

THE COMPLEXITY AND CRITICALITY OF LONG-TERM COLLABORATIVE PROCESSES: SELF-STUDY ON ONE PHYSICAL EDUCATION TEACHER-RESEARCHER WITHIN A KNOWLEDGE COMMUNITY

A COMPLEXIDADE E A CRITICIDADE DOS PROCESSOS COLABORATIVOS DE LONGO PRAZO: AUTOESTUDO DE UM PROFESSOR-PESQUISADOR DE EDUCAÇÃO FÍSICA DENTRO DE UMA COMUNIDADE DE SABERES 

LA COMPLEJIDAD Y CRITICIDAD DE LOS PROCESOS COLABORATIVOS A LARGO PLAZO: AUTOESTUDIO DE UN PROFESOR-INVESTIGADOR DE EDUCACIÓN FÍSICA DENTRO DE UNA COMUNIDAD DE SABERES 

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Abstract: There has been increasing recognition that social collectives, such as knowledge communities, support teachers learning and enhancing practice. At the same time, there is little research on how such communities form, are sustained over time, create professional knowledge and practices, and transform the professional lives of their participants. We address these gaps in this paper by drawing on self-study methodology to structure a critical reflection of Luiz's experiences of participating in an autonomous group of teacher-researchers that constituted their own knowledge community since 2005. Through critical friendship, a complexity thinking lens guided the shared reflection on Luiz's experience in the knowledge community by considering the relational connections, affective forces, opportunities for action and agential capacities that are continually made and reconfigured within the collective nature of learning communities. In conclusion, we discuss both the facilitation and cultivation of long-term collaborative processes towards a complex, critical, and socially just perspective of PETE.

Keywords: Physical Education teacher education (PETE). Community of practice (CoP). Collaboration. Critical friendship.

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1 INTRODUCTION

There has been a shift over the past four decades in respect to how the professional learning of teachers and teacher educators is conceptualised, structured, and researched, moving fundamentally towards an ecological perspective (BARAB; ROTH, 2006; BETTI; GOMES-DA-SILVA; GOMES-DA-SILVA, 2013; BRONFENBRENNER, 2005; GIBSON, 1979). Initially, there was little attention paid to the social and contextual elements of educators' work, with the focus being on short-term and off-campus workshops given by experts or specialists (EASTON, 2008; LYDON; KING, 2009). The underlying assumption being that professional learning was about "topping-up" one's professional knowledge and applying this in practice (GUSKEY, 2003; OPFER; PEDDER, 2011). There was little appreciation for practitioners as producers of knowledge, or how their practice was part of a broader learning ecosystem that both constrained and enabled pedagogical practices (DARLING-HAMMOND; HYLER; GARDNER, 2017). More recently, there has been a greater recognition that professional learning can occur across a variety communities and networks (both proximal and distal to the work setting), in a variety of spaces (both real and virtual) and increasingly facilitated by the connectivity provided by digital technologies (TOUR, 2017; TRUST, 2012; WEBSTER-WRIGHT, 2009).

In their recent review of the literature, Parker *et al.* (2022) conclude that professional learning communities in physical education professional development appear to be effective in a variety of ways, including supporting educator's curriculum and development, exploration of new pedagogical approaches, reducing isolation, and enhancing their professional work culture. This supports other research that also shows that learning communities have a positive influence on all teachers in respect to increasing collaboration, reducing isolation, improving job satisfaction, acquiring knowledge and skills, and developing practice and beliefs (DUFOR; EAKER, 2004; HORD, 1997, 2008; VESCIO; ROSS; ADAMS, 2008). At the same time, Parker *et al.*'s (2022) review also highlighted a range of issues, such as the uncertainty about the criteria for determining when a collective can be considered a learning community. There was also little research on (1) how learning communities form, (2) how they are sustained over time, (3) how they create professional knowledge and practices, and (4) how they transform the professional lives of their participants. In essence, while there is evidence in support for learning communities in professional learning, there are still some gaps that need further investigation.

In this paper we address these four gaps through a self-study of participating in a knowledge community formed through the collective efforts of a group of physical education teacher-researchers in Brazil. The nature of this community and the way it supported the professional development of its members has been researched in previous studies (e.g., SANCHES NETO *et al.*, 2006, 2013; SANCHES NETO; OVENS; CRAIG, 2015). However, these earlier publications tended to be more descriptive of the group dynamics and its work as a community of practice (CoP), rather than reflecting on the complexity of how this knowledge community emerged as a means to support transformation of practices and enable agentic capacities for its members. In this paper we turn to consider these issues through a self-study in which Luiz (the

lead author) critically reflects on his participation as a member of the community. Through a critical friendship formed by the other two contributing authors, we use complexity thinking to examine Luiz's experience in the facilitation and cultivation of the knowledge community to better understand how learning communities form and are sustained over time, how they create professional knowledge and practices, as well as how they transform the professional lives of their participants.

