


# A pedagogical model for effective online teacher professional development—findings from the Teacher Academy initiative of the European Commission

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## Abstract

During their careers, teachers experience change in education policy, societal trends, and cultural shifts in pedagogical thought, requiring continual adaptation and innovation of their practices. Coupled with this is an assumed intrinsic desire to progress, whether as part of their own subject expertise, or with a view to taking on a role as leader in school management or a specialist area. Effective support and opportunities for teachers to develop and apply their competences is crucial for maintaining both motivation and high standards in the profession. However, many teachers across Europe claim to struggle to have access to effective forms of continued professional development coupled with the numerous demands already made on their work. On-site courses with opportunities for peer learning remain popular but demand time and are not financially cost-effective in reaching a large number of teachers, nor are they viable during pandemic restrictions. By exploring the pedagogical model of the online courses of the European Commission's Teacher Academy in the context of these challenges, this article discusses how an effective,

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collaborative approach to online continued professional development can be developed as a way of addressing both teacher and education system needs.

## 1 | INTRODUCTION

Over the last decade teachers have faced significant changes in education policy and societal trends which require them to innovate and adapt their practices (OECD, 2019). If teachers are to address these changes effectively, they require training and support. It is generally agreed that continuous professional development, along the continuum of a teaching career, is crucial in addressing these changes.

However, evidence from the OECD Teaching and Learning International Survey (OECD, 2019) shows that many teachers struggle to access and benefit from continued professional development, with very few, if any, improvements registered over the last decade (OECD, 2009, 2014). For example, 54% of teachers in the participating countries<sup>1</sup> reported conflicts with their work schedule as a barrier to continued professional development. In fourteen countries the percentage of teachers reporting such barriers increased since 2013, while only six countries registered a decrease (OECD, 2019). Figures are particularly high in some European countries with 75% of Portuguese teachers and 60% of Italian and Spanish teachers reporting a conflict with their work schedule as a reason for not attending continued professional development (OECD, 2014). Other barriers reported by teachers also impact a substantial proportion of the teacher population: 48% of teachers highlight a lack of incentives to participate and 45% identify financial costs as a reason for not participating in continued professional development. Furthermore, 38% of teachers did not have access to a relevant offer for training (OECD, 2019). With little improvement of these indicators over the last decade, the question beckons, what needs to change for teachers to access the continued professional development they require to address the increasingly complex and urgent challenges they face in their classrooms.

The lack of progress in making professional development opportunities more widely available for teachers is not surprising if one takes into account that the most common format of teacher continued professional development has been *on-site* courses, conferences or seminars—76% according to 2018 international survey data (OECD, 2019)—and that this had not changed in the last decade before the COVID pandemic. The fixed time and place of such activities is at odds with the little flexibility teachers have over their schedules, usually resulting in teachers having to miss class time. Even in countries where professional development fees are covered for teachers, teachers often have to pay their own travel expenses and their choices are limited by the distance to on-site training locations. To not take up too much time, these courses are also often short with little opportunity to establish a community. And even if these barriers could be reduced somehow, scaling up the offer of continued professional development via on-site formats to address the increasing demand for support from teachers, would be difficult and costly. As is now apparent, on-site continued professional development is also not viable during a pandemic with restrictions on close human interaction.

European education policymakers, supported by the European Commission, are committed to improving engagement in, and access to, high quality professional development for teachers. This is not only a question of striving to provide meaningful learning experiences for all pupils, but also of supporting teacher careers that are motivating and have diverse opportunities for progression (European Commission, 2020a).

The European Commission is known for supporting peer learning between policy makers through the ET2020 Framework; and also more directly between schools and teachers through the Erasmus+ funded mobility and partnership project actions (European Commission, 2020b). In order to make an additional direct offer to teachers and school leaders across Europe, in 2017 they launched the Teacher Academy as part of the School Education Gateway platform (European Commission, 2020c), offering Massive Open Online Courses (MOOCs) developed by a pedagogical team with the support of an advisory board (the authors of this paper). To date, the Teacher Academy has offered 24 different MOOCs following this design, with almost 48.000 unique users registered.

In this article we describe the potential of the European Commission's Teacher Academy initiative to address various challenges, asking:

1. To what extent are MOOCs for teacher continued professional development an effective format that results in changes to teachers' practices and student outcomes?
2. To what extent are MOOCs for teacher continued professional development a scalable mechanism that can be accessible to teachers in need of more relevant continued professional development?
3. What instructional design features should MOOCs for teacher continued professional development incorporate to engage teachers in a meaningful way?

While this paper cannot offer definitive answers, it addresses each question by reviewing recent literature and reporting observations and data from the Teacher Academy initiative, thereby offering new insights to online teacher professional development.

## 2 | LITERATURE REVIEW

Online continued professional development formats are inherently more flexible than on-site alternatives in when and where training is accessed, allowing teachers to participate at times that are compatible with their usual work schedule, and without the costs and inconvenience of travel. Furthermore, teachers can access a wider selection of choices regionally, nationally or even internationally.

While most of these advantages apply to all forms of online continued professional development, the wide spectrum of activities—from webinars, communities of practice, twitter chats, online courses, to MOOCs—encompass many distinct processes of delivery. Scalability of these activities vary; for example, closed online courses designed for 30 or 50 participants allow for less scalability than MOOCs designed for hundreds or thousands of participants.

