FROM ISOLATION TO COLLABORATION: DEVELOPMENT OF A COMMUNITY OF PHYSICAL EDUCATION TEACHERS IN PANDEMIC TIMES

DO ISOLAMENTO À COLABORAÇÃO: DESENVOLVIMENTO DE UMA COMUNIDADE DE PROFESSORES DE EDUCAÇÃO FÍSICA EM TEMPOS DE PANDEMIA 🔗

DEL AISLAMIENTO A LA COLABORACIÓN: DESARROLLO DE UNA COMUNIDAD DE PROFESORES DE EDUCACIÓN FÍSICA EN TIEMPOS DE PANDEMIA 🔗

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Abstract: The purpose of this study was to explore the development of a group of Brazilian Physical Education (PE) teachers, who struggled with remote teaching, into a community of practice (CoP) during the COVID-19 pandemic. The study focused on factors that supported the CoP cultivation process in an online format. Employing action research methodology, the study involved 15 PE teachers, with one of them acting as a teacher-facilitator, and one critical friend. Data were generated through CoP's meetings, interviews, critical friend conversations, and reflexive journaling. Thematic analysis resulted in four overarching themes: a) the pandemic as a catalyst for collaboration; b) teachers' self-organization to enact the community; c) development of collaborative research; and d) dialogue towards a new cycle of collaboration. Noteworthy was that teachers' self-organization was critical for guiding the CoP throughout stages of development. Further aspects that contributed to CoP's development in a pandemic scenario are discussed.

Keywords: Teacher continuing education. Teacher professional development. Communities of practice. Digital technology.

1 INTRODUCTION

The rapid transition to remote education due to the COVID-19 pandemic presented numerous challenges to university and school communities, including educators' lack of knowledge on digital instruction (LEITE *et al.*, 2022; OVENS; PHILPOT; BENNETT, 2022), limited resources and infrastructure for online education (PARRIS *et al.*, 2022; VENÂNCIO *et al.*, 2022), and the need for online pedagogies (CARRILLO; FLORES, 2020; KUCERA *et al.*, 2022). In particular, physical education (PE) teachers found barriers to integrate technology into a subject that has been historically and socially constructed based on its practical and experiential nature (ARAÚJO; OVENS, 2022; KIRK, 2010; O´BRIEN *et al.*, 2020). For instance, international research revealed that PE teachers faced a lack of direct contact with students and restrictions for teaching movement activities (KUCERA *et al.*, 2022; VAREA; GONZÁLEZ-CALVO, 2021). In addition, a need to be more flexible and rethink teaching practices, as well as difficulties in establishing personal connections with students have also been identified (HOWLEY, 2021). Similarly, in the Brazilian context, PE teachers were challenged to develop relationships with students through digital platforms (FERREIRA *et al.*, 2021; SILVA *et al.*, 2021) and to adapt PE lessons to an online format (FERREIRA *et al.*, 2021; GODOI; KAWASHIMA; GOMES, 2020).

Due to these unexpected changes, PE teachers expressed a need for continuing professional development (CPD), mainly related to the use of technology in classes (HOWLEY, 2021; MERCIER *et al.*, 2021; VILCHEZ *et al.*, 2021). In general, teachers had to "learn as trying" (PATTON; PARKER; PRATT, 2013) while experiencing online teaching. One of the ways that PE teachers responded to this challenging situation was through collaboration within and across institutions (FERREIRA *et al.*, 2021; GODOI; KAWASHIMA; GOMES, 2020; NETOLICKY, 2020; O´BRIEN *et al.*, 2020; VILCHEZ *et al.*, 2021).

In a time of crisis, collaborative responses emerged out of necessity and solidarity to find solutions to address educational needs (NETOLICKY, 2020). Especially in uncertain scenarios such as the pandemic, collaborative practices have been endorsed as a promising strategy to support teachers' learning and professional well-being (DARLING-HAMMOND; HYLER, 2020; NETOLICKY, 2020) as sharing, reflecting, and interacting with peers can help teachers navigate tensions and professional dilemmas, as well as to find emotional support (SOLVASON; KINGTON, 2020).

Within the scope of collaborative CPD, communities of practice (CoP) (WENGER, 1998) have been increasingly explored as a valuable context for PE teachers' professional learning (PARKER *et al.*, 2021; PATTON; PARKER, 2017). The contributions of CoPs to PE teachers' CPD have been reported in a variety of ways, including: strengthened teacher identity and sense of commitment to the profession (O'SULLIVAN, 2008), increased autonomy and empowerment (GONÇALVES; PARKER; CARBINATTO, 2021; PARKER; PATTON; TANNEHILL, 2012), reduced isolation (PATTON; PARKER, 2017), improved practice and student learning outcomes (PARKER *et al.*, 2021), and support of curriculum development (PARKER *et al.*, 2010).