1.1 A COMPLEXITY THINKING LENS ON SOCIAL COLLECTIVES

The theoretical underpinning of the paper uses a complexivist perspective which enables us to conceptualise the human participants as sensing, knowing, embodied and embedded within affective assemblages of thought, language and material forms (e.g., schooling contexts) (ATTENCIO; JESS; DEWAR, 2012; OVENS, 2017). In particular, we draw on four key concepts from complexity thinking to frame our analysis. Firstly, we focus on the concept of "relational connections" and the way social collectives are constituted through the connectivity of their members. This focus allows a sensitivity to the dynamic and emergent nature of social collectives (like knowledge communities) and the way they are constantly changing as they move through time and space (OVENS; BUTLER, 2016). Secondly, we focus on the way social connectivity is driven by the "affective forces" that underlie human decision making. This shifts attention to the way individuals actively seek to be part of a social group, often because they share an affinity to, or interest in, a common belief, practice or culture (GEE, 2005). Thirdly, we consider how participation in a social collective opens up avenues for further action from members by drawing on the concept of "affordances" (GIBSON 1979; PYYSIÄINEN, 2021). This allows us to shift attention to the way sociocultural environments enable possibilities for action that are not properties of the group, but rather relational and emerging as an outcome of group activity. Finally, we draw on the concept of "agential capacities" to focus on how the interactions and entanglements of people generate the capacity for action. Agency, in this sense, is a relational quality where the capacity to act is constituted by the system the individual is a part of (BENNETT, 2004). Our analysis is then focussed on the affective forces, relational connections, affordances, and agential capacities that are continually made and reconfigured within the collective nature of knowledge communities.

1.2 BACKGROUND

The background for this study is a group that was initially formed in 2005 by four Brazilian physical education teachers who began to contact one another by telephone, e-mail exchanges, and informal conversations. A core driver to the formation of the group was their desire to research their own practices and their collaboration allowed them to talk, reflect, and undertake collective inquiry. In their own words, they described themselves as "an autonomous group of physical education teacher-researchers without institutional affiliation" (SANCHES NETO, 2014b, p. 64), meaning their collective was autonomous and self-governing, and not connected to any university or school. It was a group in which their teaching beliefs,

knowledge and aspirations could be shared, discussed, validated and challenged between members (CONCEIÇÃO; ARAÚJO, 2020; OVENS; STROM; GARBETT, 2016). Craig (1995) and Craig *et al.* (2020) describes groups that work in this way as knowledge communities because they provide an interactive space or locus where teachers negotiate meanings for their own experiences and validate the production of their own professional knowledge. In this paper we will call the group an autonomous knowledge community (or “group” for short) because it provides a useful description of the collectivity the group aspired to create that the term “learning community” does not fully capture.

To help facilitate their connections and discussions, and enable new members to join, they created a website for the group in 2006. There was keen interest from others, and, by 2011, there were 268 members connected through their website, including teachers from all regions in Brazil and faculty from other areas and different levels of basic and higher education. Such a large group unlocked new avenues for research and Luiz studied the complexities of this popular network in a variety of ways, including the (auto)biographical narratives of the co-founders and the professional (labour experiences), academic (schooling and higher education pathways), and sociocultural (friends and family affairs) issues that were important to their connection as teacher-researchers (SANCHES NETO; OVENS; CRAIG, 2015; SANCHES NETO *et al.*, 2017).

Working collaboratively to research their own teaching was an important focus for the group since its inception. Their first collective reflections resulted in an inquiry about assumptions on their own theories of actions and theories in use (SANCHES NETO *et al.*, 2006), informed through vignettes that they had learned from Tsangaridou and O’Sullivan (2003). Another example of collaborative writing were the two books the teacher-researchers wrote together in 2017 (OKIMURA-KERR *et al.*, 2017; VENÂNCIO *et al.*, 2017). These examples of publications arose as a by-product from the group’s need to take the necessary time for ideas to coalesce around discussions, agendas for inquiry to be set and then collectively to agree on the outcomes. For example, one article that eventually got published in the *Movimento* journal (SANCHES NETO *et al.*, 2013) took five years to write because it was continually adjusted, considered and revised as many group members, both core and peripheral, were involved in its production.

After 17 years, the knowledge community continues, albeit in a smaller form. Three of the co-founders had a Master’s degree from the group’s onset in 2005 and now there are five Masters, one PhD and four postdoctoral members between them. All co-founders work currently as teacher-educators, two of them working part-time jobs both as school physical education teachers and teacher educators. Ten key members, including Luiz, continue to meet and keep ongoing collaborative reflections on their teaching an active part of their community (CONCEIÇÃO *et al.*, 2022; OKIMURA-KERR *et al.*, 2017; VENÂNCIO *et al.*, 2017). It is this community, and the collective data and experiences produced over the past 17 years, that provide the experience for this self-study.

2 METHODOLOGY

Self-study methodology provides a means to support a systematic reflective analysis of the experience of professionally developing through and leading a knowledge community. Core to self-study is the idea that turning the critical gaze on oneself enacts a disposition of desire, particularly in the sense that it “reflects a desire to be more, to improve, to better understand” (OVENS; FLETCHER, 2014, p. 7). In other words, the underlying common purpose in self-studies is to become more fully informed about our process(es) of enacting practice and to explore and build on these “learnings” in public ways (LOUGHRAN, 2007). The characteristics of self-study are that it is “self-initiated and focused; it is improvement-aimed; it is interactive; it includes multiple, mainly qualitative, methods; and it defines validity as a validation process based in trustworthiness” (LABOSKEY, 2004, p. 817).