### 2.1 | What is effective online teacher professional development?

The existing literature on effective teacher continued professional development agrees that it should cover specific subject matter, allow engagement over time, and offer interactive experiences (Parsons et al., 2019). Furthermore, “*Successful [professional development] programmes [...] encourage the development of teachers' learning communities [... and support] teachers to share their expertise and experience systematically*” (Schleicher, 2016, p. 91). Similarly, Laurillard argues that “[...] *unless teachers are the 'prime actors' in their own development, it will be impossible for them to keep up with the rapid changes in the environment, political, cultural, economic and, especially, technological [domains]*” (Laurillard, 2016, p. 3). Darling-Hammond et al. (2017) conducted a review of 35 methodologically rigorous studies that have demonstrated a positive link between teacher continued professional development and teaching practices and student outcomes. Based on this review they identify the following seven elements of effective professional development:

- Content-focused
- Incorporates active learning
- Supports teacher collaboration
- Offers models of effective practice
- Provides coaching and expert support
- Provides time for reflection and feedback
- Sustained duration

None of these elements are restricted to on-site scenarios of professional development; they equally apply to online training. However, we can identify particular elements for effective teacher professional development online, drawing from the literature about online adult learning. Powell and Bodur (2019) identify six design and implementation features that online teacher professional development should integrate:

1. Address teachers' specific learning needs—for example through needs assessment and by promoting ownership for teachers to determine valuable content and learning approaches (Darling-Hammond et al., 2017; Farris, 2015; Vrasidas & Zembylas, 2004).
2. Be a useful means to solve problems regarding teaching practice, instruction, or student learning (Dede et al., 2009).
3. Support interaction and collaboration to generate engagement from all learners in online communities (Huang, 2002; Scott & Scott, 2010; Vrasidas & Zembylas, 2004; Whitehouse et al., 2006).
4. Integrate authentic tasks and activities which reflect teacher practice through real-world classroom situations (Huang, 2002; Reeves & Pedulla, 2013; Vrasidas & Zembylas, 2004).
5. Integrate reflection to help participants contextualize new information to their own teaching context (Huang, 2002; Scott & Scott, 2010; Vrasidas & Zembylas, 2004).
6. Understand the *intersectionality of technology, content, pedagogy, and learners* in order to effectively implement and deliver the other features mentioned above (Whitehouse et al., 2006).

These six features correspond with what Parsons et al. (2019) identify, for example the importance of social presence over teacher presence (Holmes et al., 2010; Rodesiler, 2017). *Social presence* refers to online interactions teachers have with each other in the context of professional development activities (Holmes et al., 2010). Rather than pushing their own centrality in an online space, online instructors should focus on design, facilitation, and feedback that results in teacher interactions in an online community (Cheawjindakarn et al., 2012; Fetzner, 2013).

Prestridge and Tondeur (2015) add that some form of mentorship is important which addresses the various cognitive and affective demands of autonomous learners in online environments. Concerning effective approaches to assessment in MOOCs, Gamage et al. (2017) find that peer review rather than traditional assessment grading “leads to significantly longer and more useful feedback as well as more discussion” (Gamage et al., 2017, p. 1) between participants.

## 2.2 | MOOCs for teacher professional development

MOOCs have become a common online learning format since the early 2010s. While MOOCs were originally designed to offer free education to those most in need, it quickly transpired that those making most use of MOOCs were highly educated professionals (Ho et al., 2014). Rather than using MOOCs as a format for undergraduate education as originally envisioned, they quickly became a format for professional development. In fact, common MOOC pedagogies focussing on a combination of instruction, video case studies and peer community learning are more aligned with professional development practices than with undergraduate teaching (Laurillard, 2016).

Interestingly, many participants of MOOCs, regardless of MOOC topic, are teachers. A large-scale study covering 68 MOOCs from Harvard and Massachusetts Institute of Technology revealed that almost 39% of those enrolled identified as current or previous teachers (Ho et al., 2015). Similar results were obtained in Europe where 10%–25% of all learners in non-teacher professional development MOOCs were teachers (Castaño-Muñoz et al., 2018).

While there is an increasing number of teacher professional development MOOCs—on general learning platforms (such as Coursera, Edx, Futurelearn), as well as those specifically for teacher continued professional

development (such as Teacher Academy, European Schoolnet Academy, INTEF MOOCs, MOOC-Eds)—research on teacher professional development MOOCs is scarce, with no literature systematically examining their effectiveness in changing teacher practices or student outcomes.

Fyle (2013) was among the first to address the topic by evaluating the appropriateness of MOOCs for different types of teacher education. He understands MOOCs as an appropriate format only for certain types of teacher education and more useful for experienced teachers than those at the start of their career. He proposes that MOOC designs suitable for teacher professional development would have to incorporate “*sophisticated online forums and other technology-oriented social structures and features that would support effective forms of social-constructivist learning*” (Fyle, 2013, p. 6).

Jobe et al. (2014) suggest that there is great potential for teacher professional development MOOCs as long as MOOCs are recognised, validated, and accredited by teacher professional development providers. They should be designed with a focus on collaboration and connections between peers, more along the lines of the Connectivist MOOC (cMOOC) variant than the Transmissive MOOC (xMOOC) variant<sup>2</sup> as “*the potential for community building and exchange of ideas, best practices, and lessons learned increases significantly*” (Jobe et al., 2014, p. 1584).

Koutsodimou and Jimoyiannis (2015) report positive findings from offering a teacher continued professional development MOOC in Greece, achieving a much higher completion rate than other MOOCs as well as highly positive feedback from teachers about their participation and impact on professional practice. Koutsodimou and Jimoyiannis focussed on specific MOOC design elements in their study. They conclude that a balance between structure (following the xMOOC approach) and openness (following the cMOOC approach) is required to enhance the outcomes of teacher professional development MOOCs.

Laurillard (2016) investigated whether MOOCs could function as co-learning models of teacher continued professional development (Avalos, 2011), particularly focussing on their applicability in emerging economies. Her findings demonstrate the efficiency of using a MOOC for teacher professional development on ICT use in primary education. The MOOC format “*fits well with the objective of supporting effective co-learning for professionals, who appreciate this form of high-quality learning, value each other's experience and knowledge and are willing to share their experiences to learn together*” (Laurillard, 2016, p. 13).

Castaño-Muñoz et al. (2018) examined the profile of participants in teacher professional development MOOCs offered by the Spanish Ministry of Education, finding that MOOCs have become an alternative channel for teacher continued professional development in Spain, however, teacher participation remains low. They conclude that awareness needs to be raised, particularly among primary school teachers who are women, and that formal recognition could significantly bolster the standing of MOOCs.

Misra (2018) offers a comprehensive summary on the topic of teacher professional development MOOCs, synthesising not just research on the topic but also blog posts and newspaper articles. He concludes that there is substantial untapped potential for using MOOCs for teacher professional development and suggests six actions that would allow a wider use in the teaching profession.<sup>3</sup>

### 3 | THE TEACHER ACADEMY—HOW AN EFFECTIVE, COLLABORATIVE APPROACH TO ONLINE PROFESSIONAL DEVELOPMENT WAS DESIGNED

Teacher Academy courses are based on the view that learning and teaching are dynamic processes. This includes considering the target group, purpose and goals, organisation, content, learning approaches and, evaluation. The course design by the pedagogical team and advisory board is therefore undergoing constant revision and new approaches are regularly experimented with based on data<sup>4</sup> and observations. Nevertheless, core features of the course design have remained unchanged.

