

Social media and teacher professional learning communities

Goodyear, Vicky; Parker, Mellissa ; Casey, Ashley

DOI:

[10.1080/17408989.2019.1617263](https://doi.org/10.1080/17408989.2019.1617263)

License:

None: All rights reserved

Document Version

Peer reviewed version

Citation for published version (Harvard):

Goodyear, V, Parker, M & Casey, A 2019, 'Social media and teacher professional learning communities', *Physical Education and Sport Pedagogy*, vol. 24, no. 5, pp. 421-433.
<https://doi.org/10.1080/17408989.2019.1617263>

[Link to publication on Research at Birmingham portal](#)

Publisher Rights Statement:

Checked for eligibility: 23/07/2019

This is an Accepted Manuscript of an article published by Taylor & Francis in *Physical Education and Sport Pedagogy* on 13/05/2019, available online: <http://www.tandfonline.com/10.1080/17408989.2019.1617263>.

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

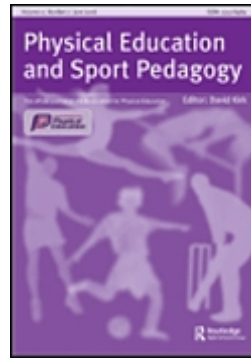
Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.



Social media and teacher professional learning communities

Journal:	<i>Physical Education and Sport Pedagogy</i>
Manuscript ID	CPES-2017-0238.R2
Manuscript Type:	Original Article
Keywords:	communities of practice, professional learning, constructivism, situated learning

SCHOLARONE™
Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Social media and teacher professional learning communities

2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review Only

Abstract

Background: An extensive and international evidence base positions professional learning communities (PLCs) as an effective continued professional development (CPD) mechanism that can impact on teachers' practices and, in turn, students' learning. The landscape of teacher PLCs is continuously developing; notably through teachers' uses of social media. Yet, there is limited robust evidence identifying the characteristics of social media PLCs that impact on teachers' learning and practice.

Purpose: This exploratory study examined the characteristics of a specific Twitter-based professional learning community - #pechat. The research questions were: (i) **what is the nature of a Twitter-based professional learning community?** and (ii) what characteristics of a Twitter-based professional learning community develop learning and practice?

Methods: Data were generated from 901 tweets between 100 participants; and 18 in-depth semi-structured elicitation interviews with participants and moderators of the Twitter-based professional learning community. Data were analysed through a process of deliberation, and a relativist approach informed quality.

Findings: Two themes are reported to explain the nature of the Twitter-based professional learning community and the different types of characteristics of #pechat that developed learning and practice. The first theme *engagement* shows how different participants of #pechat engaged with discussions and how moderators played a key role in facilitating discussions between participants. The second theme *shared practices* shows how discussions between participants of #pechat led to the development of new practices that some teachers were able to use to accomplish particular objectives in their physical education lessons.

Conclusion: The analysis of the data provided evidence to suggest that #pechat is a PLC and is representative of an established group of practitioners. These characteristics should be considered in the design of future online professional development experiences. Facilitator or moderator training could support the development of social media based PLCs that subsequently and positively impact on teachers' practices.

Keywords: communities of practice; professional learning; constructivism; situated learning

66 It is extensively agreed that teacher professional development (PD) is an essential mechanism
67 through which to enhance the quality of teaching and, in turn, improve students' learning
68 outcomes (Armour et al. 2017; Sato and Haegele 2017). Yet, for a number of decades it has
69 been reported from diverse international and socio-economic contexts that physical education
70 teachers are rarely able to access and engage with effective PD, with time, cost, and a lack of
71 access to relevant content frequently cited as key barriers (Parker and Patton 2017,
72 Makopoulou 2017). **As a result, there are concerns about teaching quality and whether
73 classroom practices are evidence-based (Armour et al. 2017, Sato and Haegele 2017).** The
74 enduring issue of effective teacher PD is coupled with the ongoing marginalisation of the
75 subject (Pope, 2011, masked for peer review). For example, cuts to the time devoted to the
76 development of subject knowledge in graduate physical education teacher education
77 programs are becoming commonplace (Dudley and Burden 2019), alongside the reduction of
78 physical education teacher education programmes in leading international institutions^{1,2}. This
79 means that, across physical education teachers' careers, opportunities to learn and develop
80 their practices are becoming increasingly limited. The creation of new PD practices that
81 support teachers' learning needs, and navigate contextual barriers to PD, are therefore vital
82 for teachers and for those researching physical education.

83 Social media has been reported as an increasingly 'popular' digital/online context
84 used by teachers for PD purposes (see Greenhow et al. 2018, Greenhow and Lewin 2016).
85 There is evidence that teachers use a range of different social media sites - such as Twitter,
86 Facebook and YouTube - to post and exchange pictures, resources and information
87 (Greenhow et al. 2018, Harvey and Hyndman 2018). Furthermore, teachers are reported to be
88 forming communities on social media, and engaging in social-media based chats to share

¹ <https://www.thelantern.com/2018/02/physical-education-teacher-education-program-to-be-phased-out-by-2022/>;

² [MASKED FOR PEER REVIEW]

information about their practices (Krukta and Carpenter 2016, Trust et al. 2016, Wesley 2013). Yet, there is limited robust evidence on the types of content, interactions and spaces that support teachers' learning and practices (Britt and Paulus 2016, Carpenter and Krukta 2016, Krukta and Carpenter 2016). Despite almost a decade of research on social media and teacher PD (Greenhow et al. 2018), the primary empirical focus has been on why teachers engage with social media for PD (Britt and Paulus 2016, Carpenter and Krukta 2015, 2014, Harvey and Hyndman 2018). There is very limited understanding about how *teacher learning* occurs via social media and how social media operates as a form of PD that impacts on practice.

The purpose of this paper is to examine social media as a contemporary form of teacher PD. The specific focus is on better understanding how teachers' engagement with social media develops their learning and practice(s). The article reports on a case study of a Twitter-based physical education chat - #pechat - and presents new data from over 100 international participants. **The concept of professional learning communities (PLCs) is applied to explain the social media-based learning context(s).** The research questions were: (i) what is the nature of a Twitter-based professional learning community and (ii) what characteristics inherent within that professional learning community develop learning and practice?