2.1 UNDERSTANDING SELF AND DATA THROUGH SELF-STUDY

Our data set consisted of previously collected data and research on the knowledge community (SANCHES NETO, 2014b; SANCHES NETO; SOUZA NETO, 2016), including previously written biographies by the teacher-researchers (SANCHES NETO, 2014a), which stimulated Luiz to also construct a similar biography of his own journey into teacher education. The analysis of the data set was complemented with e-mail correspondence, Google Docs™ comments, and recorded Google Meet™ conversations. We – the authors – initially started meeting online and conducted more formal meetings where our discussions sought to trigger memories, challenge interpretations, and see experiences from new perspectives. This process, of generating and sharing memory-stories, provides a powerful way of facilitating critical reflection on the sociocultural structuring of experience (HAMM, 2013; 2021; OVENS; TINNING, 2009). We have met seven times for about 1h30min each meeting. This approach enabled an ongoing, iterative and generative process with the aim to make the tacit knowledge constructed through Luiz’s experiences explicit and available to us for reflection and interpretation.

2.2 COLLABORATION AND CRITICALITY IN DATA ANALYSIS

A self-study is explicitly a collaborative process in which one’s experiences are shared and analysed through dialogical discussions with critical friends whose role is to listen, empathise with particular events, seek clarification where needed, provoke and challenge interpretations, and provide different viewpoints (OVENS; FLETCHER, 2014). It is neither an easy nor a simple task to research the self of a teacher-researcher through self-study methodology (SAMARAS; ROBERTS, 2011). In this case, it demanded discussion about getting rid of the “trauma of evidence” for the first time for Luiz. Being himself a teacher-researcher and teacher educator, Luiz had to recognise this writing both as an autocritical and safe space. As a process different from other previous types of academic conversations, it was completely unnecessary to reaffirm his validity as a teacher-researcher through numbers and figures as a form

of evidence. Instead, there has been a solid trustworthiness process through dialogue with the two critical friends.

The notion of evidence has been embedded in digressions, memory, and insights while we carefully searched for themes from the dataset. Entangled with criticality, complexity thinking in physical education teacher education (PETE) suggests a significant reworking of social ontology to embrace intersubjectivity. The method enabled a rich data set to be generated with each meeting generating another set of memories and insights. Our analytic challenge was to examine all of the empirical materials (including those generated as part of our meetings) to foreground the key embedded themes and construct a research narrative. We worked with the data in a recursive manner, seeking to describe it in relation to the following dimensions drawn from complexity thinking: a) affordances, b) relational connections, c) affective forces, and d) agential capacities. In this way, we used theory as a way of making sense of the empirical material rather than the empirical material being used to verify theory (ALVESSON; SKÖLDBERG, 2009).

3 FINDINGS

As a provisionally rational form of inquiry (FLETCHER; OVENS, 2015) we acknowledge that our interpretations in self-study, as in any analysis of research materials, are situated and partial. Our aim is not one linked to a representational epistemology of using data to gain a more accurate understanding of reality, but about finding more complex and creative ways of interacting with our reality, with which we can then use to interact in yet more complex and creative ways (OSBERG; BIESTA; CILLIERS, 2008; ST. PIERRE; JACKSON; MAZZEI, 2016). In this sense, our interpretations provide a productive way of shifting attention to the co-constitutive relatedness of human relationships and the social-cultural-material environments in which the knowledge community takes place. In what follows, we discuss the higher order themes underpinned by the complexity thinking framework through i) relational connections, ii) affordances, iii) and affective forces (respecting that these are interconnected) before considering how these dimensions gather to generate iv) agential capacities for members of the group. Within each main theme, respective sub-themes will be highlighted.

3.1 RELATIONAL CONNECTIONS

Social groupings emerge through their connections and functions. In this sense, understanding how the group emerged and sustained itself as an entity means being sensitive to relationality, particularly in the sense that affiliation, group cultures and affects are deeply entangled and emerge from the connected, connecting and connectable nature of elements in any educational assemblage (GARBETT; OVENS, 2017). The sub-themes generated under relational connections are represented in the ideas of “Building on Critical Friendship to Nurture a Values-Based Knowledge Community”, “Negotiating Horizontal Leadership Relations and Opportunities”, and “Collective Support to Individual Academic Development”.

3.1.1 Building on Critical Friendship to Nurture a Values-Based Knowledge Community

For Luiz, the formation of the group was driven by the participants actively connecting through friendships and shared values, and was facilitated in a range of ways, both face-to-face and online, as well as by a commitment to collaborative projects. It was very much a "self-organising" development in which the leadership, culture and membership were embedded within the ongoing negotiation of being members. There has been non-hierarchical structure, with the group being formed organically by connecting the teachers' contextual complexity microsystems. Part of the value of their encounters was the support they could give each other in the desire to be teacher-researchers (ELLIOTT, 2017; VENÂNCIO; SANCHES NETO, 2022). One of the key values was being able to challenge the discrimination and oppression, as to be discussed in the affordances and affective forces sections. The group started from a friendship Luiz developed with one of the other founding members (Tiemi). Both enrolled in the same PETE degree program in the mid-1990s at the University of São Paulo. They found a common interest in physical education and used to safely discuss issues about the lack of criticality in their practicums. Then, when Luiz began his Master's, he linked with another co-founder (Luciana) through their shared concern that their academic education lacked a focus on social justice issues. The fourth co-founder (Carla) was introduced to Luiz by Tiemi as someone else sharing similar views. Connections like this enabled the group to grow, with new people being introduced because of their concerns with conventional forms of physical education and university learning, and a desire to politicise and research their own practice. The group expanded to a core of around 14 members, before the development of the website that allowed a broader range of people to connect.

