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Wintle, Jordan ORCID logoORCID: <https://orcid.org/0000-0002-1195-4964>, Ní Chróinín, Deirdre, Fletcher, Tim, Goncalves, Luiza Lana, Scanlan, Dylan, Hamblin, Declan, Iannucci, Cassandra, Luguetti, Carla, Morrison, Hayley, Mally, Kristi, Alfrey, Laura, Beckey, Alex and Hordvik, Mats (2026) Features of an Online Professional Learning Community That Influence Teacher Educators' Experiences of Collaboration. Journal of Teaching in Physical Education. doi:10.1123/jtpe.2025-0502 (In Press)

Official URL: <https://doi.org/10.1123/jtpe.2025-0502>
DOI: <http://dx.doi.org/10.1123/jtpe.2025-0502>
EPrint URI: <https://eprints.glos.ac.uk/id/eprint/16203>

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1 **Abstract**

2 Purpose: Understanding how to create favourable conditions for collaboration is critical to the
3 success of online professional learning communities for teacher educators. This single
4 illustrative case study explored the features of an online international professional learning
5 community (PLC) that influenced physical education teacher educators' experiences of
6 collaboration.

7 Method: The PLC focused on teacher educators' learning about meaningful physical
8 education and included 13 participants over a 20-month period. Activities included nine large
9 group meetings and multiple meetings of small groups who conducted self-study of teacher
10 education practices research.

11 Results: A dual large-small group structure scaffolded complementary collaboration activities
12 that were amplified by a diverse membership and enhanced the professional outcomes for
13 teacher educators.

14 Conclusion: Findings contribute to understanding how to promote collaboration to support
15 rich professional learning in teacher educator PLCs online and provide direction for others
16 contemplating development of and participation in online and international teacher educator
17 PLCs.

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19 **Keywords:** international; teacher; reflection; structure; membership; practice sharing

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24 Professional learning communities (PLCs) are a valuable site for teacher educators to
25 collaborate and learn in community, but physical education teacher educators can struggle to
26 access this peer support and collegiality locally (Patton & Parker, 2017). Online PLCs offer a
27 solution through the possibility of connection with peers in other parts of the world for
28 support and professional development (Lantz-Andersson et al., 2018). Understanding how to
29 create the conditions for collaboration between teacher educators in an online environment is
30 an under researched topic that merits more attention as it opens up new opportunities across
31 international contexts, a growing area of interest in the field of physical education (Rufino et
32 al., 2025).

33 This paper focuses on a PLC including international physical education teacher
34 educators guided by the following question: What features of an online professional learning
35 community (PLC) influence teacher educators' collaboration experiences? Collaboration
36 between members is foundational to the successful operation of PLCs (Patton & Parker,
37 2017; Vangrieken et al., 2015). Drawing on the wider PLC literature, five main features are
38 essential to this collaboration: (a) a supportive group with a shared leadership, where (b)
39 people have shared values, goals and a vision (c) collective learning and application happens,
40 (d) individual practices are shared (e) in supportive conditions (Hord & Sommers, 2008;
41 Vangrieken et al., 2017). Collaboration between members is the mechanism by which these
42 features are promoted in the operation of PLCs; interaction among members is the most
43 influential factor in determining the outcomes of a PLC (Vangrieken et al., 2017).

44 Collaboration is defined as an 'umbrella term' that captures 'joint interaction in the
45 group in all activities that are needed to perform a shared task' (Vangrieken et al., 2015, p23).
46 The conceptualisation of collaboration adopted in this research (Little, 1990) represents a
47 continuum of collaboration activities: a) Storytelling and scanning for ideas represent the
48 ways teachers gather information indirectly through short, informal interactions b) Seeking

49 help and advice from peers involves asking questions, but not crossing over into offering
50 unsolicited advice, c) Sharing of practice-related ideas represents a mutual and open
51 exchange of ideas, grounded in discussion and debate, and finally, 4) Joint work involves
52 shared responsibility and investment in shared outcomes within a collective. All steps on this
53 continuum have a value in teacher's lives in providing sources of collaboration to complete
54 shared tasks situated in the everyday experiences of teaching. This continuum of
55 collaboration represents an increasing interdependence and agency in sustained interactions;
56 which form of collaboration is most appropriate in a given situation will depend on the
57 context, the nature of the task, available resources and time (Little, 1990). For some, seeking
58 advice or listening to others' stories of teacher can provide direction to practice (Brennan and
59 Gorman, 2023; Kowalczyk-Walędziak and Underwood, 2023). For others, sharing resources,
60 strategies and experiences of implementation can provide impetus to changes in practice
61 (Nguyen & Ng, 2020). Joint work is represented in a range of teacher learning communities
62 with different functions, structures and purposes (Vangrieken et al., 2017). Within a typical
63 PLC it is likely that interactions across the continuum will occur. For example, informal
64 exchanges and conversation around the focus of the joint work can provide a range of
65 valuable supports to members (Parker et al., 2022; Patton & Parker, 2017).