### 3.1 | An overview of the design

The pedagogical approach of Teacher Academy courses focuses on combining theory and practice for supporting both collaborative processes as well as individual reflection. The activities and use of materials and tools blend several pedagogical approaches with elements of constructivism, social constructivism, connectivism, and to a lesser extent a cognitivist approach. Hence, the didactic framework supports a strong focus on practice, individual reflection and knowledge construction, collaboration, and supporting networking and discussion in combination with content of a more instructive nature.

The frame consists of content around which a range of community building dynamics are implemented to get teachers to exchange and share their experiences and expertise with each other. Most courses do not feature a 'sage on a stage' but rather curate a range of content including classroom observation videos, teacher and student interviews, screencasts or short practice-focussed researcher presentations. The emphasis is on material coming from classroom practitioners themselves, designed to trigger reflections and exchanges amongst the participants about day-to-day teaching practices. This content can be easily reviewed by a participant in one to two hours per week, whenever and wherever the participant prefers.

However, to fully benefit from the course experience, participants should engage in the course community that is built up as the course progresses. The community is nearly always decentralised and exists wherever the participants chose to be active: on social media channels such as Facebook or Twitter, on the course platform in the forum, or on one of the many Web 2.0 tools used in the courses. The link between different channels is established via dedicated course moderators who actively connect participants and content across the growing network of activity. Such immersion in the courses usually requires around two to four hours of a participant's time per week but offers still, for most, the flexibility to organise this engagement according to the time and place that suits the participant. Figure 1 illustrates this dual dynamic through the organisation of the course design, giving an example of a short content piece followed by a reflection and exchange activity.

Throughout a course, participants are required to transfer their learning to a course output, such as a lesson plan or action plan which facilitates transfer to practice once the course has come to an end. This work is then assessed via a peer review activity at the end of the course. Participants who successfully complete all sections of a course, including the final course output together with the peer review activity, are awarded a course badge and digital certificate.

Figure 2 outlines a typical Teacher Academy course structure starting with the course introduction and ending with the peer review activity and certification. The structure is influenced by the specific pedagogical principles of: (1) Facilitating peer exchange, (2) Community building, (3) Content as trigger, (4) Flexibility, and (5) Facilitating transfer to practice, which are discussed below.

### 3.2 | Facilitating peer exchange and peer review

Peer exchange and peer review are the cornerstones of the pedagogical model and used for learning and assessment throughout the courses. Courses are designed to enable active participation and the development of teacher relationships across schools and countries—beyond the walls of their own schools. A sense of European co-design is cultivated which supports participating teachers to respect ownership and expertise and facilitates innovation from a process of mutual curiosity and collective review.

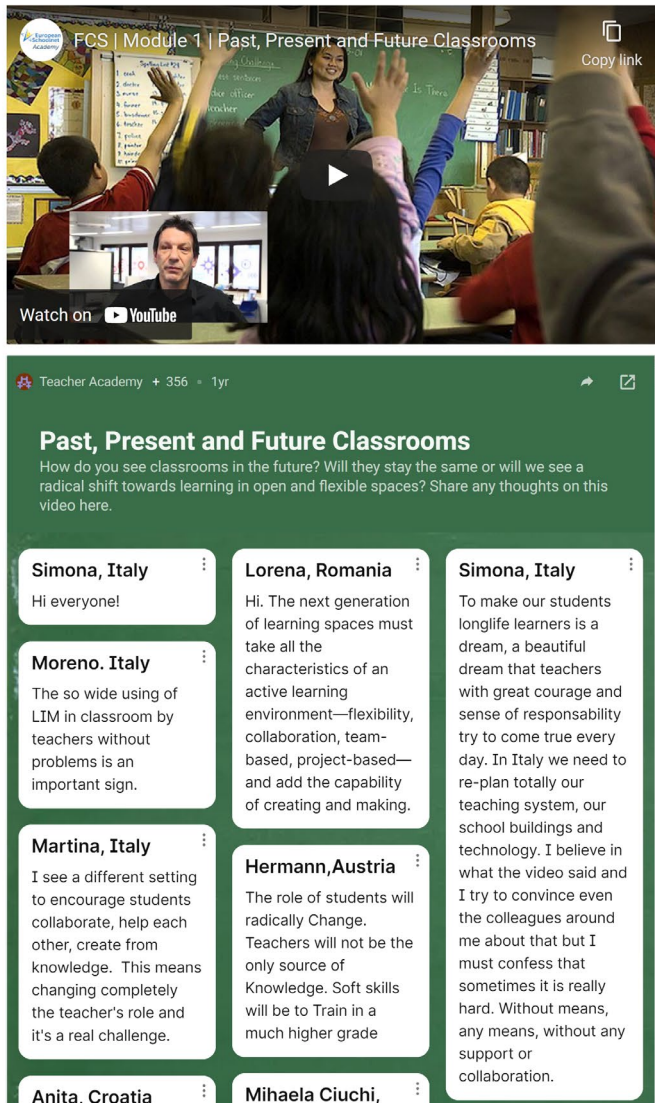
The peer review activities are equally important, not only to facilitate peer exchange and shared ownership, but also as the only assessment mechanism that exists for the courses. Completion of the peer review activity is a key requirement for receiving the course certificate because it signifies active engagement and deep reflection. The peer review activity usually comes at the end of a course after teachers have already extensively shared their ideas, using Web 2.0 tools like Padlet or Tricider which facilitate exchange, via Teachmeets or Twitter Chats which allow for synchronous exchanges, or through debates on the online Forum and the official Facebook group.

## Module 1: What does the future classroom look like?

### 1.2. Past, Present and Future Classrooms

Exploring similar questions to Deirdre but with a slightly different take on them, take a look at this video where **Bart Verswijvel, Pedagogical Advisor at European Schoolnet**, provides a brief **overview on the organization of learning spaces** in the past and then explores different classroom setups and learning environments. It will provide you with some useful ideas to consider when discussing your own classroom environment and how you would like to change it.

