

Using personalized support & school-based study groups to increase teachers' participation in MOOCs – findings from two European pilot projects

Benjamin Hertz^a, Katja Engelhardt^b

^a European Schoolnet, benjamin.hertz@eun.org

^b European Schoolnet, katja.engelhardt@eun.org

ABSTRACT

There is little doubt that online training formats and Massive Open Online Courses (MOOCs) in particular have the potential to increase accessibility for training educators and address some challenges reported by teachers in being able to access relevant professional development (OECD, 2019). However, pre-pandemic data shows that participation in online training is not yet widespread amongst teachers (OECD, 2019).

This paper therefore explores two mechanisms that could potentially increase teachers' participation in MOOCs: an offer of personalized support during a MOOC and the provision of school-based study groups. Evidence of the implementation of a personalized support in field trials has demonstrated substantial impact on teachers' participation in MOOCs, with 42% of the test group completing a series of MOOCs versus only 32% of the control group. Results from a small pilot program focusing on the use of school-based study groups are more tentative but suggest that a school-based blended learning model that makes use of study groups has the potential to increase participation in MOOCs by engaging teachers who would not have previously considered enrolling to a MOOC and building teachers' competence and confidence levels so that they are able to start and complete a MOOC.

SINTESI

Non c'è dubbio che le modalità di formazione online e i *Massive Open Online Courses* (MOOC), in particolare, abbiano il potenziale per aumentare l'accessibilità della formazione per gli insegnanti, affrontando alcune delle sfide segnalate da questi ultimi per poter accedere a uno sviluppo professionale adeguato (OCSE, 2019). Tuttavia, i dati pre-pandemia mostrano come la partecipazione alla formazione online non sia ancora diffusa presso gli insegnanti (OCSE, 2019).

Questo contributo esplora di conseguenza due meccanismi che potrebbero potenzialmente incrementarla: un'offerta di supporto personalizzato durante un MOOC e gruppi di studio nelle scuole. La prova dell'implementazione di un

supporto personalizzato ha dimostrato un impatto sostanziale sulla partecipazione degli insegnanti ai MOOC, con il 42% del gruppo test che ha completato una serie di MOOC, a fronte del 32% del gruppo di controllo. I risultati di un piccolo programma pilota incentrato sull'uso di gruppi di studio scolastici sono più provvisori, ma suggeriscono un modello di apprendimento misto basato sulla scuola che fa uso appunto di gruppi di studio. Ciò ha il potenziale per aumentare la partecipazione ai MOOC, coinvolgendo insegnanti che in precedenza non avrebbero preso in considerazione l'iscrizione e costruendo livelli di competenza e fiducia in modo che essi siano in grado di avviare e completare un MOOC.

KEYWORDS: teacher professional development, teacher training, online learning, blended learning, MOOCs

PAROLE CHIAVE: sviluppo professionale degli insegnanti, formazione degli insegnanti, apprendimento online, apprendimento misto, MOOC

Introduction

Even before the COVID-19, teachers had been facing complex challenges in how they work with their students in classrooms, for example caused by the digitalization of society or the inclusion of special education needs students in mainstream schooling. The shift to distance learning during the pandemic has accentuated these challenges, requiring teachers to adapt to a distance learning scenario from one day to the next. Many teachers have struggled with this, and education systems need to support teachers through training to develop the skills needed, so that teachers can transform their practice and benefit from the opportunities and address the challenges that come with the increasing digitalization of education systems (OECD, 2021; School Education Gateway, 2020).

There is little doubt that online training formats and Massive Open Online Courses (MOOCs) in particular have the potential to increase accessibility of training for teachers and address some of the challenges reported by teachers in being able to access relevant professional development (OECD, 2019). However, pre-pandemic data shows that participation in online training is not yet widespread amongst teachers (OECD, 2019). MOOC platforms for teachers such as the European Schoolnet Academy, the School Education Gateway, or the Spanish INTEF MOOCs platform report enrolment numbers far below their potential (Castaño-Muñoz et al., 2018; European Schoolnet, 2021; Majella & Bulceag, 2020). Furthermore, course participant profiles consist mostly of experienced practitioners with high levels of self-motivation and digital literacy (Castaño-Muñoz et al., 2018; Majella & Bulceag, 2020).

Even if participation numbers improve due to the pandemic, teachers who already participate in MOOCs often report challenges to make the most of such trainings. For example, O'Shea and Bulceag report about challenges faced by teachers participating in MOOCs, which can be grouped into the following general categories: language barriers, technical issues, time pressures, workload and issues linked to online collaboration with peers (Majella & Bulceag, 2020). These challenges are similar to those of other learners on MOOCs (Castaño-Muñoz et al., 2018; Jordan, 2015; Kizilcec et al., 2020; Lee & Choi, 2011) and relate to a lack of digital competence (technical issues, online collaboration), self-regulated learning competence (time pressures, workload) and language competence (language barriers, online collaboration).

While there may be other reasons why overall teachers' participation in online training and MOOCs in particular remains below its potential, finding effective measures to support teachers in addressing these types of challenges surely has the potential to increase overall participation of teachers in MOOCs. If successful, such measures could improve the experience and success of those participating for the first time and thereby result in educators turning to MOOCs more regularly. Furthermore, teachers who have been skeptical about participating in online training formats at first glance and have therefore shunned them are more likely to change their mind if they see others succeeding.

This paper therefore explores the following research question: *How can teachers' participation in MOOCs be increased?* To answer this question, the paper explores two mechanisms that could help in addressing the challenges teachers face in benefiting from MOOCs that were piloted by European Schoolnet¹ and the School Education Gateway² between 2018 and 2020.