66 Strategies to advance collaboration, such as sharing of experiences and collective
67 problem-solving are a feature of some physical education-related PLCs (Parker et al., 2022;
68 Patton & Parker, 2017). Specific collaboration strategies reported include sharing of action
69 research, teacher reflection and mentoring (Parker et al., 2022). Patton and Parker (2017)
70 provide an in-depth overview of the significant social dynamics and group processes of nine
71 PLCs involving 36 physical education teacher educators. In these PLCs, collaboration
72 grounded in sharing of practice promoted a safe supportive space to risk and learn (Patton &
73 Parker, 2017). They explain how 'group interactions encouraged participants to use their

74 collective experiences as a means for sharing ideas to increase knowledge and skills' (p.357).
75 Reflective discussions on the application of ideas in teaching are further indicators of
76 successful PLCs in physical education (Parker et al., 2022). The value of sharing practice-
77 based accounts is well-established, but more practical direction is needed on the features that
78 determine the effectiveness of collaboration, particularly in an online environment.

79 Being situated online allows easy access for PLC members to connect with others in
80 different countries and continents, across time zones and contexts. Still, online and
81 international PLCs face specific challenges in building the strong relationships and authentic
82 conversations needed to scaffold authentic collaboration. Examples of online PLCs where
83 sharing stories of teaching practices supported teacher learning and application of ideas in
84 their own context (Brennan & Gorman, 2023; Kowalczyk-Walędziak & Underwood, 2023)
85 suggest the potential of an online PLC for collaboration. Overall, online teacher PLCs show it
86 is possible to promote collegiality and information sharing, but collaboration can sometimes
87 be superficial and lack criticality (Lantz-Andersson et al., 2018). These findings indicate that
88 collaborative activities at the more interdependent end of the continuum (Little, 1990) are
89 more challenging in online environments. As Garrison (2016) emphasises, the technology
90 creates the shared space for connection in an online environment but worthwhile
91 collaboration that promotes authentic professional learning requires careful scaffolding.
92 Better understanding is needed of how to organise collaboration activities to promote
93 authentic professional learning in online PLCs, and specifically for teacher educators.

94 It is widely accepted that participation in various forms of PLCs hold potential to
95 enhance professional learning for teacher educators (Hadar & Brody, 2018 Patton & Parker,
96 2017; Parker et al., 2022). Participation in PLCs is beneficial for the professional learning of
97 teacher educators at different stages and in different contexts with resultant increases in
98 teaching and research capacities (Patton & Parker, 2017). For example, PLC engagement can

99 be empowering in helping beginning teacher educators to learn in a self-directed and
100 collaborative way (Gallagher et al., 2011). For senior educators, participating in PLCs offers
101 the benefit of fostering mentorship roles, providing opportunities to contribute to the
102 development of others while enhancing their own expertise (Parker et al., 2022).
103 Understanding how to ensure these benefits result is a key consideration in the design of
104 PLCs, particularly online. Providing insight into the features of the PLC that influenced these
105 teacher educator experiences of collaboration can inform how to activate professional
106 collaboration and learning in online and international contexts.

107 **Methodology**

108 *Research design*

109 This research was situated within an international online PLC whose purpose was to
110 engage with ideas about teaching future physical education teachers how to prioritise
111 meaningful experiences for young people. The PLC serves as the case for this research. This
112 single intrinsic case study (Stake, 1995) design was selected based on its potential to provide
113 a holistic contextual picture that could illuminate the particularity and complexity of the
114 participation experiences of the members. Case studies are an appropriate methodology to
115 better understand the professional learning of teacher educators (Hadar & Brody, 2017)
116 because of the potential to capture the contextual and situational complexities of the teacher
117 education role. Rather than exploring how this case might represent all cases in general, our
118 attention was on the local working of this case (Stake, 2006). Still, given case studies have
119 ‘the capacity to uncover nuance, to identify detailed patterns that can serve to enhance
120 understandings and contribute to generalisations’ (Stake, 1995, p.7-8), we aimed to provide
121 some insight and direction on the features that influenced collaboration in teacher educator

122 PLCs. To this end, we provide a detailed illustration of the case through two themes to allow
123 others to generalise and make connections to their context.

124 *Purpose and membership of the PLC*

125 The PLC was initiated by two teacher educators (P1 and P2) who had previously
126 explored their own experiences of teaching future teachers about using meaningfulness in
127 physical education. Learning about Meaningful Physical Education (LAMPE) is a set of
128 pedagogical principles to support how teacher educators teach pre-service teachers to
129 prioritise meaningful experiences for children and young people in physical education (ref
130 blinded for review). Other physical education teacher educators were invited to be a part of
131 the PLC based on their interest in LAMPE or commitment to using practitioner inquiry, such
132 as collaborative self-study of teacher education practices (S-STEP) (Loughran, 2014). In the
133 invitation to participate, the proposed purpose of the PLC was explicitly stated as focused on
134 how ideas related to teaching about meaningfulness in their physical education teacher
135 education programme. As all PLCs have a student learning focus, the application of their
136 learning to their own engagements with their students was an important consideration.

