

Article

# After the Pandemic: Teacher Professional Development for the Digital Educational Innovation

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**Abstract:** On the one hand, the pandemic has posed unprecedented challenges for teachers all across the world; on the other, created opportunities for teacher professional development (TPD) as well. Furthermore, this educational emergency has uncovered the potential of digital technologies authentically and showcased its relation to the TPD and educational innovation. In this article, the concepts such as teacher agency, networked learning and reorganization are reexamined and theorized. The current article is a continuation of the research that has shed light on the TPD patterns and peer learning in the context of the pandemic and represents qualitative research covering 15 representatives of different-level schools from three different countries (Italy, Spain and Turkey), focusing on their experiences and future opportunities for TPD. Based on the said theorization, through iterative and abductive reasoning, and narrative inquiry, the lived experiences of teachers are examined and explored. The results indicate that in times of uncertainty and relaxation of macro-level frames, teachers have reorganized their teaching and learning activities relying on peer networks and collaboration while reinforcing their agentic qualities. The implications of the research contribute to the theory, policy and practice of TPD.

**Keywords:** teacher professional development; networked learning; educational technologies; teacher agency



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## 1. Introduction

It has been argued that the pandemic-related emergency has constituted an opportunity to better understand what technology can do in and for education [1,2] and brought educational change opportunities to the “stalled school system” [3]. The forced transition to the emergency remote teaching (ERT) [4] has led many researchers to a quest to understand its impact and underlying factors for success or failure [5]. Many have investigated questions, such as teachers’ attitudes [6], change in motivation and digital skills in the context of the forced transition [7] while also trying to identify the potential for teacher development (TPD) opportunities in them [8–11]. We posit that based heavily on educational technologies, the current, post-COVID educational landscape asks for questions primarily about TPD and the transformative nature of these technologies, teacher agency, and educational change, among others. It has also been argued that “the COVID-19 lockdown experience has put into practice many ideas and principles developed in the field of networked learning” [12].

Consequently, the main focus of this paper is digital pedagogies and TPD; more concretely, with what support and agency teachers have acted during the reorganization attempts, the use of networked and peer-learning approaches, and what lessons can we learn from lived experiences of the teachers that can have an impact on the TPD approaches employed in future. This research is a continuation of a previous ethnographic case study on three self-initiated teacher communities (in Italy) and the reorganization of teaching and learning during the COVID [2]. In the previous study, we have provided evidence that the pandemic has expanded what we call the *meso level* of the reorganization through peer communities of teachers while it has also served as an authentic experiment to explore the potential of educational technologies, and their connection to reorganizing teaching and learning process [1]. This paper tries to further uncover possible futures and perspectives for TPD while theorizing on what new insights the experiences from COVID-19 ERT can bring. Furthermore, the paper continues to theorize and examine the interactions between different organizational layers in the context of the authentic context of pandemic-related reorganizational needs while further theorizing the concepts of *teacher agency* and *networked learning* in the broader context of re-organizing teaching and learning practices. Specifically, it focuses on teachers' lived experiences and their support mechanisms during the COVID-related lockdowns in the reorganization of their teaching activities. To explore and showcase the lived experiences of the teachers and shed light on post-pandemic perspectives of TPD, the current paper reports on the qualitative results of semi-structured interviews with 15 teachers from three countries and analyzes them through abductive approaches while theorizing further the re-organizing of teaching and learning, and TPD prospects.

## 2. Literature Review, Previous Research and the Research Framework

### 2.1. Teacher Professional Development through Peer Learning and Pandemic Experiences

Professional learning networks are “*complex systems of interactions consisting of people, resources, and digital tools that support ongoing learning and professional growth*” [13]. Research shows that a bottom-up approach, such as community-based peer learning, is an effective approach to professional but also theorizing development [14]. It has also been reported that school leaders acknowledge the importance of including social networks in a multi-faceted approach to the TPD [15], primarily via Twitter, to provide teachers with growth opportunities. Peer learning is thought to be effective in TPD and has been regarded as one of the crucial components of quality education and one of the predictors for improvement in learning outcomes [16]. Delivering an appropriate level of difficulty in a less threatening environment [17], teachers regard this form of learning as valuable [18]. Different models consider professional learning networks and peer learning for teachers [19–21] and community-based models constitute a meaningful part of TPD in this context [22]: teachers mostly seek ideas and examples to solve their personal, immediate problems in their teaching practice (i.e., [23]) and self-initiated professional learning through personal learning networks can also be used for professional development in educational technology-based practices [18]. Previous research has found that Facebook cannot magically deliver outcomes for TPD, “online groups may serve as learning networks, requiring additional activities as well” [19]. We posit that aside from activities, there is more to add to this picture based on the recent landscape shift in education.