Implicit in this is the fact that connections were made between people based on shared concerns about conventional forms of physical education teaching and the desire to position themselves as teacher-researchers. However, as a form of social collective, the nature of these relational connections varied and changed as the group evolved over time. Wenger, Trayner and Laat (2011) suggest that groups have different levels of relevance to different people and, when the boundaries of the group are flexible, participation can vary between being core, active, occasional, or peripheral members. Luiz experienced this in this study. At the core of the group was a relatively small number of people whose passion and engagement energised and nurtured the group. From 2005 to 2012 there were twelve core members in addition to Luiz. Outside of these people, there were other members that could be identified as more active, occasional, or peripheral members (SANCHES NETO, 2014b). These people tended to participate when the topic was of special interest, or when they were involved in a project. They tended to have less engagement and authority, either because they were newcomers or because they did not have as much personal commitment to what the group was about. The core group remained relatively consistent and, as of writing this paper, continues to have ten key members, including Luiz, who keep ongoing collaborative reflections (CONCEIÇÃO *et al.*, 2022; OKIMURA-KERR *et al.*, 2017; VENÂNCIO *et al.*, 2017).

3.1.2 Negotiating Horizontal Leadership Relations and Opportunities

Relational connections were also core to the way leadership of the group emerged and was negotiated. Luiz refused the leadership role from the outset. For him, leadership must be shared and circulated within the knowledge community. He saw allocating leadership roles as a stratifying practice in the sense that, if there is someone to be a leader then there must be led ones. For him, teachers were critical intellectuals and were not supposed to be led. In his view, leadership should be embodied as a co-responsibility of all group members. In practice, this meant that when members suggested a discussion topic, they were responsible to lead the meeting about that topic. Such democratic and inclusive collaboration underpinned a non-hierarchical leadership where decision making was shared between the teacher-researchers. It is an approach that is in line with McCuaig *et al.* (2020) affirmation on the need for collaborative and adaptive leadership skills for physical education teachers and teacher educators.

3.1.3 Collective Support to Individual Academic Development

Relational connections were also core to enabling and sustaining the career paths of members. For example, Luiz wrote in his PhD about the importance of the group to enabling him to undertake his postgraduate studies. As he writes,

The research project that originated my PhD dissertation is anchored in the interaction with this group of “teacher-researchers”, and the possibility of systematising their collective actions. Particularly, they became very close to me: I ended up researching with my wife and friends. It was therefore necessary to face the risk of bias due to “contamination” of the data and “irrelevance” of the sample, according to innumerable critiques from academicians and scholars. The decision was to face this risk with the support of experienced researchers¹. It is necessary to acknowledge that the viability of this research is mainly due to their contributions, together with the teacher-researchers from the group who also assumed themselves as researchers in the project (SANCHES NETO, 2014b, pp. 7-8).

For Luiz, his agency to carry out this self-study as a teacher-researcher stems from his relationships with his fellow teacher-researchers and other key academics. Such relationships supported his work and sustained him against criticism. As he stated,

The criticality and complexity of the research were possible due to the permanent dialogue established with all the teacher-researchers [...]. I hope I respected them in the investigation. I hope, more than that, to continue having their friendship for the rest of my life. In a way, I think we are **critical friends** (SANCHES NETO, 2014b, p. 8).

3.2 AFFORDANCES

Relational connections, as evidenced above, emphasise the centrality of processes of co-constitution. Relationships are constitutive of, and capable of, shaping

¹ They are Prof. Dr. Samuel de Souza Neto (PhD advisor), Prof. Dr. Mauro Betti (Master's advisor), Prof. Dr. Cecília Maria Ferreira Borges (international supervisor), Prof. Dr. Maria Amélia do Rosário Santoro Franco and Prof. Dr. Dario Fiorentini (critical readers), and Prof. Dr. Elisabete dos Santos Freire (critical observer).

social collectives in ways that open up avenues for further action from members, otherwise known as affordances (GIBSON 1979; PYYSIÄINEN, 2021). The members of the group participated because of what the group offered them, reflected in the sub-themes of "Sharing Cultural Affordances on Social Justice and Anti-Racism", "Challenging Educational Policies and Practices", and "Spanning Boundaries across Countries and Epistemologies".