Yet, empirical evidence regarding how CoPs evolve and are sustained over time is still limited (PARKER *et al.*, 2021). Focusing on the concept of CoP (WENGER, 1998) as a collaborative strategy for PE-CPD, the purpose of this study was to explore the development of a group of Brazilian PE teachers, who struggled with remote teaching, into a CoP during the COVID-19 pandemic. The study placed particular emphasis on: what factors supported the successful development of the group in pandemic times?

1.1 COMMUNITIES OF PRACTICE: DEFINITION AND STAGES OF DEVELOPMENT

The CoP framework has both theoretical and methodological potential to foster PE teachers' CPD in articulating their real needs within the challenging Brazilian education scenario (BRASIL *et al.*, 2015; GONÇALVES; PARKER; CARBINATTO, 2021; RISTOW *et al.*, 2020). The concept of CoP has its origins in situated learning theory (LAVE; WENGER, 1991), contending that learning is a social process situated in the context in which people are immersed. In this sense, people learn from participation in communities formed by members who interact with each other on a regular basis and are mutually engaged in the activities they do together (WENGER, 1998). Wenger-Trayner and Wenger-Trayner (2018) define CoPs "as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (p.9). Hence, CoPs can be understood as social structures through which members learn from each other's experience (WENGER-TRAYNER; WENGER-TRAYNER, 2018).

Regarding the emergence of CoPs, Wenger (1998) highlighted that CoPs are informal and can be characterized as "self-organizing systems" since they produce their own practice according to what has value to members. Another important characteristic of CoPs is that they develop through a lifecycle and grow over time. Although each CoP is unique and evolves in a different way and at a different pace, a developmental pattern can be identified (WENGER-TRAYNER; WENGER-TRAYNER, 2018). CoPs move through stages of development according to varying activities and levels of interaction among participants (WENGER, 1998). Recently, Wenger-Trayner and Wenger-Trayner (2018) proposed a revised version of CoP's stages of development to include:

1. Potential: people discover each other and find a potential value in collaboration.
2. Coalescing: members build connections, have some initial ideas and experiences, and identify the viability of developing the CoP.
3. Maturing: members increase their commitment to learning together on a regular basis and the CoP´s identity is built.
4. Evolving: continuous development towards a sustained practice, including a renewal process of values, relationships, and negotiation of practices.
5. Transforming: CoP may assume a new form to continue existing or leave a legacy through the practices it produced.

For a community to move through stages of development, Wenger-Trayner and Wenger-Trayner (2018) emphasize that an important element of the CoP is to support participants to find value in their participation and handle the challenges they face in daily lives. Additionally, other key aspects may influence CoP's development, such as the provision of support (e.g., use of technology, outside experts) and the role of facilitation or leadership legitimated by members (WENGER, 1998; RISTOW *et al.*, 2020). Overall, the process of developing a CoP can be affected by varied factors that either facilitate or hinder its cultivation, requiring a consideration of the context of implementation (HOWLET; ARTHUR; FERREIRA, 2016).

2 METHODS

The study draws on an ongoing Brazilian action research project initiated in May 2020. Action research (AR) methodology (CARR; KEMMIS, 2004) is a participatory approach that involves cycles of action and reflection, which may result in an increased comprehension and transformation of participants´ practices. Given its participatory, democratic, and transformative character, AR is also a means of supporting teachers´ needs in CPD (CARR; KEMMIS, 2004), as in the case of this study.

2.1 CONTEXT AND PARTICIPANTS

This study was undertaken in the Brazilian context of two Federal Institutes (FIs), affiliated with the Brazilian Network of Educational, Scientific and Technological Education. FIs have a particular educational identity, specialising in professional and technological education at different levels, from vocational high school to higher education. FIs can be considered as privileged institutions within the Brazilian scenario of public schools, mainly in terms of structure and funding received, educational level of teachers (e.g., 86% of PE teachers with a master or doctoral degree; ALMEIDA *et al.*, 2020), full-time working contracts, tenured positions, and because of increased opportunities offered to teachers to develop research, service, and collaborative projects (ALMEIDA *et al.*, 2020).

