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ORIGINAL

EXPANDED LEARNING PROCESS IN MANAGING A PE TEACHERS' ON-LINE COMMUNITY OF PRACTICE

APRENDIZAJE EXPANDIDO: GESTIÓN DE UNA COMUNIDAD DE PRÁCTICA ONLINE PARA EDUCADORES FÍSICOS

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ABSTRACT

Through a case study, tensions detected in the design and management of an online community of practice for Physical Education teachers are investigated. The discussion is established within the conceptual framework of "Expanded Learning" (Engreström). A five-phase model was found. In phase 1, tensions arise between the ideas of the designers themselves; in phase 2, tensions are established between ideas and technological possibilities; in phase 3, tensions arise between developer ideas, practices, and participant needs; in phase 4, tensions between developers and practices continue, but mediated by the incorporation of new managers who come from the community of practice; and finally, in phase 5, designers and managers quit the forefront of the platform and their initial ideas end up dissolving among the ideas of the community

KEY WORDS: Virtual Communities of Practice, On-going Teachers Training, Expanded Learning.

RESUMEN

A través de un estudio de casos, se indaga en las tensiones detectadas en el diseño y gestión de una comunidad de práctica online de profesorado de Educación Física. El marco conceptual usado en la discusión es el “Aprendizaje Expandido” (Engeström). Se constata un modelo de cinco fases. En la fase 1, las tensiones se dan entre las ideas de los propios diseñadores; en la fase 2, entre las ideas y las posibilidades tecnológicas; en la fase 3, las tensiones surgen entre las ideas de los desarrolladores, las prácticas y las necesidades de los participantes; en la fase 4, continúa la tensión entre desarrolladores y prácticas, mediatizadas por la incorporación de nuevos gestores que provienen de la comunidad de práctica; y, finalmente, en la fase 5, los diseñadores y gestores van retirándose del primer plano de la plataforma y sus ideas iniciales acaban disolviéndose entre las de la comunidad.

PALABRAS CLAVE: Comunidad de Práctica Virtual, Formación del Profesorado y Aprendizaje Expandido.

1. INTRODUCTION

This article analyses the development and implementation of a virtual platform for educational practices in physical education (PE); teachers, university lecturers, and researchers participate in these programmes for initial and permanent training. This study aimed to investigate the tensions and expansive transformations encountered when implementing the ideas proposed by instructional designers and managers throughout the process.

In the previous two decades, efforts towards the development, consolidation and expansion of virtual communities of practice (vCoP) have proliferated. Some efforts were directed towards the pragmatic aspects, such as analysing different parameters for the success of virtual communities (e.g. Iaquinto *et al.* 2011; Preece 2000, 2001; Wegener and Leimeister 2012) or examining the design and administration of the community (e.g. Koch and Fusco 2008; McDermott 2003, 2004, Pallof and Pratt 2007). A majority of the case studies describe the operation dynamics of vCoP (e.g. Mak and Pun 2015; Schlager *et al.* 2004; Riverin and Stacey 2008; Trust and Horrocks 2017) and their potential and limitations. Lantz-Anderson *et al.* 2018 conducted an updated review of research on online teacher communities. However, to the best of our knowledge, no research has focused on the process of developing and implementing vCoP by instructional designers and managers for teachers.

The studied case has some distinctive characteristics from other CoP: 562 voluntary users (they are not a part of any institutional program) and different levels of professional socialisation (teachers in initial training and expert teachers), different work areas (primary, secondary, and university education), and various geographical origins (seven nationalities).

1.1. Conceptual framework

Wenger (1998) and Barab *et al.* (2003) initiated research on these processes with reference to Engeström (1987) and identified system tensions. Wenger (1998)

investigated these communities from the perspective of the interaction between system dualities, because Engeström (1987) stated that these contradictions enable the evolution of the dialectical analysis of the systems. According to Engeström and Sannino (2011, 370),

Dialectics deals with systems in movement through time. The elements of a dialectical contradiction relate to each other within the moving structure, historically. A dialectical contradiction refers to a unity of opposites, opposite forces or tendencies within such a moving system.