Emergency remote teaching (ERT) has had an impact on how TPD has been implemented during the pandemic times. Face-to-face programs for teachers were not possible during the lockdowns, and teachers had to communicate with them remotely. Therefore, new methods of TDP emerged or became more used than before the pandemic, e.g., the use of social networks (e.g., Twitter) for exchanging knowledge and educational materials and receiving support among peers [7]. Not surprisingly, during the pandemic, self-initiated professional learning networks through social media have been successfully used by teachers in the reorganization of their teaching and learning activities in different countries (i.e., [1,7,9,24]). The Twitter messages analysis made by Beardsley et al. revealed that, during the lockdown, teacher advice seeking related more toward tracking down content

for online teaching, performing basic classroom tasks online and finding applications that could make online learning interactive. Whereas during the post-lockdown period (the new normal), it related more toward supporting their TPD (seeking pedagogical advice) and creating their educational content and materials. Another example of using social networks during pandemic times and beyond (new normal) is the proliferation of Facebook pages of groups of teachers that create a common space online to serve TPD's immediate needs and create support during the needed reorganization of teaching and learning activities [2,25,26].

## 2.2. Background: Educational Innovation, Educational Change and Teacher Agency

While defining educational innovation is somewhat problematic itself, it is a concept that has been linked to different processes and levels: at the intersection of pedagogy and technology, whether the instrumentalist dichotomy has governed the issue of whether pedagogy or technology should drive the innovation, the concept of "entangled pedagogy" has been suggested, which states that both technology and pedagogy work in tandem to create innovation [27]. Others have suggested that educational innovation happens on different quadrants, suggesting that real innovation takes place on an organizational level [28]. Fullan has indicated, how the TPD is tied to organizational development and innovation, focusing on teachers as *agentic* individuals, change agents that can drive innovation [29] while supported with different other external, organizational factors. Individuating factors and trying to create certainty and measurement indicators for educational innovation is not new [30,31].

We posit, that a crucial question in improving TPD approaches after two years of ERT could be the reinforcement of *teacher agency*. However, the concept of *teacher agency* needs to be first defined. Let us explore, how this can happen. The past literature often presents an unclear conceptualization; it is described as "autonomy and causal efficacy" but according to some authors, it appears too often as a personal ability but little or not at all connected with the context and the learning environment. While previously, the teacher agency has been usually considered as an individual skill, nowadays, the perspective of teacher agency is perceived in a wider and deeper ecological view. As a result, in this view, teacher agency has been defined as an "interplay of individual efforts, available resources and contextual and structural factors as they come together in particular and, in a sense, always unique situations" [32]. However, the support mechanisms for this interplay can be multi-faceted: from this more sociological point of view of the teacher, the agency appears dialogically connected with the social but also chronological context. The most recent literature makes the importance to consider teacher agency explicit as a result of the past but also oriented to the future and able to modify it [33]. In this specific situation, actual teacher agency could be seen as the result of forced ERT but also as a starting point for future innovation. Creating conditions for activation and reinforcement of teacher agency could play a role in educational innovation helping to bring about technological and methodological innovation in the post-pandemic world not only in the short but also in the long-term perspective of TPD.

It is true, that teacher agency can be fundamental but is necessary a caveat: within the most modern frameworks reinforcement of teacher agency could be able to support TPD with networked learning approaches [2]. This ecological and contextual vision of teacher agency is linked to the engagement: so, it's evident for the development of teacher agency a sort of peer learning and the communities of practice are needed as fundamental "spaces" in the complex and delicate ecology of the agency [33]. In the ecology of teacher agency, a prominent place is held by networked learning. Networked learning is useful to promote connections in the teacher community (as well as in the learners' community) through Information and Communication Technology as a horizontal connection between people, machines and learning resources [34]. By the recent definition, "Networked learning involves processes of collaborative, co-operative and collective inquiry, knowledge-creation and knowledgeable action, underpinned by trusting relationships, motivated by a sense

of shared challenge and enabled by convivial technologies” [35]. Networked learning is based on people, computer and their mutual connection. So, the interactional aspect of this notion in the reinforcement of teacher agency is very useful. The question we might pose: is just this interactional aspect the basis for the blooming of collaborative work driving innovation? There are, however, some methodological (including ontological and epistemological) challenges to this issue, as rightly noted by researchers [36]. One of these challenges is to go beyond individual factors, beliefs, perceptions and properties as suggested by Biesta [37]: “relative lack of a clear and robust professional vision of the purposes of education indicate that the promotion of teacher agency does not just rely on the beliefs that individual teachers bring to their practice, but also requires collective development and consideration”.