3.2.1 Sharing Cultural Affordances on Social Justice and Anti-Racism

Participants valued the collegiality and affinity to a shared set of beliefs about researching their own practice and addressing issues of social justice and anti-racism as a shared and cultural affordance (RAMSTEAD; VEISSIÈRE; KIRMAYER, 2016; SILVA *et al.*, 2013). Collaboration afforded them the opportunity to research, publish and advocate on particular issues. There was value in the way the group could validate a political stance that was in opposition to more established professional associations that were not addressing issues of equity, justice or inclusions. Explicit in this is the value of autonomy (CONTRERAS DOMINGO, 2001), particularly in the way the group could set their own agenda and focus on the issues that were important to them. An example of this for Luiz was when he and three others from the group analysed how white educators and liberal institutions played key roles in perpetuating racism and whiteness in the constitution of their teacher identities. In the paper that was eventually published (CONCEIÇÃO *et al.*, 2022), their collaboration afforded the opportunity of the critical friendship needed to confront the discourses and practices that naturalize racial oppression in Brazil. Their collaboration afforded a safe environment to discuss how the concept of whiteness operates in the hierarchy and maintenance of racial privileges of white people and its implications for teaching and teacher education. In recalling their stories in the schooling process, Luiz identified racist practices that were repeatedly normalised.

3.2.2 Challenging Educational Policies and Practices

The group, and the research they supported, afforded opportunities to challenge and shape the educational practices they were engaged in creating. This was important because, as Luiz noted, even though he could draw credibility of being a professor in a PETE undergraduate degree program and two Master's programs (in Ceará and Rio Grande do Norte) it does not guarantee credibility or trust before undergraduate students - especially in practicums as he has investigated collaboratively (BRUNO *et al.*, 2022; SANCHES NETO *et al.*, 2018; VENÂNCIO *et al.*, 2021). Despite that, according to Conceição *et al.* (2022), this movement of reflection allows them today to fight collaboratively and intersubjectively for anti-racist education while navigating in a more complex way as part of a knowledge community of teacher-researchers.

Related to this is the important affordance offered by the group to adopt and validate a particular political stance in respect to being teacher-researchers and their role in being advocates for socially just physical education curriculum and pedagogy.

The group provided the means to have a 'voice' in relation to educational policy and change, such as:

- Curriculum contents emerged as a collective framework and trigger of the group – the *National Curriculum Parameters* were compulsory by 2005 (CBCE, 1997; DARIDO *et al.*, 2001). Then, criticism towards the Brazilian curriculum triggered a collective construction of an alternative and situated curriculum systematisation framework in terms of contents, objectives, strategies, and assessment within the group (SANCHES NETO *et al.*, 2006);
- There were 15 theoretical-methodological approaches to physical education teaching referred to in the literature by then (SANCHES NETO, 2003; SANCHES NETO; BETTI, 2008) on which the teachers were assessed to get their professional qualification - these were in place at the time of the group's beginning and a need of coherence was identified by the teacher-researchers (SANCHES NETO; VENÂNCIO; OVENS, 2021);
- The group presented their proposal to two Brazilian academicians (Jocimar Daolio and Mauro Betti) who started to organise a physical education curriculum proposal to the São Paulo state network - Luiz and Luciana were invited and worked as curriculum makers in this process (from mid-2007 to late-2009) (BETTI *et al.*, 2014, 2015; SANCHES NETO *et al.*, 2014b; VENÂNCIO; SANCHES NETO, 2018).

3.2.3 Spanning Boundaries across Countries and Epistemologies

The research and publications produced by the group also afforded Luiz with the quantum of PETE scholarship to further his own professional career and extend his range of connections. For example, from writing (auto)biographical narratives of his teaching within the group he was able to participate in the 4th *International Congress of (Auto)biographical Research* (CIPA) in 2010 (VENÂNCIO *et al.*, 2010). Throughout the following years, he attended and participated in self-study conference sessions at the *International Study Association on Teachers and Teaching* (ISATT) (SANCHES NETO; OVENS, 2017; SANCHES NETO; OVENS; CRAIG, 2015; SANCHES NETO; SOUZA NETO; BETTI, 2013; VENÂNCIO; SANCHES NETO, 2011). As an international affiliate, he also participated in several webinars of the *Self-Study of Teaching and Teacher Education Practices* (S-STEP) Special Interest Group (SIG) of the American Educational Research Association (AERA) (KITCHEN *et al.*, 2020). Such experience contributed to Luiz becoming an advocate for self-study in Brazilian PETE in the past decade. For instance, he taught a course on S-STEP to graduate students, supervised a Master's thesis and introduced the methodology to PETE practicum undergraduates (SANCHES NETO *et al.*, 2018; VIEIRA; ABREU; SANCHES NETO, 2022).

3.3 AFFECTIVE FORCES

Discussion about the group and reflections on what was the "glue" that held everyone together for so long frequently revealed affective forces that either had direct impacts on the way the group operated or indirectly enabled the group to work

collaboratively. These affective forces were represented through the sub-themes of “Mutual Positive Feelings”, “Ethical Tensions Arising with External Recognition”, and “Co-Responsibility for and Co-Ownership of the Knowledge Community”.

3.3.1 Mutual Positive Feelings

As discussed above, the group formed around a common set of values and politics, which enabled mutual feelings of safety, autonomy, openness, trust, validation and support. In such a sense, autonomy has a political collective meaning that depends on collaboration between teachers because when a teacher simply claims autonomy as a justification for working individually, it is perversity instead (CUNHA, 1989). Over time, there were also feelings of achievement, commitment to one another, and motivation. The impetus to form a group itself stemmed from the desire to enact a political stance in respect to other professional associations and institutionalised research groups that were present in the Brazilian physical education field.