After the onset of the COVID-19 pandemic in March 2020, the two FIs that were part of this study transitioned to remote learning in a very short period of three to fifteen days. As in many other contexts, the school community (including PE teachers) did not have ample time for preparation but needed to respond to the uncertain scenario. As a response, in May 2020, a group of PE teachers united to collaborate and navigate tensions caused by the pandemic crisis. The primary purpose of this group was to find solutions to the challenges they were facing in their daily professional practice. The emerging community was initiated by one of the teachers (first author) and it was built internally by the PE teachers themselves. A secondary focus of the group became to undertake research on their own practices.

2.1.1 Teachers

Fifteen PE teachers[1], eight women and seven men, who were facing challenges with remote teaching, agreed to participate in the group. The teachers' ranged in age from 33 to 60 years old and they had between three and 26 years of teaching experience. All of them hold a tenured and full-time position at a FI, working at high school level within the same education network. They had prior professional relationships and had known each other for several years. Three teachers held a doctoral degree, three others had a doctorate in progress, eight had a masters' degree, and one had an undergraduate degree in PE.

2.1.2 Teacher-facilitator

One of the teachers (first author - Heidi) invited colleagues from her education network to form the group for the purpose of sharing experiences of remote teaching. As Heidi launched the idea of the group, she was naturally identified as a potential facilitator. She took responsibility to organize group's activities and conversations. She has a doctoral degree and previous research experience; however, she did not have experience with group facilitation processes. Then, she sought for help from a trusted friend and researcher who joined the project as a critical friend to support her learning about facilitation.

2.1.3 Critical friend

Luiza was a Brazilian early-career researcher in the area of teacher collaborative PE-CPD who provided critique, support, and an outsider perspective to challenge Heidi in her development as a teacher-facilitator. Luiza interacted with Heidi for 11 months (May 2020 - March 2021) while CoP meetings were occurring until they agreed that Heidi had gained enough understanding about the facilitator's role.

2.2 DATA COLLECTION

Data collection occurred from May 2020 to December 2021 (20 months), using online methods. Prior to data collection, ethical approval was gained from the Research Ethics Committee – Federal University of Mato Grosso do Sul.

Data were generated through AR cycles of planning, action, observation, and reflection (CARR; KEMMIS, 2004). At fortnight intervals, the CoP had online meetings to plan actions and strategies to organize group's activities. During the interval period, the teachers taught in their local context according to their planning while observing the development of their own practices. At the subsequent meeting, the teachers reflected and discussed their experiences, as well as planned the group's next activities, restarting the planning-action-observation-reflection cycle.

In addition to the transcripts of CoP's recorded meetings (CoPM) throughout the spiral of AR cycles, data sources also included transcripts of interviews with teachers, transcripts of critical friend conversations (CFC), and entries of the teacher-facilitator´s reflexive journal.

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1 Except from the first author, participants of the study are identified in the article by pseudonyms.

2.2.1 CoP's meetings

A total of 28 recorded meetings occurred in a virtual space (Google Meet), lasting one hour each. Attendance at meetings ranged from three to ten teachers, with an average of six participants. The topics of discussion were decided by the teachers every meeting and revolved around the challenges faced with PE remote teaching, feelings experienced during the pandemic situation, best practices for online pedagogies, issues of concern in the PE profession, and design of research activities.

2.2.2 Interviews

Semi-structured individual interviews were carried out with six PE teachers who agreed to participate and lasted approximately one hour each. Interviews were conducted virtually by the critical friend in December 2020, at the end of the Brazilian academic calendar. An interview guide was developed that covered topics related to teachers' needs in CPD, challenges faced in remote teaching, expectations and engagement with the community, barriers and facilitators for participation, and perceptions of the group's practices.

2.2.3 Critical friend conversations

From May 2020 to March 2021, twenty-two recorded critical friend conversations (total of 20 hours) were conducted to support Heidi in her learning journey to become a facilitator. Conversations relied mostly on facilitation processes, involving critical discussions about the challenges and tensions faced by her while acting as a teacher-facilitator.

2.2.4 Reflexive journal

The teacher-facilitator produced a reflexive journal (44 pages) throughout the research process. This data source documented her perspectives and reflections over the occurrences and interactions identified during CoP's meetings, as well as her observations of CoP's development.

2.3 DATA ANALYSIS

Data were manually examined both inductively and deductively through thematic analysis (BRAUN; CLARK, 2006), using the CoP framework. The analytical process involved six steps: familiarizing with the data set, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report (BRAUN; CLARK, 2006).

Initial coding was proceeded through an inductive approach to identify features and patterns grounded in the data. In searching for themes, analytical questions were employed as a deductive strategy to sensitize our analysis to more subtle details in the data relating to the particular aspect of CoP's stages of development (see Chart 1).