137 The PLC included 12 members at the outset, the two initiators and ten other physical
138 education teacher educators. Participants came from seven countries including 5 from
139 Europe, 3 from North America and 5 from Australia. Of the original 12 members, 11
140 participated throughout. One teacher educator left the PLC at the end of year 1 due to
141 competing work commitments, and one other new member joined to replace them. All 13 are
142 included as authors of this manuscript. At the outset, everyone in the group knew one or more
143 other group members from professional interactions. For example, some had collaborated
144 with other group member or were professional colleagues, or had engaged on social media.

145 Participants came with a wide variety of experience, including five early-career
146 teacher educators who were completing or had recently completed their PhD studies (teacher
147 educators P3, P4, P5, P9, P12), four mid-career teacher educators more than three years post-
148 PhD (teacher educators P6, P7, P8, P13), and some with 10+ years of experience (P1, P2,
149 P10, P11). Selection of members was based on their experience with self-study research and/
150 or teaching for meaningfulness. The PLC included members with little or no knowledge of
151 LAMPE (for example, 3 and 7) alongside others with extensive experience (for example, 9
152 and 12). Some members used LAMPE regularly in their teacher education practices, some
153 engaged occasionally, and some had never explicitly prioritised meaningfulness. The
154 inclusion of members with both attached and detached perspectives was intentional to
155 promote a critical engagement that would allow the group to make progress. The members
156 did share some commonalities. All were primarily qualitative researchers and about half had
157 previously completed practitioner inquiry. An overall exploration and questioning of ideas,
158 rather than a predetermined acceptance of ideas was, therefore, collectively understood.

159 *Structure of the PLC*

160 The PLC operated for a two-year period – this was deemed a suitable time period for the
161 exploratory work and was agreed at the outset. The PLC structure combined the overall large
162 group and small groups; all members were part of both the large group and one small group
163 (see figure 1). Design of the PLC structure and operation was informed by the theoretical
164 framing of ‘collaboration’ as occurring on a continuum to include storytelling and scanning,
165 helping and advising others, sharing of practice, and joint work (Little, 1990; Vangrieken et
166 al., 2015). The PLC design reflects an understanding of professional learning as happening
167 through peer-to-peer collaboration, ranging from storytelling to offering advice and problem-
168 solving, to joint work, involving individuals with a mixture of expertise and experience.
169 Attention to the volume and quality of interactions was core to both large and small group

170 engagements was a key consideration to ensure that collaboration was promoted because this
171 PLC was situated solely online (Kowalczyk-Wałędziak & Underwood, 2023).

172 The large group met online nine times over a 20-month period on MS Teams. The large
173 group was led by P1 and P2, who initiated the learning community. Their role involved
174 devising and sharing meeting agendas, inviting expert inputs identified/requested by the
175 group, chairing meetings and collating individual responses. The purpose of the large group
176 meetings was about collective exploration of ideas and knowledge exchange around
177 meaningful experiences, and to check-in about how each small group was progressing. Each
178 meeting included a detailed meeting plan with emphasis on collaborative activities, for
179 example:

- 180 1. 'Food for thought' presentations on specific topics by both PLC members and invited
181 guests. For example, an expert guest presented on the topic 'What is (not) Meaningful
182 PE?'
- 183 2. Sharing by representatives from the small groups in which they were encouraged to a)
184 provide an update (where are we?), b) seek input (what is working or not?), c) engage
185 in problem-solving (questions for the group) and identify needs (we need to know
186 more about...). based on the concept of 'collaboration' (Little, 1990; Vangrieken et
187 al., 2015).
- 188 3. Break-out room discussion – 'The question I have about LAMPE is...' in which
189 multiple perspectives were considered.

190 The questions used as prompts in these activities aligned with Little's (1990) conception
191 of collaboration, ranging from story-telling and asking questions to sharing of and
192 reflection on examples of practice.

193 Following Hadar & Brody (2010), the initial focus was on creating a safe space for
194 discussion, social and professional interactions. This included opportunities for each teacher
195 educator to introduce themselves, presentations by group members in relation to S-STEP and
196 meaningfulness in PE, sharing of resources, and opportunities to share and discuss their
197 interests. These introductory conversations and activities were intended to establish some
198 common ground and help group members make professional connections. In between
199 meetings, we accessed a shared repertoire of resources and literature.

200 Parallel to these large group activities, progress was made following the first meeting
201 of the large group to establish three small S-STEP groups, with each comprising four teacher
202 educators based on their preferences for specific inquiries. S-STEP was chosen to frame
203 small group activities as it offered a flexible structure for professional collaboration aligned
204 with Little's (1990) conception of joint work, with shared responsibility for engagements and
205 outcomes. Specifically, each small group pursued a collaborative S-STEP project based on a
206 different and self-selected idea connected to meaningfulness (one group focusing each on
207 social justice, enactment of democratic practices, and understanding the meaningfulness of
208 being a teacher educator). Members of small groups were in contact regularly by e-mail and
209 online meetings to share experiences as they implemented their S-STEP research. Within the
210 small groups, members acted as critical friends to each other in different guises as they
211 experimented and enacted practices with some connection to the ideas of LAMPE. Each
212 small group generated data through their inquiry process that was intended for sharing
213 outside of the group through formal dissemination, aligned with the view that 'professional
214 development needs to include efforts to make that implicit expertise explicit and to create
215 opportunities to share it with others' (Kelchtermans & Vanderlinde, 2018, p.127).