The first mechanism consists of the provision of an offer of personalized support to teachers participating in MOOCs. Personalized support in this case refers to the proactive offer of one-to-one support for course participants, where the person or system offering the support is aware of the background and situation of the participant being addressed with the offer. The first sub-question the paper therefore addresses is: *To which extent can the offer of personalized support increase teachers' participation in MOOCs?*

The second mechanism the paper explores is the provision of school-based activities that run alongside a MOOC and therefore creates a school-based blended learning model of teacher training. The school-based activities focus on teacher study groups that meet alongside the MOOC so that the participating teachers support each other in addressing the challenges often faced by teachers in MOOCs. Through the participation in this blended learning approach, teachers might feel more empowered to also participate in MOOC courses that do not offer such school-based infrastructure in the future. The second sub-question the paper therefore addresses is: *To which extent can a school-based blended learning model increase teachers' participation in MOOCs?*

The two mechanisms explored in this paper are only two of many that could address the challenges identified. Their selection for further investigation in this paper is due to the availability of new data and insight gained from the pilot programs of these mechanisms in two projects run by European Schoolnet.

1. Factors Affecting Teachers' Participation in MOOCs

Teachers' participation in MOOCs can be measured through the amount enrolling in MOOCs, the amount starting a MOOC and the amount finishing a MOOC. While getting teachers enrolled in MOOCs is the first step of also getting them engaged, it is of course not sufficient if those teachers never start the MOOC after enrolment.

There is little research available on the factors that affect teachers' enrolment, starting and completion of MOOCs or online learning in general. However,

¹ European Schoolnet is the network of 32 European Ministries of Education based in Brussels. It is a non-profit organization, that aims to bring innovation in teaching and learning to Ministries of Education, schools, teachers, researchers and industry partners.

² The School Education Gateway is an online platform for teachers, school leaders, researchers, teacher educators, policymakers and other professionals working in school education. It is an initiative of the European Union and is funded by Erasmus+. It is steered by the European Commission and implemented by its European Education and Culture Executive Agency. It is operated on behalf of the Agency by European Schoolnet.

extensive research exists looking at the factors that lead to completion of online courses. While the contexts, settings and populations explored by this research cannot be easily compared to the situation for teachers, it does offer an idea of the specific factors that are also likely to affect teachers.

Studies often highlight the importance of a participant's low expectations (Pursel et al., 2016a) and a lack of motivation that affects their completion rate in online courses (Osborn, 2001). This is likely due to the self-directed nature of online courses (Bawa, 2016). Thus, participants' skills are of particular importance for the completion of online courses: course participants who have higher self-regulated learning skills such as time-management and resilience are more successful at completing online courses (Bawa, 2016; Kizilcec et al., 2017; Lee & Choi, 2011; Yukselturk & Bulut, 2007). Another factor that affects completion is digital literacy, in particular the ability to navigate online (Dupin-Bryant, 2004; Osborn, 2001; Yuan & Powell, 2013).

Course completion is also affected by external factors that participants need to navigate in order to succeed; for example, lack of time, unexpected events and distractions (Kember, 1995). Teachers, who often struggle from high workloads usually need to take online courses at home, leading to distractions from family and other commitments (Pierrakeas et al., 2004; European Schoolnet and University of Liege, 2013; Wastiau et al., 2013, Lee & Choi, 2011). Accordingly, to what extent teachers receive support from their environment (Holder, 2007; Ivankova and Stick, 2007) and suitable situations for studying (Castles, 2004; Osborn, 2001; Shin and Kim, 1999) is said to be an important factor affecting a teachers' persistence in online courses.

While course providers need to take into account these individual and external factors when designing the support infrastructure for their courses, there are also other course-based aspects that affect completion. For example, if a course is designed in such a way as to promote exchanges between course participants and with the instructor, it has a positive impact on course completion numbers (Muilenburg & Berge, 2005; Bettinger et al., 2016). In fact, it is likely that, especially for less experienced learners, a lower number and lower quality of student-teacher exchanges are key reasons for lower completion numbers of online courses (Bawa, 2016, Briggs and Spaulding, 2018).

2. To which extent can the offer of personalized support increase teachers' participation in MOOCs?

2.1. Literature review

Research findings acknowledge that learners' participation in online courses could be potentially increased by improved instructional design and support mechanisms in online courses. An emerging strand of research looks at different online support solutions. Such support mechanisms are often designed to provide support on one or several factors that existing research – as described in the previous section – has identified as potential predictors of success in online courses.

Examples are digital skills, self-regulated learning skills, or previous experience with online courses. Leveraging predictive data analytics on such factors has the potential to improve targeting and providing learners with personalized support (Briggs and Spaulding, 2018). However, robust evidence on what works is limited and is not specifically focused on teachers (Kizilcec et al., 2020). In this section we look at some examples tested in post-secondary distance education settings, as we argue that they may provide valuable lessons learned for online teacher training.

Orientation programs are one possible intervention that introduce students to the demands of online classes. First, correlational evidence suggests that such programs could be beneficial to students' successful completion of the online courses. Kai et al. (2017) applied machine learning techniques to study the likelihood of registering in a university online program among students who participated in an online orientation course. They confirmed a positive correlation between the degree of action and interaction during online orientation courses and the enrolment in university programs.

There are also interesting examples emerging from research focusing on behavioral science interventions. Al-Shabandar (2017) examined the effectiveness of machine learning approaches to the behavioral analysis and prediction of student outcomes within MOOC's. The study examined – amongst others – click streams, which represent the number of user events related to lecture views, course content interaction, access to assignments and posts in discussion forums. The study demonstrated a strong correlation between learners' behavioral patterns (e.g. click stream actions) and their course outcomes Al-Shabandar (2017).