Chart 1 – Analytical questions employed in data analysis.

Stage	Questions
Potential	Who cares? Who else is out there? In what ways are their issues similar? Do we share enough to benefit from forming a community?
Coalescing	What can we each gain and contribute? Can we produce something useful? Does forming a community open possibilities no one saw before?
Maturing	What exactly is our domain? Where does it fit or stop? What activities produce the most learning value? What will constitute success?
Evolving	How do we sustain community learning loops? Where are gaps in our performance? What new issues are arising? How should we include newcomers?
Transforming	Is the community in a temporary slump or has it outlived its usefulness? Should it take a new form? What is its legacy?

Source: Adapted from Wenger-Trayner and Wenger-Trayner, 2018, p.23

From 25 initial codes, relevant data and codes were developed into nine potential themes. Next, preliminary themes were reviewed and further developed for refinement and naming. As a result of the qualitative analysis (Chart 2), four themes were constructed as representative of the CoP´s developmental process.

Chart 2 – Example of data analysis.

Initial codes	Codes grouped into potential themes	Final themes
Facing similar problems with remote learning (RL); transition to RL; same context of FI; learning to teach online while doing; lack of support; initiative of forming a group.	A trigger for collaboration	Theme 1: the pandemic as a catalyst for collaboration
Recognizing the importance of the group; negotiating ways to work online; defining topics for conversation; barriers for participation; adapting schedule; teachers' non-response to tasks; partnership university-school; internal facilitation.	By teachers, for teachers; finding meaning in collaboration; teachers' self-organization; obstacles in the way; teacher-only community	Theme 2: teachers' self-organization to enact the community
Examining best teaching practices; doing research as a catalyst; connecting research and practice; registering a project; building resources; learning skills; writing for publication; shaping identity.	Sharing experiences and doing collaborative research; becoming teachers-as-researchers	Theme 3: development of collaborative research
Valuing participation; willingness to continue; identifying new interests.	Dialogue and future actions	Theme 4: dialogue towards a new cycle of collaboration

Source: Authors

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3 RESULTS

We identified that the CoP moved through four stages of development (potential, coalescing, maturing, and evolving). Results are presented in four themes constructed to represent the main factors that supported CoP's cultivation at each stage of development: a) the pandemic as a catalyst for collaboration; b) teachers' self-organization to enact the community; c) development of collaborative research; d) dialogue towards a new cycle of collaboration.

3.1 "IT'S A WAY FOR US TO BE UNITED AT THIS MOMENT": THE PANDEMIC AS A CATALYST FOR COLLABORATION

The first theme describes a combination of two factors that supported PE teachers to see the potential of forming a community, characterizing the first stage of CoP's development. These factors included: common struggles faced by the teachers due to the pandemic crisis and transition to remote teaching as a trigger for collaboration; and prior relationships as participants of the same education network.

The teachers recognized they were facing similar challenges with remote PE teaching. At the first meeting, they identified common feelings of anguish and anxiety in relation to the pandemic scenario.

> DANIEL: I've never thought that one day I would have to work with PE in a virtual way.
>
> CRISTIANE: It is a big anguish, because it's new for everyone.
>
> BRUNA: I also think that everyone shares these feelings […] Because, in fact, we've never thought of needing technology to act as PE teachers. We need to learn and we're having to do it as an emergency. This really makes us uncomfortable. (CoPM-1, May/2020)

In addition to identifying common struggles with remote teaching, the teachers recognized collaboration as a means of supporting their professional needs during the pandemic.

> HEIDI: I think this exchange of experiences could be very beneficial for us at this moment [...] it could be a space that would give us support to create a collective thinking.
>
> CRISTIANE: I think this group is very important. [...] it's a way for us to be united at this moment. (CoPM-1, May/2020)

The initiative to launch a community originated from the teachers as a possible way to find solutions to navigate tensions caused by the pandemic crisis. Heidi initially invited colleagues to collaborate, and she explained her primary motivation: "I think if it wasn't for the pandemic, I wouldn't even have the idea to invite them and ask, 'what are you doing?'. It's a situation that really created a need and facilitated connection" (CFC, August/2020). Referring to this idea of connecting teachers, Heidi added: "People have been saying a lot, but in the end, there's nothing of support or guidance. I realized that I find help on teachers' blogs. We learn much more from what the other is doing" (CFC, May/2020). Hence, to Heidi's view, PE teachers could find help in other teachers' experiences.