Engeström (1987) adapted the cultural-historical activity theory underlining the collective character of human activities by analysing the changes in activity systems as a process of resolving contradictions caused by structural tensions inside and outside the system. As a manifestation of these tensions, Engeström and Sannino (2011) identified dilemma (expression of incompatible evaluations, e.g. 'yes but'), conflict (resistance, disagreement or criticism, e.g. 'no', 'I disagree'), the critical conflict (situations in which people encounter inner doubts immobilising them against contradictory motives that cannot be overcome by them alone), and double bind (actors repeatedly encounter pressing and equally unacceptable alternatives in their activity systems with seemingly no alternatives, e.g. 'we have to'). To overcome these contradictions, people invent new meanings, which are termed by Engeström as 'expansive learning' (1987) and defined by Engeström and Sannino (2010, 2) as learning, in which learners construct and implement a radically new, wide and complex object and concept for their activity.

To understand the dynamics of MultiScopic and detect potential tensions regarding expectations, as well as interests and imbalances in its construction and development, several studies have examined different phases. Lave and Wenger (1991) described the basic process of legitimate peripheral participation; the dynamics of a CoP include tensions and changes in power distribution.

Lewellen (2009) presented structural contradictions between the vertical and horizontal interests of human groups subjected to power redistribution, that supposed some basic coordinates to be oriented, although vCoP developments revealed complex scenarios (Chua 2009; Fombrum 2003; Preece 2004), in which the roles of developers, administrators, community managers or participants maintain a dynamic tension (Kaulback and Bergtholdt 2008; Koch and Fusco 2008). These complex scenarios do not always fit the spatial metaphor proposed by Lewellen. In such dynamics, the tension between the diversity and coherence (Barab *et al.* 2004) is interesting, because of which a vCoP continually resists dispersion tendencies that disfigure its initial interests and identity.

Studies, such as Koch and Fusco (2008, p. 2), are consistent with those of Wenger (1998) and consider the CoP a self-reproduced, emerging and evolutionary community, which frequently extends beyond formal organisational structures. Barab *et al.* (2003, 238) state the following:

Much like a living organism, they are self-organising and cannot be designed prima facie. They grow, evolve and change dynamically, transcending any particular member and outliving any particular task.

Similarly, Hiltz and Turoff (2002) stressed that these communities do not require leaders because the leadership would be distributed among several members (Raelin 2003). However, many CoP are subjected to structural inequality, and some studies have challenged leadership distribution (Bolden, Petrov & Gosling, 2009; Pearce, Conger & Locke, 2007). In numerous cases, online CoP are initiated by people, who design the meeting platform, promote objectives and topics of the community, launch the CoP by disseminating their ideas, and encourage participation. Some virtual CoPs are already subjected to difference and potential tensions regarding the legitimacy of the disseminated ideas and limitations of participation (Contu and Willmott 2000; Fox 2000; Probst and Borzillo 2008). Studies such as Lai, Pratt, Anderson y Stigter (2006) precisely differentiated vCoP from face-to-face CoP (co-located) because vCoP are generally designed from top to bottom, and the leaders do not emerge from the community. In such structures, CoP operations (Koch and Fusco 2008) are dependent on founders or primary administrators, and thus their inactivity can reduce CoP activities (Bruckman and Jensen 2004). To avoid such dependence, Koch and Fusco (2008, 17) proposed a model with different phases, in which the developers allow participants to acquire responsibility for managing the community.

On the other hand, a basic tension is observed between the interests of sponsoring organisations and those of participants (Kaulback and Bergtholdt, 2008). However studies, such as Anand, Gardner y Morris (2007) and Brown and Duguid (2001), have revealed that sponsors and organisations cannot completely control the dynamics of the participants.

In the ideal democratic management and emerging self-organisation of the CoP, the members consider that they own the community, and they must be involved in its development and participate actively. However, Kaulback and Bergtholdt (2008, 41) argued the presence of the fragile balance between ownership and time involvement among participants. The cost of time is not easy to assume, particularly in communities with the free and selfless participation of its members.