Another interesting recent example of behavioral science intervention is a large-scale study carried out by Kizilcec and colleagues (2020). The study analyzed completion rates in a sample of one-quarter million students in 247 online courses. Students were randomly assigned to a control group or three different interventions.

The “plan making” intervention prompted students to describe when and how they will complete required coursework. While this intervention increased short-term persistence, it did not increase course completion, which was previously found (Yeomans and Reich, 2017).

The “value-relevance” intervention was a motivational activity that asked students to describe important values and their participation to the course related to them. This second intervention was found to increase completion rates only in a subset of courses carried out in developing countries.

The “mental contrasting with implementation intentions” intervention prompted students to reflect on barriers in following the course and plan ahead possible countermeasures. This intervention increased completion rates only for students in individual countries. Overall, the authors conclude that the impacts of such interventions could be highly heterogeneous across contexts, type of participants and that support interventions should be targeted and take those factors in due account.

2.2. TeachUP experimental setup

Drawing on this existing research base, the TeachUP policy experimentation project³ designed and tested in field trials a personalized support mechanism to help teachers succeed in MOOCs. The research question was: to what extent does such personalized support increase teachers' and student teachers' participation in MOOCs?

The TeachUP support model consisted of nine messages with personalized support that were triggered by data points from the participants' profile or progress on the course; some messages also contained the offer to book a one-to-one online session with a personalized support agent. The support mechanism aimed at supporting course participants in completing the courses they started, but also in starting the courses they had enrolled in. The messages addressed key elements of the instructional design and course timeline (e.g. the final submission of a course product). They were sent only to those course participants in the test group that were identified as in need, based on two sets of criteria. The first concerned teacher characteristics that, based on prior studies, were considered to predict dropout in online courses – e.g. low digital competence – no prior experience with online courses.

The second set of criteria relied on course platform analytics regarding teacher progress on the courses. For example, teachers who had not started a course after five days, received a personal reminder offering additional support. For more details about these interventions see Hertz & Engelhardt (2020, pp. 17–19).

During the 2018/2019 school year, this newly developed personalized support mechanism was tested in field trials in the context of four scalable online courses⁴ in 10 countries (Austria, Hungary, Greece, Estonia, Malta, Lithuania, Portugal, Spain, Slovakia, Turkey). Four-thousand ninety randomly sampled lower-secondary in-service teachers (2,192) and student teachers (1,898) participated to the field trials.

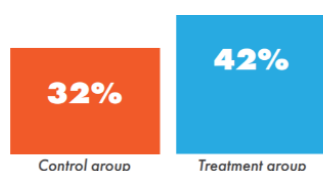
To answer the research question, TeachUP compared a group receiving personalized support consisting of emails with personalized guidance and an offer of support (test group) to a personalized support on teacher's course participation. Teachers and student teachers in both groups were invited to fill in two surveys (Baseline and Follow-up), as well as short surveys after each course. For the analysis of the research question, data from the surveys and the course platform

³ The policy experimentation Teach-UP was coordinated by European Schoolnet, with partners from 11 countries (Austria, Hungary, Greece, Italy, Estonia, Malta, Lithuania, Portugal, Spain, Slovakia, Turkey). The project aimed to support teacher training stakeholders in finding ways to scale up effectively and efficiently online teacher training. It ran from March 2017 to August 2020 and was co-funded by the Erasmus+ Programme of the European Union.

⁴ The project defined scalable online courses as: courses designed in such a way that there is no practical, technical, or other limit to the number of learners in the courses. While such courses have the potential to accommodate “massive” numbers of learners, they do not necessarily do so.

itself was used. To enrich the quantitative analysis, qualitative feedback was collected from key stakeholders and in focus group sessions in each country.

2.3. TeachUP findings



One key finding was that the personalized support offer increased the likelihood of enrolled teachers to complete an online course by ten percentage points. For student teachers, the support offer increased the likelihood to complete the courses only for those with prior experience in online courses (i.e. completed more than one online course per year in the past three years). No effect could be observed for teachers and student teachers in Turkey. This impact was observed even though very few teachers and student teachers accepted the offer for an online 1:1 session (57 in total), and also few replied to the more general offer of support made in all personalized support emails. The few questions put forward by participants regarded practical aspects of the courses rather than course contents.

It is not possible to provide a conclusive answer to how the personalized support offer actually worked. However, qualitative evidence, for example from focus groups carried out in the field trials countries, suggests that a set of different dynamics was at play (Livingston, 2020). For some teachers, the messages may have acted as simple reminders to do certain things, such as to start the course. The messages may have also served as guidance, as they entailed concrete useful information. The fact that the messages were clearly tailored to course participants' respective situations may also have resulted in a feeling of being monitored, suggesting that if they did not proceed/succeed someone would have noticed and thereby "re-creating" the social pressure that also exists in face-to-face training settings.

In conclusion, a personalized support offer can increase teachers' participation in MOOCs. 42% in the treatment group completed the TeachUP courses, compared to 32% in the control group. It is likely that what made the difference was the fact that messages were personalized by including information about participants' profile and progress. Further research is needed on how to use predictive analysis to better target and personalize support in online courses (Kizilcec et al., 2020). The fact that the personalized support did not work for everyone points to the likely importance of background profiles, patterns of course participation, institutional setting and implementation processes. Future research is needed to shed further light on the contextual and learner characteristics that affect course participants' likelihood to participate to online courses.

Offering online support via personalized messages is a solution that can increase – at a relatively low cost – teachers' likelihood to start and complete courses that they registered to. Any support as part of a course will however not reach teachers that do not register to online courses in the first place, for example because they are not convinced of their usefulness or do not think of themselves as capable of

succeeding at online learning. For any support offered entirely online, an inherent limitation is, that it may not reach teachers that lack basic digital competences to successfully navigate a course. The school-based blended learning model to be discussed in the next section may offer a bridge to online learning especially for teachers that are less prone to try out online courses on their own or may lack essential digital or other competences.