From this perspective, Heidi initiated the process of finding potential members to create a community within the context of the Brazilian federal education network: "I already have contact with these teachers. I invited people I really knew to see if they were interested in sharing some ideas. I got in touch, and they agreed" (CFC, May/2020). As the initial group started conversations, the teachers suggested inviting other colleagues to expand the group. Through this process of identifying peers, membership was formed by PE teachers who already knew each other, had previous connections, and were working with remote classes at high school level in FIs.

Reflecting on the group's potential development, Luiza commented to Heidi: "You already know each other and work together. Perhaps this is an important thing that makes the group distinctive and gives you more confidence to do it online. What you have is everything to be a CoP, but we don't know yet if it will happen" (CFC, May/2020). As Luiza emphasized, the existence of previous connections among the teachers was a facilitator for the initial process of discovering the community and reaching the first stage of CoP development (potential).

3.2 "THE QUESTION IS HOW TO ORGANIZE OURSELVES": TEACHERS' SELF-ORGANIZATION TO ENACT THE COMMUNITY

The second theme identified factors that supported teachers' self-organization to make the community viable and move it through the second stage of development (coalescing): a) use of online methods; b) internal facilitation; and c) construction of CoP's agenda grounded in teachers' real needs.

In times of physical distancing, the CoP coalesced through online methods. The group employed a combination of technological tools (synchronous and asynchronous) as a strategy to handle issues of teachers' time availability and different levels of engagement. At their first meeting, the group discussed, recognized their conditions for participation, and reached some decisions.

> HEIDI: So we move like this? I'm going to create a file and share with everyone through Google Drive. Everyone records during this period the activities and main concerns, so that we can establish priorities. I'm going to create a group on WhatsApp, which is for us to have quick communications, decide date and topic for the next meeting.
>
> BRUNA: It looks great. I think we accomplished for this first moment. We got closer and defined the next steps. (CopM-1, May/2020)

Data indicated that another important aspect of the group's development was the emergence of internal facilitation. Heidi took responsibility of organizing group's activities: "Another arrangement we made was to create a WhatsApp group for the purposes of organization and quick communication [...] Then I'm responsible for organizing all this and sharing it with them (CFC, May/2020). To Jane's view, Heidi played a role that helped CoP's development: "I think she's an essential factor in group's achievement. I think she manages well, and she has a very positive leadership. So, I think that made it easier". Thus, the emergence of a teacher-facilitator also supported the community in its self-organization.

Nevertheless, some of the organizing strategies planned by the group did not function as expected. As Daniel described: "we had a folder on Google Drive to share all our documents, proposals […] this was quite significant at the beginning, although it didn't work 100%. There were few colleagues who contributed" (Interview). This kind of situation required flexibility from teachers to negotiate and rethink their activities according to their real conditions, which was also the case with scheduling online meetings. Describing one of these occurrences, Heidi noted: "I asked if anyone had suggestions to improve meetings' schedule. I noticed that it's getting more difficult because of work overload" (Reflexive journal, June/2020). Despite these issues, Luiza observed that the group was moving ahead: "I'm impressed how this group has resistance [...] because it came vacations, changes in schedule, several things are happening and the group goes on and on" (CFC, September/2020).

Since the initial meetings, the group built a practice of sharing stories of successes and struggles in PE, pedagogical experiences, tips of technological tools for remote classes, and content ideas. As the teachers developed these practices and found value in their participation, they became more committed to the community. In Julia's words: "In the beginning I said - one more group? […] But then, with the organization, it's nice to come in, talk, because everyone is there. It started to be something that I didn't want to miss. It's a time that I take to reflect" (Interview). The main practice of the community revolved around an agenda grounded in teachers' real needs and experiences. Daniel described the way the group planned the meetings: "We create an agenda right there at our meeting, but always leaving an open topic for the next meeting that we could discuss" (Interview). Thus, the combination of a flexible agenda, support of technology and internal facilitation allowed the teachers to meet frequently, reaching the second stage of CoP's development in which members found ways to make it a viable enterprise.

3.3 "I REALLY ENJOYED DOING SOMETHING THAT I LEARNED": DEVELOPMENT OF COLLABORATIVE RESEARCH

The third theme recognized that CoP's identity was not only defined by the domain of school PE, but also by the practice of doing research. Teachers' engagement in research was an overarching factor that served as a catalyst for moving the CoP through the third stage of development (maturing).

The teachers agreed that a joint research project could be a means to gain institutional recognition both in terms of time dedicated to group activities as well as in relation to the group's intellectual production within the school context[2]. At the first meeting, Heidi raised this possibility: "We could register a research project. It would be a recognition of our work, since projects are covered by the system points. Somehow it helps us to dedicate one hour a week". Referring to the idea, Michele added: "I think it's very important for us to build this project, even to give institutional strength to PE area, because we know that we are marginalized at school" (CoPM-1,

2 The context of FI where the teachers worked (institutions which value the academic triad of learning-research-service) enabled them to build conditions for creating collaboration time.

