

## **ONLINE LEARNING IN THE COVID-19 PANDEMIC: TEACHER REPRESENTATIONS AND TECHNOLOGICAL INSTRUMENTS**

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### **Abstract**

*Online teaching has become the fundamental teaching tool during the Covid-19 pandemic. In order to guarantee the right to study, educational institutions have quickly tried to change the teaching-learning methods and digital tools already possessed. This modality required wide technological skills and a reorganization of the educational objectives of the school and family context.*

*This paper aims to present the online teaching methods implemented, the teaching profession, the pros and cons of online teaching-learning processes, and the digital tools chosen by schools and teachers to promote inclusive learning. The study involved 284 teachers from kindergarten to secondary school in the Italian context. Questionnaire and semi-structured interviews were carried out between April 2020 and June 2020.*

*The data analyzed show that all educational institutions have adopted at distance teaching-learning devices to avoid the collapse of the scholastic system by March 2020. Teachers reported that they initially sought to reproduce face-to-face teaching strategies in the online contexts. This allowed teachers to work in their comfort zone, but did not promote long-term results. The data shows an increase in the representations of the workload and a lowering of students' learning results. The difficulty in differentiating the school context from the family one emerged. The technological devices and platforms chosen often did not have the necessary functionalities to reproduce an in presence teaching-learning process. Sometimes the functionalities were not known by teachers to be fully applied. The family-school relationship has changed, becoming more informal and continuous during the day. All respondents agree that the teaching strategies chosen during the first phases of the pandemic were emergency strategies that have fastly attempted to promote learning and interaction. The tools and methodologies of online teaching are not the same as those of school teaching in presence. The importance of digital pedagogy and the need to include it in training programs to prepare future teachers for the light in the new social reality is fundamental.*

**Keywords:** *online teaching, covid-19, digital technology, lifelong learning*

### **1. INTRODUCTION**

"Within the entire national territory there is [...] the possibility, for the school managers in which teaching activity has been suspended due to the health emergency, to actively manage distance teaching methods for the duration of the suspension, also with regard to the specific needs of students with disabilities" (Italian Ministry of Health 01/03/2020).

"In order to combat and contain the spread of the COVID-19 virus, on the entire national territory [...] limited to the period from the day following the effective date of this decree, the educational activities for children are suspended [...] in schools of all levels, as well as the frequency of school and higher education activities, including universities and institutions of higher artistic, musical and dance training" (Italian Ministry of Health 03/04/2020).

In Italy from 9 March 2020 until the end of the school year in June, schools and educational services throughout the country were closed due to the emergency caused by the COVID-19 pandemic. From physical places of training, aggregation and socialization, schools become online virtual places through distance learning platforms. Suddenly families, students and teachers were catapulted into a parallel dimension of their lives, where the tools used were distance learning, webinar, online, platforms,

network, connection. Young people understood its most important function, the connection to maintain social interactions. Even elderly discovered the value of global and digital communication.

Despite the thirty years of technological didactic experimentation, despite the digitization plans (MIUR nd), despite the European and Council Recommendations of 18 December 2006 (Official Journal of the European Union 2006) and subsequent update of 22 May 2018 (Official Journal of the 'European Union 2018), place digital skills as a priority for lifelong learning, not all educational institutions have activated distance learning effectively. Not all people had the digital skills and tools to be able to actively act in the closure situation. These inequalities have led to the emergence of new forms of marginalization and exclusion: digital divide with respect to the IT resources possessed, digital illiteracy with respect to adequate skills, economic poverty and therefore the inability to access minimal tools, peripherality with respect to the broadband network or fiber (Pinnelli 2020).

Unesco, Unicef and the World Bank have published a report on educational interventions in response to Covid-19. Schools have been fully or partially reopened in 2/3 of the states. 25% have not set or respected the expected reopening date, as low or low-middle-income country. Digital education has been activated in 90% of rich countries. Instead, digital education was activated in 40% of middle and low-income countries. 90% of states have facilitated access to online learning. Internet access was offered subsidized or free of charge. (UNESCO, UNICEF, et al, 2020)

The pandemic has certainly been an acceleration factor in this direction, since being digital has become a primary need. The whole world of education, schools and academies have played a fundamental role in this context and the test bench of the thirty-year digitization plans have been put to the test (Lucisano 2020).