3.3.2 Ethical Tensions Arising with External Recognition

There has been a recognition of the group through their participation in academic and scientific events. For Luiz, the “culture of events” is important both to share collectively and learn collaboratively. The first time the group was paid for presenting a workshop at an event was in 2009. By that time, one institutional research group tried to prevent other collectives from presenting workshops, but the event coordinator kept the teacher-researchers’ group in the program and consulted with Luiz about the circumstances. Luiz was a member of both collectives (the autonomous group and the institutional research group) and decided to decline his membership in the institutional research group after that even though his former PhD supervisor was its leader by then. Such a decision – as well as its timely aftermath – seems connected to Luiz’s personal politics and ethics, choosing an advocacy stance for the autonomous knowledge community rather than the power relationships that could work in favour of his academic position as a graduate student. In fact, Luiz changed PhD supervisors after three and a half years (2006-2009) and redesigned his research project through 2010 – emphasising, even more, the PETE complexities and collaboration processes between teacher-researchers within the group – while taking another three and a half years (2011-2014) period to conclude his dissertation.

3.3.3 Co-Responsibility for and Co-Ownership of the Knowledge Community

Circulating leadership between members of the group has an impact on the individuals involved (MCCUAIG *et al.*, 2020). The data suggests that co-responsibility in suggesting topics and leading meetings, workshops, writing projects etc. appears to have influenced the teacher-researchers to seek academic qualification by their own, enrolling in Specialisation programs, Master’s, PhD and post-doctoral studies. Luiz refused the core leadership role decisively and built his PhD and post-doc projects from the group collaboratively with his peer members. Nevertheless, perhaps the

group allowed him to be the leader the way he wanted to be, i.e., by sharing the leadership for a sense of co-ownership.

3.4 AGENTIAL CAPACITIES

In this section we turn our attention to considering how the affordances, relational connections, and affective forces that constituted the group generated agential capacities for its members. In framing these agential capacities, three sub-themes were identified as “Metaphors of Agency”, “Navigating through Complex Ontologies and Epistemologies of Knowledge Communities”, and “Facilitating the Nurture and Sustainability of the Knowledge Community”.

3.4.1 Metaphors of Agency

Two metaphors – “springboard” and “momentum” – were repeatedly used as ways agential capacities were generated with and through the enactments of the group. In respect to the “springboard” metaphor, the group created a type of platform for the future career trajectories and desired outcomes for its members. In respect to the “momentum” metaphor, the group enabled a collective focus, progress and motivation for specific objectives. Luiz speaks of a core of 10 teachers (including himself²) who have kept connected, following the idea of a French anthropologist (CLASTRES, 2011a, 2011b) when speaking of Brazilian Indigenous societies against the state, i.e., who want to make decisions by themselves and not to be dependent on an external regulator, e.g., in this case portrayed by the CREF/Confef system. It also connects to the thinking of an Indigenous intellectual and activist (KRENAK, 2021), regarding the necessary dialogue to resist the injustices promoted by the Brazilian state. Krenak (2021) advocates for knowing the sense of our history – as planetary relatives – and the emergence of collaborative experiences – still invisible to the state and stakeholders – happening in communities, entangled in multiple networks. Both Clastres (2011a, 2011b) and Krenak (2021) explain experiences of collaboration against anthropocentric or individualistic world views.

3.4.2 Navigating through Complex Ontologies and Epistemologies of Knowledge Communities

Across their 17 years, the group was able to enact a safe space for criticism. Then, Luiz’s narrative is related to the insights of that entire period. This way, back then at the time of the PhD, thinking about himself and the teacher-researchers as a CoP has been helpful but, at the same time, Luiz expressed being conscious that they are not a CoP under its conceptual definition (WENGER, 1998). At that time, the concept of a CoP was used only to make sense of the dataset. More importantly, questions about his own agency and professional learning emerged: “What autonomy do I have as a physical education teacher in relation to, or confronting principals,

² Regarding Luiz’s pathway to becoming a teacher-researcher, see the course *Physical educations: emerging themes for (im)possible worlds* (module 1) from *Geprofef-IFSuldeMinas* – retrieved from: <https://www.youtube.com/watch?v=uZ5oo45k-IE&t=3621s> – and the project *Historying* (episode 9) from the *Brazilian Journal of School Physical Education (Rebescolar)* – retrieved from: <https://www.youtube.com/watch?v=p7Ot3zs5qe4>. Accessed: 12 Feb. 2022.

coordinators, stakeholders, etc.? How can we – as an autonomous collective – be agentic about the connections that we make? How to engage teachers outside schools with other colleagues instead of colleagues within the school? What are the boundaries and roles learned from institutional research groups that influence the dynamics of the group?”. With such questions in mind, we discussed internal communities and outside school communities as both are necessary, and reflected on Luiz’s work as a school teacher. Critically, this process aligns with a systemic and reciprocal connection across different settings and levels of contextual complexity of facilitating professional learning through nested systems of knowledge communities (ATTENCIO; JESS; DEWAR, 2012). Concurrently, as discussed by Ovens (2017), this account demonstrates how complexity thinking and its foregrounding notions allow to theoretically frame inherently complex, dynamic and collective interactions between teachers and their sociocultural and socioprofessional settings towards the development of professional learning.