May/2020). Hence, the group registered a collaborative research project focused on their own pedagogical experiences with remote PE teaching.

While sharing experiences of remote PE, the teachers also started discussing possibilities of producing resources together. An example was the creation of a questionnaire to identify students' health conditions and experiences with remote PE. Later, when reflecting on the richness of students' responses, the teachers considered the possibility of further exploring the data with research purpose. As Daniel said, "It's only now, from the moment we applied it, that all these questions came for us to reflect on [...] are we going to publish these data?" (CoPM-7, September/2020).

The CoP engaged in qualitative research, drawing on their narratives of remote PE teaching, conducting peer data analysis and discussing findings, as well as reflecting on their experiences of developing research skills.

> HEIDI: How was data analysis?
>
> CRISTIANE: I confess that I had never done it. I have never dealt with anything related to qualitative research, so for me it was a novelty. At first, I found it very complicated [...] But I really enjoyed doing something that I learned because I had never learned to do this. (CoPM-12, December/2020)

Cristiane demonstrated satisfaction in developing research skills. In addition to teachers' self-perceptions of learning, another indicator of CoP's achievement was the submission and publication of their work. From February to August 2021, the teachers engaged in writing an educational experience report and an original article.

> DANIEL: Congratulations to the group! I think the article contemplates the effort that we made in these fortnightly meetings. I didn't imagine that one day I could reach this end. I think it's a very big achievement for us, and we didn't have the dimension of what could happen at the end of our meetings. (CoPM-22, July/2021)

Echoing appreciation of their work, Heidi added: "I think the text was really good, and it evolved a lot with the notion of teacher-researcher. I think it's very interesting for us to position ourselves in this way as teachers investigating our own practices" (CoPM-23, August/2021). Doing research and writing for publication was crucial for building an identity of a community of teachers-researchers. This CoP's identity was reinforced with the acceptance of the article by an academic journal, contributing to teachers' experiences of success and to the CoP reach the maturing stage of development.

3.4 "IT NEEDS TO BE SOMETHING THAT GIVES US MOTIVATION AND MEANING": DIALOGUE TOWARDS A NEW CYCLE OF COLLABORATION

The fourth theme revealed factors that enabled the CoP to sustain over time, moving through the fourth stage of development (evolving). These factors included achievement of products in the form of publications, and dialogue throughout a renewal process of interest, value, and practice. The teachers reflected on their actions and development as a CoP, and they demonstrated willingness to continue. An excerpt of their dialogue showed this collective reflection:

> HEIDI: Our project ended last week, so I think it's important for us to reflect how this whole process was [...] and for us to think about the future of the group, if we want to continue...
>
> DANIEL: I see that it's important to call colleagues again for this new cycle that we intend to open.
>
> MATEUS: I think we should continue […] maybe in the future, we'll be able to bring even more people to talk and strive for our spaces. (CoPM-23, August/2021)

Data revealed the teachers' intention of expanding the group, welcoming new members, and renewing invitations to initial participants that, over time, reduced their engagement. The CoP envisioned a new cycle of collaborative activities, and they started a renewal process in relation to their shared practices.

> DANIEL: I was thinking about our first meeting, when we met to discuss our anxieties and fears of what was about to come, how we would face remote teaching […] At that moment, there was a reason for us to come together [...] Then, I keep asking myself, what motivates us to meet again? […] I think it has to be in the format of a research project to make sense [...] but it needs to be something that gives us motivation and meaning to come together.
>
> JANE: It's so nice that we have this space for sharing [...] It's the exchange, contribution, construction of a collective thinking […] that's exactly what motivates me, you know? This encounter. (CoPM-24, September/2021)

After participatory decision-making, the teachers designed a new research project focusing on their experiences of transitioning from remote to in-person teaching. As Heidi observed, "we are moving forward and becoming able to do things that we didn't do before, at least not together" (Reflexive journal, October/2021). Overall, the CoP continued evolving through the fourth stage of development by doing collaborative research connected with teaching experiences.

4 DISCUSSION AND CONCLUSION

The purpose of this study was to explore the development of a group of Brazilian PE teachers, who struggled with remote teaching, into a CoP during the COVID-19 pandemic. The findings suggest that the CoP, enhanced by supportive factors that served as facilitators to its cultivation in an online format (WENGER, 1998), was able to move through four stages of development (potential, coalescing, maturing, and evolving; WENGER-TRAYNER; WENGER-TRAYNER, 2018).