3. To which extent can a school-based blended learning model increase teachers' participation in MOOCs?

3.1. Literature Review

A school-based blended learning model in the context of MOOCs refers to a learning setup where in addition to the MOOC, the learners (in this case schoolteachers) also participate in onsite meetings that are linked directly to the MOOC and take place in school.

There are no studies that explore this specific combination of blended learning, but the literature does address the benefits of blended learning in teacher professional development (TPD) including when the onsite element of blended learning happens in school. There are also a few studies that examine the use of MOOCs for blended learning. The following overview of these studies draws substantially on the literature review of Kennedy (2021) on the topic of blended learning in teacher education and training.

3.2. Blended Teacher Professional Development

Many articles show how a blended approach in TPD can address one of the perceived shortcomings of fully online TPD, namely the creation of a sense of community among teachers. The importance of teachers to build community as part of any TPD experience is acknowledged by most of the literature (Anderson, Boaler, & Dieckmann, 2018, Schleicher, 2016).

Blended learning designs often seek to create community support to address the sense of separation from their peers felt by many teachers on online courses (Hoffmann-Dumieniński, 2016; Hramiak, 2010; Trust & Horrocks, 2017). Many studies highlight the lack of participation in online discussion activities by teachers (Holmes et al., 2005; Owston et al., 2008; Voogt et al., 2005) which a blended approach could address. Other researchers see the face-to-face part of blended learning as offering *advanced interactive experiences* that can better engage the learners (Mironov et al., 2014, p. 228).

Blended learning designs mean that professional development programs for teachers can be integrated into the local context in which teachers work, their school (Owston et al., 2008). This could offer better opportunities for applying to practice what was learned and to develop school-based learning communities. The benefits of blended learning therefore also include the possibility to develop more meaningful activities (Herrington et al., 2003) because of the location within the

site of their professional practice. Furthermore, Philipsen et al.'s findings show that learning in an online or blended environment with familiar colleagues present, was perceived to be of key importance to the participating teachers and enabled different support mechanisms, including peer support (Philipsen et al., 2019).

3.3. Blended MOOCs for Teacher Professional Development

Research on blended MOOCs for TPD is gradually emerging. The massiveness of MOOCs presents challenges for creating the conditions necessary for learning insofar as the educator cannot provide individual feedback to each learner. A blended MOOC design has the advantages of compensating for the perceived weaknesses of the MOOC model.

The few studies that examine blended MOOCs in the context of TPD offer mixed results on their effectiveness. Gynter (2016) designed a MOOC for teachers which included supplementary, blended sessions where participants could experience synchronous teacher presence both online and face-to-face. However, the MOOC participants appeared largely unhappy with the MOOC design, highlighting in particular the lack of teacher presence and teacher feedback. Peer responses were not seen as a qualified replacement of this. Educators in the study were in many cases unfamiliar with the MOOC concept and were therefore likely to reproduce what had been taught online rather than support students in more meaningful ways, which might explain the negative feedback of participants.

More positive results were observed by King et al. (2018) who blended an existing TPD MOOC at a local level for seven Timorese teachers. The teachers took part in a study group and studied independently on the MOOC. The study group met each week for around one-to-two hours. During the meetings the teachers watched the videos and discussed the content. Research on the teachers' experience of the blend highlighted as a key benefit the ability to access high quality TPD content as part of the MOOC. This, in combination with the exchanges and discussions with the other teachers of the study group and in the international online community, offered substantive value to the teachers.

Another example of a blended MOOC for TPD is described by Chase et al. (2019). Three face-to-face workshops ran before, during and after the MOOC. Teachers and academics who had participated in the design of the MOOC provided presentations and organized group discussions, and activities. The tools used during the workshops were the same as those featuring in the MOOC. This helped the participants to engage better with the platform, including to participate in the online discussions. The evaluation showed that the participants valued the face-to-face discussion, and especially the opportunity to discuss directly with the experts featuring on the MOOC to clarify their understanding, ideas, and questions. The blended design also provided more opportunities for teachers to test their ideas and to practice with the digital tools as well as to address misconceptions or tackle technical issues. Moreover, the participants felt better equipped to make more meaningful contributions to the MOOC community. This suggests that not only the

teachers who participated in the blended design benefited but also the online course community as a whole.

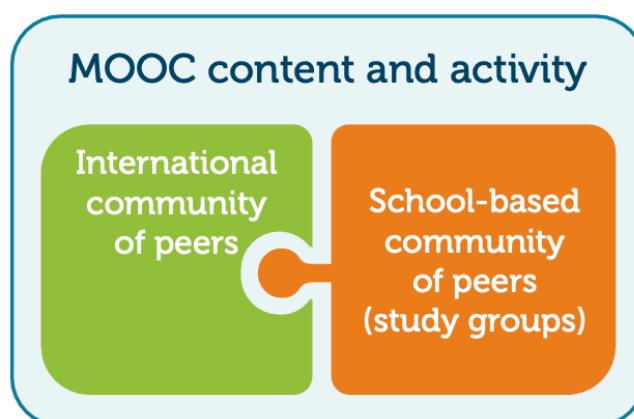
4. The Teacher Academy school-based Study Groups Pilot

The Teacher Academy (TA) is a section on the European Commission's School Education Gateway which is managed for the European Commission by European Schoolnet. At the TA teachers can access a variety of TPD opportunities, including MOOCs. Considering the potential benefits of blended learning in TPD identified by the literature and to address some of the challenges reported by teachers in benefiting from the MOOC offer of the TA, a small pilot project was launched in 2019 with 8 teachers from across Europe.