Share your thoughts on Bart's video in the Padlet tool below the video. Of course you can also use Twitter with [#fscourse](#) or the course [Facebook group](#).



The image shows a screenshot of a digital learning environment. At the top, there is a video player with the title "FCS | Module 1 | Past, Present and Future Classrooms". The video shows a teacher standing in a classroom, interacting with students who have their hands raised. Below the video player is a Padlet reflection activity. The Padlet has a green background and contains several white text boxes with comments from various users. The comments discuss the future of classrooms, the use of technology, and the role of teachers and students.

**Past, Present and Future Classrooms**

How do you see classrooms in the future? Will they stay the same or will we see a radical shift towards learning in open and flexible spaces? Share any thoughts on this video here.

**Simona, Italy**  
Hi everyone!

**Moreno, Italy**  
The so wide using of LIM in classroom by teachers without problems is an important sign.

**Martina, Italy**  
I see a different setting to encourage students collaborate, help each other, create from knowledge. This means changing completely the teacher's role and it's a real challenge.

**Anita, Croatia**

**Lorena, Romania**  
Hi. The next generation of learning spaces must take all the characteristics of an active learning environment—flexibility, collaboration, team-based, project-based—and add the capability of creating and making.

**Hermann, Austria**  
The role of students will radically change. Teachers will not be the only source of knowledge. Soft skills will be to train in a much higher grade.

**Simona, Italy**  
To make our students longlife learners is a dream, a beautiful dream that teachers with great courage and sense of responsibility try to come true every day. In Italy we need to re-plan totally our teaching system, our school buildings and technology. I believe in what the video said and I try to convince even the colleagues around me about that but I must confess that sometimes it is really hard. Without means, any means, without any support or collaboration.

**Mihaela Ciuchi,**

**FIGURE 1** Typical Teacher Academy course section with a short video and associated reflection activity. *Source:* The authors have generated this image drawing on materials from the School Education Gateway and the European Commission

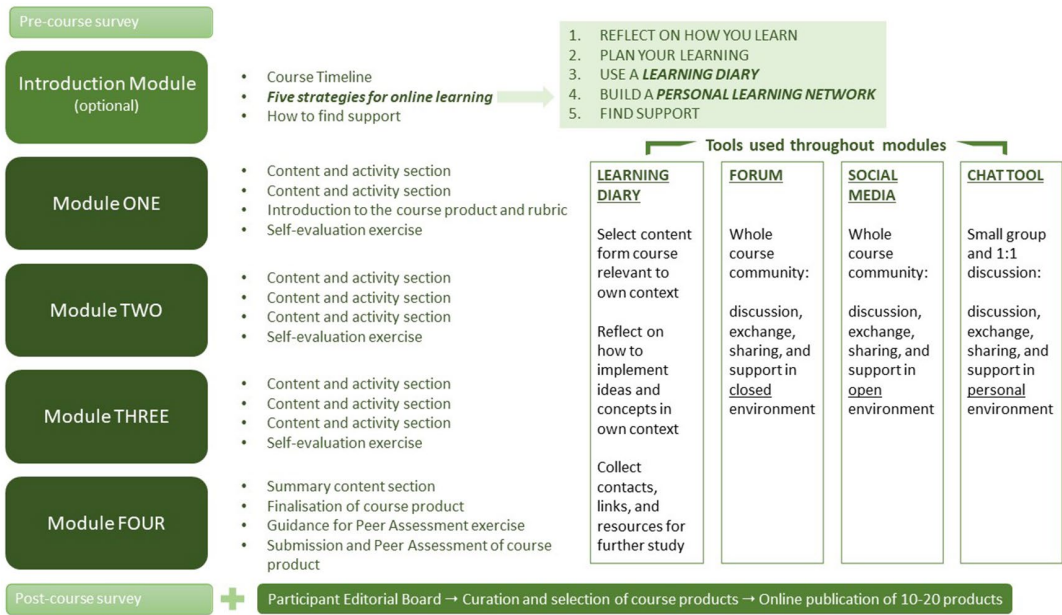


FIGURE 2 Teacher Academy course organisation. Source: Authors

Course activities, where participants exchanged ideas and resources with each other, included sharing individually-designed learning activities and commenting and rating each other's ideas. A chat application, *Differ Chat*, was also used to support private study groups. These prepared participants for more focused exchanges between peers in the main *peer review* activity at the end of the course.

Unlike many other MOOCs, the peer review process is not anonymous. This is to encourage participants to see the process as the beginning of an exchange between two professionals and participants are encouraged to continue the conversation with their peers once the formal peer review process has finished. This concept is supported by Gamage et al. (2017) who find that non-anonymous reviews result in longer and more useful feedback due to social accountability and community affiliation.

The term *peer review* is used, rather than peer assessment, and participants do not provide each other with summative grades but only qualitative feedback, so as to avoid any sense of a formal summative evaluation that may create tension or stress. The requirements of the peer review involve highlighting the positive elements of a participant's work and providing suggestions for further development. This ideally facilitates a sense of collaboration with a fellow professional, rather than being evaluated.

Despite some participants misusing the process (see below), the peer review process was rated very highly by course participants with 94% agreeing that the reviewers' feedback to their work was valuable, and the same percentage found the process of providing feedback to others as valuable, as illustrated by one participant's statement:

The peer review activities were so important! It was a big responsibility to look at someone's work and try to help that person to improve it. We were teachers and students too. And this is the characteristic of this course that I most appreciated. Now, when I return to school next September, I will know how my students will feel like. That is so important! (participant course evaluation, teacher participating in a Teacher Academy MOOC, 2019)



These findings align with the literature in confirming that teachers' sharing of practices is one of the most popular methods of professional development amongst teachers (Boyle et al., 2004) and that successful teacher professional development programmes foster strong working relationships among teachers (Chong & Kong, 2012; Schleicher, 2016).