### 2.3. Theoretical Framework: Analysing the Meso-Space

As a continuation of this argument on the agency and networked learning of horizontal relationships between tools, people and learning practices, we refer to the already explored topic on the transformative potential of digital technologies that should be situated in a specific organizational layer referred to as the Meso level [38–40], which have expanded during the ERT [2], acting as a magnifying glass to examine its significance [1]. According to this view, the Macro level is where patterns of collaboration, structures, and frames, are formalized and enforced. The Macro is opposite to the Micro level, which is, conversely, expressive of individuals’ neurophysiological processes, as well as psychological dispositions, attitudes, experiences, as well as personal agendas and plans, as already mentioned by Biesta [37]. The Meso is the organizational layer that sits in between Micro and Macro enabling actors to organize and, from time to time, reorganize with the available educational tools.

The Meso here (Figure 1) signifies an organization layer of cognitively saturated processes, which is distributed across people and tools, working together to make decisions, accomplish tasks and pursue collective goals, not yet crystalized in any macrostructures [40] (p. 5). The Meso cuts across the distinction between individual processes and collective ones; however, it does not address the individual taken in isolation or the social system independently from its constituent individuals. Both organizing and re-organizing are carried out in dialogue with the available tools—so, as correctly noted by Fawns [27] the pedagogy and technology create a symphony of re-organizing. As far as the education system is concerned, that means that at the Meso level technology and pedagogy go hand in hand to find viable solutions.

<b>Meso</b>	Organizing	Responsive to situations	Handling contingency
	Re-organizing	Generative of new organized forms of collaboration	Exploring opportunities and articulating insecurities

**Figure 1.** Conceptualization of the Meso level (from [2]).

## 3. Study Context, Methodology and Methods

### 3.1. Study Context

The study took place within the scope of an attempt to uncover opportunities and needs for post-pandemic TPD in light of the recent pandemic-related challenges during remote teaching activities. The main research problem of the study is to gain insight into the pandemic experiences shedding light on the post-pandemic TPD needs in the context rooted in pandemic-related educational emergency experiences. This research aims to create a research-based TPD theoretical framework coming from the insights of the research

and a practical technological environment for TPD incorporating learning design (LD) tools, and learning tool contextualization possibilities while creating reflection and collaboration opportunities for teachers.

#### Methodology, Research Questions, Data Collection and Analysis Methods

The overarching methodology within the scope of the overall aim is a convergent mixed approach [41], aiming to first, qualitatively explore the lived experiences of teachers across three different countries (Italy, Spain and Turkey) and consequently develop a survey instrument to quantitatively investigate reported insights. Moreover, in the current research, we are trying to gain further insights into the foci of interests suggested by the findings of the previous studies by the authors of the article [2], which indicated the expansion of the meso space (among the three organizational layers), through self-initiated communities of teachers. Not only does this research aim to develop a framework for TPD based on the authentic, lived experiences of teachers during the educational emergency but also creates tools and a networked, peer-learning environment for TPD based on these experiences. This particular paper reports on the first, explorative phase of the larger convergent mixed study trying to shed light on the opportunities for TPD in the context of the pandemic.

The sampling procedure followed a purposive sampling procedure by identifying teachers with various types of experiences, subjects and levels of education. The data was collected through semi-structured interviews, with the same questions for the interviewees in all three countries and the same protocol and questions for all cases (see the protocol in Appendix A). Before the interviews, ethical approval for the research has been requested and granted, as well as informed consent has been signed by individual teachers.

The interviews were held with 15 teachers from different levels of school from Italy, Spain and Turkey, with different experiences in teaching (12 experienced, 3 not very experienced), teaching different subjects (humanities 5, STEM—7, different—3, with varied experiences in digital teaching (10 teachers with limited experience in distance and digital teaching and 5 with some experience). The main foci of interest were based on the theorizing provided in previous research as already underlined in chapter 2. The guiding research questions of the study are the following:

RQ1. What kind of uncertainties and opportunities has the pandemic-related emergency created in TPD?

RQ2. What kind of support have the teachers found during the pandemic lockdowns in terms of official guidance/recommendations, peer networks or/and formal training?

RQ3. How can the lockdown experiences inform future TPD perspectives for educational change and innovation?

The interview questions concerned (a) basic demographic information on the field of teaching and experience; (b) pre-existing experiences with digital education and experiences of ERT during COVID-19 emergency-related lock-downs (c) support received in terms of official recommendations, formal or informal training, networking and future modes and models for TPD needs.

The data was analyzed iteratively, through abductive analysis, which means using existing theoretical lenses, iteratively moving back and forth from theoretical insights to data, to move away from rigid deductive approaches and generate further theoretical indications, informed by qualitative data, while finding the most plausible explanations [42]. This theorizing, as already mentioned in previous chapters, is again, data-informed from previous research, however, we are still moving beyond existing pre-conceived notions to explore more through the lived experiences of the school teachers. For this purpose, thematic analysis, in particular, following a narrative analysis method was used. Narrative research collects and tells a story or stories in detail, based on lived experiences describing and discussing the meaning of the experience [43].

