It took place between November 2021 and March 2022 as part of the agreement between the Department of Political Science of the University of Messina and the Scuol@informate Network, which includes the main primary and secondary schools in the Messina area. The course stemmed from the network's teachers' need to be supported in the configuration of inclusive research methodologies that could also draw on the experience of online didactics, obtained during the pandemic. Fifty teachers participated in eight training sessions, for a total of 24 hours, in conjunction with university teachers and professional experts. The teachers who participated had differentiated profiles in terms of school type, gender and age. In fact, the teachers were drawn from fourteen schools in the city of Messina from each grade (pre-school, primary and secondary school). Specifically, of the 50 teachers interviewed, 8 were pre-school teachers, 26 primary school teachers, and 16 secondary school teachers. In terms of gender, only 3 of 50 of the respondents were men, while 47 were women. Finally, in terms of age, 5 were in the 30-40 age group, 20 were in the 41-50 age group and 14 in the 51-60 age group; 4 were over 60 years; 6 respondents did not answer.

Using a multidisciplinary approach and a dialogic key, during the training course the effects of the pandemic on interpersonal and school relationship were discussed and shared, as were the critical issues teachers had to face, and the strategies (methods and techniques) implemented to counter the phenomena of school dropouts, educational poverty and enhanced inclusiveness. Distance learning started in Italian schools in March 2020 and ended in December 2020. During the 2020/2021 school year, following requirements and closure protocols issued by the Ministry and the Messina metropolitan area, distance learning sessions (lasting 2-3 weeks) were held and repeated in the first and second semester of 2020/2021.

In the first meeting, the participants were given a structured open-question form, inspired by the BEI (Behavioral Event Interview (McClelland, 1998). The aim was to stimulate the respondents to recall concrete key episodes involved them with regard to the distance learning and digital tools used during the different periods of the Covid 19 pandemic. The form required the respondent to dwell on three pivotal periods from the beginning of the pandemic in March 2020 until the end of the school year, during lockdown; from the resumption of the new school year 2021/22 until the start of the inclusive school project; and about the future, his or her expectations

and opinions about the evolution of the professional figure of the teacher. The respondents were asked to answer qualitatively a number of open-ended questions (table 1), while in other cases they had to summarize their answers by means of key words and/or images.

Table 1 - Open-question form

REMEMBER THE PERIOD OF THE PANDEMIC OUTBREAK AND THE VARIOUS FORCED LOCKDOWNS: Question 1 - Identify three concepts (nouns, adjectives, images, etc.) to describe 'school' during that period. Question 2 - Tell one positive or negative episode (of your choice) that particularly affected you in relation to school life. Question 3 - Based on your experience, identify three difficulties that in your opinion characterized your teaching, your relationship with pupils and school life. Question 4 - Based on your experience, please identify three findings that have characterized teaching, the relationship with students and school life.
THINK NOW ABOUT THE RETURN TO SCHOOL IN PRESENCE FROM SEPTEMBER THIS SCHOOL YEAR: Question 5 - Identify three concepts (nouns, adjectives, images, etc.) to describe 'school' and your experience at the school at that time. Question 6 - Tell one positive or negative episode (of your choice) that particularly affected you in relation to school life. Question 7 - Based on your experience, identify three difficulties that in your opinion are characterizing teaching, the relationship with pupils and school life. Question 8 - Based on your experience, identify three findings which in your opinion are characterizing teaching, the relationship with pupils, school life. Question 9 - Describe with three adjectives, pictures or words your needs as a teacher at that time.
TO CONCLUDE WE ASK YOU FOR SOME IMAGES ABOUT THE FUTURE: Question 10 - Describe with three adjectives, pictures or words your expectations about the future as a teacher right now. QuWe ask you to make two suggestions that, based on your experience, could improve your work at school.

The self-completed form was to be handed in by the participants before the end of the training course to ensure, at the final project meeting, the sharing and discussion of the data collected in line with the dialogic and participatory research model. Field notes were taken by the researchers during the meetings, especially in relation to the interventions of the participating teachers, and the focus meetings (the first meeting for the presentation of the project and the final meeting for the discussion of the project pathway) were recorded.

The qualitative analysis of the data collected used mixed techniques: (i) semantic schematization of thoughts into key words (identified by adjectives and nouns or images) with the help of WordInOut software; (ii) discursive analysis of open-ended responses; (iii) SWOT analysis.