In stage one (potential), supportive factors involved the pandemic crisis as a catalyst for teachers' collaboration as an alternative to address their feelings of incapacity and problems with remote teaching (LEITE *et al.*, 2022; PARKER *et al.*, 2010). This finding endorsed the idea that CoPs can emerge from turbulent and challenging situations that act as an impetus for action (GONÇALVES; PARKER; CARBINATTO, 2021; NETOLICKY, 2020; TANNEHILL; MACPHAIL, 2017). This was the case of the problems posed by the COVID-19 pandemic to educators, guiding them to collaboration as a possibility to find solutions (LEITE *et al.*, 2022; OVENS; PHILPOT; BENNETT, 2022; VENÂNCIO *et al.*, 2022). Characterizing the potential

stage of CoP development (WENGER-TRAYNER; WENGER-TRAYNER, 2018), the teachers recognized similarities in their struggles within the context of FIs, saw value in forming a community, and envisioned possibilities for collaborative practices and mutual help.

In stage two (coalescing), teachers' self-organization was critical for developing the CoP. Similar to other studies (GONÇALVES; PARKER; CARBINATTO, 2021; PARKER *et al.*, 2010), a key aspect of CoP's development was that teachers organized their practice themselves, grounded in their realities and daily challenges. With a self-determined perspective (MCDONALD *et al.*, 2012), the teachers relied on internal facilitation to organize the group. While prior studies have recognized the importance of having a facilitator within CoP's structure (PARKER *et al.*, 2010; RISTOW *et al.*, 2020), as well as of teachers' autonomy and democratic leadership for meaningful CPD (GONÇALVES *et al.*, 2022; GONÇALVES; PARKER; CARBINATTO, 2021), the emergence of a teacher-facilitator within the CoP was a particularity of this group's development. Internal facilitation functioned as a motivational force to nurture the CoP (MCDONALD *et al.*, 2012), and importantly, it dismissed external intervention and allowed the creation of a teacher-only space.

Another aspect that facilitated the second stage of development was the adoption of technology as a support system. Digital technologies enabled the teachers to meet frequently and intensify the process of developing practices, confirming the convenience of online approaches to CoPs in terms of reducing barriers of time, distance and resources (RISTOW *et al.*, 2020). Nevertheless, we noticed that teachers' quality interactions and commitment in an online environment were favored by their previous existing connections, which reinforces the significance of relationships in collaborative practices (PARKER *et al.*, 2010), specifically when online design is applied (SCHWEN; HARA, 2003).

During the stage three (maturing), a supportive factor for CoP's development was teachers' involvement with research, reinforcing that teachers' aspirations in CPD may go beyond improving teaching (GONÇALVES; PARKER; CARBINATTO, 2021). In the maturing stage, the CoP shaped its identity of teachers-researchers while engaging in an enterprise of doing research connected with practice. As typical of a maturing stage, the CoP found an activity that produced the most learning value for its members (WENGER-TRAYNER; WENGER-TRAYNER, 2018). Supporting previous research (PARKER *et al.*, 2010; TANNEHILL; MACPHAIL, 2017), we identified that developing research skills, writing for publication, and seeing products resulting of collaborative effort showed to be rewarding learning experiences to teachers.

In stage four (evolving), the CoP was revitalized with the realization of final products (e.g., publications), the arrival of newcomers, and the design of a new collaborative research project. Typically, at the evolving stage, the CoP has a rediscovery experience with new issues arising, new members arriving and renewing relationships and interests (WENGER-TRAYNER; WENGER-TRAYNER, 2018). At this point, the CoP was able to evaluate and identify areas for further development (e.g., strategies to stimulate engagement of some initial members).

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Noteworthy, a key aspect of the CoP's development was the context of the study. With a privileged structure within the Brazilian scenario of public schools, FIs offered conditions that supported teachers to sustain their participation in collaborative projects and research, which reinforces the importance of improving working conditions for teachers in other settings in order to provide adequate support for all to engage in collaborative CPD.

Overall, this study sheds light on aspects that might be considered in the cultivation process of a CoP, particularly in an online environment, since concerns over the growing adoption of online methods for professional learning have been raised (e.g., prescriptive approaches, misapplication of CoP's concept, and exaggerated enthusiasm for technology) (SCHWEN; HARA, 2003). The process of CoP's development showed that grouping members who had previous connections and shared similar realities, adopting a combination of technological tools, developing internal facilitation, preserving a teachers-only space contextualized with their real needs, and doing research as a joint enterprise were crucial elements for CoP's meaningful and sustainable growth, even at distance.