However, while the peer review process can be deemed successful, it is not without challenges. In all courses there are participants who misuse the process due to the lack of an official grade and who know they cannot *fail* the course. The course leaders cannot easily identify participants who have not completed their work to the standards required or who have not taken the feedback process seriously unless help is provided by the course community through a process of reporting. Following-up on these cases has become essential to maintain the integrity of the peer review process and thereby ensure that it remains a useful and trusted tool for the participants.

Further challenges exist: 65% of course evaluation respondents agreed that they would appreciate more guidance on how to carry out a constructive peer review and 36% of participants agreed with the statement *I found it difficult to review my peers' work*. There is clearly additional work to be done by the Teacher Academy to guide teachers in this process. It is also possible that the difficulty lies with the apparent summative nature of the assessment (coming at the end of the course for the final submission) whereas it may be better framed as formative, i.e., as part of a fellow participant's continuing and longer-term development. Nevertheless, while challenges exist, overall the peer review process functioned as an effective culmination of facilitated exchanges between teachers throughout the courses.

### 3.3 | Community building

An aim was to design teacher participation to be more than an individual transaction. A sense of connection and shared values is encouraged to motivate participants to promote openness and free sharing of ideas. Trust is recognised as an important factor to encourage exchange and for a critical friend approach to be effective.

Building such an environment can be particularly difficult in the context of a MOOC due to the large number of participants and their usually quite diverse backgrounds, which can lead to a feeling of isolation among participants. On the other hand, there is research that suggests that online collaboration in professional learning communities appears most productive when membership is diverse in roles, areas and levels of expertise (Blitz, 2013), indicating that professional development MOOCs which usually feature a large and diverse audience in fact are well suited for community building. Teacher Academy courses purposefully integrate additional activities that do not necessarily focus on the course topic but only on developing a trusting and supportive environment—similar to the opportunity for informal exchanges during a coffee break, or fun warm-up activities, as part of an on-site workshop.

Summary data about the course participants' background—such as the percentage of secondary and primary school teachers, age ranges and subject specialisation—are shared to course participants. Participants are encouraged to share their learning diaries with each other, so as to make the course community feel less anonymous and more personal. Research suggests that activities designed to promote self-reflection and the sharing of these reflections can also help community building (Blitz, 2013). One participant statement illustrates the positive dynamic generated through the sharing of participants' learning diaries:

First time creating a Learning Diary and sharing it with so many colleagues! This was really fun! The support and recognition received from colleagues was indeed one of the main reasons that kept me going! (Teacher participating in a Teacher Academy MOOC, participant course evaluation, 2019)

Successful community building depends on a variety of factors, including the skill of the course moderators to establish a communal rather than competitive atmosphere in courses. It also depends on the profile of participants.

One course for school leaders saw substantially less engagement and community building than courses with classroom teachers. However, overall, evaluation results show that 71% of participants agreed with the statement *I am still in contact with participants I met on the course*, suggesting that meaningful links between participants are being established in the courses.

### 3.4 | Content as trigger

The courses provide varied content such as project and lesson observation videos, and teacher and expert interviews, as well as contributions from participants. This is not used primarily as a tool of knowledge transmission, as would be the case in a traditional MOOC, but rather as a trigger for reflection, sharing and exchange by participants. Typical course content would be a short interview with a teacher followed by footage showing the practice being implemented in the classroom. This is typically framed with questions such as, *What works in the implementation shown? What would you do differently?* These types of guiding questions are followed by a task to share the reflections and read the reflections of peers, as well as a further discussion question that supports an exchange between the participants about how the pedagogical practice was implemented in the video. The following statements from Teacher Academy course participants illustrate well the value participants placed on the type of content used and how it was used for triggering reflection and exchange with peers:

The best of this course was the collaboration between participants, the learning from each other's experience and the quality of the resources that the organizers provided us, which promote reflection and debate of ideas, enriching all participants in this training experience

and

It was great to have time to reflect on my own classroom practice and look at ways in which activities, resources and classroom layout could be improved to provide a more inclusive environment for all. The course leaders provided so many opportunities through the choice of videos and activity tasks set to challenge ideas and beliefs. (Teacher Academy participant course evaluations, 2019)

This approach was carefully chosen with the target group in mind: rather than teachers simply knowing theories or methods, they have to understand how to apply them in their very specific own teaching context. It acknowledges that teachers' professional judgement derives from both theoretical knowledge and working knowledge (i.e., a variety of contextually specific experiences) and thereby reflects Shulman and Shulman's (2004) model of an accomplished teacher. Participants better understand the concepts and principles needed for teaching by means of engaging with the content presented to them (Shulman & Shulman, 2004). However, it is through the reflections and discussion with their peers about how to implement a teaching practice in their own specific context that they become *"more able to engage in the complex forms of pedagogical and organizational practice needed to transform their visions, motives and understanding into a functioning, pragmatic reality"* (Shulman & Shulman, 2004, p. 259).

### 3.5 | Flexibility

Given that conflicts with work schedules is the most prominent barrier, flexibility is unsurprisingly one of the main reasons why teachers appreciate online professional development (Collins & Liang, 2015). Teacher Academy courses therefore try to minimise the restrictions set on course participants concerning a course schedule. There

is only one deadline—for the final peer review activity—allowing teachers to move through the course to a certain degree at their own pace. All obligatory course activities are asynchronous and teachers are free to pick and choose among course components, just focussing on specific modules. While peer exchange and collaboration are highly encouraged and facilitated in the courses, teachers are also free to benefit from them by simply surveying the courses without active participation. The following statement from a course participant illustrates the importance of flexibility in the course design.

This course was excellent for me because these were very difficult weeks, not only at school but also in my personal life, in terms of schedules. The possibility of doing the work late at night and on weekends allowed me to complete the course. (participant course evaluation, teacher participating in a Teacher Academy MOOC, 2019)

Despite this flexibility, 48% of participants who dropped out and still responded to the evaluation surveys (in total 61 surveys), did so because of timing issues. Of those who do complete the courses almost 21% report having struggled with timing. However, making the courses even more flexible is difficult whilst still maintaining the collaborative spirit and community elements of the courses. These aspects require a common timeframe for interactions to happen and establishing a community feeling in an entirely self-paced online course is rarely achieved.