Professional Learning Communities

An extensive evidence-base reports on how the concept of PLCs can be applied to assist in explaining the architecture of learning environments in group or community-based contexts (Parker et al. 2012, MacPhail et al. 2014). PLCs are generally referred to as groups involving members who share common learning/professional interests, in which interactions and discourse take place over time through discussion, analysis and problem solving, that result in

114 professional learning (MacPhail et al. 2014, Parker et al. 2012). The conceptual framework of
115 PLCs was, therefore, highly relevant the social media-based context of a bi-monthly Twitter
116 chat, and was applied as an analytical framework for this study.

117 An international literature base has sought to define and establish different types of
118 characteristics of PLCs (see Author 2015, Armour et al. 2017, Parker and Patton 2017, Yoon
119 & Armour 2017). Parker et al. (2012) identified three broad types of PLCs: (i) collections of
120 authentic teachers, (ii) established groups, and (iii) communities of practice (CoP) (see Table
121 1). These different types of PLCs are defined by five characteristics with differing features:
122 (i) success; (ii) guideposts; (iii) facilitator; (iv) roadblocks; and (v) potential (see Table 1).

123 The main differences between these five characteristics is the collaborative and co-
124 constructed nature of how individuals work together in groups. For example, whereas in the
125 collection of authentic teachers' success is determined at an individual level, in a community
126 of practice (CoP) success is integrated amongst the practices of group members (Table 1).
127 Parker et al. (2012), and later MacPhail et al. (2014), argued that the more groups adhered to
128 the constructs of CoPs deeper learning, more focussed the direction of learning, and stronger
129 growth in teachers and the community would be evident. The characteristics of CoPs can
130 therefore be used as aspirational criteria for the design of effective professional development
131 (MacPhail et al., 2014; Parker et al., 2012). In that context, we explain CoPs in a bit more
132 detail.

133 CoPs are grounded within situated learning perspectives (Parker et al., 2010). A CoP
134 can be summarized as 'groups of people who share a concern or a passion for something they
135 do and learn how to do it better as they interact regularly' (Wenger and Wenger-Traynor
136 2015, 1). CoPs are not haphazard groups (Lave and Wenger 1991). Groups evolve as
137 members come and go and as old members leave and new ones join. Lave and Wenger's
138 (1991) notion of legitimate peripheral participation can be used to describe how newcomers

139 become fully participating community members. When members are new, learning is not so
140 much seen as knowledge acquisition as it is more of a process of social engagement as
141 learners ‘move toward full participation in the socio-cultural practices of a community’
142 (Smith 2009, no page). During legitimate peripheral participation, newcomers begin their
143 participation by engaging in activities that may appear simple, yet, are necessary for the
144 group. Through these peripheral activities, novices become acquainted with the tasks,
145 vocabulary, and organising principles of the community. In this phase there ‘is a concern
146 with identity, with learning to speak, act, and improvise in ways that make sense in the
147 community’ (Smith 2009, no page). In essence, ‘learning to talk the language of the
148 community’ is foundational to legitimate peripheral participation (Lave and Wenger 1991)
149 and is representative of the process of newcomers.

150

151 **Methods**

152 A case study design was adopted to provide rich and in-depth insights into teachers’
153 engagement the Twitter-based chat, #pechat (Hodge and Sharpe 2016). An iterative design
154 was adopted to provide both breadth and depth in the data generation process.

155 ***Site and Context***

156 The site of this study is Twitter and the context of Twitter that we explore is the
157 #pechat group. Twitter is a free micro-blogging site where members can post messages in the
158 form of tweets. At the time of the study, tweets were restricted to 140 characters but these
159 could include text, pictures and/or links to other websites. Various other functions are
160 available that enable Twitter users to share or view information with specific people and view
161 or engage with discussions with groups of Twitter members (Table 2). Hashtags can be
162 embedded within tweets and are used to signify a specific topic, a group of people, or to
163 tweet within a Twitter chat group. Twitter members can create their own hashtags or search

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

for specific hashtags commonly used. When Twitter members search or use common hashtags they can view other tweets about the specific topic (for example, #physed), they can engage with a specific group of people (for example, #pegeeks), or they can engage with a Twitter-based chat (for example, #pechat). Importantly, a Twitter user does not have to tweet to view the posts that are made using the hashtag.

[Insert Table 2 here]

#pechat is a Twitter based chat forum that uses the same hashtag for Twitter users to engage in discussions. #pechat was founded in 2011 by a physical education teacher who was also the founder of a professional development website (www.thephysicaleducator.com) that is linked to and used to promote #pechat. At the time of the study #pechat (which had been running for approximately three years) was hosted bi-monthly and occurred at 7pm across five international time zones (Australian Eastern Time, Singapore Time, Greenwich Mean Time, Eastern Standard Time, Pacific Standard Time) on a Monday evening. Each #pechat was based around a specific topic with pre-defined questions for contributors to answer. The topics and questions were usually selected by the founder of #pechat and were generated through polls hosted on the website and shared through Twitter.

For each of the five #pechat's a moderator was assigned; one for each of the time zones. The moderator's role was to tweet the pre-defined questions and to guide the discussions by asking questions and prompting users to share their perspectives.

Data Generation

Data were generated from two sources: Twitter and interviews. The contextual focus was on five different international #pechats that took place on the same day in March 2014. The broad topic of the #pechat was 'a cry for help' and was focussed on how practitioners could help other teachers to develop and change their practices. The moderators were provided with a series of questions to guide discussions.

First, similar to the approach adopted by Author (2017), data were generated from tweets made during the five chats using the application Twitonomy³. The aim of generating data from Twitter was to provide an illustrative example of the types of interactions within the Twitter chat. The hashtag #pechat was used to search for and gather tweets. Data from Twitonomy were exported to an Excel file and the participants and the content of each participant's tweets were identified. Across the five #pechat's a total of 901 tweets were made by 100 different people. The tweets generated informed the selection of participants for interviews and the content of interview questions, and the tweets were later combined with the interview data during analysis. The tweets therefore provided an additional layer of rigor in this study. Methodologically, the tweets directed and maximised the focus on the relationship between social media and teacher learning. Empirically, the tweets strengthened the robustness of the findings, where evidence is reported from real time (tweets) and retrospective data (interviews) (Author 2017).