Prior relationships established among the teachers within the educational network of FIs supported the group to find potential members and discover a common interest in their context. These previous connections and relationships of trust facilitated teachers to feel comfortable and safe to mutually engage in a common effort (RISTOW *et al.*, 2020), as well as to organize themselves through online methods in a pandemic situation. In being among peers, the teachers built an agenda based on their experiences and real needs, which appeared to add meaning to their participation. In this sense, this study showed a possibility of creating collaborative CPD opportunities to teachers contextualized with their realities (GONÇALVES; PARKER; CARBINATTO, 2021).

Understanding the essential role of collaboration and teachers' self-organization in developing and sustaining a meaningful CoP in times of crisis makes evident the importance of supporting teachers' initiatives in CPD. Depending on the context, support to teachers might come from provision of resources, professional recognition, institutional legitimization, creation of spaces and collaboration time, among others. The experience of the pandemic showed the teachers' capacity to respond to their professional challenges, and collaboration was central to this response (CAMPBELL, 2020). It does not however mean that teachers may be left adrift to act by themselves on educational issues. Importantly, we believe that education stakeholders should recognize teachers' experiences, needs, and interests, and thus provide adequate support to them to enable the construction and maintenance of collaborative CPD practices embedded in their contexts. Lastly, echoing Campbell (2020), collaborative efforts across the education sector have emerged out of urgency and necessity during the pandemic, and what it is critical now is the question of how collaboration might become integral part of teachers' professional practices and ongoing learning in a post-pandemic era.

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Resumo: O objetivo deste estudo foi explorar o desenvolvimento de um grupo de professores de Educação Física (EF), que enfrentaram dificuldades com o ensino remoto, em uma comunidade de prática (CdP) durante a pandemia da COVID-19. O estudo teve como enfoque os fatores que apoiaram o processo de cultivo da CdP em formato *on-line*. Empregando a metodologia de pesquisa-ação, o estudo envolveu 15 professores de EF (uma professora atuou como professora-facilitadora) e uma amiga crítica. Os dados foram gerados por meio de encontros da CdP, entrevistas, conversas com amiga crítica e diário reflexivo. A análise temática resultou em quatro temas abrangentes: a) a pandemia como catalisadora da colaboração; b) auto-organização dos professores para viabilizar a comunidade; c) desenvolvimento de pesquisa colaborativa; e d) diálogo para um novo ciclo de colaboração. Notavelmente, a auto-organização dos professores foi fundamental para guiar a CdP ao longo de estágios de desenvolvimento. São discutidos outros aspectos que contribuíram para o desenvolvimento da CdP em um cenário de pandemia.

Palavras-chave: Formação continuada de professores. Desenvolvimento profissional docente. Comunidades de prática. Tecnologia digital.

Resumen: El objetivo de este estudio ha sido explorar el desarrollo de un grupo de profesores de Educación Física (EF) que enfrentaron dificultades con la enseñanza remota, en una comunidad de práctica (CdP) durante la pandemia de COVID-19. El estudio se centró en los factores que apoyaron el proceso de cultivo de la CdP en un formato *online*. Utilizando la metodología de investigación-acción, el estudio involucró a 15 profesores brasileños de EF, una profesora que actuó como profesora-facilitadora y una amiga crítica. Los datos se generaron a través de encuentros de la CdP, entrevistas, conversaciones con la amiga crítica y diario reflexivo. El análisis temático resultó en cuatro temas generales: a) la pandemia como catalizadora de la colaboración; b) autoorganización de los profesores para hacer posible la comunidad; c) desarrollo de investigación colaborativa; y d) diálogo para un nuevo ciclo de colaboración. De manera notable, la autoorganización de los profesores fue fundamental para guiar a la CdP a lo largo de las etapas de desarrollo. Se discuten otros aspectos que contribuyeron al desarrollo de la CdP en un escenario de pandemia.

Palabras clave: Formación continua de profesores. Desarrollo profesional de docente. Comunidades de práctica. Tecnología digital.

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CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest in this study**.**

AUTHOR CONTRIBUTIONS

Heidi Jancer Ferreira: Conceptualization, project administration, data collection and analysis, investigation, and writing – original draft.

Kevin Patton: Conceptualization, formal analysis, and writing – review and editing.

Melissa Parker: Conceptualization, data collection and analysis, investigation, and writing – review and editing.

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EDITORIAL RESPONSIBILITY

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