Linked to this is the issue of openness to sharing information and self-limitations when expressing oneself. In corporate CVdP, educational programs or access to some type of qualification (see Lai, 2013; Probst and Borzillo, 2008; Rhoades and Woods, 2013), incentives for participation are marked by this unequal relationship in that recognition, promotion or some type of reward is sought (Bock, Zmud, Kim and Lee, 2005; Davenport and Prusak, 1998). This raises questions such as: what makes different professionals who freely decide to participate in a CVdP open to sharing information; what kind of information will they share; or how that freedom can collide with the intentions of the CVdP developers.

These studies present a basic representation of tensions, interests, dynamics and imbalances to examine. Considering this starting point, this study aimed to explore the expansive tensions and transformations observed in the ideas of the instructional designers and managers throughout the development of a vCoP.

2. METHODOLOGY

A case study was conducted with reference to Stake (1998, 2010). This approach

is suitable for a methodological proposal of Engeström and Sannino (2016). This approach employs activity theory as a system of collective activities mediated by artefacts and oriented to objects (objectives), with multiple participants in a community, who have different perspectives and interests that result in transformations over time through contradictions and development that yield expansive transformations.

- Tension between tendencies of instructional designers.
- Tension between intentions and the use of digital tools.
- Tension between initial ideas and practices resulting in successive expansive transformations.

2.1. Context

The platform used for examination is called MultiScopic (meaning multiple perspectives on the same phenomenon), which is a platform with online social network design. The platform hosts different vCoP, with voluntary participation of PE teachers, students enrolled for the teaching degree, university lecturers and researchers in PE. Currently, 562 PE professionals participate in different CoP. Numerous participants are a part of several such groups, and therefore, the platform can be considered a recognised CoP.

In this virtual space, PE lessons developed for different groups of school children from a primary school are discussed. These lessons are used for the analysis and shared construction of knowledge by different participants in MultiScopic. Different studies and research have been focused on this online platform (vid. García-Monge et al (2014); Bores-García; González-Calvo y García-Monge (2018) o García-Monge; González-Calvo y Bores-García (2018))

2.2. Position of Participants and Researchers

The study focuses on the ten people responsible for the development of MultiScopic, comprising university lecturers with more than 20 years of experience in the initial and permanent training of PE teachers. These people maintain professional and friendly connections and are a part of the same work group (InCorpora Group) that has been developing a common PE concept. This group has three subgroups:

- Those who participated in the design process.
- Those who participated in the development process.
- Those who did not participate in the design process but participated in management.

Participants	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Design										
Development										

Table 1. Types of participants according to their involvement in the instructional design and management of MultiScopic.

The researchers and the primary participants of the study are long-time acquaintances, which allows the detailed investigation and understanding of the motives of each participant. The researchers are a part of the instructional designer and manager group of the platform. Thus, information was collected from the beginning of the project. To avoid the bias of that position, they have worked based on the existing data and through reflexivity (Hammersley and Atkinson 1994); their decisions and reasons have been questioned, thereby opening up to alternative perspectives of the participants to understand the different positions of the actors.

2.3. Data collection and data analysis procedure

The follow-up of this case was conducted during the year prior to the launch of the platform and during its first 4 years of development. Information was collected using different procedures as follows:

- Analysis of the documents regarding the creation of MultiScopic (17 min of meetings and 2 projects). We aimed to appropriately understand the initial ideas of the network developers and compared those with the current conditions. Each piece of text was individually coded and the concepts and assigned categorisation were subsequently discussed. The included topics were eliminated (Miles and Huberman, 1994) based on the issues and informative questions in the case design (table 2).
- Semi-structured interviews (six) conducted with the designers and developers of the platform at different stages of the process. The interviews were focused on different topics related to the informative questions in Table 2. The interviews were conducted at the end of the design year, at the beginning and end of the first year after launching the platform, and at the end of each of the subsequent three years.
- To gain insights into the experience of the developers, a self-study was conducted. One of the developers has been studying and writing a weekly field diary (during the first four years of MultiScopic), which highlights his experience in the development and implementation of the platform.