It is also possible that while flexibility is important and appreciated by some teachers, it can be experienced as overwhelming. Participating in a course with so much flexibility requires a significant degree of self-regulated learning competence, which not all teachers possess. While we currently do not collect data on teachers' self-regulated learning competence, acknowledging this issue is important. If only teachers with advanced skills can effectively benefit from the courses then the desired scalability of the design is impacted. Accordingly, the development of self-regulated learning competence as part of Teacher Academy courses is an area for further reflection and development.

### 3.6 | Facilitating transfer to practice

Teacher Academy courses focus on classroom and school practices, helping teachers to implement pedagogical change in their daily work. As Wiliam and Leahy argue: “*Teachers don't lack knowledge. What they lack is support in working out how to integrate these ideas into their daily practice*” (Wiliam & Leahy, 2014, p. 8). According to a study carried out by Reeves and Pedulla (2013), more learning takes place when online professional development content can be easily transferred to a classroom setting. A core feature of all Teacher Academy courses is that they require participants to transfer their learning into a course output, such as a lesson plan, that allows for easy implementation in their own context. Figure 3 is an example of such output in the form of a lesson plan developed for a Teacher Academy course using the UCL Learning Designer tool.

Through the creation of context specific course outputs participants have the opportunity to reflect on what they have learnt, and to adapt it for use in their own setting. Course evaluation results suggest that this approach is effective, with 91% of participants who responded to the evaluation surveys saying they had already implemented some elements from the course in their work; 94% of participants said they will make use of the tools and ideas they learned in their practice (teaching or otherwise).

Scaling up transfer to practice requires sharing the knowledge and resources generated as part of the courses with the broader teaching community. The Teacher Academy has introduced Editorial Boards that curate the course outputs after a course has come to an end. These boards consist of former course participants who provide an additional layer of review, tagging, and categorising of the outputs so that a select few can be published on a public page of the School Education Gateway. This enables other teachers (non-participants) to browse, adopt,

<b>Name</b>	The Healing Power of Art	<b>Aims</b>	Understanding the many benefits of art; Learning by doing.
<b>Topic</b>	The many mental benefits of being involved in an art experience	<b>Outcomes</b>	Knowledge, Comprehension, Analysis, Application, Affective learning outcomes, Synthesis, Evaluation
<b>Learning time</b>	16 hours	<b>Editor</b>	MariellaBrunazzi (browser.php?uri=/submitted/by_user/MariellaBrunazzi)
<b>Designed time</b>	16 hours		
<b>Size of class</b>	20		
<b>Description</b>	The module "The Healing Power of Art" deals with the benefi...		

Turn editing on

Pre-visit activities (1)

**Discuss** 15 20

A quote by Frieda Kahlo is displayed on the Interactive Whiteboard "I am not sick. I am broken. But I am happy to be alive as long as I can paint." The students are free to express their opinion on it after reflecting on what these words evoke in their minds. Some of them may report their or their friends' experiences, and everyone can add a comment.

**Collaborate** 15 20

A brainstorming activity follows. The students are asked to think about the painter Frieda Kahlo, and write every word related to the artist that comes to their mind. The activity is done collaboratively using

Notes:  
Add notes

Resources linked: 0

Pre-visit activities (2)

**Produce** 60 20

The same groups as in the previous lesson collect information from the websites and make their videos on the set topics.

**Practice** 60 20

The videos are shown and peer assessed. The students check if their mates' work is detailed, accurate, and can be easily understood using a grid.

Notes:  
The material is uploaded on the twinspace of the eTwinning project. A discussion in the forum section of the project is started: the students asks their partners for

Resources linked: 0

Pre-visit activities (3)

**Read Watch Listen** 120 20

The film "Frieda" (2002) is shown. At the e formative assessment activity using Kaho out to check what the students have und withheld.

**Investigate** 40

Working in 5 groups of 4 students each (c Frieda Kahlo picture are handed out, the : the same picture form a group), the pupil write down ten questions they would like answer to during their visit to the museur reads their questions and the best 10 one

Notes:  
Add notes

Resources linked: 0

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**FIGURE 3** Lesson plan. Lesson plan developed for a Teacher Academy course using the UCL Learning Designer tool. *Source:* Authors

and adapt these ideas for their own teaching. Figure 4 shows an example of such a page with lesson plan descriptions, evaluations, reviews, and tags.

It is believed that, by sharing their goals and plans in public, participants are further encouraged to implement their course work. Furthermore, dissemination on a public platform run by the European Commission provides important public recognition of the professionals.

While the feedback from participants suggests that a transfer of learning to practice is happening, this is entirely self-reported. A significant challenge exists in how the Teacher Academy can actually measure and evaluate the extent to which participants engage in applying newly learned concepts in their own classrooms and schools as well as the quality of learning outcomes and new practices. Future plans of the Teacher Academy will therefore need to be cognisant of resources available for follow-up evaluation.

## 4 | FINDINGS

### 4.1 | Efficiency

In response to our question on the extent to which *teacher continued professional development MOOCs are an effective format for changing teacher practices and student outcomes*, we have found evidence that Teacher Academy MOOCs are effective for supporting teacher learning. Teachers participating in Teacher Academy courses have consistently

### Mathematics at a Museum

**Author:** Anamaria Corina Golumbeanu

**Description:** "I designed an activity which links mathematics to a museum. So, I chose a lesson about symmetry taking place at the Ethnographic Museum. The Ethnographic Museum has a valuable collection of objects that can illustrate in an attractive way various situations of symmetry."