3.4.3 Facilitating the Nature and Sustainability of the Knowledge Community

For Luiz, while teaching physical education, it has been important to assume a Freirean perspective about returning to himself as a teacher-researcher and as a teacher educator (FREIRE, 1996). Collectively, such a perspective demanded the agency to build a supportive network since the PETE degree course (OVENS; GARBETT; HUTCHINSON, 2016). We identified three facilitating factors, including: (1) agency, (2) making connections, and (3) critical events that made Luiz move and create the group by that time. These factors denote the value of working in knowledge communities that contribute to the development of teachers (PARKER *et al.*, 2022, PARKER; PATTON, 2017). Luiz had to reflect on how valuable it has been for him to work within the group in terms of safety and some other important issues, like the sense of autonomy along with the lifespan of the group and a collective need for the group. Then, two questions arose from our shared reflections: How did the group operate? What does it take to sustain a meaningful knowledge community of teachers? We found three issues regarding a possible explanation for the group dynamics, then we revisited them to deepen our understanding, in terms of: i) affinity (commonality of values), ii) social semiotics, and iii) authenticity.

Affinity. There has been a commonality of values shared by the teacher-researchers based on their *affinity* from career planning, and discussions on participatory planning to better contextualise teaching with their students. Enhancing the students’ learning is a constant challenge in teaching towards social justice (MODELL; GERDIN, 2022). For Flor *et al.* (2020) and Silva and Noffs (2020), democratic and progressist values are embedded in participatory planning for teacher-researchers and are critical to enacting politically engaged teaching. Besides, the convergence between the dynamics of culture, movement, body, and environment has been advocated thoroughly by Luiz both as a value and as criteria for coherence in teaching (BORGES; SANCHES NETO, 2014). For the teacher-researchers, as a knowledge community, such a convergence means an epistemological foundation entangled in their practical argumentation and their premises about values, experiences, situated contexts, and teaching conditions (SANCHES NETO; SOUZA NETO, 2014).

Regarding *affinity*, from the metaphor of "taking a ride" (SANCHES NETO, VENÂNCIO; OVENS, 2021, p. 699) we discussed whether Luiz and Luciana would have been co-opted as curriculum makers. It seems not to be the case as they were both respected intellectually throughout the decision-making process. They participated directly in negotiations with the governmental stakeholders and demanded more meetings to dialogue with the state network teachers. However, even being available, they were not heard by academic researchers avid to publish papers on the curriculum making as soon as possible due to the visibility and impact of that network (VENÂNCIO; SANCHES NETO, 2018). São Paulo is the largest basic education network in the Southern hemisphere with more than 8,800 physical education teachers - from a total of 250,000 teachers in all subject areas - and more than 3,5 million students - distributed in 5,100 public schools.

Social Semiotics. In this sense, systematisation of teaching is often seen as sharing learning opportunities based on complexity thinking – converging cultural elements, intersubjective aspects, movement living experiences, and environmental demands – and criticality towards a more socially just physical education (SANCHES NETO *et al.*, 2013, 2021). Comprehending *social semiotics* from the thematic systematisation demands recognising a communication difficulty because the group refuses to generalise their systematisation either as a “new” or “innovative” curriculum proposal. Absolutely, the teacher-researchers do not suggest any attempt to “reinvent the wheel” as Luiz reinforces in his PhD dissertation (SANCHES NETO, 2014b) and post-doctoral report (SANCHES NETO; SOUZA NETO, 2016). Physical education teaching is situated and complex. And semiotics inspires multiple meanings and challenges for physical education teaching, questioning its culturalistic approach (BETTI, 1994, 2007; BETTI; GOMES-DA-SILVA; GOMES-DA-SILVA, 2013). Then, improving communication through respectful and critical dialogues with teacher-researchers as intellectuals is an aftermath of Betti’s reflection (2017, p. 56) about “*What academicians could learn from the teacher-researchers*”.

Authenticity. Fostering communication with scholars and being honest with teachers requires *authenticity*. We understand that *authenticity* is possibly compromised by the academic and institutional responsibilities of the different members, being necessary to address such issues for a discussion on the meaning of “authentic” in this context. Thus, it is interesting to consider this in relation to the different groups (as PETE specific spaces) that Luiz occupied. For instance, we found the following four aspects as possible assumptions related to the facilitators: (1) it is authentic when a school teacher develops his/her own teaching – as Luiz justifies his teaching in relation to a complexity thinking notion advocated by the group collective; (2) *authenticity* can be defined by the measure of risk and openness in terms of group belonging – according to Luiz’s personal politics (agenda) when navigating between the knowledge community and the curriculum-making group (BETTI *et al.*, 2014, 2015) because the curriculum frameworks from both groups were not necessarily the same (SANCHES NETO *et al.*, 2011, 2014); (3) it is interesting to find that the group unlocked more professional development and career opportunities than the São Paulo curriculum-making group - as such opportunities reflected on pedagogical dilemmas discussed by the teacher-researchers within the group (SANCHES NETO *et al.*,

2011); and (4) meeting spaces were public (i.e. not structured) – which also reflects the political perspective of “going against” formalised spaces as an “autonomous group of teacher-researchers without any institutional affiliation”.