## 4. Results

### 4.1. Theoretical Dimensions and Explorations

As already mentioned, following the abductive analysis principles, the research is primarily guided by several notions as described in chapter 2, while further theorizing them. First of all, we should mention, that teachers from all three countries have faced *uncertainties* and also have explored *opportunities* with the use of tools. Of course, the experiences of the countries are not identical (for instance, in Spain, there is more emphasis on innovation and pedagogy and a lack of macro-level support, in Turkey—lack of infrastructure and devices, in Italy—the divide caused by distance and related interaction issues); however, the narrative of the analysis does not follow any distinctions between the countries as the main idea is to draw conclusions based on all the interviews as a whole. We follow the narrative on a thematic basis and based on the foci of interest of our research, further theorizing them.

#### 4.1.1. Reorganization for Educational Innovation—Increased Variety

**Micro level—Increased variety:** From what we have learnt from the interviews when dealing with new, uncertain situations and an ever-increasing number of educational tools, consequently—increased variety of options, overload with technology and tools can be disorientating and frustrating. The modes and modalities are mixed, orchestration of tools and tasks can be overwhelming, leading to frustration and despair. According to one of our participants, “... we did the course with Google applications and everything, but when the pandemic arrived, we found ourselves completely disoriented. Then there was also the problem of homework that returned to us, however, in digital format, and to open them to be able to look at them and to be able to correct them ... and there was all this”. Not only it causes frustration and individual, micro-level (individual) uncertainties, but it also creates different options and frames of operations that need to be re-established and re-negotiated.

The whole pandemic has been an uncertain entertainment of different options pushed through the increased variety. As one teacher eloquently puts it: “some time ago I also reflected on the fact that due to the pandemic, we have started to make some things that were previously sporadic of almost daily activities. For example, I realize that technology also brings those children who may not attend school for another reason closer together. So for example a child who is forced to stay at home for a long period, thanks to the use we have found with these instruments, the child may even enter the classroom while staying at home. We had a little girl who had an accident and was therefore physically unable to come to school: here, thanks to this new mode of interconnection we were able to reach her and do activities with her”. We can see that new opportunities are explored when the *uncertainties* push, and teachers take responsibility for what options they can entertain.

**Micro level—ERT pushing the limits:** From the accounts of the teachers, it is clear that increased variety in tools and teaching practices forced by emergency pedagogies pushed the limits on the micro level, as there have been many problems with infrastructure issues, such as lack of devices, lack of preparation for specific skills. Another obvious problem that has emerged is that of the lack of interaction, and sense of isolation of the students, which caused the problems of distraction. It is clear that some have used and expected that the use of synchronous teaching would help cross the “transactional distance” [44] with the expected impact to overcome the sense of isolation. “I’m thinking now, in order to keep our students active, we needed to interact immediately. For this, we first tried discord to gather all students, but then discord doesn’t offer students the opportunity to meet face to face. Only verbal communication. We found ZOOM. We immediately start to use ZOOM. We may even be one of the first to pass. I had each of the students open a camera via ZOOM. We were able to open our camera and directly teach”. This quote is an illustration from many similar accounts of how teachers were trying together to find new options for teaching with tools, to address the immediate, most difficult part of distance learning—interaction.

The narrative from the lived experiences of the teachers suggests that they would need help in guiding them in cognitive strategies to overcome the isolation issues, help them in

the reorganization of teaching and learning activities in a way that the sense of isolation, distraction and other problems can be avoided when re-organizing activities with the use of tools. *“Actually, I received a few trainings, there were training programs related to Web 2tools. I renewed them, I examined them for a while. I think I can do them. Because it just makes it a little more fun. Because it is distance education and it is not face-to-face, children get bored very quickly. They get distracted very quickly. Because something is going on in the home environment that will distract them”*. This, again, indicates that teachers were trying to reorganize their teaching and learning in tandem with technology, however, the training they received was not exactly about the contextualization of these tools, but about operational use. The teacher had to still explore further how to reorganize to meet the challenges of ERT. This passage moves us to another, meso level of re-organizing that is explored in the following chapter.