Most of the schools included in the research were in fragile and difficult socio-territorial contexts, such as working-class areas of the city or inland and peripheral municipalities marked by educational poverty and the economic precariousness of families. In many schools in Messina, the problem of educational poverty and 'hidden' school drop-out emerged during the pandemic, i.e. students working from home who were formally connected with the school but were, in fact, inattentive, did not participate in class and fell behind. This was particularly noticeable in large families, with low-educated parents, experiencing housing deprivation (i.e. overcrowded houses or shacks), with little digital equipment and low familiarity with such equipment (Farinella, 2023). In addition, a chronic shortage of local public and social services exacerbated caregiving tasks for families with children with disabilities and learning disorders. This increased the risk of social exclusion for these families. For this reason, a focus group on the topic of educational poverty was held in June 2022 at the conclusion of the research, involving teachers, social workers, pedagogists, representatives of the third sector, and some local public institutions (overall 13 participants). Led by the researcher, participants were invited to question and reflect on the problem of pre- and post-Covid educational poverty, to share personal experiences, to identify training needs, to discuss critical issues and best practices experienced in their own professional practice in contact with children in educational poverty or those with special learning needs.

Our findings, while making no claim to generalizability due to the qualitative nature of the research and the unavailability of a representative sample, help to illuminate some challenges that teachers faced during the pandemic and in the immediate post-pandemic period, showing how they reshaped the educational relationship, and what resources they mobilised in pursuit of new educational practices, especially in relation to children with learning disabilities or disorders.

A limitation of the study could be the lack of the families' point of view (both students and parents), given the context in which the study originated (a course aimed at teachers). The main data was based on the teachers' representations of their experience, and the way they reworked their own experience during the Covid 19 pandemic experience. This is in line with the aim of the article to focus on the way in which teachers re-signified their professional community by experimenting with new practices and new meanings, prompted by the pandemic emergency. The inclusion of families could be a further future development. Despite these limitations, our research has pragmatic relevance, providing useful insights that could be used as a basis for future empirical research and educational policies, as suggested in the conclusions.

3. Results

As mentioned in section 1, the pandemic experience and the dematerialization of the educational relationship that derived from it with the introduction of distance learning broke down the tangible everydayness of the educational relationship, undermining the taken-for-granted educational practices that informed the teaching community, and revolved around face-to-face teaching as the heart of the educational relationship, and the physical classroom as the space for its realization.

This disorientation linked to the disruption of the school's organisational routines as evidenced in the spatial and temporal co-presence of teachers and students in the classroom, and around which these two social roles were reciprocally constructed, is well represented by the sentiments expressed by the teachers in responding to the first open-ended question on the form: "Remember the outbreak of the pandemic and the various forced lock-down periods. Identify three concepts (nouns, adjectives, images, etc.) to describe the 'school' at that time". The results are summarized in the concept map shown in Figure 1, elaborated by WordItOut software that shows two opposing core dimensions describing school representations in light of the pandemic emergency and the subsequent lock-down periods: on the one hand, the sense of 'disorientation', uncertainty and isolation: the school in lockdown is "alone". On the other hand, the school is somehow called upon to be active, to be experimental, to rise to the challenge and to innovate.

Figure 1 Teachers' conceptual maps during distance learning in pandemic lock-downs

Source: Our elaboration through WordItOut software based on the frequency of adjectives and nouns found in the responses to question 1.

Related to the semantic areas of disorientation and loneliness, there are other negative images such as frustration, unpreparedness, chaos and confusion, fuelled by having to experience a totally new situation in an emergency context, without any opportunity to provide oneself with time to get ready. On the one hand, the school and its members (students and teachers) are distant, abandoned, empty, inadequate when it comes to facing this emergency. The breakdown of the face-to-face educational relationship generates feelings of mistrust, such as discouragement, fear, isolation, discounting, anger, powerlessness. On the other hand, the lack of preparedness results in the fact that teachers feel abandoned, the school becomes 'closed', 'sudden', 'oppressive', 'intrusive', 'alienating' and 'penalizing' both them and the students and, above all, 'stressful'. The metaphors of the school as a 'tunnel' or as 'a ship without passengers' are emblematic.