The 8 teachers were set the task to organize study groups in their school that would work alongside and integrated with a TA MOOC. The original aims of these groups were the following:

1. engage teachers in MOOCs who would not previously have considered participating in such type of TPD format;
2. support teachers in completing a MOOC by offering a local support infrastructure in the form of a network of school colleagues supporting each other;
3. develop teachers' self-regulated and digital competences to empower them to take MOOCs by themselves in the future;
4. increase impact of MOOC participation by embedding MOOC discussions and activities in a school-based context.

The following diagram illustrates how the study groups sat alongside and were connected with the international community of peers within a framework created by the MOOC content and activities:



The teachers were recruited via an open call and selected based on their previous experience of working with MOOCs, their ideas for implementing a study group at

their school, as well as ensuring a good geographical mix. The teachers were free to go about the implementation in the way they felt best and were only provided instructions on how to record their planning and observations via an action plan template and learning diaries. At the end of the process, the pilot teachers had to prepare an online publication that summarized their experience.

No systematic evaluation of the participants of the study groups themselves was undertaken but the pilot teachers conducted reflection activities with the study group participants during the last study group session. The results of these discussions and quotes from the participants were recorded in the pilot teachers' learning diaries and online publications. Furthermore, interviews were conducted with the pilot teachers where they reported about their and the study group participants' experience.

The study groups varied in size from 5 to 30 teachers. Amongst those teachers who came to the first study group session, between 80% and 100% also attended the last study group session and completed the MOOC that the study group was associated with. While implementation of the study groups varied, four key findings can be identified from the experiences reported by the pilot teachers:

- 1. Benefit of the study group derives from peer support and timing** – A major benefit to the participants of the study groups was the ability to take the MOOC together during the study group sessions. While many pilot teachers had planned for the participants to take the MOOC by themselves and use the study group sessions for discussions, most study groups ended up working in small groups or pairs and taking the course together during the sessions. Whereas this was combined with some discussion, most of the time was spent with watching the course videos and doing the course activities together. Based on the feedback provided, the added value to the participants seems to have come more from the peer support offered during the sessions as well as the fixed date and time reserved for the work on the MOOC. Interestingly, the support the teachers provided each other was focused particularly on language issues, although technical issues were also mentioned. These findings correspond with the conclusions found in the literature about the importance to create community support infrastructures to mitigate the isolation felt by many teachers in purely online courses (Hoffmann-Dumienski, 2016; Hramiak, 2010; Trust & Horrocks, 2017). It also supports the finding of Philipsen et al. (2019) that working with known colleagues in online or blended courses was preferred by teachers and enabled different kinds of peer support.

«The most enriching experience for teachers in my school was the ability to have real-time support while doing a course in English language. They felt confident because they all knew they could ask for help at any point and this facilitated the process for them».

Pilot Teacher, Croatia

«It is not the first time I have taken part in the courses of Teacher Academy but I have not always finished them, because of lack of time and/or interest in the activities. The strategy to work in presence has been effective because I could find a lot of reasons to keep going».

Study Group Participant, Italy

- 2. Participation in the study group built confidence to engage in the online community** – The participation in the study group sessions gave participants confidence to engage in the online discussions and exchanges that were taking place in the course community. Study group participants reported that the language and technical support offered by their peers made them more confident to post online – for example by demonstrating how to use Google Translate or proof-reading a post before publication. This finding supports the conclusions of Chase et al. (2019) that participating in a blended model of learning with a MOOC can have a positive impact on the wider course community as it empowers learners who might not have engaged in the online community to start engaging with it.

«The platform looked very complicated and I first felt discouraged. However, the onsite workshop organized at the school level helped me to navigate the course and communicate online».

Study Group Participant, Croatia

- 3. Participation in the study group built confidence to take further online courses** – Study group participants reported that as a result of their participation they felt more confident to participate in other online courses. According to the feedback received this was primarily due to increased confidence in dealing with language issues as well as a better understanding of how an online course worked. Notable here is that participants highlighted their ability and confidence to help themselves should they come across an issue in the future – for example by using Google Translate, asking a peer, or reaching out to the course moderator or helpdesk. This suggests that an important component of self-regulated learning competence, help-seeking, seems to have been successfully activated through the study group participation.

«In the initial phase I had difficulties because beyond the language problem was the difficulty in understanding how online training worked. After finishing the training, I not only feel like doing other kind of training, but I recommend it to other teachers».

Participant of the study group in Portugal

- 4. Study groups generated a learning community at school that went beyond the MOOC** – Pilot teachers reported that exchanges amongst study

group participants regularly addressed issues that were unrelated to the MOOC and that one of the key benefits of organizing the study groups had been the collaborative culture it generated amongst the school colleagues. Due to the cross-curricular topics addressed by the MOOCs, the study groups included colleagues from different subject areas and facilitated an exchange between them – something that was far from common in many pilot schools. Furthermore, collaboration extended beyond the study group sessions, for example resulting in “open door lessons” where study group participants were invited to drop-in to each other’s lessons for observation. Considering that the literature identifies teachers’ communities which can offer support on an ongoing basis in a local context as an important component of impactful TPD. This finding highlights the potential of a school-based blended learning model with MOOCs as an effective TPD format. It is however not clear to what extent this type of collaboration was maintained for a longer period after the study groups.

«During those sessions we would not only speak about the content of the course but also about mentoring a teacher or teacher trainer and about education in general. This has led to a more professional learning community with motivated teachers».