Ultimately, *authenticity* was represented not from a deficit and passive perspective of these teachers being “topped-up” on knowledge from an external entity (GUSKEY, 2003; OPFER; PEDDER, 2011). The narrative from this self-study shows how important it is for teachers to develop their own sense of *authenticity* in the epistemological and ontological dimensions across a variety communities and networks (both proximal and distal to the work setting), in a variety of spaces (both real and virtual) and increasingly facilitated by the connectivity provided by digital technologies (TOUR, 2017; TRUST, 2012; WEBSTER-WRIGHT, 2009).

4 CONCLUDING THOUGHTS

In conclusion, while a complexity thinking lens guided the shared reflection on Luiz’s experience in the knowledge community, the study findings address the stated gaps in the literature in relation to how a community of teacher-researchers may be formed, how it can be sustained over time, how teachers create professional knowledge and practices, and how they transform their professional lives. This self-study presented different heuristics of the same problem, providing epistemological or ontological insights on the knowledge community dynamics and processes. Framing the knowledge community across the different heuristics under a complexity lens has been helpful to analyse its dynamics and comprehend its epistemological foundations. However, understanding its ontological sense as a knowledge community seems paramount for the transitions of the teacher-researchers as critical intellectuals. Particularly, for Luiz as a teacher educator, the dilution of institutional responsibility and accountability when at the group was a possible facilitator related to safety. Sustaining the group as a safe space for 17 years has been a complex task for the teacher-researchers because their relationships to knowledge change over time (VENÂNCIO *et al.*, 2022). As complexity thinking permeated Luiz’s assumptions, it is important to reinforce that complexity thinking is not a theory but rather an idea that foregrounds a situated form of an inquiry stance. Complexity thinking demands “considering the implications of assuming a complex world” and is “potentially generative of – and pays attention to – diverse sensibilities without making claims to or being trapped by universals or absolutes” (OVENS; HOPPER; BUTLER, 2013, p. 3).

In a sense, agreeing with Attencio, Jess and Dewar (2012), learning emerges through the relationships that develop between nested levels and constituent elements amidst the teacher-researchers which are themselves considered shifting, dynamic and diverse. For Luiz’s advances of social justice advocacy in physical education teaching depend on critical dialogue and collaboration about complex issues. Professional learning within the knowledge community has been a collaborative endeavour reflecting the complex interactions of teacher-researchers. By fostering long-term collaboration in PETE and critical friendship through self-study we are part of an ontological shift.

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Resumo: Tem havido um reconhecimento crescente de que os coletivos sociais, como as comunidades de saberes, apoiam a aprendizagem dos(as) professores(as) e aprimoram a prática docente. Concomitantemente, há poucas pesquisas sobre como essas comunidades se formam, sustentam-se ao longo do tempo, criam saberes e práticas profissionais e transformam a vida profissional de seus(as) participantes. Abordamos essas lacunas neste artigo, recorrendo à metodologia de autoestudo para estruturar uma reflexão crítica das experiências de Luiz ao participar de um grupo autônomo de professores(as)-pesquisadores(as) que constituíram sua própria comunidade de saberes desde 2005. Por meio da amizade crítica, uma lente de pensamento da complexidade guiou a reflexão compartilhada sobre a experiência de Luiz nessa comunidade de saberes, considerando as conexões relacionais, as forças afetivas, as oportunidades de ação e as capacidades proativas que são continuamente reconfiguradas na natureza coletiva das comunidades de aprendizagem. Em conclusão, discutimos tanto a facilitação quanto o cultivo de processos colaborativos de longo prazo em direção a uma perspectiva complexa, crítica e socialmente justa da formação de professores(as) de Educação Física.

Palavras-chave: Formação de professores de Educação Física. Comunidade de prática. Colaboração. Amizade crítica.

Resumen: Cada vez se reconoce más que los colectivos sociales, como las comunidades de saberes, apoyan el aprendizaje de los/as docentes y mejoran la práctica. Al mismo tiempo, hay poca investigación sobre cómo se forman, se sostienen en el tiempo, crean saberes y prácticas profesionales y transforman la vida profesional de sus/as participantes. Abordamos estas brechas en este artículo, recurriendo a la metodología de self-study para estructurar una reflexión crítica de las experiencias de Luiz al participar en un grupo autónomo de profesores/as-investigadores/as que constituyeron su propia comunidad de saberes desde 2005. A través de la amistad crítica, un lente de pensamiento de la complejidad hay guiado la reflexión compartida sobre la experiencia de Luiz en la comunidad de saberes al considerar las conexiones relacionales, las fuerzas afectivas, las oportunidades de acción y las capacidades proactivas que se reconfiguran continuamente dentro de la naturaleza colectiva de las comunidades de aprendizaje. En conclusión, discutimos tanto la facilitación como el cultivo de procesos colaborativos de largo plazo hacia una perspectiva compleja, crítica y socialmente justa de la formación de profesores/as de educación física.

Palabras clave: Formación del profesorado de educación física. Comunidad de práctica. Colaboración. Amistad crítica.

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CONFLICT OF INTERESTS

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

AUTHORS' CONTRIBUTIONS

Luiz Sanches Neto: conception, data, analysis, writing, revision and editing

João Costa: conception, analysis, validation, writing, revision and editing

Alan Ovens: conception, analysis, validation, writing, revision and editing

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