As one interviewee points out, distance learning during lockdown is found to be "tiring, intrusive. I couldn't manage time, and contacts were continuous" (interview n. 24: Female, Secondary school, Age range 41-50 years). This is an effect of the forced "platformization of education" during the pandemic emergency. Poell et al. (2019) highlighted the negative impact on everyday life of the hyper-dependence of sociality on private digital platforms (so-called "platformization of society"): although the platforms facilitated and simplified work, they ended up becoming very intrusive and increased workload and stress because of the difficulty in disconnecting.

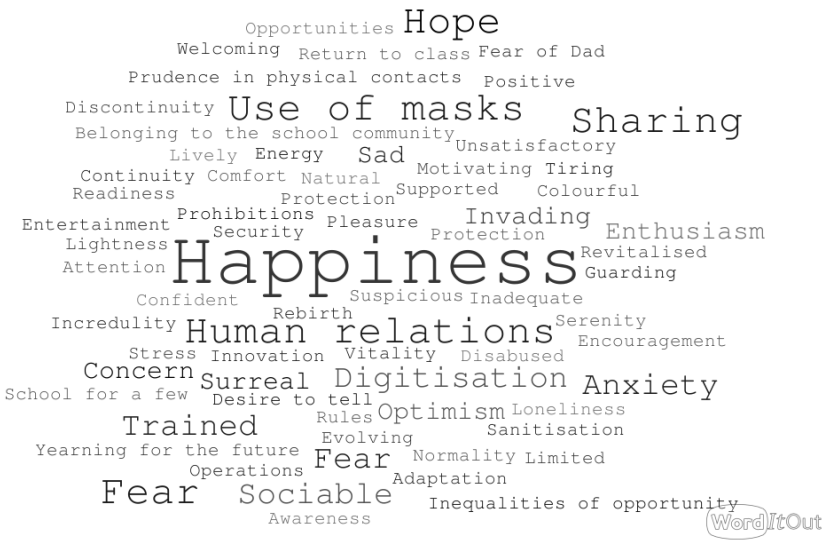
All respondents complained about the intrusiveness of these tools, the difficulty to disconnect, the anxiety of always having to feel available because of being at home: distance learning has required much more flexibility in their working hours and the permeability of the boundaries between work and private life, generating "subjectivity at work", as Lazzarato (1997) would say, with class meetings while preparing dinner at eight o'clock in the evening. Cingolani (2021) commented about the 'colonization' of work in the domestic space: the temporality of work multiplies and overlaps with domestic cares: everyday schooling becomes permanent, overflows into everyday-life, is synchronous and asynchronous, expanding throughout the day and aligning itself in parallel with other daily life activities (dining, cooking, etc.), emphasized by the absence of regulation when it comes to distance learning (Pirro et al., 2022).

This is in line with other research: Argentin et al. (2022) emphasisze how the emerging nature of distance learning has exacerbated the deep tensions affecting work in school, already described as a loosely-coupled system (Weick, 1976) and more and more differentiated and heterogeneous as a result of New Public Management policies and school autonomy, both of which have conveyed a highly individualised model of teaching and a form of *soft privatization* (Cone et al., 2022). Distance learning has resulted in an extreme

individualization of the responsibilities of the educational task and the way in which it is done, as well as the isolation of workers who, in the domestic space, struggle to reconcile work and home life, with increased workload and the risk of burn-out (Argentin et al., 2022). Carbone (2023), Pirro et al. (2022) and Argentin (2022) reported similar findings: uncertainty, confusion, the paradox of a hypertrophic bureaucracy and a lack of regulation, generating discretionary and heterogeneous responses from educational institutions, implying individual overwork. Respondents reported that they were busier than they were before the closure of the school buildings.

Figure 1 shows how, alongside the semantic area revolving around disorientation, loneliness, and stress, another area emerged, which, as we shall see, strengthens over time (Figure 2). This area identifies 'commitment' to reacting proactively, considering the emerging context as a change and a challenge, a opportunity to innovate. According to the teachers, the Covid 19 pandemic forced a change in the way we teach, representing a challenge to enhance the institutional role of teachers, and order to avoid the increase of 'inequalities between students', especially in the case of fragile learners who risk social exclusion due to the digital mediation of education. Distance learning is reframed as an opportunity to innovate, to use curiosity and experimental and alternative teaching based on 'face and smiles', 'computer'. Adopting an open attitude to experiencing, the teachers must turn technology into a positive support tool for families through the construction of new forms of collaboration and coordination based on the trust and solidarity that risks being broken by isolation.