Pilot Teacher, Netherlands

The 4 findings outlined above highlight how school-based study groups that work alongside a MOOC have the potential to increase enrolment, starting and completion numbers for teachers on MOOCs. Through the trusted peer support such study groups offer as well as by the nature of their success in building confidence in the participants and a learning community at school level, the study groups could drive interest and enrolment in MOOCs of teachers who might not normally have considered it. Furthermore, by strengthening participants’ confidence, their ability to help themselves, and by offering fixed times to work on a MOOC, the study groups are likely to increase the likelihood of participants starting and completing a MOOC. The existence of a longer term impact of the confidence gained would deserve to be investigated further to see if it could result also in more participation in MOOCs that do not offer a school-based study group alongside them.

While these results seem promising, the nature of the evidence presented is limited due to the low number of cases, lack of representativeness, and limits in the research design applied. Further investigation is therefore necessary to understand better the impact of participating in school-based study groups alongside a MOOC. A more systematic analysis of study group participants’ competences and confidence levels, as well as their perceptions of and participation in different TPD formats before and after participation in the study groups would be necessary. Also, longer term investigations that examine teacher collaboration at school-level would be beneficial to better understand the dynamics at play and any longer-term impact of the study groups.

Conclusions

This paper examined the question to what extent a personalized support offer and a specific school-based learning model increase teachers' participation in MOOCs. Evidence of the implementation of a personalized support in field trials has demonstrated substantial impact on teachers' participation in MOOCs. Results from the Teacher Academy school-based study groups pilot are more tentative but suggest that a school-based blended learning model that makes use of study groups has the potential to increase teachers' participation in MOOCs by engaging teachers who would not have previously considered enrolling to a MOOC and building teachers' competences and confidence levels so that they are able to start and complete a MOOC.

To address teachers' participation in MOOCs, both mechanisms could complement each other well. While the personalized support offer targets those teachers who have already made the first step of enrolling on a course and then coaxes them towards starting and completing a course through a mix of psychological effects and direct guidance, the school-based blended learning model has a stronger potential to reach those teachers who would never have considered enrolling to a MOOC in the first place.

One could hypothesize that different teacher profiles – depending on their personal learning preferences, competences and school setting – will benefit more from one of the two offers, or a combination of both. For instance, teachers with a lack of basic digital competence and a low level of self-regulated learning competence might benefit in particular from study groups. Other teachers might respond more positively to support that is built directly into the online courses, for instance if they require only sporadic or specific support (e.g. a reminder of a deadline or how to submit a task). Such course-based support would also be more suited for cases, where study groups are not easily organized at school level because school management or colleagues are not supportive or open to such training opportunities.

While the mechanisms can complement each other, the infrastructures required for the implementation of both mechanisms differ substantially. The personalized support offer requires a centralized technical infrastructure that offers the data for the personalization to be possible, while the school-based blended model requires a distributed and local network of collaborators in schools. Accordingly, for a combination of the two mechanisms to take place, a collaboration between course providers and a network of school leaders would be useful.

The personalized support offer and the school-based blended learning model are only two examples of support mechanisms that could be offered to teachers to address common challenges of MOOC participation. While previous studies have identified factors that affect participation in online courses in general, little research

is yet available looking at teachers specifically. Accordingly, there is still insufficient understanding of the teacher profiles that are most in need of support as well as a clear understanding of what their needs are. Consequently, to improve the two mechanisms explored in this paper and to develop alternative mechanisms, more research is needed in this area.

The findings in this paper offer two examples of promising mechanisms that can be implemented by course providers and schools to help more teachers benefit from the TPD opportunities offered by MOOCs. While this does not mean that MOOCs – regardless of the support mechanisms on offer – are a suitable TPD format for all teachers, it does suggest that MOOCs can be made more accessible to different teacher profiles. However, more research is needed to understand the impact and dynamics at play of the identified support mechanisms and to explore further ways to increase the accessibility of MOOCs for teachers.

Bibliography

AL-SHABANDAR, R., HUSSAIN, A., LAWS, A., KEIGHT, R., LUNN, J., & RADI, N. (2017). Machine learning approaches to predict learning outcomes in Massive open online courses. In *2017 International Joint Conference on Neural Networks (IJCNN)* (pp. 713–720). IEEE.

ANDERSON, R. K., BOALER, J., & DIECKMANN, J. A. (2018). Achieving elusive teacher change through challenging myths about learning: A blended approach. *Education Sciences*, 8(3). <https://doi.org/10.3390/educsci8030098>

AZZOLINI, D., MARZADRO, S., & RETTORE, E. (2020). TeachUP Evaluation Report. Retrieved from:

http://teachup.eun.org/documents/556205/5084344/TeachUP_Evaluation_Report_FINAL.pdf/44e9a095-635e-4a88-82fe-92ee25bfe5b8

BAWA, P. (2016). Retention in Online Courses: Exploring Issues and Solutions – A Literature Review. *SAGE Open*, 6(1).

<https://doi.org/10.1177/2158244015621777>

BETTINGER, E., LIU, J., & LOEB, S. (2016). Connections matter: How interactive peers affect students in online college courses. *Journal of Policy Analysis and Management*, 35(4), 932–954.

BOZARTH, J., CHAPMAN, D. D., & LAMONICA, L. (2004). Preparing for distance learning: Designing an online student orientation course. *Educational Technology & Society*, 7(1), 87–106. Retrieved from: http://www.ifets.info/journals/7_1/10.pdf

BRIGGS, A., & SPAULDING, S. (2018). Three Ways Technology Can Help Nontraditional Students Succeed in Online Coursework. Urban Institute. Retrieved from:

<https://www.urban.org/urban-wire/three-ways-technology-can-help-nontraditional-students-succeed-online-coursework>

CASTAÑO-MUÑOZ, J., KALZ, M., KREIJNS, K., & PUNIE, Y. (2018). Who is taking MOOCs for teachers' professional development on the use of ICT? A cross-sectional study from Spain. *Technology, Pedagogy and Education*, 27(5), 607–624. <https://doi.org/10.1080/1475939X.2018.1528997>

CASTLES, J. (2004). Persistence and the adult learner: Factors affecting persistence in Open University students. *Active learning in higher education*, 5(2), 166–179.