## **2. THE RESEARCH**

The research team wanted to analyze the modalities of reorganization of the teaching profession implemented during the first lockdown caused by the Covid-19 pandemic in Italy, the research question being: "How did the teaching profession change the teaching-learning modalities during the March-June 2020 lockdown?". In addition: "What are the pros and cons of the digital tools mostly adopted?" "Did the digital tools chosen by schools and teachers promote inclusive learning?"

224 teachers were interviewed for the aim of the research. They worked in the kindergarten (24/224), in the nursery school (147/224), in the primary school (61/224), in the lower secondary school (10/224) and in the upper secondary school. (6/224). The group is not homogeneous for gender, since we reached 220 Females and 4 Males. Nevertheless, national data on school staff confirm this imbalance towards the female gender. In fact, in Italy the school staff is 902.487, the male gender covers 164.358 places and the female gender covers 738.129 (Single School Data Portal, 2020).

Online questionnaires and semi-structured interviews were adopted to collect data from April to June 2020 throughout Italy. The research team distributed to teachers the online questionnaire created with Google Forms in April. From May to June 2020, the team contacted the teachers again and carried out a semi-structured interview.

The research tools were built aiming to explore three topics: pre-pandemic teaching profession; teaching profession during the Covid-19 pandemic; choice and use of digital tools for teaching-learning activities. The questionnaire and the interview have the same structure and are made up of 24 questions divided into 4 parts. After a part dedicated to demographics data, a second part explored the pre-pandemic professional habits with 6 questions. The third part on the profession during the Covid-19 pandemic and the necessary training with 8 questions. The fourth part on the choice and use of digital tools with 8 questions.

The analyzes were conducted by the researchers through MAXQDA 20.3 (VERBI GmbH, Berlin, Germany), Excel and Word.

### 3. RESULTS

The research team analyzed data firstly qualitatively. Subsequently the data were compared with the answers given by the teaching staff using the semi-structured interview tool.

As a first result emerged that the working hours of the teaching increased significantly during the pandemic (Table 1).

	<b>Minimum</b>	<b>Maximum</b>	<b>Hourly average</b>
<b>Pre-Covid-19 working hours</b>	4	40	21,26
<b>Working hours during Covid-19</b>	0	100	N/A

**Table 1.** Working hour Pre/During Covid-19

This data is not linked to a salary increase. The actual online teaching hours are shorter than face-to-face teaching. Teachers justified these data with two reasons. The first reason is more time to plan lessons and choose the adequate tools (120/224). The second reason is the lack of a difference between working time and family time (74/224). Compared to face-to-face teaching, planning the online lesson is said more demanding both from the point of view of the choice of tools and activities. Furthermore, schools has entered families' homes and teachers taught from their own houses, so that there was not a dividing line between private life and work.

Analyzing the data for each respondent, the exponential increase of working hours is confirmed (145/224). As for the teachers who work in Nurseries and Kindergartens, on the contrary, a decrease in working hours or their cancellation (79/224) emerged. The reason given by the respondents is linked to the age of children (60/79) and the specific system of 0-3 educational services (19/79).

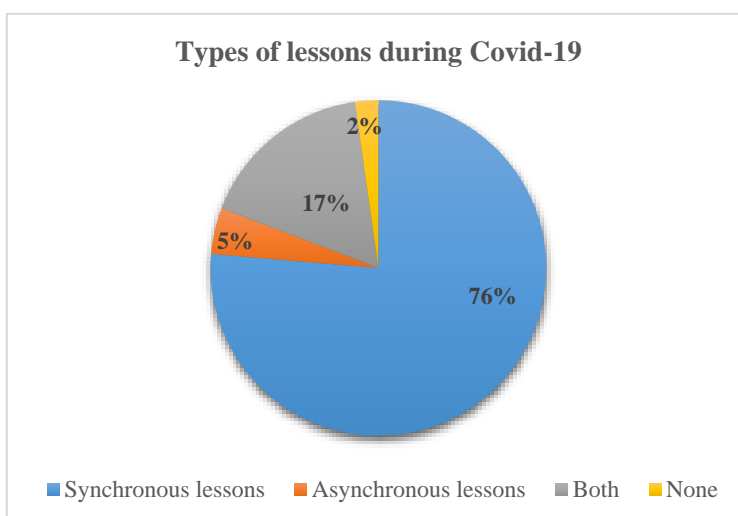
As can be seen in the Table 2, the personal computer and the smartphone are the two most used technological devices both in daily and working life. In everyday life, the most commonly used device is the smartphone (176/224), while at work level the personal computer (200/224). The tablet is less used both in everyday life and at work. The IWB was rarely used during lockdown. The school staff who entered it claim that they used it when they could access the school to carry out online lessons from the classroom.