The orientation of this process was given by the emerging topics in the development of the study using a cyclic procedure as follows:

- Formulation of issues, informative questions (Stake 2010) and lines of inquiry in research group meetings.
- Data collection (minutes of meetings, e-mails, conversations, interviews and personal diary).
- Open coding (Glasser and Strauss 2006) of the data conducted by the researchers for diverse interpretations, which are sometimes in contrast with those of the case participants, and the basic questions advised by Flick (2010, 310: what, who, how, when-where, how much, why, what for and by which) were asked for follow-ups.

- Formulation of new informative questions (Stake 2010) and identification of new tensions limit the issues of the raised topics in this case.
- Theoretical sampling (Glasser and Strauss 2006) to guide the new collection of information.
- New data collection to expand, confirm or contrast the raised topics.
- New codification in contrast with the previous data and categories.
- First-order theoretical analysis by constructing theoretical explanations and translating descriptive categories into theoretical categories (Shkedi 2004).
- Contrast the data with the concepts of other authors (Shkedi 2004) and the new collection of information (if necessary) to expand, confirm and contrast the raised topics or suggest new lines of inquiry. The data were contrasted with the studies presented in the theoretical foundation of this article, primarily with the works of Engreström.
- Contrasting categories and reducing them using axial coding (Glasser and Strauss 2006).
- First-order theoretical analysis to generate 'low-level theories' (Creswell 1998).

Ngulube (2015, 137) summarises the process as follows:

The stages of data analysis are similar because the process is iterative (i.e., moving backwards and forwards), revolving around the research questions or theoretical frameworks identified from the literature and reducing the data into segments and groupings, which are finally linked to the literature and theory as data are interpreted.

Throughout the process, the partial reports were read and adapted by the participants. Image 1 represents the Scheme of the case investigation process.

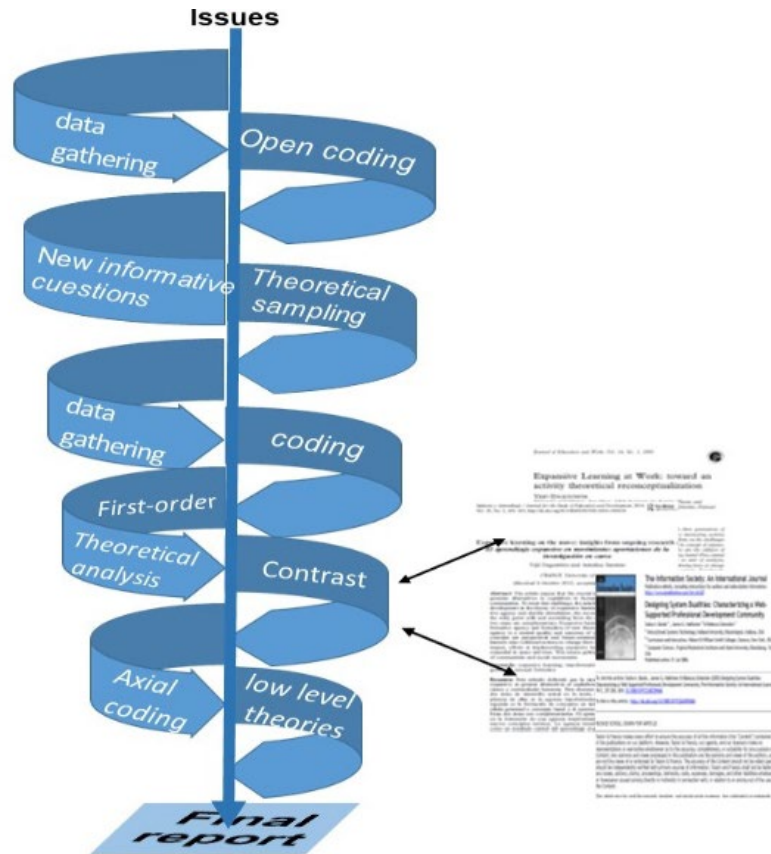


Image 1. Scheme of the case investigation process

In the process of data collection and analysis, the following informative questions and lines of inquiry were reached [Table 2]:

Issue	Informative questions	Lines of inquiry and analysis	Topics
-Tension between the tendencies of instructional designers	What tendencies among instructional designers are detected in the process creating MultiScopic?	<ul style="list-style-type: none"> - Are the purposes of the different developers homogenous? - What are the tendencies among instructional designers? - How does the common idea take form? -What resistances are encountered when opening the group to a virtual space? - How does the discussion process help to realise a common idea of PE? - Which topics are discussed? Does thematic dispersion exist? - Is the knowledge of the group homogenous? - Is the knowledge of the group coherent? - Which contradictions are observed? - Does the professional identity clash with other ideas? - Which expansive transformations are observed? 	<ul style="list-style-type: none"> - Tendencies among instructional designers - Process of unification of ideas - Resistance to openness - Group identity - Gaps in the group's knowledge - Personal aspects in the shared knowledge - Contradictions, conflicts and ruptures - Expansive learning

Tension between the intentions and digital tools usage	Which possibilities and limitations are offered by different digital tools towards the development of the group ideas?	<ul style="list-style-type: none"> - What are the aims of the instructional designers? - What problems does the group find in the dissemination of its work? - Do the technical possibilities limit or enable the development of the planned objectives? - Does the work dynamics of the group clash with the possibilities of the digital tools? Do the digital tools condition the usual approach of working? - Do the technological possibilities generate new intentions in the group? 	<ul style="list-style-type: none"> - Aims and intentions of the group - Technical possibilities and limitations - Expansive learning
Tension between the initial ideas of the managers and the practices that lead to successive expansive transformations.	How do the ideas of the MultiScopic managers change in the development of the experience?	<ul style="list-style-type: none"> - Which difficulties are encountered in developing the planned objectives? - Do the planned objectives clash with the interests of the participants? - Are the planned objectives based on a fixed or changing reality? - Who devised and developed the platform? - Was its design established by a small group or did it follow the interests of many participants? - What were the initial purposes? - Was the creation of the CoP intended? Was the main idea to spread their own perspectives or to share and build perspectives? - Are the purposes changing over time? What issues are encountered now? Are the intentions coherent? - In an idea that the developers disseminate their perception on PE, what worries them? Why do they want to link their perspective to concrete processes of educational practice? - What ideas are the developers adding? - How are the developers' expectations changing? - Do everyone's ideas change at the same time? - What reasons does each of them have for the change? - How does the expansive learning occur? - How do the participants change the ideas of the developers? - How do the dynamics of the operation change? 	<ul style="list-style-type: none"> - Motives for the creation - Contradictions - Adaptation to the participants - Democracy in the process - Clarity of purpose and knowledge - Shared identity - Consistency between purposes and means - Changes during the process - Changes in the expectations of the developers - Expansive learning - Co-configuration

Table 2. Issues and emerging informational questions.

The following report collects a part of the responses to the lines of inquiry in Table 2. Considering the formal limitations, most of the results are presented without the examples in which they are supported.

3. RESULTS

3.1. Group identity, lack of homogeneity and divergence

Tracing the MultiScopic creation process, it was found that the members of the InCorpora group devoted a year of weekly discussions to the establishment of their 'identity signs' (2009–2010 academic year). After 20 years working together, multiple ideas are shared by a group, and a significant amount of knowledge is accumulated; however, this knowledge is not always homogeneous, coherent and explicitly complete.

A review of the minutes of these meetings reveals the following:

- *The diversity of topics and their ramification.* The group started by trying to answer the basic questions regarding how they understood the person, society, learning, education, school and PE. The members of the InCorpora group had reviewed diverse pedagogical, psychological, anthropological, sociological and philosophical sources, and taking on remote or antagonistic positions is not always feasible. Knowledge acquired from different pieces is appreciated, and there are some common basic generic ideas with multiple inconsistencies resulting from a background that had been changing and incorporating new perspectives and professional concerns.
- *The particularities and sensitivities in knowledge that seemed homogeneous and common.* Divergences in the personal constructions of knowledge were checked or discovered during 20 years of the shared training. The process of developing the shared knowledge with the help of personal nuances and emphasis is remarkable. For example, small aspects, considering the innumerable shared images regarding PE practices, suppose a common background that allows clear communication and understanding between group members. The initial ideas of *Tratamiento pedagógico de lo corporal* (Embodied Pedagogy Group, EPG onwards) on PE will be pointed out as an example, because these ideas are based on the psychomotor approaches of the 70s and 80s; however, over the three decades of the EPG development, the group have had to respond to the demands of four educational laws, new sensitivities and trends in the profession, and new approaches of pedagogy, psychology or sociology (e.g. from situated learning to embodied cognition).
- *The lack of response or inconsistency regarding basic questions about various aspects, such as the person, education, or PE.* The knowledge of the group is a construct, a product of generic theoretical assumptions, multiple personal experiences linked to the educational practice and its subsequent joint analysis. Therefore, a broad and detailed theoretical corpus is associated with the planning development and evaluation of educational situations; however, many gaps remain in the great mosaic of knowledge. Comprehensive theories (Schön, 1998), sensitive concepts (Blumer, 1982), work hypotheses and intermediate-range theories (Merton, 1980) have been proposed that help the group to focus on practical proposals; however, these theories do not always allow them to answer multiple questions about education or to generate a more global pedagogical discourse.

From these debates, the members of the InCorpora group reached some basic agreements about their identity and the foundations of their educational proposal. The design of such a project provides an opportunity to reinforce a group identity and express tacit knowledge, although it can generate tensions that fragment the group (in fact, one member of the group decided to start a project on his own).

3.2. Intentions change as a function of technological possibilities

The members of the group are convinced of the educational value of their practical proposals in PE and pointed out that their initial idea (2002–2003 academic year) was to create a website to show some of those PE experiences. In the 2004–2005 academic year, they attempted to launch the project; however, the project did not succeed because of the technical difficulty and high time investment required to manage a web page. One of the reasons for failure is the group's working method based on the action-research concept. The original idea is to record the weekly PE lessons with a group of school children, perform a narration of the lesson, initiate a shared analysis to rethink the plan of the next lesson and incorporate this into agreements to be shared through the website. These reflection-action cycles have been common in the face-to-face working groups with teachers (see Martínez-Alvarez & Vaca Escribano, 1997); however, when performed online, this process requires a considerable work and was too ambitious. A discrepancy was observed between the intentions, real possibilities of time and dedication and the technological requirements of the available webpage.

This problem is detected in the history of the group and is included in some interviews:

We have always had a problem with the dissemination of our work. We have dedicated a lot of time to prepare practices with teachers and to conduct observations and shared analysis, but the dissemination of this information requires a significant amount of simplification and requires a considerable amount of time and capacity to give up a part of the complexity. Because I believe that when sharing, you always have to choose what you think the interlocutor is willing to hear. [Interview manager 3 of MultiScopic, September 2011]

The idea of simplifying a shared educational practice is a problem as defined by Barab, MaKinster & Scheckler (2004). A certain fear of being misunderstood is observed.

It has happened to us many times that we have shared an experience, and the audience asked questions, which demonstrated that they had misunderstood everything, [...] well, that they had understood it from a point of view of recreational PE in which the school children “learn without realising it”. [Interview manager 2 of MultiScopic, September 2011]

Therefore, the group's writings are always loaded with narrative bullets regarding the educational practice. There is a need to place the reader in the event leading to the subsequent reflections and formulations. This belief that a deep and focused dialogue on PE becomes easier when the interlocutors handle shared images of educational practice could be the basic idea that will help MultiScopic evolve.

Over time, the new technological means will engender new approaches in the dissemination of results, as stated by one of the interviewees:

When we were told about the possibility of creating an online social network for the group in around 2008–2009, new perspectives of what

we could do appeared. We could contact many people who had gone through the EPG seminar and former students with whom some of us kept in touch. [Interview manager 4 of MultiScopic September 2011]

In this initial approach is observed the origin of the tension between the intention of disseminating an understanding of the PE and the essence of a CoP that is being opened to share knowledge.