Figure 2 Teachers' conceptual maps with regard to distance learning on return to school in September 2022



Source: Our elaboration through WordItOut software based on the frequency of adjectives and nouns found in the responses to question 5.

Question 5 asked the teachers to identify three concepts (nouns, adjectives, images, etc.) to describe the school and its experience in the period from September to November 2022, when the Covid-19 pandemic was waning, and school activities went back to normal. Figure 2 shows the results: the main semantic dimension emerging is related to the emotion of 'happiness' that prevailed, connoted as emotional charges experienced in the long-awaited encounter with the students. Around it revolves other feelings of 'hope', 'optimism', but also an awareness of the need to rebuild relationships, to remake the school community (human relationships, sharing, being sociable). Coming back to class triggered positive feelings: as one interviewee said: "the school appears revitalized". The emotional impact of returning to the classroom was stronger for teachers in the first school cycle (Argentin 2022), for whom the importance of physical and visual contact is fundamental in forming and maintaining relationships, and for the children's learning. Therefore, in the case of primary schools, the challenges posed by distance learning to learning were relatively large. The joy of returning to school is broken by word 'distancing', an obligatory consequence of being in the classroom within a more rigid school context, which limited interactions, and which generated fears and anxieties. The school in presence, mediated by masks, was no longer accommodating or familiar. Instead, it appeared intrusive, rejecting, ugly. It should also be pointed out that in the Messina

area, between September and December 2021 there were frequent periods of forced school closures, aimed at containing a renewed outbreak of the pandemic. The hybrid form of interaction (classroom and home learning) led to discontinuity in teaching, disorientation and chaos. At first, the pandemic dramatically highlighted how the school lockdown had in fact achieved biopolitical containment (Aruta et al., 2020), in the sense understood by Foucault of engaging in an attempt to rationalize, through the imposition of norms, the behaviour of bodies in everyday living. Subsequently, following the end of the lockdown and the reopening of schools, teachers and students had to deal with the norms of social distancing that involved not only the organizational aspect, but entered directly into the educational and creative processes. These dimensions emerge clearly when looking at the framework of key words that emerged to describe that period, as shown in Figure 2. Based on their experiences, the respondents reported that in those months the school presented a complicated and confusing distancing, characterized by closely-interconnected concepts that were surreal, guarded, unaccustomed and suspicious. In fact, public opinion, including that of teachers, is split into two factions: those who fear contagion and want to pursue distance learning, and those who believe a return to attendance is necessary to resume the daily routine.

In spite of these troubles, Figure 2, which identifies a period (late 2021) in which digital mediation has become normalized, shows how 'digitization' has been included within the new educational practices: the school is now, in this sense, digitally 'trained', but it has mainly become so thanks to the commitment of individual teachers who, in a framework of uncertainty and lack of training, have decided to do, experiment, try. It is this dimension of educational *bricolage*, of experimentation in the face of difficulties, that we will try to bring out from the analysis of the interviews and the tales told by the teachers in section 4.

4. Discussion

As already mentioned, the enforced use of distance learning during the pandemic, if it initially resulted in a crisis with regard to traditional teaching methodologies and educational relationships, was then a driving force to try to imagine new practices, developing what Lanzara (1993) calls 'negative capability', i.e. an ability to build and innovate in contexts of uncertainty, where established routines and taken-for-grated action settings no longer exist.

The isolation, disorientation, and unpreparedness noted in Figure 1 are related to the realization that one had forcibly transited within a dematerialized teaching context without having an adequate infrastructure:

(i) technological: that is, devices such as PCs, tablets, webcams, and headsets with microphones
(ii) material: dwellings organized to make smart working and smart education comfortable, with spaces properly equipped and dedicated to learning (e.g., with desks and ergonomic chairs).
(iii) intangible: technological skills to use devices and platforms by both teachers and families.
(iv) relational: related to the difficulties of rethinking educational work that is also care work (especially for children up to 13 years of age, the subject of the research) within a dematerialized space, in which contact, which is one of the strategies for generating empathy, was no longer possible.

Here is how one respondent summarizes the three main difficulties:

- The Internet made connections difficult.
- Most pupils were unfamiliar with handling devices and platforms.
- There was the human factor, i.e. the difficulty in perceiving pupils' emotions and moods.