Secondly, data were also generated from 18 individual interviews, that took place following the #pechat. The aim of generating data from interviews was to interpret how the participants engaged with the #pechat, and how they had engaged with #pechat over time (i.e. beyond the specific chat in March 2014). A purposeful sampling approach was adopted using a criterion-based technique (Sparkes and Smith 2014). This approach was selected to ensure that the participants of this study were representative of range of #pechat participants, but that had all participated in #pechat over a period of time. The criteria used was based on different intensities of engagement, in terms of participants' role in #pechat and the number of tweets participants made. Following this approach, a sample of 18 was considered to provide a level of rigor (Sparkes and Smith 2014). The sample selected included; (a) moderators (n=4) and (b) participants (n=14) who engaged with the #pechat at high (50 or more tweets), moderate-

³ www.twitonomy.com/

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

high (20 or more tweets) and low (less than 10 tweets) levels. The criterion sampling approach also sought to ensure an appropriate balance in gender and geographical location (see Table 3).

The interview process was initially informed by an elicitation approach to provide depth in the participant responses through the use of text-based data to trigger responses and memories (Phenoix and Rich 2016). Participants were asked to read the tweets they made during the #pechat and then discuss their interpretations of these. Following this, questions were asked in a semi-structured format about how #pechat had supported their engagement and learning. Each interview was conducted via Skype and lasted between 45-60 minutes.

[Insert Table 3 here]

Ethics

Ethical approval was provided by the Institutional Review Board and Twitter’s terms of service were consulted prior to data generation. Passive consent was sought from participants to access tweets made during the #pechats. Passive consent occurred via an information statement posted by the moderators and the first and third author prior to, during, and at the end of each #pechat. The statement was also posted to one of the author’s website. The information statement informed participants that tweets made during the #pechat could be used for research and participants’ names and specific tweets could be used in the reporting of the findings. Given the public nature of Twitter, the traceability of tweets and, subsequently, the limited effectiveness of de-identification processes in social media research (see Author 2017), anonymization strategies were not employed in the writing of this paper. The information sheet, however, did state that participants had the right to contact the research team via Twitter or email if they did not want their name or tweets to be used in the reporting of the findings. None of the participants of #pechat contacted the research team and in the reporting of the data from Twitter participants first names are used to represent their

238 Twitter handle (e.g., @Adam) and tweets presented verbatim. Active consent and anonymity
239 procedures were followed for data generated from interviews. Participants provided written
240 informed consent and participants were de-identified from the interview transcripts, due to
241 the sensitivity and confidentiality of some of the information they shared.

242 ***Data Analysis***

243 The characteristics of PLC's identified by MacPhail et al. (2014) and Parker et al.
244 (2012) (see Table 3) were used to analyse the data. Following this framework, the authors
245 were guided by concepts of success, guideposts, facilitator, roadblocks and potential, where
246 analytical questions derived from the framework were deliberated, decided upon and used by
247 the authors. This process ensured that the research questions remained a central focus while
248 also remaining open and reasonable to emerging understandings. The analytical questions
249 constructed and utilised were: (i) what is the nature of success, guideposts, facilitator,
250 roadblocks and potential in #pechat; and (ii) how does success, guideposts, facilitator,
251 roadblocks and potential support and develop learning and practice?

252 The first analytical step involved the organisation of the Twitter data. In order to
253 interpret ongoing discussions between participants and groups of participants, tweets and
254 conversations were grouped by; (i) separate #pechat's, (ii) singular tweets, and (iii)
255 conversations, that involved a series of two or more tweets. The second step of analysis was
256 informed by the analytical questions. A deliberative strategy was used, inspired by Tracey's
257 (2010) end goals for excellent qualitative research, as well as the work of Englund (2006) and
258 Author (2017). The analytical questions were used by the researchers to independently
259 analyse the data. Each researcher formulated codes and themes, and these became the basis
260 for deliberation between all three authors. The aim was to ensure that themes represented
261 something 'in common' (Author 2017, p. X) about the answers to the analytical questions.
262 The deliberative process resulted in two themes: (i) engagement and (ii) moderation.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Validity

A relativist approach was applied to **inform validity** and determine quality (Burke 2016). A relativist approach extends the robustness of traditional measures of quality drawn from criteriological approaches (Burke 2016), such as trustworthiness, as it offers a framework for determining quality in a way that aligns with the contextual circumstances of the study. In applying a relativist approach and, following the work of Smith and McGannon (2017), universal criteria for judging the quality of research are not applied (e.g. dependability, confirmability). Instead, criteria are selected from an ongoing list of characterising traits that relate to the context of the research (Smith and McGannonn 2017). The following criteria were selected as representations of quality and validity within this research: the worthiness of the topic; the significant contribution of the work; width, that is, the comprehensiveness of evidence and the use of multiple and numerous data sources from a wide sample of participants (n=100); and credibility through the first and third authors' familiarity with the #pechat group, as well as the rigorous analytical process involving deliberation. As part of a list of characterising traits for enhancing the quality of this work, this study also aimed for coherence. In other words, how well the study hung together in terms of purpose, methods and results, as well as its strong underpinning of theory, i.e. PLCs through CoPs. Evidence of quality and validity in this study are therefore aligned with the contextual circumstances of the research.

Results

Two themes represent the nature of the Twitter-based professional learning community and the different types of characteristics of #pechat that developed learning and practice: (i) *engagement* and (ii) *shared practices*.

289 Engagement

290 Two overarching and contrasting forms of engagement were identified: *active* and
 291 *observational*. *Active* engagement was associated with participants of #pechat who held an
 292 identity as a “big name on Twitter” (participant 1 interview). *Observational* engagement was
 293 associated with participants who were referred to as lurkers.

294 The “big names on Twitter” were those who were identified as being “active in social
 295 media” (participant 1 interview) and were often the high or mid tweeters and/or the
 296 moderators (Table 2). The big names shared firm and dominant views and were individuals
 297 who other participants attempted to connect with through replies, retweets (RTs) or favourites
 298 (see Table 1). For example:

299	Adam:	Activities and learning opportunities are differentiated for readiness
300		level. Students can choose within that framework #pechat
301	Naomi:	RT
302	Andy:	@Adam Amen! #pechat
303	Naomi:	@Adam Agree!... That was well said! #pechat (tweets)

304
 305 High levels of connectivity with the big names was associated with these participants
 306 having “something worthwhile to say” (participant 2 interview). The high levels of
 307 interactivity were also associated with the number of tweets sent by the big names. Most of
 308 the big names tweeted in more than one of the five #pechat’s. For example, Andy, who made
 309 a total of 65 tweets during the five #pechat’s, tweeted his opinion on a particular topic more
 310 than once. For example, he re-shared his views from the Singapore chat in the Canada chat,:
 311 ‘as I said in last night’s chat, she’s taking responsibility which is great I think. Not so much
 312 blaming herself #pechat’ (tweet).