Evaluation	Reviews	Implementation	Tags
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- history
- lesson plan
- cultural awareness and expression
- computer science
- technology tools
- collaborative learning
- 240min
- age of students not mentioned
- digital competence
- maths
- art
- inter-disciplinary learning
- mathematical
- scientific and technological competence

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### Our customs, our habits

**Author:** Isabela Giorgi

**Description:** This is a learning activity for 16-19 years old students. They will search more information about the customs and traditions, especially the old crafts and they will understand better the national culture. They will visit The Village Museum from local area-

Evaluation	Reviews	Implementation	Tags
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- Angela Lucia Capezuto:** The lesson plan is well-planned and quite detailed in its progression of activities although not always logical in its chronological sequence, creating some confusion for its implementation. The summative assessment using peer feedback is innovative and would be very engaging for the students involved because it directly affects the outcome of the student product.
- Małgorzata Malczyk:** A well-designed project which engages students and makes them more sensitive to the local traditions and heritage. The lesson plan is well aligned with its learning outcomes: activities and assessment clearly link with the defined learning outcomes and allow the teacher to determine by the end of the lesson if the objectives have been achieved. There is also room for peer review of various products prepared with the use of ICT tools and apps appropriately chosen for the tasks. A good point is that the choice of apps can be consulted with the teacher. There is also space for justifying students' choices of the crafts to be included in the brochures/posters/presentations/slide shows, etc. promoting the region. Students are also encouraged to employ critical analysis of the data. The lesson plan includes a good mix between inquiry, scaffolding for learning and hands-on tasks. Museum learning is embedded in real world contexts and raises students' awareness and appreciation of their regional cultural heritage. The lesson plan encourages students' creativity as they prepare their own learning materials. The lesson plan clearly mentions collaborative work strategies and includes the participation of experts from the museum. There is an interesting follow-up activity in which the students become experts and prepare a field trip to the local museum for their younger schoolmates thus carrying out peer teaching. However, 16-19 year-olds probably do not need to discuss how to behave in the museum and devoting only 20 minutes to making presentations is not enough. The title is not clear because habits are not mentioned in the project at all. Instead of these some crafts are referred to, so why not use the word in the title? A few grammar and spelling mistakes need to be corrected.
- Claudia Maria Neacsu:** A good and interesting job.

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### The Healing Power of Art

**Author:** Mariella Brunazzi

**Description:** "The module ""The Healing Power of Art"" deals with the benefits of being involved in an art experience. The set of lessons is aimed at students aged 17 who are in the fourth year of a health and social care course or any course where art and psychology are or can be included in the curriculum. As far as psychology is concerned the topics are: the many mental health benefits of art; how art lessons benefit students; how art may improve the quality of life of suffering people; how art eases the burden of chronic health conditions; and as for art the topic is: an artist (Frieda Kahlo) - biography, art and analysis of works. The module can also be part of the activities carried out together with partner schools in an eTwinning project focused on learning in a museum. The students are asked to analyse how art relieves stress, encourages creative thinking, boosts self-esteem, and increases empathy thus improving the quality of life. A central experience in the educational path is the visit to a museum to get in touch with the work of an artist that epitomizes the power art has to relieve suffering. That is why the exhibition dedicated to Frieda Kahlo, an artist that is the symbol of an individual overcoming challenges through art and creativity, has been chosen."

Evaluation	Reviews	Implementation	Tags
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- How clear is the work (how easy is it to understand): 4 = very much so
- How appropriate is the work to the course topic and activity?: 4 = very much so
- To what extent are the activities aligned with the learning outcomes?: 4 = very much so
- Do the assessment activities show the learning outcomes have been achieved?: 4 = very much so
- How logical is the progression of activities?: 4 = very much so
- How likely is it that students will be engaged?: 4 = very much so
- How realistic is the implementation of the work?: 4 = very much so
- How innovative is the work?: 4 = very much so

**FIGURE 4** Curation results. This screenshot shows the Curation Results page where the course products selected by the Participant Editorial Board are published. Online platform users can see the evaluation, reviews, and tags for each course product. *Source:* Authors

reported over the last three years that they have already implemented elements learned in Teacher Academy courses to their practice, with more than 91% confirming this in the Teacher Academy course evaluation surveys. Qualitative feedback from teachers further confirms the potential for impacting teacher practices and perceptions.

Of course, this does not provide objective evidence as to the impact of Teacher Academy course participation nor the effectiveness of continued professional development MOOCs in general. The evidence is limited to a small subset of the course participants—those that have successfully completed a course and decide to complete the evaluation survey—self-reporting the impact. We do not know to what extent teachers actually change practices nor to what extent any such change would be sustainable over a longer period of time. There is currently no evidence available that could claim that Teacher Academy courses have any impact on student outcomes.

Regardless of these limitations, the available data and observations from the Teacher Academy courses are in line with the broad literature we have studied that reveal tangible benefits and potential within MOOCs for teacher continued professional development. We propose that the findings from the Teacher Academy courses and development add further evidence to the belief that teacher continued professional development MOOCs can be an effective teacher continued professional development format.

## 4.2 | Scalability

Our findings show a positive response to our question on *the extent to which teacher continued professional development MOOCs can be scaled up for providing access to teachers in need of more relevant continued professional development*. MOOCs are comparatively more scalable than on-site courses or closed online courses. Teacher Academy course numbers are relatively high, with course enrolments of 1,000–4,000 users, a starting percentage of 50%–70% (of those enrolled) and a completion rate of 25%–45% (of those who started). In that regard, they are considered an effective mechanism to increase the offer of continued professional development to teachers. However, in order to benefit from MOOCs, teachers require not only digital competence but also self-regulated learning competence and, in case of the Teacher Academy courses, English language competence. This may reduce again the accessibility of the MOOC format, further evidenced by the profile of the majority of teachers participating in Teacher Academy courses: experienced teachers with on average 16–20 years of teaching behind them and 76% already having experience of participating in online continued professional development.

These results correspond with the findings of Fyle who suggests that MOOCs are more suitable for experienced teachers (Fyle, 2013). To a certain extent, this aligns with the findings of Castaño-Muñoz et al. (2018) who report that teachers in professional development MOOCs in Spain already had substantial teaching experience and had a lower need for training in ICT skills than the overall Spanish teacher population, suggesting that MOOCs are less suited to those with lower ICT skills or digital competence overall.

While teacher continued professional development MOOCs can be a mechanism to make more continued professional development available to teachers, it should not be the only solution to address the need for more continued professional development for teachers. More needs to be done to make MOOCs more accessible to all teacher profiles. At the same time, it is necessary to ensure teacher competences are developed to be able to benefit from continued professional development MOOCs and other online continued professional development formats. Blended approaches which make use of the online provision of a continued professional development MOOC with an on-site support infrastructure or workshop programme could be a way to support and reach more teachers.