I remember the early days and the difficulty in making online connections, especially of one of our children with a disability. After several unsuccessful attempts, one day we managed to have him with us, just for a hello, thinking that seeing his classmates again, albeit through a computer screen, could somehow spur him on and convince him to accept the 'new' way of doing school. After an initial positive approach, the child was taken aback because he was convinced that he was the only one at home, while his classmates were at school. (Interview n. 13: Female, Primary school, Age range 51-60 years)

Teachers are aware that the risks of social exclusion because of these difficulties are exacerbated in the case of fragile families, characterized by some kind of disadvantage, be it territorial (remote and inland areas, with limited infrastructure); socio-cultural (uneducated parents, unable to support their children educationally); housing (overcrowded housing and/or shacks), linked to a disability or the presence of BES (Special Educational Needs) or DSA (Specific Learning Disorders). For many students the disadvantages were multiple. Here are some examples from the interviewees' experience:

At this age, it is impossible to manage electronic tools alone and therefore parents have had to support teaching, with the resulting difficulties: working parents, insufficient devices, difficulty in grasping attentional skills in children. (Interview n. 31: Female, Pre-school, Age range 41-50 years)

Often, the pupil (resident in an Aeolian Island) had to use the internet connection of the hydrofoil ticket office to log on and follow the lessons. This was a double inconvenience for him: a pupil with an attention deficit

disorder, he had to follow the lessons, interact with the teachers and the class group, and carry out the assigned tasks in an uncomfortable, cold, and above all noisy and distracting place. (Interview n. 18: Female, Primary school, Age range 41-50 years)

Another major difficulty was the organizational problems that affected most families. For example, households with several children who had to connect to several platforms at the same time, on different devices, often did not own sufficient PCs or tablets to allow all the children to connect, often had to connect from a mobile phone with enormous difficulties related to working with this tool to follow the video lessons or send in the homework. Moreover, among the most affected groups were disabled pupils and their families, who suffered more than anyone else from the forced isolation. In fact, these subjects suffered most from the forced absence from the school environment, which entailed an interruption of interpersonal relationships that are indispensable for their global and relational growth. (Interview n. 19: Female, Primary school, Age range 51-60 years)

Working with a disabled child, it was difficult to capture his attention through an object that for him was just a means with which to play, have fun and search for the things he liked best. It must also be pointed out that the sudden disruption of the daily routine was hard for all children, let alone autistic children who, as we all know, are very habitual! So:

1. It is difficult to get him to stand in front of the computer to follow an explanation.
2. It is difficult to get him to work at home because he was constantly getting up and asking to go to school.
3. It is difficult because of his parents' lack of technological competence and also because of really difficult connections due to network issues. (Interview n. 11: Female, Primary school, Age range Over 60 years)

In the classroom was a boy with Down Syndrome with a medium to severe intellectual disability and a dysfunctional approach to computer technology. Distance learning, however much his support teacher tried by every possible means to reach him, inevitably cut him off from the dynamics of the class and the school, in which he was perfectly integrated and in which he had precise tasks linked to his IEP (Individual Educational Plan). (….) In those long months, the loss of his father (the only one in the house with a minimum of digital skills) made the boy's participation in the few brief moments of sociability and communicative exchange that the use of the telephone allowed him, even more complicated and, in some ways, impossible. Moreover, I further realized how the absence of an Individual Plan, and therefore the lack of a network between local authorities, school and family, runs the risk of thwarting the work, time and resources that are used during school time for the process of integration and the inclusion of students with disabilities,

and how an emergency such as the pandemic, can suddenly make invisible precisely those who are the most fragile and most in need of care and attention. (Interview n. 2: Female, Secondary school, Age range 41-50 years)

A key challenge was how to build an educational relationship based on care and emotions through digital mediation and a PC screen that made it difficult to decode the body language based on which the relationship is calibrated, as well as to maintain attention and stimulate the children. Teachers summarized the complexity of managing emotions in digital space as follows:

The difficulties in distance learning were not being able to follow the children individually; not being able to gratify them with a caress or a hug; lack of emotions, feelings, sharing of experiences and souls and a didactic lack of stimuli. (Interview n. 18: Female, Primary school, Age range 41-50 years)