313 Despite the “**big names**” connectivity being associated with a valued voice and
 314 opinion, it was acknowledged that others connected with them because they “think that it is
 315 the right thing to do” (moderator 1 interview). The big names held a certain identity within
 316 the #pechat community and were described as “those types of people that will say something
 317 and people will buy into it right away” (participant 3 interview). This identity, however, was

318 not only attributed to the number of tweets, knowledge, or confidence. The big names were
319 described as being white males that was perceived to provide them with a certain privilege
320 for their voice to be heard: “It’s a certain gender, it’s a certain ethnicity, so it’s an interesting
321 question because some voices are heard based on our privilege and based on who we are”
322 (participant 4 interview). The data indicate that the nature of the learning was shaped by
323 positions of power and influence.

324 At the other end of the engagement spectrum were participants identified as “lurkers”
325 (participant 5 interview). Lurking involved observing tweets and commenting only when
326 something was interesting or engaging.

327 I’m basically a lurker.... So I look at everyone’s ideas, like whenever I have
328 downtime I’m on Twitter I’m scrolling through the hashtags seeing what people are
329 saying and then if I see something that’s like really really cool or really inspiring I’ll
330 comment on it. (participant 6 interview)

331 The reason for lurking was often associated with participants feeling like they did not
332 have something worthy to contribute. For example, “I don’t feel like I have much to add to or
333 I’ll listen but I won’t add to things so I’ll just lurk a little bit!” (participant 5 interview).
334 Lurkers averaged between one and three tweets (Table 2) and rather than sharing opinions,
335 their tweets often involved asking questions: “how do I give choice to some while still
336 maintaining structure for others in the same class #pechat” (Joe, tweet).

338 Despite a number of participants suggesting that they or others lurked, lurking wasn’t
339 seen as a problem. For example, one lurker was quite open to the #pechat group that he/she
340 had lurked and tweeted, “enjoyed lurking and following along - good discussion all”
341 (coachdeneef, tweet). For the more active users of Twitter, lurking was an accepted form of
342 engagement because it was positioned as a way of helping Twitter members to learn about
343 Twitter, what to tweet, and with whom to interact. In other words, it was a form of
344 apprenticeship or work-place learning. Lurking was seen as a process that would enable
345 people to develop their own professional learning network:

You get on, you lurk, you have to find people, you have to find groups to follow topics to follow and you lurk and you read and you know ... then all of a sudden you like something. You favourite something, you retweet something and then comes your big ... you know either a reply to somebody else cos I think that's what I did first, I post somebody ... sent ... reply...that's an awesome idea so that was the first thing I wrote. And then from there it was kind of like, ok so I'm gonna put something out there, you kind of put your feelers out there and your PLN [Professional Learning Network] grows. (participant 7 interview)

The mid tweeters' engagement in #pechat contributed to the momentum of discussion. These participants' engagement might best be described as sharers. The mid tweeters would often respond to a moderator's question by sharing their opinions or by providing examples from their own practices. The mid-tweeters would ask questions and interact with others during #pechat to understand how they could do particular practices others had shared. Nicholas asked Adam and Andy (both high tweeters) to explain how he could use the ideas they had shared in lessons; '@Andy @Adam I only see my 4-6gr. [grade] classes 30 times in #physed during the year...how do I learn what motivates my S's [students] #pechat' (Nicholas, tweet).

Regardless of the form of engagement it seemed that moderators played a key role in facilitating the different types of participants' engagement. Moderators described their role as being about "trying to get people involved... guiding discussions" (moderator 2 interview). For some moderators this meant ensuring that all participants knew how to engage in #pechat. The moderators would do this by RTing the pre-determined questions for the #pechat or RTing the @physical.educator.com's tweet on how to engage with #pechat: "RT @phys_educator: Not sure how #pechat works? Want to join in the discussion? Check out our #pechat 101 video here: [link to website removed]" (tweet). During the chats the moderators posed the topic questions but they also aimed to respond to and develop the discussions. One moderator spoke of how she aimed to "try to put myself in their shoes to continue to explain...I try to make them feel emotionally safe" (moderator 3 interview). This

375 moderator acknowledged that there were different types of practitioners involved in the
 376 discussions who had different experiences and levels of knowledge.

377 Sometimes people ask a question and I feel like doh you don't have that foundational
 378 piece, but those are the people I want to support and encourage the most. I am not
 379 sure that everybody feels that way. Tone can sometimes get lost, I am the person that
 380 would rather take five tweets to make sure my tone is clear as opposed to the someone
 381 who might take one and not worry about that (moderator 3 interview)

382
 383 The moderator's role was also seen as being about creating discussions (i.e. a series of
 384 tweets) and encouraging participants to move beyond solitary statements (i.e. one tweet). As
 385 one moderator commented, he needed to question participants as a means for them to
 386 describe and discuss their practices in further detail:

387 Often people will respond with a pretty closed response. I guess the role of the
 388 moderator is to question that again and say ok well why, how or when would you do
 389 this rather than just accepting that, otherwise you end up with, well its not really a
 390 conversation its just a series of statements (moderator 1 interview).

391
 392 In summary, two predominant forms of engagement and types of practitioners existed
 393 within #pechat; active engagement (big names) and observational engagement (lurkers). The
 394 mid tweeters, known as 'sharers', supported the momentum of discussion and the moderators
 395 played a key role in encouraging practitioners to share practices.

396 **Shared Practices**

397 Shared practices refers to how participants generated new understandings, new ideas,
 398 and new practices that could be transferred into their lessons. While #pechat was described as
 399 a form of PD, #pechat discussions did not support all participants learning or practices.

400 Most of the discussions in #pechat involved sharing practices around the pre-defined
 401 topic. Many of the tweets were focused on offering different ways of doing similar things.
 402 These types of tweets were described as being useful to practitioners as they could gain
 403 different ideas that they could transfer into lessons.

404 Naomi: we use e-portfolios in our school & have video and pics #pechat
 405 Tish: videos, blogs, go to school board, NP anything to highlight #pechat

Jennifer: I use @socrative to get info. Kids use phones. Took abt 15 min and gave me great data to use #pechat (tweets)

I have an idea or an opinion and so often somebody adds extra value to that or brings that different perspective that I hadn't thought of, you know, for context and it's like... fantastic I'm gonna try that. (participant 8 interview)

Participants did not always agree on all practices. The moderator was positioned as someone who would "make the boat rock a bit" (participant 9 interview) and encourage participants to question their own or each other's beliefs and/or practices.