<b>Technological device</b>	<b>Daily life</b>	<b>Work</b>
<b>Personal computer</b>	197/224	200/224
<b>Smartphone</b>	176/224	126/224
<b>Tablet</b>	73/224	55/224
<b>IWB</b>	3/224	16/224
<b>Printer</b>	5/224	6/224
<b>Scanner</b>	1/224	4/224
<b>Camera</b>	1/224	4/224
<b>Webcam</b>	0/224	1/224
<b>Recorder</b>	0/224	1/224
<b>Radio</b>	1/224	1/224
<b>Tv</b>	6/224	0/224

<b>Domestic appliances</b>	1/224	0/224
<b>Smartwatch</b>	1/224	0/224
<b>Voice assistant</b>	1/224	0/224

**Table 2.** Technological tools for Daily life / Work

The most chosen online lesson modality is the synchronous one (76%). Mixed lessons as synchronous and asynchronous lessons (17%) were preferred to asynchronous lessons (5%). Some teachers did not take lessons due to the reduction in hours or the non-activation of distance learning (2%). (Figure 1)



**Fig. 1.** Types of lessons during Covid-19

Synchronous lessons are the teaching method most adopted. These lessons were designed having as a didactic tool the video lessons with the students (76/224), the online platforms (54/224), making video calls with families to co-design the objectives (14/224), video calls with colleagues (17 / 224), the Lead mode (7/224) and distance learning (46/224).

The offline activities are workshops (25/224), tutorials on the topic explained (12/224), didactic material (20/224), slides (10/224), power point (9/224), videos (14/224). 35 teachers considered important to diversify the tools made available to students to facilitate teaching-learning. 12 teachers considered the training carried out during the lockdown on the new way of planning and implementing teaching to be fundamental.

The data illustrated above make us understand the choice of new digital tools tested and used during the lockdown period. It can be seen from Figure 2 that the platforms and / or applications most used are Zoom and Meet with 97/224, Classroom with 33/224, Padlet with 30/224, Skype with 27/224.

The apps / platforms summarized in the Figure 2 have different functionalities that are used to make video calls, video lessons with interactive whiteboards, chat, create audio and video, create texts and presentations, record lessons, annator grades and assignments, enhance learning through games, etc.



<b>Professional training</b>	28/224
<b>None</b>	26/224
<b>Collaboration between teachers and families</b>	18/224

**Table 3.** Positive aspects of distance learning for teachers

In Table 4, we present the negative aspects of distance learning. The lack of human contact is the worst aspects of distance learning. Teachers stated that children need human contact (90/224), concrete and real experiences (35/224) for learning. Another problem is the accessibility. There are families without technological devices, without internet connection, incompetent in the use of technologies. (48/224) The digital divide is still present in Italy.

<b>Negative aspects of distance learning</b>	<b>N°</b>
<b>Lack of human contact</b>	90/224
<b>Accessibility problems</b>	48/224
<b>Concrete and real experiences</b>	35/224
<b>Prolonged use of technological devices</b>	18/224
<b>Mediation of the adult</b>	10/224
<b>None</b>	7/224
<b>Many</b>	5/224

**Table 4.** Negative aspects of distance learning for teachers

#### 4. DISCUSSION

In Italy, during the first lockdown caused by the Covid-19 pandemic, the educational institutions quickly reorganized their teaching methods in order to guarantee the right to study for students.

The reorganization required a period of adaptation of the figures involved, teachers, families and above all students. From the data presented, the reorganization required a great expenditure of energy both in working hours and in the need to training. With regard to working hours, the data in Table 1 show a different situation with an exponential increase in working hours for teachers in primary and secondary schools, while a reduction / cancellation of time for teachers involved with children from 0 to 5 years old. This result is confirmed by the responses regarding the negative aspects of using the technology (Table 4). Adults mediation is inversely proportional to the age of the children. The younger the children, the greater the adult support.