CHASE, E., KENNEDY, E., LAURILLARD, D., ABU MOGHLI, M., & PHERALI, T. (2019). A Co-design Methodology for Blended Teacher Professional Development in Contexts of Mass Displacement. *NORRAG SPECIAL ISSUE 02: Data collection and evidence building to support education in emergencies*, 2019.

CLAY, M. N., ROWLAND, S., & PACKARD, A. (2009). Improving undergraduate online retention through gated advisement and redundant communication. *Journal of College Student Retention: Research, Theory & Practice*, 10(1), 93–102.

DUPIN-BRYANT, P. A. (2004). Pre-entry Variables Related to Retention in Online Distance Education. *International Journal of Phytoremediation*, 21(1). https://doi.org/10.1207/s15389286ajde1804_2

GYNTHER, K. (2016). Design framework for an adaptive MOOC enhanced by blended learning: Supplementary training and personalized learning for teacher professional development. *Electronic Journal of E-Learning*, 14(1).

HERRINGTON, J., OLIVER, R., & REEVES, T. C. (2003). Patterns of engagement in authentic online learning environments. *Australasian Journal of Educational Technology*, 19(1). <https://doi.org/10.14742/ajet.1701>

HERTZ, B., ENGELHARDT, K., AZZOLINI, D., MARZADRO, S., & RETTORE, E. (2020). Implementing personalised support in scalable online courses. Retrieved from:

http://teachup.eun.org/documents/556205/5084344/TeachUP+-+Implementing+Personalised+Support_FINAL.pdf/8e58ee40-5842-4f0e-817c-f49208d8b0c4

HOFFMANN-DUMIENSKI, K. (2016). Professional development across the islands of the South Pacific: A perspective of a blended learning facilitator. *Journal of Open, Flexible and Distance Learning*, 20(2), 66–78.

HOLDER, B. (2007). An investigation of hope, academics, environment, and motivation as predictors of persistence in higher education online programs. *The Internet and higher education*, 10(4), 245–260.

HOLMES, A., POLHEMUS, L., & JENNINGS, S. (2005). CATIE: A blended approach to situated professional development. In *Journal of Educational Computing Research*. <https://doi.org/10.2190/F97W-QUJ4-G7YG-FPXC>

HRAMIAK, A. (2010). Online learning community development with teachers as a means of enhancing initial teacher training. *Technology, Pedagogy and Education*, 19(1), 47–62. <https://doi.org/10.1080/14759390903579265>

IVANKOVA, N. V., & STICK, S. L. (2007). Students' persistence in a distributed doctoral program in educational leadership in higher education: A mixed methods study. *Research in Higher Education*, 48(1), 93.

JORDAN, K. (2015). Massive open online course completion rates revisited: Assessment, length and attrition. *The International Review of Research in Open and Distributed Learning*, 16(3). <https://doi.org/10.19173/irrodl.v16i3.2112>

KAI, S., ANDRES, J. M. L., PAQUETTE, L., BAKER, R. S., MOLNAR, K., WATKINS, H., & MOORE, M. (2017). *Predicting Student Retention from Behavior in an Online Orientation Course*. International Educational Data Mining Society.

KEMBER, D. (1995). *Open Learning Courses for Adults: A Model of Student Progress*. Educational Technology Publications.

KENNEDY, E. (2021). Blended Learning in Teacher Education & Training – Findings from Research & Practice. In *Pre-Service and In-Service Teacher Education*.

KING, M., LUAN, B., & LOPES, E. (2018). Experiences of Timorese language teachers in a blended Massive Open Online Course (MOOC) for Continuing Professional Development (CPD). *Open Praxis*, 10(3), 279.

<https://doi.org/10.5944/openpraxis.10.3.840>

KIZILCEC, R. F., PÉREZ-SANAGUSTÍN, M., & MALDONADO, J. J. (2017). Self-regulated learning strategies predict learner behavior and goal attainment in Massive Open Online Courses. *Computers and Education*, 104, 18–33.

<https://doi.org/10.1016/j.compedu.2016.10.001>

KIZILCEC, R. F., REICH, J., YEOMANS, M., DANN, C., BRUNSKILL, E., LOPEZ, G., TURKAY, S., WILLIAMS, J. J., & TINGLEY, D. (2020). Scaling up behavioral science interventions in online education. *Proceedings of the National Academy of Sciences*, 117(26), 14900 LP – 14905. <https://doi.org/10.1073/pnas.1921417117>

LEE, Y., & CHOI, J. (2011). A review of online course dropout research: Implications for practice and future research. *Educational Technology Research and Development*, 59, 593–618. <https://doi.org/10.1007/s11423-010-9177-y>

LIVINGSTON, K. (2020). Final-Cross Country Dialogue Lab Report. Retrieved from:

<http://teachup.eun.org/documents/556205/5084344/Cross-Country-Dialogue-Lab-Report/49f4ffef-29dc-42f8-a1b1-94bd58ac6fd2>

MCGARR, O., & CLIFFORD, A. M. (2013). 'Just enough to make you take it seriously': exploring students' attitudes towards peer assessment. *Higher education*, 65(6), 677-693. <https://doi.org/10.1007/s10734-012-9570-z>

MIRONOV, C., BORZEA, A., & CIOLAN, L. (2012). Blended-learning – an effective tool for the professional development of higher education teachers. In *The International Scientific Conference eLearning and Software for Education* (Vol. 1, p. 226). "Carol I" National Defence University.

MUILENBURG, L. Y., & BERGE, Z. L. (2005). Students Barriers to Online Learning: A factor analytic study. *Distance Education*, 26(1), 29–48.