He was playing devil's advocate sometimes, to expand your thinking and kind of take the opposite side, whether they agree with it or not. (participant 9 interview)

The following series of tweets provides an example of how the moderator would "play devil's advocate" (participant 9 interview). The tweet discussion begins with a participant sharing the idea of students developing their own games (tweet 1). The moderator challenged the participants by asking them to explain the learning environment (tweet 3) and by then suggesting that students developing games is a messy process (tweet 5). Tweet 7 invited other participants into the discussion but the moderator continued to challenge the participants by raising issues of Moderate to Vigorous Physical Activity (MVPA) (tweet 6). As the discussion continued (tweets 8 - 13), the participants expanded on the original point about students developing games and began to discuss how lessons could be structured to accommodate MVPA. The tweet discussion continued beyond the 13th tweet used as in the illustration below, but as the 13th tweet indicates, after the moderator had "rocked the boat" (tweet 5 and tweet 6) the moderator began to agree with the suggestions for practice made by the participants.

Tweet 1: (Matt): @Moderator @Nicholas hand the group a bag of equipment. Let them develop the game. Also, use 7 parts of the game as guide #pechat

Tweet 2: (Nicholas): limited opportunities for creativity within their educational experience. Expecting more rules/guidelines from me #pechat

Tweet 3: (Moderator): @Nicolas so how can you create a culture of learning that embraces the opposite

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Tweet 4: (Matt): kids set own goals. They are becoming self-motivated to learn and move #pechat

Tweet 5: (Moderator): @Nicholas @Matt I do have personal bias against this idea. Same with peer teaching. Always messy #pechat

Tweet 6: (Moderator): @Nicholas @ Matt and always loses tons of MVPA....

Tweet 7: (Andy): @Nicolas @Matt @Moderator LEARNING IS MESSY YAHOOO!! #pechat

Tweet 8: (Moderator): @Nicholas @Matt @Andy hah! I am absolutely ok with messiness – IF there is a purpose behind it #pechat

Tweet 9: (Andy): @Nicholas @Matt @Moderator it also doesn't have to loose MVPA when done well

Tweet 10: (Nicholas) @Matt @Moderator @Andy Students HR's during class today over 150. Their games = more passion! Creating thinkers, not just doers! #pechat

Tweet 11: (Andy) @Matt @Moderator @Nicholas so you give them a goal to get HR 150+ for majority of the time, get them monitoring it #pechat

Tweet 12: (Matt) @Moderator @Nicolas @Andy set up a goal/focus that toward MVPA. This is an item the teacher can help students develop #pechat

Tweet 13: (Moderator):@Andy @nicholas @Matt I suppose anything will work if done correctly. I am a HUGE believer in peer feedback #pechat (Twitter conversation)

The ability to engage in a series of tweets where participants offered different perspectives had not always been part of #pechat. The participants described how there had been a shift from resource sharing toward interactions and the development of shared practices; “it started off being all about resources but now it’s more about concepts or idea sharing. It’s definitely evolved for me” (participant 10 interview). Importantly, there was a distinct difference between learning through using Twitter and engaging with #pechat. The latter made learning associated with collaboration and discussions possible.

Social media is not professional development. Social media is a platform. Professional development for me is the interactions I have with people. The conversations that I have with people. And the collaboration that it kind of leads to. So PE-Chats – I think if you are engaging in a PE-Chat and you’re having conversation – even if you’re lurking you’re definitely learning something. You’re seeing different perspectives for different people. So yes. So I’d say that it’s a form of professional learning. (participant 11 interview)

Despite somewhat widespread agreement that #pechat was a form of PD, the growth and popularity of #pechat from its initial introduction had caused some participants to

480 consider that their learning wasn't always supported. As one participant suggested, "a lot of
481 us who started on it [#pechat] feel that it's too big at this point" (participant 10 interview).

482 Moreover, #pechat was described as being "much more congested" (participant 12
483 interview):

484 By the time you've seen something you'd like to engage with 50 other people have
485 jumped in and taken that part of the conversation away so it's just about impossible to
486 actually keep up (participant 12 interview)

487
488 Some individuals were accessing other social media sites and/or developing smaller
489 groups on Twitter. There were other connections forming that were described as "close-knit
490 groups" where participants considered people in these groups as "not just colleagues but
491 friends" (participant 13 interview). The following highlights one participant's engagement
492 with the social media site Voxer and how the community on Voxer enabled her to change and
493 develop her lesson within the same day.

494 I got on Voxer and you know, in between classes I'd have five minutes, I got on and
495 said hey, don't know if any of you played this it's a great warm up game bla bla bla
496 so I wasn't even asking for any help... but...in two to three minutes I had two or three
497 other people who got on and who replied with hey I do that but I do a variation like
498 this... And the very next class I switched and I added that. So I have five minutes
499 between classes and within that time period I learned a new variation that
500 incorporated adding math to my lesson and then a grade in other content areas and I
501 mean the kids loved it just the same. (participant 14 interview)

502
503 Overall participants of #pechat developed shared practices through their responses to
504 particular questions and/or through the moderator challenging the participants' discussions.
505 Although #pechat was valued as a form of PD, many participants engaged with other social
506 media sites to collaborate with smaller groups of members from #pechat.

507 Discussion

508 This exploratory study into a Twitter-based PLC has demonstrated that social media
509 can operate as a form of PD for teachers that develops their learning and practices. There was
510 evidence that observing and/or actively **participating** in Twitter-based discussions supported
511 teachers to develop new understandings and shared practices. In some cases, practices that

1
2
3 512 were co-constructed between teachers during Twitter-based discussions transferred into a
4
5 513 teacher's lessons demonstrating that social media has the potential to be a very powerful form
6
7 514 of contemporary PD that impacts on practice. Yet, the Twitter-based professional learning
8
9 515 community did not influence all participants learning and practices. The participants had
10
11 516 different learning needs, contexts, knowledge and practices, and they engaged in #pechat in
12
13 517 different ways (active, moderate engagement and passive) and to different intensities (high,
14
15 518 mid, low tweets). The differences between the participants resulted in variance in how
16
17 519 learning was facilitated and structured within #pechat. The challenge for the field of PD is
18
19 520 understanding how to support and develop teacher learning in digital spaces when there are
20
21 521 mass numbers of participants with different needs and different intensities of engagement.
22
23
24
25