216 The large group continued to meet alongside the small group activities, providing a
217 collaborative sounding board and meeting place for the three small groups to share their

218 progress and challenges they faced, and to ask questions for collective consideration.
219 Towards the end of the two-year period, the small groups shared their final outputs with all
220 members of the large group.

221 *Data sources related to the PLC*

222 Ethical approval for this research was granted by [Masked for peer review]. All
223 participants signed informed consent. Following Stake (1995), data sources were selected so
224 as not to disturb the ordinary activity of the PLC. The perspectives of the participants were
225 sought in an effort to capture how individuals were experiencing the PLC activities, with
226 awareness of potential differences in perspectives.

227 Primary data sources included:

228 1. Large group sources:

- 229 a. Two focus group interviews (1 hour each) at the conclusion of the 20-month
230 period which included a total of eight of the PLC members.
- 231 b. Emails from members including feedback at the end of year one.
- 232 c. Transcripts of the large PLC meetings (n=9, 1-2 hours each) as well as
233 meeting agendas and meeting documentation (PowerPoint presentations,
234 examples of materials designed for or shared with students).

235 2. Small group sources:

- 236 a. Five peer-reviewed journal articles and PowerPoints from two peer-review
237 presentations which resulted from small group PLC sharing activities.
- 238 b. Update emails from members of each small group sharing progress on
239 activities.
- 240 c. PowerPoint presentation updates of small group activities shared at large
241 group meetings.

242 Together, these sources captured the processes and products of the PLC, giving insight on
243 members' experiences of sharing activities and their connection to professional learning.

244 *Data analysis and trustworthiness*

245 Reflexive thematic analysis that combined inductive and deductive approaches was
246 used to identify and analyse patterns in the data set related to the experiences of members
247 within the PLC. Recognition of the researcher's active role in knowledge production (Braun
248 & Clarke, 2021) was important given the analysis was led by P1 who with P2 led the large
249 PLC. Analysis of data aimed to go deeper than surface level data interpretation towards
250 producing nuanced insights that connected to and advanced current understandings of PLC
251 operations.

252 The process of coding and identification of key ideas was organic and iterative. With
253 the purpose of the PLC and the research question in mind, P1 began by reading and
254 reviewing all the data sources. To forefront the participants' voices, familiarisation with the
255 data set was conducted from the end point of data collection and worked chronologically
256 backwards to the starting point of the PLC. Reviewing the two focus group interviews
257 conducted at the conclusion of the 20-month period gave an overall sense of how members
258 had experienced the PLC and key ideas were systematically coded and comments attached.

259 Next, emails from teacher educators were reviewed and ideas that were emphasised or
260 recurred were coded. Critical and reflexive engagement involved questioning of how and
261 why some members' impressions and experiences were the same or different to others, asking
262 how individual dispositions coloured their assumptions and engagements, and inevitably
263 (given the co-lead was conducting the analysis), wondering how things might have played out
264 differently and how decisions around the operation of the PLC might have impacted upon
265 participants' experiences. Finally, documentation from meetings and the transcripts of the

266 PLC meetings were reviewed in backward chronological order, less for content than with
267 attention to the types and extent of inputs from individual members of the group. The outputs
268 of the three small groups were also reviewed for confirmatory insights.

269 Making sense of patterns in the codes from all these sources led to identification of
270 three initial themes related to the membership, structure and outcomes of PLC participation.
271 These broad initial themes were important to capture multiple perspectives on an issue as it
272 was clear that members of the PLC had experienced activities quite differently. Due to P1's
273 role in organising the PLC, efforts were made to triangulate data sources to ensure
274 consistency of interpretation and avoid bias towards any one perspective. Next, key
275 theoretical ideas related to PLCs (Vangrieken et al., 2017; Wenger-Trayner & Wenger-
276 Trayner, 2015) were used to review initial themes. This resulted in refinement of ideas and
277 insight on how the findings might contribute to understandings of PLCs. For example,
278 'structures' was refined to be 'large and small group structures' and then refined again to
279 highlight the emphasis on the processes of sharing activities. A summary paragraph along
280 with a specific name helped to finalise and define each theme.

281 Stake (1995, p.107) suggests the following questions when conducting case study
282 analysis: 'Do we have it right?' and 'Are we generating a comprehensive and accurate
283 description of the case?' (Stake, 1995, p.107). With these in mind, the summary paragraphs,
284 along with supporting data were shared with three other members of the PLC (P 6, 7 and 12,
285 one from each of the small groups). This member check was important given P1's position as
286 the PLC co-lead; confidence in the analysis was strengthened as they confirmed the
287 resonance of ideas with their experiences. Based on their feedback each theme was refined
288 further and theme 3, related to outcomes was collapsed into the theme related to structures,
289 and the theme related to membership was refined to emphasise the influence of differences in
290 perspective. A draft of the full paper was then shared with all authors for comment and

291 editing. Following their suggestions, the emphasis on the relationship between collaboration,
292 structure and membership was fore fronted to strengthen the coherence of the overall
293 argument. The two final named themes represented a rich, contextualised, illustrative account
294 of the important ideas related to collaboration in response to the research question. Direct
295 quotes from participants are presented to provide an evidential basis as well as to bring to life
296 the story of each theme.