3.3. New expectations are added to the initial intentions

The group saw several possibilities in a network such as MultiScopic, which was stated in the first invitation letter addressed to colleagues from other research groups:

- The way to understand PE was through dissemination. As mentioned previously, the group had many valuable practical experiences.
- It was intended to maintain contact with former members of the EPG and former teaching students.
- An open and transparent ‘multifocal’ research procedure was envisioned, in which some researchers had control over the way others treated the data (since all participants would begin using the common data).
The idea is to create a transparent and democratic research system on educational practice. When considering that other researchers and participants know [the educational practices posted on MultiScopic] and have to perform the data analysis in public through the platform, the research process is controlled, and thus, others (among them, the people under study) can regulate the operations. [Minutes, initial MultiScopic project preparatory meeting, May 2009]

The idea was that the groups of researchers inquired about the educational practices in MultiScopic, and their research process were discussed on the platform. In this manner, this process becomes more transparent because it would be open to other researchers and members of the educational community.

- In the InCorpora group, the debates about PE were seen to be conducted from levels of abstraction that did not allow the discrimination of different practices. The same theoretical discourse with an agreement at a specific theoretical level was reflected in the practice of antagonistic forms. The group thought that the only way to discuss different approaches was to focus discussions on common realities that would allow the revelation of the tacit knowledge of participants (Nonaka and Takeuchi 1995) which is associated with specific contexts and experiences (Purvis *et al.* 2001).

However, instructional designers and managers adapted these clear intentions when implementing the platform. Initially, all participants agreed (in the first interviews we conducted) on the benefits of the idea and its potential (García-Monge, González-Calvo & Bores-García, 2018). However, the implementation brought new dynamics that were not anticipated by the managers.

3.4. Changes in expectations of managers in their interaction with other participants

The platform managers recognise certain dissatisfaction regarding the development of MultiScopic as a platform with transparent research processes. However, the thoughts may be stronger than the evidence of the process:

I know that many of the things we designed are not working, and I have no idea what to do to achieve it, but I won't give up on them. It is as if I have the certainty that they are possible, because in my head, they appear as real. I see them very clearly since I imagined them years ago. It is as if I saw the characters coming alive and interacting and congratulating themselves on developing this system of research on educational practice, and I am very aware of the practical problems for their development, but for me, they are still real and therefore possible.
[Reflections of manager 1 in his self-study, May 2012]

On paper, the ideas appear as reality. The design becomes possible, and despite some difficulties or inability to overcome certain problems, we resist giving up on the project because they have been imagined and are possible to us. However, these ideas are dynamic, and the knowledge and interaction can help modify the limits and intentions of developers:

The truth is that we have been giving up or rather postponing many of the objectives we set at the beginning. There are things that we are not yet willing to give up. For example, I still think that the only way to conduct an in-depth dialogue about the educational practice is to enable everyone to talk about it. If everyone speaks from their ideas and experiences, it is not possible for concepts to be unified, and failures and clashes between each position arise. However, it may change if we see other potentials and trends in this network. [Personal interview with manager 2, May 2012]

Original expectations, resignation and new expectations live in the same person, and these factors maintain a dialogue of constant reconstruction. It seems to be planned from a level of experiences and knowledge; however, the development of the experience and knowledge through experiences of others are changing the limits of the possible, imaginable and plannable feats:

As you read other research and experiences on the subject you realise the naivety of your initial ideas. What seemed to be a unique idea is now relativised. However, by knowing more, new possibilities open up, and without discarding the initial ideals, you realise that there are many interesting roads to travel. [Reflections of manager 1 in his self-study, January 2013]

This process is not observed for all participants at the same time or for the same reasons:

In the end, if you insist on maintaining your ideas of how MultiScopic should work, you end up being isolated and without participants.

[Personal interview of manager 7, June 2013]

After numerous attempts to take this along a path, you end up being tired and inactive. [Personal interview to manager 3, May 2013]

Considering new possibilities, fear of loss of participants or resignation because of fatigue is responsible for the transformation of the initial ideas of the developers' group.

Another idea that has been transformed is monitoring the practices posted on the platform. The creators had considered a weekly practice assuming that potential audience would be interested in at least endowing themselves with these practical resources and in weekly monitoring the construction of the teaching–learning process. The dynamics of the platform show the naivety or limitations of this approach, thereby causing the managers to reduce the frequency. Some users, primarily teachers with extensive experience, recognised that a great deal of educational practices neither have the need nor the time to implement new practices.