So many difficulties characterized teaching during the lockdown. First, the lack of physical interaction, a fundamental component for effective learning, in fact with distance learning it became isolating, each pupil having to carry it out alone behind a video without the connections that exist within a fundamental context such as the class group […] Many have lost loved ones, first and foremost grandparents, without being able to say goodbye, without a funeral, deprived of adequate space, time and rituals to grieve. These experiences have had a strong impact on the emotional lives of children and young people, who may have had few opportunities to verbalize the complexity of these emotions with the adults of reference, who themselves have been affected by these painful experiences. Therefore, as a teacher, I wonder how to help children with such important experiences in the classroom and how to manage the containment of these emotions in the relationship, while respecting the characteristics of the individual and their history. (Interview n. 19: Female, Primary school, Age range 51-60 years)

Teachers who tutored students with BES or DSA reported severe obstacles related to learning new procedures, memorizing and performing the various sequences scheduled by digital platforms, to the attentional and motivational deficits which grew at home, to the need for more time, which was complicated to balance with the demands of distance learning that had tight timetables between video lectures, homework and homework delivery, but also to the absence of the peer group: in the classroom these children derive enormous benefits from the presence of teachers, from the help of their classmates, from the continuous feedback offered by the explanation-question-reinforcement 'circuit', all of which alleviate their difficulties, but which they lack online.

Experiencing these challenging situations in everyday distance learning has awakened in teachers a proactive attitude, rather than one of surrender. Organizational theory (Lanzara, 1993; Weick, 1995) has emphasized how a

context of crisis, emergency and uncertainty, in which standardised patterns and routines do not work, represents a potential zone of *enactment* of new practices with generative potential. Following Lanzara (1993; 2016), this kind of context can stimulate negative capability, i.e. a cognitive disposition that does not necessarily seek immediate solutions, but is open to experimentation, to the exploration of new possibilities of meaning and action. It is in this way that, little by little, our teachers tried to respond to the above-mentioned challenges, not so much according to logic of *thinking*, but to that of *tinkering* (Ciborra, 1992), which essentially means learning to do *bricolage* (Aygerou et al., 2009; Lanzara, 2016). This is done through a wide and uncoded range of possibilities and combinations, within which new meanings are discovered, old ones are adapted and reworked, which are then reinvented, within a practical doing that proceeds according to a mix of experimentation, discovery and invention, adjustment, copying, cutting out and re-pasting, mistakes and advances. This practical doing is located within a context that becomes both formative and performative, contributing to the emergence of a new community of practices, which slowly replaces the one in crisis that characterized the professional culture of pre-Covid 19 teachers.

In an educational *bricolage* perspective, teachers find themselves proceeding by trial and error, crafting educational practices based on discovery and sharing. The 'discovery' consists essentially of opening themselves up to the mediation of the digital infrastructure, which is not viewed with fear or suspicion, but as a possibility to amplify teaching, learning to know, codify and include the relational, emotional and meaning dimensions that are also found to pass through this new didactic modality. Astonished teachers point out that a caring relationship can also be realized in a virtual and dematerialised space where, for example, more introverted students can feel more at ease, eliminating fears and performance anxieties, who discover that an emotion or appreciation can be conveyed with a wide variety of emoticons expressing non-verbal communication on a par with the 'body language'. They discover that it is possible to maintain meaningful and emotionally-rich relationships even at a distance, and that online teaching has several advantages:

Virtual classrooms have become excellent support for integrating material and enriching teaching. Our pupils are becoming experts with some digital tools. In some ways the possibility of meeting online has lightened the burden of fatigue which can be exacerbated by having to move from one school to another (Interview n. 24: Female, Secondary school, Age range 41-50 years)

Pupils were also able to see teachers with different eyes by discovering a little more about them, their habits, and also appreciating the new way of teaching. The video-lessons were a nice anticipation, we could not only

learn, but also share, joke, look at each other's faces. Many of us teachers discovered that it is not so difficult to use technology to teach lessons, in fact it is enriching for us and for the children. (Interview n. 16: Female, Primary school, Age range 41-50 years)

Digital tools then become the means to learn how to tinker with teaching creatively, using old content, methods and categories by rearranging them, and by inventing new ones:

Certainly, the desire to relate to the pupils in a different way has kept me very busy using the PC. I learnt how to make videos and pic collages to facilitate the documentation of work done. I often consulted sites such as YouTube on the various topics presented in animated form. (Interview n. 10: Female, Primary school, Age range 51-60 years)

A video of my pupil with autism spectrum disorder, repeating the oral lesson aided by his mother's questions moved me greatly. (Interview n. 9: Female, Primary school, Age range 41-50 years)