26 522 Identifying the characteristics of the Twitter-based PLC provides a way to determine
27
28 523 how learning can be structured and supported on social media. The original contribution of
29
30 524 this study is the empirically rich data that identifies the nature of PLC characteristics (i.e.
31
32 525 success, guideposts, facilitator, roadblocks and potential – see Table 3), and evidence of how
33
34 526 the characteristics that impacted on learning and practice. This study shows that #pechat is an
35
36 527 established group. It was evident that there was an accomplished objective of achieving
37
38 528 shared practices where individuals, to varying intensities, were empowered to engage with
39
40 529 discussions. Furthermore, the data demonstrated that there was continuous interaction
41
42 530 between participants, where moderators and mid-level tweeters supported the flow of
43
44 531 discussion. The moderators also acted as the role of facilitators, where individuals with
45
46 532 higher status on Twitter were also influential. Finally, and in smaller interactional groups,
47
48 533 issues were identified and resolved between participants. In this sense, social media was a
49
50 534 space that supports professional development in a way that impacts on learning and practice
51
52
53
54
55 535 by enabling practitioners to form established groups.
56
57
58
59
60

Although the Twitter chat acted as a form of PD, the data demonstrate a number of challenges for practitioners using social media as a PD tool. It should be noted that engagement with Twitter chats does not support all practitioners' learning and practices. Clear challenges were evident with regard to the mass, open and many-to-many forms of communication, where interactions became disconnected and fragmented due to high numbers of participants. To navigate against this issues, social media sites that enable smaller groups of participants to come together in more refined spaces are an option. The data from this study suggests that in such spaces, participants can develop richer professional relations and deeper discussions about practice occur. Due to these capabilities of smaller groups, it can be suggested that these spaces of social media may be more representative of legitimate peripheral participation and the constructs of CoPs. To further develop understandings of the social media as a PD tool, future research should examine the characteristics of these smaller and refined PLCs on social media.

Another challenge was related to influence and self-presentation. The data suggested that individuals with high status can hijack discussions and direct conversations to issues that they deem important, but may not be representative of the whole community. Issues of gender and ethnicity also provided a level of power in relation to PLCs. The role of the facilitator in PLCs is to seek a balance between new concepts with prior experiences and to push teachers at appropriate points in an effort to maximize learning (Poekert 2011). Effective facilitators guide rather than direct, question rather than show the way, and listen rather than tell (Patton & Parker 2014; Parker and Patton 2017), yet have the critical role of managing group dynamics (Molle 2013). Among other things, in order to develop trust and respect, participants should have an equal voice in conversations (Hunuk, Ince and Tannehill 2013) and actions must be taken to equalize opportunities and engagement where a power differential traditionally exists (Patton, Parker and Neutzling, 2012). Armour and Yelling

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

(2007) described the intricacies of doing this stating that effective, professional development providers ‘need to tread a careful line, simultaneously being leaders (providing expert input, helping teachers to work together) and followers’ (195). While these issues occur in face-to-face communities, controlling and limiting the domineering behaviours presented in social media environments may be more complex and require even more skill in facilitation. These findings therefore further stress the importance of professional development for facilitators or moderators in social media contexts (Makopoulou, 2017).

Although this study has demonstrated impact, several limitations exist. Firstly, only a small sample of practitioners were interviewed from a broader sample of participants. While the potential for generalizability was addressed, a wider sample could have provided further insights. A second limitation concerns the generation of empirical data from one collective #pechat. [To understand the nature and form of a PLC over time, data could be generated from Twitter over a series of #pechats.](#)

Conclusion

Teachers access to, and engagement with high quality, PD has been an enduring issue. Social media can overcome some of the barriers to teacher PD. The findings reported are from a diverse and international sample and provide evidence on how teacher learning occurs via social media, and the characteristics of social media-based groups or communities that influence knowledge and behaviour change. Hence, the findings indicate that social media is a contemporary form of professional development that can address the clear challenges associated with teacher learning and, in turn, enhance the quality of teaching and improve student learning outcomes.

References

Author, 2017; 2014a, Author 2015 (PESP article)

- Armour, K. M. Quennerstedt, F. Chambers, and K. Makopoulou. 2017. "What is 'effective' CPD for contemporary physical education teachers? A Deweyan framework." *Sport, Education and Society*, 22(7): 799-811
- Armour, K. M., and M. Yelling 2007. "Effective professional development for physical education teachers: The role of informal, collaborative learning." *Journal of Teaching in Physical Education*, 26: 177-200.
- Britt, V.G., and Paulus, T. 2016. "'Beyond the four walls of my building': A case study of #Edchat as a community of practice." *American Journal of Distance Education*, 30(1): 48-59.
- Burke, S., 2016. "Rethinking 'validity' and 'trustworthiness' in qualitative inquiry: how might we judge the quality of qualitative research in sport and exercise sciences?" In *Routledge handbook of qualitative research in sport and exercise*, edited by B. Smith and A.C. Sparkes, 330-339. London: Routledge.
- Carpenter, J.P., and D.G. Krutka. 2014. "How and why educators use Twitter: a survey of the field." *Journal of Research on Technology in Education* 46: 414-434.
- Greenhow, C., Campbell, D., Galvin, S. and Askari, E. 2018. Social Media in Teacher Professional Development: A Literature Review. Retrieved February 28, 2019 from <https://www.learntechlib.org/primary/p/182975/>.
- Greenhow, C. and C. Lewin. 2016. "Social media and education: reconceptualising the boundaries of formal and informal learning." *Learning, Media and Technology* 41 (1): 6-30.
- Harvey, S., and B. Hyndman, B. 2018. An investigation into the reasons physical education professionals use Twitter. *Journal of Teaching in Physical Education*, 37(4), 383-396.
- Hodge, K., and L. Sharp. 2016. "Case studies." In *Routledge Handbook of Qualitative Research in Sport and Exercise*, edited by B. Smith and A. Sparkes, 62-74. London: Routledge.
- Hunuk, D., M. L. Ince, and D. Tannehill. 2013. "Developing Teachers Health-Related Fitness Knowledge through a Community of Practice: Impact on Student Learning." *European Physical Education Review*, 19 (3): 3-20.
- Krutka, D.G. and J.P. Carpenter. 2016. "Participatory learning through social media: How and why social studies educators use Twitter. *Contemporary Issues in Technology and Teacher Education*, 16(1): 38-59.
- Krukta, D.G., J.P. Carpenter, and T. Trust. 2017. "Enriching professional learning networks: a framework for identification, reflection and intention." *TechTrends*, 61 (3): 246-252.
- Lave, J., and E. Wenger. 1991. *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.
- MacPhail, A., K. Patton, M. Parker, and D. Tannehill. 2014. Leading by example: teacher educators' professional learning through communities of practice. *Quest* 66 (1): 39-56.
- Makopoulou, K. 2017. "An investigation into the complex process of facilitating effective professional learning: CPD tutors' practices under the microscope". *Physical Education and Sport Pedagogy*, iFirst.
- Manca, S. and M. Ranieri. 2016. "Yes for sharing, no for teaching!": social media in academic practices. *Internet and Higher Education* 29: 63-74.
- Molle, D. 2013. "Facilitating Professional Development for Teachers of English Language Learners." *Teaching and Teacher Education* 29: 197-207.
- Patton, K., & M. Parker. 2014. "Moving from 'things to do on Monday' to student learning: physical education professional development facilitators' views of success". *Physical Education and Sport Pedagogy*, 19(1): 60-75.