## 4.3 | Supporting engagement

Our findings indicate that continued professional development MOOCs can be used *to engage teachers in a meaningful way*. While it has not been possible to determine the impact of the separate components of the Teacher

Academy instructional design, the quantitative and qualitative data from course participants suggest that the design succeeds in creating a flexible learning environment which stimulates reflection, sharing of experience, discussion and transfer to practice. Almost all respondents (99%) to the course evaluation surveys rated the structure of courses positively. Learning activities that received a higher than 90% positive rating included course video content, the main course activity of a course output with subsequent peer review, and the sharing of ideas and reflections. Over 90% of participants reported that they have already implemented some elements from the course in their professional practice before the end of the course; that they will use the tools, ideas and examples presented in the course in their everyday teaching practice; and that they have gained practical ideas on how they can improve their professional practice.

These findings correspond to those of Koutsodimou and Jimoyiannis (2015) who also received highly positive feedback from MOOC course participants from a course with a similar design that used connectivist (cMOOC) and transmissive (xMOOC) design features. While focussing on establishing connections between participants, Teacher Academy courses nevertheless operate from a centralised learning platform that is designed around course content.

The 71% of respondents reporting that they remain in contact with other course participants after the conclusion of the course, also suggests that some form of meaningful community building is taking place with useful connections between participants being created. This is consistent with Laurillard's findings on the usefulness of MOOC environments for professional co-learning (Laurillard, 2016). Furthermore, the Teacher Academy course design through its use of web 2.0 tools, social media, and chat environments, uses to a certain extent "*technology-oriented social structures and features that would support effective forms of social-constructivist learning*" as advocated by Fyle (2013, p.6).

While we cannot conclude anything about the general teacher population from the results of the Teacher Academy course evaluation surveys, the data show strong approval of the instructional design and an impact on professional practice. Accordingly, we can say that for those that successfully participated in the Teacher Academy courses the instructional design implemented seems to have worked very well.

## 5 | CONCLUSIONS

Teachers are experimenting every day with developing their pedagogical approaches in the classroom and are doing so increasingly with digital tools. This huge and knowledgeable workforce, across the world, is working daily with their learners to discover new ways of supporting, guiding and inspiring learning. However, they are often working in isolation, with very few ways of finding out how other teachers are tackling the challenges of the 21st-century classroom, in all its complexity. Support for teachers is often too limited and if available, teachers struggle to access it, so that most teachers will feel very much on their own when it comes to working out how to best approach a multicultural student group, a rapidly changing curriculum, or an ever-increasing workload by blended in-school and distance learning. It can be a lonely individual professional journey, with little community support, whereas teachers need and deserve rewarding development opportunities throughout their careers.

Policymakers recognise that career-long support to teachers is paramount for addressing some of the main challenges faced by education systems today. Professional development is clearly a way to effectively support teachers and is likely to gather increased interest in the years following the school closures of 2020. The existing literature supports the potential of MOOCs as a mechanism to reduce the barriers teachers face in accessing relevant continued professional development and at the same time scaling up the offer for continued professional development in an effective and efficient way. However, policy action that promotes and supports the use of this form within existing professional development processes—such as certification and recognition, funding, and quality assurance guidelines—will be needed for the widespread use and establishment of online continued professional development.

By critically reflecting on the experiences and evaluation data of the European Commission's Teacher Academy courses, this paper contributes insights and data to the still limited literature on the topic of teacher continued professional development MOOCs. The instructional design of the Teacher Academy courses is an example of how MOOCs can function along the principles of effective online continued professional development as defined in the literature. Feedback from participants suggests that the instructional design—based on a strong sense of interactive and collaborative community with responsibility for peer reviewing—was highly appreciated by course participants and led to changes in teaching practices.

We acknowledge that the findings presented in the literature reviewed and in this article are not representative and do not offer a systematic investigation of the effectiveness of continued professional development MOOCs generally. More, and more systematic and longer-term research addressing the research questions in this paper is therefore required.

Scalability, while possible with MOOCs, remains limited when using the specific instructional design presented in the Teacher Academy and this is the compromise that has to be reflected on by any course provider seeking to do the same. Furthermore, teachers' need for digital competence and self-regulated learning competence—as well as English language competence in the case of the Teacher Academy—in order to gain value from continued professional development MOOCs, means that there will be many teachers who are either left out, or not yet in a position to benefit from this continued professional development format. This is also an important consideration for online course providers and policymakers looking to review a continued teacher professional development system.

## DATA AVAILABILITY STATEMENT

Many of the data that support the findings of this study are available from the corresponding author upon reasonable request. Some data are not available due to privacy or ethical restrictions.

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## ENDNOTES

- <sup>1</sup> European Union Member States, candidate and EFTA countries taking part in Teacher Academy 2018 were: Austria, Belgium, Bulgaria, Cyprus, Croatia, Czech Republic, Denmark, Estonia, Finland, Hungary, Italy, Latvia, Lithuania, Malta, Netherlands, Norway, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Turkey, United Kingdom (UK was still part of the EU at the time of the survey).
- <sup>2</sup> Connectivist MOOCs, usually referred to as cMOOCs, are based on the Connectivist Learning Theory proposed by Siemens (2005) and Downes (2010). These MOOCs emphasise the building of connections (networks) amongst participants with most of the course content being contributed by the participants themselves. Transmissive MOOCs, usually referred to as xMOOCs, are more based on cognitivist and behaviourist learning theories, using a more traditional lecture format where knowledge is “transmitted” from a teacher to a student.
- <sup>3</sup> (1) Design government policies that support MOOCs within teacher continued professional development. (2) Develop appropriate mechanisms e.g., for certification. (3) Launch initiatives that raise awareness of the benefits of MOOCs. (4) Remove language and financial barriers. (5) Promote a MOOC culture of developing expertise and sharing practice via this approach. (6) Research into the effectiveness of MOOC practices.
- <sup>4</sup> The data and quotes offered in the next section about the Teacher Academy instructional design are based on the results of the pre- and post-course surveys administered by the Teacher Academy as part of its courses. The pre-course survey primarily collected data on participant profiles and experience while the post-course survey primarily collected feedback and impact reported by participants. Participation in these surveys is optional for the participants and entirely anonymous. The respondents therefore do not fully represent all course participants. The data presented mostly originates from a 2019 summary evaluation report of 1,560 pre-course surveys (44% of the total number of users starting a course) and 805 post-course surveys (52% of the total number of users completing a course).



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