This dimension of discovery and experimentation turns the constraints in resources around and permits mutual enrichment of students and teachers. New educational practices are thus experienced, paying attention to increasing the students' awareness of 'being in' the world that the experience of the Covid 19 pandemic disrupted:

When the children did the volcano experiment in remote learning they were delighted. The good thing was that being at home with their parents, we had the opportunity to use everything, so they had fun learning. And the parents acted as mediators/facilitators. But also, when using the technology, we explained the use of some everyday objects like the coffee machine, and they made coffee. Or when we took pots and pans to make a musical rhythm. The children on the way back to class kept saying to me: 'Teacher do you remember when we made the volcano…' and they had a light in their eyes! (Interview n. 14: Female, Primary school, Age range 30-40 years)

The complementary dimension associated with the *bricolage* educational practices is sharing: teachers are aware that behind the new practices are complex and multi-significant educational relationships that require the collaboration and cooperation of both families and colleagues. Educators (both teachers and parents) are considered co-learners involved in a mutual learning process with students (Landvogt, 2006). The family becomes a strategic resource for shaping child's educational and biographical trajectories (Jordi et al., 2019) and for improving the quality of distance learning (Conto et al., 2020). In the interviewees' reports, it emerged that the Covid 19 pandemic experience facilitated collaborative relationships between teachers and families. Parents often acted as mediators/facilitators between teachers and pupils, helping their children in the use of technology and digital platforms.

As far as relationships with colleagues is concerned, it emerged that teachers are aware of the need to overcome the drive towards the individualization of teaching that comes with the use of digital platforms, through the sharing and cooperation of emerging practices with their colleagues. However, collaborations remain based on personal micro-relationships with colleagues who know each other and with whom they share the same vision, with a difficulty in institutionalizing themselves in a community of practice, in which values, cognitive frames, meanings, methodologies, taken-for-granted rules and tacit knowledge are shared, experienced and circulated in a practical learning circuit.

5. Conclusions

To summarise the main findings, we have combined all the results of the answers within the SWOT Analysis in Table 2, that assess Strengths, Weaknesses, Opportunities and Threats.

Table 2 - SWOT analysis on open-form respondents

Strengths Educational bricolage and negative capability New practices including digital tools Sharing and collaboration with other teachers based on personal relationships and trust Strong cooperation with the family	**Weaknesses** - Device/platform unpreparedness - Uncertainty - Disorientation - Institutional abandonment - Weak technological and digital infrastructure and devices - Individualization of work, overwork and burnout
Opportunities - Teamwork - Community of practice - Digital training - Institutionalization of digital tools in practices	**Threats** - Hidden school drop-out and educational poverty - Social exclusion (especially for fragile students) - Lack of regulation - Work overload and burnout - Weak digital training

Source: Own elaboration on answers to questions n.2, 3, 4, 6, 7, 8 (see table 1).

The main weaknesses are related to the sudden acceleration that the Covid 19 pandemic caused in terms of a forced shift to digital tools and distance learning, in a context of uncertainty, disorientation, unpreparedness with regard to the use of digital tools, and a lack of digital infrastructure and devices. This resulted in several threats, which could be perpetuated in the post-Covid school: the risks of social exclusion, especially for the most fragile groups, the hidden school drop-out that particularly affects poorly-edu-

cated families, linked to the fact that students, even if present in the digital class, may not improve their knowledge, because of a lack of interest and attention. The research showed that upon returning to class, the youngest children (first years of primary school) had great difficulty concentrating, and were behind the expected level of learning, with an increase in educational poverty in the underclass neighbourhoods:

Educational poverty is also a reduced vocabulary, i.e. these children express themselves with very few words. I recently did a project at the Catalfamo School in which we started from emotions and feelings: they have very few words to express what they feel! […] We are human beings. Having many words to express ourselves also allows us to self-understand who we are, but they don't have that. The context is really asphyxiated […] when you get to adolescence, they are completely aphotic, blocked basically!' (Focus group, D., Association Representative).