- Parker, M., K. Patton, and D. Tannehill. 2012. "Mapping the landscape of practice as professional development in Irish physical education". *Irish Educational Studies*, 31(3): 311-327.
- Patton, K., M. Parker, and M. Neutzling. 2012. "Tennis shoes required: The role of the facilitator in professional development". *Research Quarterly for Exercise and Sport*, 83 (4): 522-532.
- Parker, M., and K. Patton. 2017. What research tells us about effective continuing professional development for physical education teachers. In *Routledge Handbook of Physical Education Pedagogies*, edited by C.E. Ennis, 447-460. New York: Routledge.
- Phoenix, C., and E. Rich. 2016. Visual research methods. In *Routledge Handbook of Qualitative Research in Sport and Exercise*, edited by B. Smith and A. Sparkes, 139-151. London: Routledge.
- Poekert, P. 2011. "The pedagogy of facilitation: Teacher inquiry as professional development in a Florida elementary school." *Professional Development in Education* 37 (1): 19-38.
- Ranieri, M., S. Manca, and A. Fini. 2012. Why (and how) do teachers engage in social networks? An exploratory study of professional use of Facebook and its implications for lifelong learning. *British Journal of Educational Technology*, 43(5): 754-769.
- Ross, C.R., R.M. Maninger, K.N. LaPrairie, and S. Sullivan. 2015. "The use of Twitter in the creation of educational professional learning opportunities. *Administrative Issues Journal: Connecting Education, Practice and Research*, 5(1): 55-76.
- Sato, T., and Haegele, J.A. 2017. "Professional development in adapted physical education with graduate web-based professional learning." *Physical Education and Sport Pedagogy*, 6, 618-631.
- Sparkes, A.C., and B. Smith. 2014. *Qualitative Research Methods in Sport, Exercise and Health: From Process to Product*. London: Routledge.
- Smith, M. K. 2009. "Communities of practice. *The encyclopedia of informal education*, www.infed.org/biblio/communities_of_practice.htm.
- Smith, B. and K. R. McGannon. 2017. "Developing rigor in qualitative research: problems and opportunities within sport and exercise psychology." *International Review of Sport and Exercise Psychology* iFirst
- Trust, T., D.G. Krukta, and J.P. Carpenter. 2016. "Together we are better": professional learning networks for teachers. *Computers and Education* 102: 15-34.
- Visser, R.D., L.C. Evering, and D.E. Barrett. 2014. "#TwitterforTeachers: The implications of Twitter as a selfdirected professional development tool for K-12 teachers. *Journal of Research on Technology in Education*, 46(4): 396-413.
- Wenger, E., Wenger-Trayner, B., 2015. *Communities of practice. A brief introduction*. Retrieved from: <http://wenger-trayner.com/introduction-to-communities-of-practice/>.
- Wesley, P.M. 2013. "Investigating the community of practice of world language educators on Twitter." *Journal of Teacher Education* 64: 305-318
- Whitcomb, J., H. Borko, and D. Liston. 2009. "Growing talent: Promising professional development models and practices." *Journal of Teacher Education* 60 (3): 207-212.

We would like to thank the reviewers for their helpful comments on revising this article. Below we have identified where these comments have been addressed. In addition, we have now revised the length of the paper and it is now 7490 words

Reviewer 1	
Comment	Addressed
2/36-7 - 'characteristics inherent within' – why 'inherent'? The term strikes me as not altogether necessary and potentially confusing.	Inherent has been deleted – and changed to what is the nature of a Twitter-based professional learning community and
2/53 – 'evidence to suggest that #pechat is a PLC' – who decides if it IS a PLC? Should the authors use language to show that it is their labeling/theorizing that makes #pechat a PLC? This would be more in line with their discussion of a relativist approach on p. 12.	While we agree with the change. We have chosen not to make this change as it would alter the tenses that we have used in the manuscript and do not feel that we/our would be representative of the paper.
3/73 – 'evidence-based practices are being transferred to the classroom' – I would expect practices to take place in the classroom. If this is the case, what is being transferred?	We have modified this sentence and it now reads As a result, there are concerns about teaching quality and whether classroom practices are evidence-based (Armour et al. 2017).
4/111 – 'the architecture' – sounds like a theoretical/specialist term but is not accompanied by any explanation. I can't say that I had anything but a vague idea of what it referred to.	This sentence has been changed to The concept of professional learning communities (PLCs) is applied to explain the social media-based learning context(s).
5/117 – 'an extensive evidence-base reports' – this sentence would be clearer with an actor doing the reporting. Maybe 'A number of researchers have reported...'	We feel that the suggested change conveys the same meaning and we have chosen not to make the change
5/125 – 'extensive and international' – one of the terms is redundant	We have deleted extensive
5/127-37 – I don't follow how the three types of PLCs and the five distinguishing characteristics fit together. Do the three types have different characteristics? Some clarification here would be greatly appreciated.	Due to space we have not elaborated on these fully but have signposted to the Table for further information
7/170 – 'Learning to talk' – suggestion: 'learning to talk the language of the community'.	This change has been made
9/216-18 – this sentence does not describe the topic of the chat in very much detail. It could be that the topic was not very specific but if that is the case, it should be made clear for the reader.	We have chosen not to elaborate on this due to space
9/232 – 'the sample size was consistent with research undertaken in sport, exercise and	Please see changes made on page 8 Following this approach, a sample of 18 was considered to