#### 4.1.2. Meso and Macro Interactions—Teacher Professional Development Support during the COVID-19 Pandemic

**Meso level, uncertainties pushing re-organizing:** Uncertainties in how to re-organize with tools and space (only restricted to the digital) available, have brought out opportunities in terms of re-organizing while creating opportunities for the teachers to act on the uncertainties, turning them into opportunities *“indeed I believe that the digital tool must be placed side by side with the traditional frontal lesson, which I believe is no longer what it once was. in the sense that the frontal lesson no longer gives the same results it once did. now the situation has changed and we also adapt in the right way . . . in the sense, consistent with the times we live in”*. Another teacher states, that while not having the needed training, they had many uncertainties. However, still while having re-organizing attempts, they have found the experience to be actually empowering: *“During the pandemic we didn’t have time for pedagogical training. We have to do practical things to solve problem. In my case, since I had to adapt all my classes, it was very complicated. But I think it was very good later. After the pandemic, we could continue with the course; just in case, it happens again, we were ready for online teaching. I also remember the uncertainty”*. Another teacher explains that they had to adapt all the classes, as they were using very hands-on methods previously. The school was late in re-establishing the frames of operation with new tools (i.e., regulations, rules and guidelines). Teachers were left with many uncertainties, which then pushed the expansion of the meso space, creating new opportunities. Let us hear what one teacher had to say: *“I had to adapt all my classes. In addition, that my classes were very practical. That was a very big handicap. We had to adapt all the material to digital. At the beginning of the pandemic, we couldn’t do video conferences. The school adapted to do video conferences later, it was already April. Then what I did was record myself... but I thought “what if the students don’t understand the recording”. I don’t know if they understood or not. I did not interact with students. It was really complicated. I decided to explain things three times, in different ways: theoretically, with activities... to try to get the students to understand. Thereafter, I searched for techniques to make students ask me questions. This required a lot of effort. Also, this required changing the way I thought about would do the classes. Thinking about the activities, I have to [re]design so students could really get some knowledge; somehow to make up [substitute] the laboratory practice. It was a lot of effort. I exclusively worked during the confinement, I worked all day. I wasn’t able to leave the house, thinking, suffering . . .”*.

**Meso: Establishing common ground, re-establishing frames of operation:** at the meso level, in terms of, peer learning and professional networks, the need to establish a common ground to re-negotiate the rules and frames of operation are evident. One teacher explains how the collaboration between teachers has helped them recreate their own “new normal” and the rules within which to operate. In this case, teachers are actually asking for some specific rules, when left with uncertainties. *“This support was helpful because no one went on their own but we all followed a common line. Even the parents did not have to navigate here and there they had me this time with these precise instructions that we had to follow”*.

While exploring what kind of frames of operation and support teachers have had in dealing with uncertainties and asked about what kind of training/support they would need, another teacher pointed out *“I think in a training that provide us with some tools to put*

into practice. A training gives us very short instructions, not long manuals, to learn to use these tools; useful tips, in the case in case I forget [directions] after the course. The easiest way to learn will be learning by doing during the course. I think that the best way to learn is by using tools. The training could be online or with a face-to-face session to solve questions, and get to know the course participants". Teachers clearly express the need for contextualising their practice with pedagogy and tools in tandem and creating common grounds for operation through a network of colleagues, which in the given lived experience, was not the case—they were only taught how to use the tool on an operational level.

**The conflict between Macro-meso levels.** While creating some order in regulations and re-negotiating frames of operation, teachers have struggled. According to one teacher, guidelines were not exactly useful. "If we have to be honest, the directives are there, but when the pandemic happened there was neither the way nor the time to think about". According to another teacher, while there were some recommendations and macro-level frames of operation given, they were still uncertain. "Yes, the ministerial circulars of the ERT that predicted the time: the school time of the synchronous and the asynchronous ... even if, according to my experience, not all the managers have applied and implemented the circular correctly ... because then the ministerial circular spoke of the synchronous and asynchronous lesson, saying that in primary school the synchronous should be reduced to a couple of hours because the attention time of a child behind a computer is that. And instead, we started with this reduced synchronous, but then, in reality, the school time even when we were at a distance, was uninterrupted, so from 8:30 to 13:00 the child was always connected ... it is true that within the lesson there were synchronous activities, and therefore he had to do the exercise, or the activities ... but the child still did not disconnect ... so he remained connected from 8:30 to 13:00, and in my opinion, it wasn't like that ... also because you have to do a maximum of 2 h after which the teacher used these hours also to prepare asynchronous work ... and this was, in my opinion, the idea of the ministry ... but then the managers did not understand it in this way so we did a synchronous activity from 8:00 to 13:00". Not only this teacher expressed the frustration based on the uncertainty created, but we can see that while operating in this uncertainty the collective "we" have taken the agentic responsibility and found a way to re-organize.

From the account of one teacher on the guidelines to follow, it emerges that the school management itself gave them plenty of freedom, however, conflict emerged in the transition period, while the whole management and the ministry were trying to re-establish themselves. "We are in a difficult moment; the transition of the school management staff, and we notice it in different aspects. Some inputs are coming up about where the guidelines are going. On the side of the government, we are receiving educational reform which suggests that we must be assessed by skills. In this sense, we have some guidelines, which change the way we evaluate a little. In my case, I have reviewed it and I think it won't affect much the way I design".

In some other cases, while initially, all was very unclear, with increased variety and tools, then slowly, the school was able to follow the lead of teachers and re-organize, however, this only meant the provision of tools and some infrastructure. "All the first initial phase that was of upheaval, so we do not consider it, then, in the end, everything was structured, so the means were then provided directly by the school, so the institutional email was used to access the Classroom package. So I received full access to the package from the school. In the beginning, we were on our own with some problems also because it was at our discretion and then the technology was not necessarily the same ... then afterwards the thing was structured, the classroom package was structured with the institutional email etc ... So the only form of support I can think of is this". So, from this account, we learn that aside from infrastructure, the school was not able to provide any significant frame of operation.