297 **Findings**

298 Collaboration (Little, 1990; Vangrieken et al., 2015) provides the lens to examine the
299 experiences of members in this online, international PLC. The findings of this single
300 descriptive case study are presented and analysed in two themes that illustrate the key
301 features of the PLC that influenced collaboration experiences in this online PLC.

302 *Theme 1: A diverse membership enriched collaboration online*

303 A PLC is defined by the shared purpose of the membership (Wenger-Trayner et al.,
304 2023). This shared purpose should be owned by the members rather than imposed and can
305 evolve and be negotiated as a joint enterprise. Members in this PLC held in common the
306 agreed and shared purpose related to exploring teaching teachers to prioritise meaningfulness
307 through engagement with the pedagogical principles of LAMPE. For example:

308 It just helps being part of a bigger group and understanding that there's other
309 people trying to work out what to do with the framework as well and how you use
310 it in teacher education... it made me feel part of a bigger movement (P5,
311 interview).

312 Members brought different perspectives to this shared purpose based on their expertise and
313 experience which influenced the professional learning of members in a number of ways.

314 First, the membership included teacher educators who aligned with and used ideas
315 related to meaningfulness explicitly in their teaching and others who had never engaged in
316 any depth with these ideas. The online location of the PLC made possible this combination
317 and created the conditions for rich, reflective engagements during sharing activities:

318 The bits that probably made me reflect most is when you listen to other people,
319 because you're hearing a different perspective and that makes you question your
320 own practice and about what you do and how you present yourself (P5,
321 interview).

322 Diverse positioning about prioritising meaningfulness allowed for an open interrogation of
323 ideas. Participants acknowledged the value of diverse perspectives within the PLC of
324 avoiding 'group think' (P9, interview). The diversity of perspectives within the membership
325 created conditions that allowed members to direct and stretch the learning focus across time,
326 moving from a specific focus on the pedagogical principles of LAMPE to a broader
327 practitioner inquiry about teacher educator practices related to teaching for meaningfulness.
328 P3 explained:

329 I think the mix of people was really interesting because...the initial idea was this,
330 "revise the [LAMPE] principles and refine these" ...but I think we not only
331 accepted these principles, we challenged them' (P3, interview).

332 Sharing activities scaffolded engagement with diverse perspectives and resulted in evolution
333 of the shared purpose of the PLC to accommodate the members. P5 explained:

334 You've got to just go with it organically and see where things happen and where
335 the general consensus leads you to. And I think that's what's happened (P5,
336 interview).

337 Ultimately, a focus on practitioner inquiry of teacher education practices included all
338 members in a way that facilitated professional learning.

339 Second, the location of the PLC online provided a meeting point for teacher educators
340 from different parts of the world, at different career points, and from different backgrounds to
341 learn through conversing and collaborating. For example, for P3 from Australia, the
342 opportunity to work with P2 in North America was a valuable professional learning
343 engagement:

344 ...the Meaningful PE topic was a bit far from me and it was more important for
345 me to work on the democratic practice itself, and to work with P2 that I always
346 wanted to... (P3, interview).

347 Similarly, early career members valued the opportunity to learn from more experienced
348 members and to collaborate with other early-career scholars. More experienced members
349 thrived on the collaboration and sharing across contexts:

350 ...to have access to people like P3 and P2, on a regular basis, I think it's a huge
351 luxury. And so, I guess, ingraining that in my regular practice beyond the classroom
352 has been amazing (P11, interview).

353 The online PLC format allowed for learning through comparison and sharing of insights
354 from different contexts. The diversity of the membership within this PLC including
355 members in different locations was possible because of the PLC was online. Sharing by
356 the diverse membership led to changes in thinking about and enacting teacher education
357 practices. For example, P12 intended to use a similar model of learning through
358 interaction and sharing in the future:

359 ... how I might put my own practice under the microscope and how I might
360 research and share that and collaborate with other people (P12, interview).

361 P12's intention towards future sharing and collaboration is an indication of his positive
362 experience and the value he placed on peer sharing engagements. The relationships within the
363 PLC membership provided a foundation for further collaborative sharing too. P9 explained
364 the value of this collegiality:

365 The best outcome for me has been the connections with people. P12 came up to
366 visit in the summer and I don't think that would have happened... We just got to
367 chew the fat on lots of issues around our roles and our jobs, some of the research
368 that we're both involved in... And that's that for me is probably been the most
369 powerful outcome from the group (P9, interview).