<https://doi.org/10.1080/01587910500081269>

O'SHEA, M., & BULCEAG, I. (2020). The impact of participation in Teacher Academy online courses on the practice and identity of teachers: a research study.

https://www.schooleducationgateway.eu/downloads/webinars/PAB%20Online%20Event/Teacher%20Academy_Research%20Report_2020_Final.pdf

OECD (2019). TALIS 2018 Results (Volume I).

OECD (2021). The State of School Education – One Year into the COVID Pandemic (Issue March). https://www.oecd-ilibrary.org/education/the-state-of-school-education_201dde84-en?_ga=2.239989002.809511923.1621141738-1025739882.1621141738

OSBORN, V. (2001). Identifying at-risk students in videoconferencing and web-based distance education. *International Journal of Phytoremediation*, 21(1).

<https://doi.org/10.1080/08923640109527073>

OWSTON, R., WIDEMAN, H., MURPHY, J., & LUPSHENYUK, D. (2008). Blended teacher professional development: A synthesis of three program evaluations. *Internet and Higher Education*, 11(3–4), 201–210.

<https://doi.org/10.1016/j.iheduc.2008.07.003>

ÖZKAN, Y., & KURTULDU, E. PRE-SERVICE LANGUAGE TEACHERS' REFLECTIONS ON PEER ASSESSMENT IN MICRO TEACHING SESSIONS OF A METHODOLOGY COURSE. *Uşak Üniversitesi Sosyal Bilimler Dergisi*, 11(4), 276–284.

PHILIPSEN, B., TONDEUR, J., PAREJA ROBLIN, N., VANSLAMBROUCK, S., & ZHU, C. (2019). Improving teacher professional development for online and blended learning: a systematic meta-aggregative review. *Educational Technology Research and Development*, 67(5), 1145–1174. <https://doi.org/10.1007/s11423-019-09645-8>

PIERRAKEAS, C., XENOS, M., PANAGIOTAKOPOULOS, C., & VERGIDIS, D. (2004). A comparative study of dropout rates and causes for two different distance education courses. *International Review of Research in Open and Distributed Learning*, 5(2), 1–15.

PURSEL, B. K., ZHANG, L., JABLOKOW, K. W., CHOI, G. W., & VELEGOL, D. (2016a). Understanding MOOC students: Motivations and behaviours indicative of MOOC completion. *Journal of Computer Assisted Learning*.

<https://doi.org/10.1111/jcal.12131>

PURSEL, B. K., ZHANG, L., JABLOKOW, K. W., CHOI, G. W., & VELEGOL, D. (2016b). Understanding MOOC students: Motivations and behaviours indicative of MOOC completion. *Journal of Computer Assisted Learning*.

<https://doi.org/10.1111/jcal.12131>

RATMININGSIH, N. M., ARTINI, L. P., & PADMADEWI, N. N. (2017). Incorporating self and peer assessment in reflective teaching practices. *International Journal of Instruction*. <https://doi.org/10.12973/iji.2017.10410a>

SCHLEICHER, A. (2016). Teaching excellence through professional learning and policy reform. *Lessons from Around the World, International Summit on the Teaching Profession*. <https://doi.org/10.1787/9789264252059-en>

SCHOOL EDUCATION GATEWAY (2020). *Survey on online and distance learning – Results*. School Education Gateway.

SCHOOLNET, E. (2021). European Schoolnet's 2020 Annual Report.

SCHOOLNET, E., & UNIVERSITY OF LIEGE, PSYCHOLOGY AND EDUCATION (2013). Survey of Schools: ICT in Education. Benchmarking Access, Use and Attitudes to Technology in Europe's Schools. Retrieved 16 May 2021.

<http://essie.eun.org/homepage>

SHIN, N., & KIM, J. (1999). An exploration of learner progress and drop-out in Korea National Open University. *Distance education*, 20(1), 81–95.

STRUYVEN, K., DOCHY, F., & JANSSENS, S. (2008). The effects of hands-on experience on students' preferences for assessment methods. *Journal of Teacher Education*. <https://doi.org/10.1177/0022487107311335>

TRUST, T., & HORROCKS, B. (2017). 'I never feel alone in my classroom': teacher professional growth within a blended community of practice. *Professional Development in Education*, 43(4), 645–665.

<https://doi.org/10.1080/19415257.2016.1233507>

VOOGT, J., ALMEKINDERS, M., VAN DEN AKKER, J., & MOONEN, B. (2005). A "blended" in-service arrangement for classroom technology integration: Impacts on teachers and students. *Computers in Human Behavior*.

<https://doi.org/10.1016/j.chb.2004.10.003>

WASTIAU, P., BLAMIRE, R., KEARNEY, C., QUITTRE, V., VAN DE GAER, E., & MONSEUR, C. (2013). The Use of ICT in Education: a survey of schools in Europe. *European Journal of Education*, 48(1), 11–27.

YUAN, L., & POWELL, S. (2013). MOOCs and Open Education: Implications for Higher Education. <https://doi.org/10.13140/2.1.5072.8320>

YUKSELTURK, E., & BULUT, S. (2007). Predictors for student success in an online course. *Educational Technology and Society*, 10(2), 71–83.

<https://doi.org/10.2307/jeductechsoci.10.2.71>

YEOMANS, M., & REICH, J. (2017, March). Planning prompts increase and forecast course completion in massive open online courses. In *Proceedings of the seventh international learning analytics & knowledge conference* (pp. 464–473).

ZIMMERMAN, B. J. (1989). A Social Cognitive View of Self-Regulated Academic Learning. *Journal of Educational Psychology*.

<https://doi.org/10.1037/0022-0663.81.3.329>