**Meso-level professional networks and collaboration reinforcing teachers:** Teachers describe how the experiences have enacted the sense of responsibility to face the uncertainties together. A teacher that has been a reference point for others, tells her story: "I did the opposite: in the sense that I was the reference point for the other colleagues, especially on how to create materials. Surely there would have been a need for a course that taught how to create content compatible with multiple devices (PC, phone) and operating systems. Since that was in high demand

*from my colleagues, I helped them create this kind of content for everyone. Once again to return to the question of the socio-economic gap". As far as networking and peer learning practice goes, another teacher adds, that this is something that they also foresee in future, to use the collective reflection to guide new, innovative practices and how it has already been reflected on the current, changed practices in school: "At school, I have experience tutoring classes [mentoring other teachers]. We are indeed making changes here [at the school], step by step. These changes will have a long-term impact, co-designing, bringing several first-year teachers working together and questioning what we want, what we want to achieve, and sharing ideas".*

**Reinforcing the meso space and teacher agency:** From the narrative of the teachers, it emerges that many teachers have dealt with uncertainties through intra-school collaboration and cooperation. Peer-help was used to manage uncertainties and re-organize within the schools, however, in some cases, online resources, and open educational resources were used. Collaboration outside of school was not as common. One teacher points out, "It was precisely during the confinement that we started a new commission that we call "pedagogical vision dialogues" where teachers come together to discuss some texts at a pedagogical level... and it was started thanks to the pandemic, perhaps the result of finding a lack of spaces to talk among teachers". From this narrative, it is evident that uncertainties brought teachers together to create a "common space" to collaborate and come into dialogue around reorganization. Teachers clearly saw an opportunity in the lock-down pedagogies, even by reorganizing their professional development practice in terms of dialogue and reflection on pedagogies in the light of new tools.

When asked about how professional development opportunities can be further supported after having experienced lock-down pedagogies, many teachers underline that the mixed approaches—online and in-presence training seems appropriate. One teacher indicates that it is very important to put all the acquired knowledge about tools into practice, probably with guided approaches, hence the need for in-presence training. We can hear the uncertainty also in this case: "I notice in colleagues who are not familiar with technologies, that even if they do training courses, after the course they have already forgotten everything, because maybe they don't put into practice what they do. So, in my opinion the training courses should be much more workshops and practical, perhaps done more in presence than at a distance because in the presence they can be more followed and guided than a distance training course". From this experience we can understand that contextualizing tools in practice, while entangled with pedagogies is very important, so also here, we can hear the teacher voicing the need for the reinforcement of teacher agency.

According to another teacher, she uses peer-learning and networked approaches to share materials and resources mainly outside of school— "I mostly shared materials outside of school. Some teachers I know [shared materials] are my friends, and they also taught at high school. But, some things that they shared were not useful to me. I don't know anyone outside of my school who teaches lab classes as I do. Sometimes I think it would be great if I had a network to connect with teachers who teach laboratory classes so I could share resources with them". The teacher indicates to the need for networked and peer learning to re-organize teaching and learning processes. According to another teacher, there is a need for networked space to generate ideas and re-organize. "At the school level, the materials we share are a bit disorganized. We have them in several places: Clickedu, Google Drive... It'd be good to organize them a bit more so they would be more reusable. Unless we do, I feel overwhelmed by the material dispersion. It takes a long time to find quality material".

## **5. Discussion and Conclusions: Teacher Professional Development Perspectives—A Proposal**

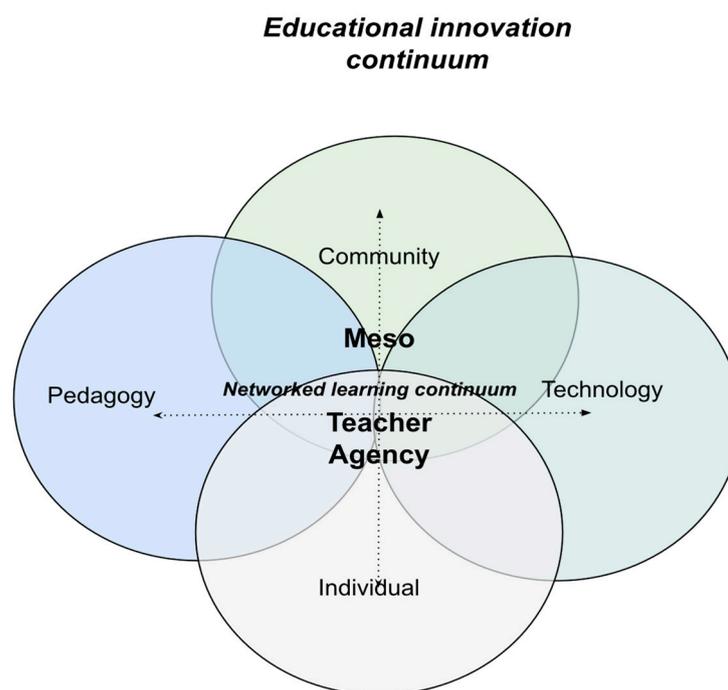
Having lived through unprecedented pressure and challenges posed by the sudden switch to ERT, the main research problem addressed in this research was to understand how teachers' experiences can inform future theory, practice and policy of TPD. The current paper has sought to shed light on the lived experiences through abductive reasoning and narrative inquiry process to gain insights about the future prospects of TPD rooted in