370 Structured collaboration activities that emphasised sharing promoted peer interactions with a
371 range of perspectives that advanced the professional learning of PLC members. The diversity
372 of experience, location and expertise enriched these sharing engagements and resulted in
373 enhanced professional learning. These findings highlight how collaborative sharing activities
374 embedded in the structure of the PLC allowed the benefits of a diverse membership to
375 emerge in an online environment. This finding provides direction when considering the
376 membership of a physical education teacher education PLC: including members with
377 different perspectives, levels of experience and expertise can enhance the value of
378 collaboration activities online.

379 ***Theme 2: A dual large-small group structure provided complementary opportunities for***
380 ***collaboration online***

381 The structure of a PLC matters to how the community is developed. For example,
382 Wenger-Trayner et al., (2023) suggest that community can be encouraged or stimulated, but
383 participation cannot be forced. The structure of this PLC included large meetings with all

384 members, as well as separate small group meetings arranged by members of the small groups;
385 the nature of collaboration within each of these groups mattered to members.

386 *The large group*

387 The large group provided an overall structure for participants' professional
388 engagement, and lines up with the defining characteristics of learning communities in
389 education (Vangrieken et al., 2017). Collaboration through story-telling and asking questions
390 (Little, 1990) were a feature of all large group meetings. For example, members learned from
391 each other by listening to the groups report in (P9, e-mail) and seeking advice on topics (P7,
392 e-mail). Sharing activities included presentations by individuals, small group sharing progress
393 updates, presentations on specific aspects of their S-STEP processes and drafting abstracts to
394 summarise their learning. Sharing at the level of each small group, rather than individually,
395 provided cover for members to share more openly: '... there were so many people in the
396 room...and we were on Zoom, and some of us didn't know each other' (P6, interview). Some
397 members identified these sharing activities as central to their PLC experiences. P10 shared,
398 'It has stretched me professionally and been a valuable source of personal reflection and
399 growth'. Collaboration through sharing activities in large group meetings provided a steady
400 rhythm to the learning community by providing purpose and direction to the learning process:

401 It was good being in the larger group, it gave us a sense of belonging to something
402 bigger... because there was some stewardship to that larger group from P1 and
403 P2. It gave us a sense of direction, which meant that when we went into those
404 small groups, we felt like we knew where we were going (P9, interview).

405 Large group meetings provided an opportunity for collaboration through collective
406 sharing that charted the PLC's trajectory. The small groups promoted a more intimate,
407 but complementary, opportunity for collaboration that was highly valued by the members.

408 *The small groups*

409 The purpose of each small group was to engage in collaborative S-STEP research
410 related to an agreed topic area connected to teaching for meaningfulness. Reflecting
411 Little's (1990) conception of joint work, these small groups operated according to several
412 parameters of S-STEP methodology in which collaboration was central; members acting
413 as critical friends to one another; again, sharing of practice was central to this role. For
414 example, P3 describes how P2, P3 and P8 engaged:

415 As critical friends, we sought to be caring of one another but were also open to
416 being challenged in respectful ways that would help deepen our individual and
417 collective understanding of PETE practice (P3 et al, 2024, journal article).

418 P11 appreciated how collaboration with 'critical friends' provided an out of the ordinary
419 opportunity for reflection on practice. More authentic relationships and more intimate sharing
420 within the small groups fostered deeper learning. P6 explained:

421 The small groups were richer spaces for learning and interacting just by nature of
422 their being fewer people... they were definitely spaces of learning and rich
423 dialogue... those small groups were super valuable to actually make sense of your
424 practice and engage in dialogue and challenge ideas and learn from each other
425 (P6, interview).

426 Collaboration through sharing with others in these small groups promoted reflection
427 on practice that resulted in clarification and refinement of individual purposes and practices.

428 P11 analysed their experiences and explained:

429 It was valuable in a few ways. So, it creates a space for reflection and exploration of
430 key pedagogical dispositions and ideas, which you don't get, at least in my typical
431 pedagogical life, gave me access to willing critical friends, which prompted me to ask,

432 I guess, bigger and more meaningful questions about my teaching... has encouraged
433 me to be more explicit and intentional about what I'm doing and why (P11,
434 interview).

435 Sharing of practice through S-STEP were instrumental in promoting this clarity about
436 intentions. Everyone saw benefits from these small group engagements. Adoption of an S-
437 STEP methodology proved an effective structure for small group collaboration online.

438 *Small-large group combination*

439 The structure of the PLC (large group and small group) was designed to support
440 collaboration resulting in production in scholarly outlets by each small group. The success of
441 the dual structure is evident in their publication of five peer review journal articles and two
442 conference presentations about their participation. Two of these focused on social justice and
443 meaningfulness (P1 et al, P6 et al.), one was about enactment of teaching for meaningfulness
444 (P4 et al.), one about meaningful work (P4 et al.) and one about democratic practice (P3 et
445 al.). Positioning formal sharing of learning as an outcome of the PLC ensured momentum of
446 collaboration activities was sustained in an online environment.