In the 0-5 age group, direct experiences are functional to learning. Children have to make experiences, to try and fail, to imitate and observe peers or other reference figures, to understand reality and learn through senses and body. The absence of relationships and of real and concrete experience also emerges from table 4 as a negative aspects of technology for school. Having to stay at home, the services for children 0-3 were not provided and the staff had a reduction of working hours or a reset of them. As for the kindergartens, timetable was drastically reduced the hours, but has continued to provide a minimum of activities (Cirilli, Kazantseva and Nicolini 2021)

Each school order and grade switched from face-to-face interactions to synchronous and asynchronous lessons. The data show that the most chosen teaching method was the synchronous one (76%). Teachers and students find themselves in a parallel digital environment and were online through the platform's digital tools. The 17% use both synchronous and asynchronous modality at the same time. From the



analysis of the interviews, the teaching staffs state that initially the synchronous modality was the most used to carry out the frontal lesson that they used to carry out in presence. This choice was subsequently overcome in order to render more appropriately and eliminate the one-sidedness of the relationship with the support of videos, photos, interactive apps, interactive whiteboards, chats, texts, presentations, online games, etc.

As can be seen from the Figure 2, teachers use different digital tools that support, personalize, enhance the teaching-learning process in online mode and platforms / applications that allow online video calls / video lessons, like Video Creator, Screencast, Hangout, Weschool, Learning Apps, Powtoon, Padlet, Book Creator, Microsoft Office package, Canva.

The knowledge and competence in using platforms and applications allow teachers to customize and diversify the presentation of the same topic to the whole class in remote mode. This customization is possible thanks to known digital tools. Teachers who possess technological skills were able to apply their knowledge in the design of online lessons for classes. The data are confirmed by teachers' representation of the need to train on the choice and use of technology during the Covid-19 pandemic. Teaching staffs say they use personal computers, and the use of smartphones was also necessary for quick communications among colleagues and with students' families (Table 2).

The research allowed to understand how technological tools are useful for different subjects and can be used to carry out interdisciplinary connections. The teachers stated that it was possible to customize the activities for children with disabilities. Above all, technological devices offered the opportunity to stay in touch with school, work and family contexts, being the face to face interactions enabled. Technology has allowed the maintenance of social interactions (Cirilli & Nicolini 2020). On the other hand, the wide use of technology generates lack of human contact (90/224) and absence of concrete and real experiences (35 / 224). Fortunately children and young people in the current generations are attracted by digital tools and they are used to interact at distance: this was a positive factor and promoted the attention to school lessons (38/224). The teachers affirm that the captivating and attractive feature must be safely promoted, since the prolonged use of the technological tools, especially for sight, generates a stress that elevates the eyes (18/224).

The teachers affirms that technology represents a new fast and collaborative tool that has made it possible to reduce long meetings in presence, such as teaching colleges, interviews with parents, sending documents, bureaucratic aspects and have promoted an environment healthier from an ecological point of view. Being in 2021, accessibility to technology should be extended to the entire population. Our research shows that accessibility is still a problem. Not all families were equipped with digital tools, connection and above all some people, adults and elderly, did not have the technological skills suitable for the situation.

## **5. CONCLUSIONS**

In this paper, the research team presented the results of a questionnaire and of a semi-structured interview administered to teaching staff from March to May 2020. The research question that was asked: "How did the teaching profession change teaching methods during the March-May 2020 lockdown?". The remote synchronous and asynchronous modality was the teaching-learning modality used by the teaching staff. This modality was made possible thanks to the knowledge and choice of the most functional technological tools to achieve the set objectives. Also the two sub-questions, "What are the pros and cons of the digital tools used?" and "Did the digital tools chosen by schools and teachers promote inclusive learning?" were answered. There are numerous pros and cons in the use of technological tools as shown in table 3 and table 4. The interesting result is the propensity to use this tool in future face-to-face teaching. The research sample, in fact, agrees on the real functionality of the technological tools as another way of personalizing and diversifying that would allow inclusive learning for all students.

This research represents a point of arrival as the research team managed to take a photograph of the school context during the March-May 2020 lockdown in Italy. It is also a starting point, because in Italy

after the summer break, the lockdowns have been repeated and we are collecting and analyzing new data to compare with the previous presented in this article.

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