these experiences. Furthermore, the paper has theorized the pandemic experiences beyond already [repeatedly] reported difficulties through different theoretical lenses and offered a conceptualization for the future of TPD, educational innovation and *teacher agency* role in the reorganization process.

From the three-country study of the teachers' lived experience of the pandemic lockdowns, it emerges that the teachers needed help with an *increased variety* of tools, and an overload of tools and options to entertain. This confirms previous research suggestions [2]. From the current research, we can observe that micro-level uncertainties can only be addressed at the meso-level [reorganizing] attempts. During the situation at hand (meaning the pandemic), in times of great uncertainties, where macro-level frames of agreed and established operations are collapsed temporarily, generative uncertainties can contribute to creating innovative options. The main presumption, however, is to take responsibility, as "*uncertainty is ultimately related to open situations one takes responsibility for*" [45]. It has brought new opportunities for re-organizing, as previous studies also have demonstrated [2,45]. Re-organizing attempts then have engaged the level directly connected to re-organizing through networked approaches, peer-learning, through sharing knowledge and practices, putting the *teacher agency* at play. Uncertainties and the needs connected to reorganization offer learning opportunities, as already stated in previous research [1,2,45].

It also became evident, that in these times of uncertainty, the situation has brought out empowerment and reinforcement of the teachers who took responsibility while shedding light on the actual concept of the *teacher agency* in action. We also argue that this need, to re-establish the common grounds for operation, is a demonstration of *teacher agency* operating in a networked environment, creating further empowerment of the teachers' agentic abilities to overcome micro-level issues through acting on the meso level. This meso level helps mediate educational innovation through re-organizing to which the macro level has to be responsive. So, in the end, we can further theorise that the meso level is what crosses between the technology and pedagogy, individual and community level dichotomies, thus creating further opportunities for educational innovation and reorganization (Figure 2). Teacher agentic qualities, as already noted by Biesta, are not individual qualities of particular teachers, thus reinforcement of teacher networks for organizational change here would become crucial.

This research has contributed to the theoretical understanding of the peer-learning role in TPD, by exploring and theorizing teacher agency based on theoretical notions from organizational cognition and TPD, has also highlighted its relevance to educational technology and the development of educational innovation. We posit that the also the communities of practices and networked learning could be better understood by theorizing them further through the suggested theorization while referring to the three-level reorganizational theory of social organizing by Secchi and Cowley [2,40,46] which was then applied to educational technologies, educational innovation and TPD, and expanded by the authors [1,2,38]. If we assume that the main characteristics of meso levels are "*responsiveness to particular situations in the here and now*" and "*generativity of a new alternative organized form of organization*" [1,2], it's clear that the characteristics of this level during the pandemic have helped to give answers to the sudden needs of ERT and could turn out even more relevant for the post-COVID era. This also could mean, that aside from the already problematized entanglement between pedagogy and technology by Fawns [27], we should re-consider the connection between technology and pedagogy more concretely within the TPD and position the teacher agency on a different level. This meso level has been tendentially and inherently collaborative but could move even further towards new generative, transformative and reorganizational educational innovations, where meso-level expansion is supported through which the teacher agency can also be theorized and on a practical level, scaffolded further.



**Figure 2.** Reconceptualizing the connection between the habitual dichotomies and main concepts for educational innovation.

Our previous research has uncovered the importance of self-initiated communities of teachers in re-organizing teaching and learning activities with educational tools in the context of ERT, to handle uncertainties and seek support, which indicates that the peer networks, when certain macro frames of operation are relaxed, can act as an expanded meso space allowing for re-organizing and innovating [2]. This research indicates that *the meso* is the level where teacher agency, interpreted as an ecological feature, can be supported. This can happen through the reinforcement and better flow between these three organizational layers, for the teacher agency to be better expressed. This meso level is in the middle ground between the *macro level*, where external forces rule, and a *micro level*, where personal skills, attitudes and dispositions predominate. Here we can observe that there is an influence of the contextual factors, but also at the same time, a collaborative push is oriented towards the future. At this level, the innovative potential and attempts to re-organize meet, thus reinforcing the teacher agency. More concretely, networked learning around actual practices bringing tools and pedagogies together, while exploring new options and opportunities, through responsible reflection are important.