447 For some, this identified goal as an endpoint of collaboration provided momentum to
448 their engagement as it helped them to meet professional requirements: ‘... So, having a paper
449 or a conference presentation as an output and end goal that gave us a sense of purpose’ (P9,
450 interview). Integrating the production of outputs in small group purposes incentivised some
451 and sustained engagement in the collaboration. P11 shared:

452 It was so valuable, that was enough for me to keep going back... neoliberalism creeps
453 in every now and again, “Come on where is this going? Anywhere? Nowhere?
454 Everywhere?” (P11, interview).

455 The combination of large and small group meetings provided complementary opportunities
456 for collaboration that together effectively supported professional learning online for
457 participants. Accountability of the small groups to report on progress to the overall large
458 group meetings helped the industry and productivity of the small groups. P12 explained the
459 relationship:

460 The small group was what was incredibly meaningful for me and I felt the larger
461 group was much more practical and pragmatic about where we were going and
462 what we were trying to do (P12, interview).

463 Through structured sharing interactions, the large group provided a space of collective
464 collaboration while also giving a level of accountability to the small groups. The small
465 groups use of collaborative S-STEP to organise their collaboration facilitated individuals to
466 direct their professional learning based on their needs and interests. These findings provide
467 evidence of the value of a dual structure to promote teacher educator collaboration in an
468 online PLC.

469 **Discussion**

470 The enabling dual structure of the large-small groups, with a diverse membership,
471 scaffolded valuable collaboration in this online PLC. This finding responds to Hadar and
472 Brody's (2017) call for illustrative accounts of *how* teacher educators learn in communities,
473 highlighting the value and suitability of an online international PLC to support physical
474 education teacher educator learning. Building on current understandings of PLC operation for
475 physical education teacher educators (Patton & Parker, 2107; Parker et al, 2022), this
476 research contributes new insight in capturing *how* the diverse makeup of the membership
477 operated within the small-large group dual structure to promote valuable collaboration for
478 members. Loughran (2014, p.271) argues that 'the manner in which teacher educators learn to

479 traverse their world of work in the development of their knowledge, skills, and ability is
480 important'. These findings illustrate some of the features of an online PLC that shaped and
481 supported the professional collaboration experiences of these teacher educators.

482 The composition of the membership influences both the dynamics and effectiveness
483 of the PLC (Vangrieken et al., 2017). For teachers, a heterogeneous membership can hamper
484 effective functioning and reduce sharing inclinations (Vangrieken et al., 2017). In contrast,
485 Theme 1 illustrates how the variety of expertise and experience within the membership
486 activated sharing activities and resulted in a broad and rich professional learning experience
487 for members. Collaboration within the large group, including story-telling, asking questions
488 and sharing practices (Little, 1990), facilitated clarification and advancement of their
489 understanding of ideas. Opportunities to critique the ideas being explored helped teacher
490 educators, such as P12, clarify the value and place of the particular innovation in their
491 practice. Through this collaboration, a variety of perspectives were affirmed and able to co-
492 exist within the learning community. Both early career researchers and more experienced
493 teacher educators appreciated the dedicated space to learn from others through interaction and
494 sharing of practice. These findings complement those found in a research-focused
495 international collaboration in physical education (Rufino et al., 2025), suggesting that there
496 are some common features across both professional learning and research-focused
497 international collaborations. In both, a diverse membership enhanced interactions.

498 Theme 2 demonstrates how embedding a variety of collaboration activities in the
499 structure of the PLC supported authentic and valuable interactions in an online environment
500 (Kowalczyk-Walędziak and Underwood, 2023; Lantz-Andersson et al., 2018). Large group
501 meetings maintained an overall shared purpose. Breaking isolation (Hadar & Brody, 2010;
502 Patton & Parker, 2017) is critical for the successful operation of teacher educator PLCs. In
503 this online PLC, small group membership provide cover for members to ask questions, tell

504 stories, and share in the large group, ensuring that the richness each member brought to the
505 learning community was harnessed to the benefit of all the members. Structured sharing, that
506 included story-telling, asking questions and seeking advice (Little, 1990), provided clarity
507 and momentum to individual's learning and ensured that there was a consistent focus on
508 sharing of expertise (Kelchtermans and Vanderlinde, 2018). In small groups, S-STEP offered
509 more intimate and interdependent collaboration with agency and flexibility to select a specific
510 focus to play to their interests and strengths. Outputs that resulted indicate the merits of using
511 S-STEP as a framework to promote collaboration online for teacher educators. It is
512 noteworthy that all members were part of the public sharing of learning that resulted,
513 indicating that this approach suited the diverse membership too.

514 Together, these findings provide direction on design of online PLCs for physical
515 education teacher educators, with merit in a dual structure that combines large and small
516 group activities with a diverse membership. While keeping in mind that 'there is no one
517 recipe for the creation and maintenance' of learning communities (Patton & Parker, 2017,
518 p.358), others can learn from the story of how this PLC was structured and operated. First,
519 these findings highlight the value of carefully considering who is part of a teacher educator
520 PLC. While establishing a shared focus at the outset is important, we suggest resisting the
521 temptation to only include those with a known interest in the topic. We acknowledge that
522 contradictory perspectives can be unhelpful, but a variety of member perspectives avoids the
523 risk of a silo or group think. Wenger et al., (2023) remind us that a PLC is unlikely to sustain
524 unless members feel a strong connection to the focus and purpose of the PLC. The
525 conundrum is how to draw teacher educators into PLCs when they may not be inclined to
526 commit to deep engagement on a topic about which they are sceptical. The structure
527 presented in this case study provides a collaboration compromise – a lesser time commitment
528 to the large group with flexibility for more investment in the small groups with a tighter, self-

529 selected focus and potential for more intimate engagements. While some relationship
530 building overall is compromised, a wider net of participants, across contexts, can be
531 supported to engage in collaboration with the PLC purposes.