health' – there is quite simply a massive amount of research undertaken in this discipline, and many approaches to sampling. The authors need to find some specific support for their method of sampling. Was it convenience, probability, purposive/targeted, snowball...? Then the authors can include a short statement of why this was suitable for this investigation and provide a reference.	provide a level of rigor (Sparkes and Smith 2014).
9/233 – 'robust' is used too often throughout the paper.	The term is only used on 4 occasions and we feel that is acceptable
11/279 – sounds to me like this was the first part of the analytical process (followed by the second part), rather than two distinct processes taking place(?)	We have changed terminology to steps
12/293 – 'guide validity' – can validity be guided?	This change has been made
14/347 – I think there is an apostrophe missing.	This change has been made
18/472 – either 'rock the boat' or 'play devil's advocate' is redundant.	Changed
21/571 – 'participation' should be 'participating'	Changed
22/585-88 – different font.	Changed
Reviewer 2	
<p>I would like to thank the authors for addressing the issues raised in my initial review. The resubmitted paper has been amended to respond to a number of these points and I would suggest it presents useful data that highlights the potential of twitter as a valuable feature of teachers' professional learning. In particular, as in the initial submission, the paper offers important observations about the roles that different teachers play in the #PEchat sessions and how these sessions offer the opportunity for different practice ideas to be shared.</p> <p>In my original review I commented on the need for more clarity about PLCs and their role in this study. While more detailed and helpful background about PLCs is now included in the text, I would suggest that this background highlights the key issue with the study. On page 5 the authors highlight how PLCs have their basis on "interaction and discourse over time through discussion, analysis and problem</p>	<p>Thank you for raising this issue. We agree that CoPs are not haphazard groups – and claims cannot be made based on examinations of workshops. In the revisions we have made extra steps to navigate this interpretation of the data, and ensure that the claims we make about PLCs are grounded in data that does reflect PD participants on-going learning experiences. Indeed, the tweet data are representative of interactions on Twitter at a specific moment in time, the interview data however, is reflective of participants experiences of #pechat over time. We do feel that further evidence on on-going interactions is required and have suggested this as a way forwards for future research in the discussion.</p> <p>The changes we have made are:</p> <p>Page 7 line 173</p>

solving". From this critical point, I would suggest that the study being reported is not investigating the nature of #PEchat as a PLC but a series of one-off professional learning events in different parts of the world. As I note above, the paper makes valuable observations about the potential of #PEChat and twitter as a form of teachers' professional development but I do not believe it is able to make claims about the nature of these one-off sessions as PLCs. The conclusion to the paper would seem to support this point as there is little mention of PLCs. I am not suggesting that #PEchat is not a PLC but that to investigate the nature of #PEchat as a PLC the data would need to be collected over an extended period of time. I appreciate that that the authors have put considerable work into this resubmission but would suggest they need to re-think the basis upon which this data set is analysed and reported in the future.

At the time of the study #pechat (which had been running for approximately three years) was hosted bi-monthly and occurred at 7pm across five international time zones (Australian Eastern Time, Singapore Time, Greenwich Mean Time, Eastern Standard Time, Pacific Standard Time) on a Monday evening

First, similar to the approach adopted by Author (2017), data were generated from tweets made during the five chats using the application Twitonomy⁴. The aim of generating data from Twitter was to provide an illustrative example of the types of interactions within the Twitter chat.

Secondly, data were also generated from 18 individual interviews, that took place following the #pechat. The aim of generating data from interviews was to interpret how the participants engaged with the #pechat, and how they had engaged with #pechat over time (i.e. beyond the specific chat in March 2014). A purposeful sampling approach was adopted using a criterion-based technique (Sparkes and Smith 2014). This approach was selected to ensure that the participants of this study were representative of range of #pechat participants, but that had all participated in #pechat over a period of time.

To understand the nature and form of a PLC over time, data could be generated from Twitter over a series of #pechats.

688
689

Table 1. Landscape of professional learning*

	Collection of Authentic Teachers	Established Groups	CoP
Success	Acquisition of new ideas	Accomplished objective + empowerment	Accomplished objective +empowerment
Guideposts	When together	Continuous	Continuous
Facilitator	External/internal leaders and or workshop leaders. Dispenser of knowledge	Internal leaders and workshop leaders; some shared facilitation	Shared facilitation and workshop leaders
Roadblocks	Leader attempts to sort arising issues	Issues identified by group; solved by leader or shared facilitators	Issues identified by and solved by group
Potential	Change in isolated classrooms		Change school culture and physical education

*MacPhail et al. (2014, p.44)

Table 2: Functions of Twitter

Function	Description
Tweet	A post of up to 140 characters
Follow	A Twitter member can follow other Twitter members
Home Page	All of the tweets posted by members that are followed by a Twitter member can be viewed on their home page in chronological order
Retweet	A Twitter member can re-post a tweet made by another member to show appreciation and to share this tweet with their followers
Favorite	A Twitter member can favorite someone else's tweet to show appreciation. All tweets that the Twitter member has 'favorited' are stored in the favorites section to the site
@name	A tweet can be targeted at specific or several people by including the other members Twitter name into their tweet. For example, @MrSmith
Notification	When another member is tweeted, their post is retweeted or 'favorited' the Twitter member will receive a notification to inform them of this
Hashtag	A hashtag can be embedded into a tweet to identify a specific topic, a community, or to engage in a Twitter-based chat
Message	Twitter members can send private messages to other Twitter users that they are followed by. This message can only be viewed by the people within the message

Table 3 Characteristics of Interview Participants

Participant	Role in #pechat	Gender	Location	No of tweets
1	Participant	Female	South Korea	31
2	Participant	Male	USA	22
3	Participant	Male	UK	21
4	Participant	Female	USA	18
5	Participant	Female	Canada	21
6	Participant	Male	China	65
7	Participant	Male	Australia	17
8	Participant	Female	USA	16
9	Participant	Male	Singapore	3
10	Participant	Male	USA	3
11	Participant	Male	Canada	2
12	Participant	Female	USA	1
13	Participant	Male	USA	1
14	Participant	Male	USA	1
15	Moderator	Male	Singapore	51
16	Moderator	Female	Canada	57
17	Moderator	Male	UK	202
18	Moderator	Male	Canada	60