Providing additional public resources and introducing policies in support of low-income families but also for other fragile ones (such as large families and/or those with full-time working parents) should be an imperative to counter the rise of multiple inequalities at school by reversing the *soft privatisation* policy of the last 20 years (Vaira and Romito, 2020; Carbone and Calvi, 2024). A similar approach is required to ensure the inclusion of students with disabilities and special needs, who suffered severe setback during the Covid 19 pandemic, in that they were deprived of the relationship with teachers and specialists and often separated from the class group (Maggioli, 2020). As one respondent emphasized, there is a need for 'the presence within the school of experts who support the management of pupils with special educational needs and also relations with families, just as there is a need for active collaboration with local facilities that contribute to the personal and social growth of children' (Interview n. 11: Female, Primary school, Age range Over 60 years).

In addition, the absence of clear regulations with regard to smart working, the lack of digital skills, specific training and technological infrastructure, in the context of a loosely-connected organisation such as a school, has reinforced the individualization processes, already initiated by the reforms in the direction of school autonomy and NPM (New Public Management), producing alienation, and the intensification of work and resulting burnout.

The research found that teachers felt abandoned and disoriented in the face of the dematerialization of the school, which entailed the loss of the spatial, temporal and relational coordinates dictated by the socio-materiality of the classroom, and the taken-for-granted educational practices that went with it. However, the so-called negative capability was activated, i.e. an adaptation to uncertainty and a cognitive aptitude for discovery and innovation, with which to assemble new educational practices through bricolage

or tinkering, which combines experimentation and innovation, adaptation, errors and adjustments, coping and reworking in a practical and pragmatic way.

The teachers became 'innovators', including digital tools in their educational practices and setting up a model of practice where the crucial variable is no longer the tool, but the method employed, centred on the student, rather than on the technology (Pandolfini, 2016). They tried to work on the student's capacity for the autonomous construction of knowledge, innovating themselves creatively (Colombo et al., 2020), by taking on the role of animator or mediator. Evidence for this are the episodes in which the interviewees tell of the use by the students of everyday tools as the coffee machine, or of the deepening of science through the collective viewing of documentaries, of video games in the language.

The new practices that have arisen from this educational bricolage have succeeded in establishing new forms of sharing and collaboration with teachers and families based on trust, even if these relationships struggle to institutionalize themselves in communities of practice, because they are mainly based on personal micro-networks with long-standing colleagues who share the same vision, and with parents who are very involved in the care of their child because he or she presents fragilities such as disabilities, BSE or DHA. The challenge for the future is to strengthen these bottom-up collaborative networks, fostering their configuration as a community of practice that brings back the complexity of the 'rematerialized' school.

According to Pitzalis and De Feo (2016), any innovation, including the introduction of digital technologies is 'actualized' and re-signified by the situated practice of teachers, students and their families in their everyday schooling. In this case, teachers have become 'activists from below' (Grimaldi et al., 2020), mobilising digital resources, students and families to re-signify the educational relationship, through what we have called *bricolage*. Students and their families were able to benefit from a more horizontal educational relationship, where tools, methods, finding solutions to overcome obstacles were co-shared and co-constructed. This meant for digital natives, often suffering from a strong individualization, implementing new modes of peer education, and comparison-exchange with the peer group.

How far and how digital technologies can be institutionalized within a new educational model is a future avenue for research. However, some suggestions emerge from our research. If these processes are not accompanied by institutions, and are left to individual spontaneity and commitment, there is a risk of a will be further drift towards the individualization of teaching, which will accentuate the sense of isolation and abandonment of teachers and students, disparities in the quality of teaching, and an increase in multiple inequalities. As suggested by Carbone and Calvi (2024), supporting col-

laboration and sharing from below in the digital transition context means reaffirming the values of public schools and investing resources in them, reversing that silent trend of the soft privatization of schools, which has often led to an uncritical and unguided introduction of technological tools, teaching methodologies and organizational models typical of the private professional training world. Overloading some positivist rhetoric of the 'digital school', we could explore the question of how this happens in practice, through what means, according to which models. Indeed, technological innovations can have positive impacts when introduced within a bottom-up model that fosters collaboration and sharing. This requires public resources that have not always, unfortunately, been injected to accompany reform processes in education.

Finally, the teachers underlined a rising need for digital and technological training, both for themselves and for students and their families. It is not just a matter of acquiring knowledge and skills, but of managing a relational digital education such as that which they learned to experience during the pandemic. This means the acquisition of the tools and critical thinking needed to adapt creatively within a digital learning environment (Giancola and Piromalli, 2022), but above all to develop those relational and emotional skills needed to reconstitute ties and care within an educational space that today is equally composed of face-to-face and virtual and dematerialized interactions.

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