532 Second, promotion of multiple perspectives and a questioning of ideas through
533 interactive sharing activities, with opportunities to learn from others as well as critique, was
534 crucial to this PLC accommodating all members. Using methodological dispositions, such as
535 practitioner research, as a PLC umbrella can allow teacher educators to explore a variety of
536 topics that they otherwise might not engage with. S-STEP provided a suitable structure online
537 that enabled joint work representing interdependent collaboration with agency (Little, 1990).
538 We suggest that the nature and role of teacher educators make them particularly suited to
539 more open than closed agendas within a diverse membership. In addition, we recommend
540 intentionally planning for a range of collaboration activities from across the continuum
541 (Little, 1990). The topic of this PLC was new to some; opportunities to ask questions and
542 share stories of implementation were important to building capacity for more interdependent
543 collaboration within small groups.

544 Third, the online and international nature of the PLC were important structural
545 elements that no doubt affected the quality of collaboration (Kowalczyk-Walędziak &
546 Underwood, 2023; Lantz-Andersson et al., 2018). Relationship building was challenging for
547 members in the large PLC meetings initially. Members leaned on established relationships to
548 trust the activities of the overall PLC; without these previous bonds to draw on, this online
549 PLC would have needed much greater time to build the trust required. The small group
550 collaborations supported relationship building that strengthened the overall collaboration. In
551 addition, inclusion of PLC members from the USA and Canada, Australia and Western
552 Europe caused logistical challenges for the timing of meetings. All these structural factors
553 prompt consideration of the appropriate number and location of members for a given PLC

554 structure when face-to-face relationship building is not possible. Wenger et al., (2023) remind
555 us that there is no magic number for a community to operate successfully and thus it is up to
556 members to contribute in ways that make sense to them. Still, this PLC was a valuable
557 experience that was relevant for all the members despite the challenges of early morning and
558 late-night online meetings; collaboration activities provided a sense of purpose that motivated
559 members to surmount these challenges and sustain engagement. Teacher educators can take
560 on board how these members judged their experiences and continue to seek ways to
561 accommodate and promote worthwhile peer teacher educator collaborations.

562 Fourth, participation in this international online PLC was entirely voluntary. The
563 professional learning demonstrated suggests this type of PLC merits replication through
564 intentional planning and support. It is remarkable that engagement in this PLC was, for some,
565 perceived as their only opportunity to engage in professional conversation with peers.
566 International organisations can play a role in scaffolding the establishment of international
567 PLCs and provide impetus for these collaborations to be a recognised and funded part of
568 teacher educators' professional lives. Wenger et al., (2023) assert that a community should
569 not persist beyond its usefulness. This community had a pre-determined timeframe of two
570 years. The endpoint was marked by continued collaboration. For these teacher educators, the
571 PLC activities were time well spent and the public sharing of learning in five peer review
572 publications indicates the depth and quality of collaboration supported. This PLC, therefore,
573 provides some direction on how the design of PLCs online for teacher educators can sustain
574 high quality collaboration across time.

575 There are some limitations. Decisions related to the overall design and operation of
576 this PLC were made primarily by the two initiators. While shared ownership and decision-
577 making with all members were promoted, overall direction was provided by these two
578 leaders. At each critical juncture, such as formation of the small groups, different leaders may

579 have taken the PLC in another direction. In addition, the membership and context of the PLC
580 shaped the findings. The generalisation of these findings to other PLCs is therefore made
581 cautiously with emphasis on a shared purpose and expectations and clear ways of working.
582 There is also a risk of bias with an ‘insider’ story such as this, authored by the members of
583 the case. To counteract this, members of the PLC were involved in member checking and
584 confirming that the story represented their experiences. Still, ensuring all viewpoints are
585 captured is challenging and there is merit in in-depth exploration of the particular experiences
586 of different members of a PLC. Future directions for research could include further
587 exploration and refinement of which types of collaboration are most valuable within a dual
588 structure combining large group and small group activities to promote self-directed and
589 purposeful learning.

590 **Conclusion**

591 These findings highlight two features of an online professional learning community
592 that influenced physical education teacher educators’ experiences of collaboration. First, the
593 richness of a diverse membership enhanced professional collaboration online. Second, a dual
594 structure, combining large and small group activities provided complementary collaboration
595 opportunities in an online environment. Together, these findings contribute to understanding
596 how to promote rich professional collaboration in teacher educator PLCs online.

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668 Figure 1: The PLC structure

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