On the practical level, this means that TPD activities could be organized around the idea of reinforcement of *teacher agency* and reorganization of learning processes, creating opportunities for the expansion of the meso level. This could mean creating networked learning environments, tools, practices and contributing policies to enhance the responsiveness of the macro level to the meso-level reorganization activities. This would also mean re-organizing TPD practices to enable and reinforce teacher agency.

As far as the interpretation and utilization of the findings for other research contexts go beyond the future research aims, it should be noted, that unlike quantitative research, where generalizability is often a primary goal, qualitative research aims to gain an in-depth understanding of a specific phenomenon. As a result, in qualitative research generalizability refers to the extent to which findings from a study can be applied to other contexts or populations beyond the specific sample or setting studied. Moreover, it is important to consider the transferability of qualitative findings. Transferability is an extent to which findings can be applied to similar contexts or populations, rather than to the entire population. Thus, transferability is often increased through thick descriptions of events (here, narrative research), which involves providing detailed descriptions of the context, the

participants and the lived experiences to help readers understand the study's findings and how they may be applicable to other contexts. It is clear that during the pandemic, all of the teachers have lived through more or less similar contexts and experiences (no massive experience with distance teaching, adoption and redesign of teaching and learning contexts almost overnight). This makes the context not only familiar but also transferable to similar lived experiences. Previous research on early pandemic ERT experiences has shown that the experiences of teachers did not vary very significantly from country to country [47], thus our research indications can be somewhat transferred to other contexts aside from the three countries. Furthermore, the purposive sampling procedure used, with various countries, various experiences, subjects and different previous experiences, results are more easily transferable to similar future contexts (i.e., post-pandemic teacher professional development). It should also be noted that firstly, this article does not have generalizability claims, as it is the first exploratory, more illustrative study about open issues, which will be followed by a future survey to further validate our claims.

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## Appendix A

### *Study Protocol and Interview Questions*

These interviews are semi-structured. This means that the questions below need to be asked, but there is room for follow-up questions AND for paraphrasing/rewording. Please have in mind the interview sections, and remind the interviewees in which section they are:

#### **Section 1: About you**

- What is your current position and discipline?
- How long have you been teaching?

#### **Section 2: About your experience with planned inclusive digital and open pedagogy (especially pre-COVID)**

- What is your experience with digital learning and teaching? Tell us about any innovation that you have performed or been involved with, with educational technologies in your career.
- What is your experience with distance learning and teaching?
- Have you used, or been asked to use, an increasing number of platforms and/or virtual learning environments during the pandemic?

- *With this question, we want to determine the cognitive load imposed on both students and teaching staff.*
- Did you feel that you worked more on distance? In what ways?
- What is your experience with open education?
  - *This should determine whether the experience is largely individual—such as searching and using OERs or is it more active, connected with others and collaborative, such as creating, sharing, remixing or embedding open practices in their teaching.*
- **Are you familiar with Open Education initiatives? If so, please describe your experience with open education.** What is your stance on open education?
- What is your experience with inclusive education, including usability and digital accessibility?
- What is your experience with networked learning, if any?
  - *By networked learning, we mean “harnessing our human ability to engage in networks of both people and tools to enable learning experiences”.*
- Do you use any educational framework (or a set of guidelines), either institutional, national, or European? If not, how do you decide the way you teach? Please tell us about it.

### Section 3: About your experience with Emergency Remote Teaching (ERT)

- Have you been involved in distance learning as a result of COVID? What would you highlight?
- Which opportunities have you explored as a result of remote teaching, for improving the way you and your institution provide education?
- Can you share a best practice that emerged out of ERT? For example, if faced with ERT once again, this is a practice or example to try and follow.
- Which challenges, uncertainties or difficulties have you encountered in that respect, both for you and your students? (please highlight the most significant ones, as this question could dominate the interview!)
  - *the order of these questions is up to the interviewer, the interviewee, and the context.*

### Section 4: About your support, training AND networking needs within ERT in COVID times

- What kind of support did you have from your school and the educational authorities in your country/region? Please tell us both positive aspects and those to be improved about the instructions, guidance and support you have received.
- What kind of normative and recommendatory support did you receive regarding emergency remote teaching? Was it useful and how?
- What kind of training or support have you received? How did this help you?
- What kind of training or support would you like to have received?
- Have you shared knowledge and best practices with colleagues? How did the sharing occur?
  - *(optional) Do you continue to share knowledge and practices in this manner? At the same frequency as during ERT or more/less?*
- Have you participated in communities of practice with practitioners in other institutions?
- How would you describe an ideal training programme/course for teaching with high standards online and with digital technology?
- How would you describe an ideal space for sharing best practices with other practitioners?

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