*It is a great idea. Who would have thought about it 20 years ago? [...]
Now, I am very involved with the coexistence programme of the centre.*

[Interview of a teacher participating in MultiScopic, May 2012]

At 25 (years of age), you put numerous hours, you need many resources, everything is less [...], but once the children are born, you slow down. [Interview of a teacher participating in MultiScopic, April 2012]

The practices [discussed in MultiScopic] are very good; however, I don't always have the time to watch the videos [...]. You know you get so used to your games that you already know how they work. [Interview of a teacher participating in MultiScopic, April 2012]

A part of the teaching staff associated with the EPG, with more than 10 years of professional experience as PE specialists, have very consolidated practices with which they feel comfortable, and when looking for 'novelties' they employ 'new activities' and not new approaches for conducting these activities. They are in phases of their life wherein they have other professional (e.g. topics related to ICTs, coexistence in the centres and inclusive education) and personal interests (e.g. family commitments). On the other hand, the need for practical resources available in the PE faculty, with the requirement of the 1990s education reform to specify the curriculum of the area, has been addressed through 25 years of courses and publications that were not easily available before the 1990s.

Therefore, the MultiScopic managers have changed their vision in this respect, and now they see the platform as a repository, in which practices are stored for the users to access at their own convenience. The initial idea of a living practice, in which users accompany the group of school children in their teaching-learning process, is then blurred (similar to a novel with weekly delivered chapters). The

origin of this idea is a principle that characterises the EPG approach, which refers to the vision of the educational practice not as isolated fragments in didactic units or lessons but as processes with long-term targets. However, the managers of the platform have limited interest in analysing long-term educational processes (the initial idea was to follow-up with a group of school children from the 1st to the 6th year of primary education) and ensure that the possible readers empathise with the educational process of each scholar, solutions provided by the teacher, and the value of undergoing various teaching-learning processes that maintain common pedagogical principles. Wenger (1998) and Barab, McKinster & Scheckler (2004) warn of this problem (tensions between the local and global: that is, how can these local success stories be captured and shared to help and motivate other teachers?) Expectations, the socio-historical context and user must enter a game that models the planned and shows new limits. Among other aspects, the requirement of the task, emotional and knowledge nexus with the exposed practices, vital and professional phases of the teaching staff or the moment of development of the profession, limit the ideas and force the reconstruction of objectives.

The development of MultiScopic leads to the fragmentation and distancing of its initial concept. MultiScopic is developed as a social network in which any of the registered users can form their work groups and vCoP. Although the intention of developing this community is to acquire different opinions on and analyse specific educational practices, the approach of the community is centrifugal, considering that the autonomy of the groups leads the dynamics towards topics differing from the analysis of the educational practices and ideas intended for sharing and discussion (i.e. the tension between diversity and coherence stated by Barab, McKinster & Scheckler (2004)).

The creators of MultiScopic are aware of this and assume that the project follows its own process through a constant dialogue with the demands of the participants:

We imagine that in the future, the groups will be more autonomous and can distance themselves. The network may become a PE social network for PE and may lose its initial meaning, although interesting things will certainly appear as has happened so far. We had our expectations and intentions, and now, the things that are motivating us have nothing to do with them. [...]

I think the work in the network does not allow you to fix anything in the long term, and at most in the medium, the network starts redirecting and repositioning you. [Personal interview with manager 2, September 2013]

Although someone recognises the following:

Now that the project takes a "life of its own", which is far from the initial purpose, I am no longer motivated to continue with it.

[Personal interview with manager 3, June 2014]

The ideas seemingly emerge from a non-homogeneous group with personal nuances, and in their materialisation their generators are transformed into an adaptive conformation of preferences (see Elster 2003). The transformations based on the needs of the users reduce the tension between the tendencies of the developers (TD) and participants (TP). If the developers insist on continuing their

initial ideas (which are not shared by the participants), a confrontation (in numerous cases in the form of abandonment as recognised by some participants), and the developers opt to any particular initiative as a form of disintegration or ‘centrifugal force’. The developers try to condition, redirect or collect user tendencies and steer them towards their interests; however, personal and relational processes are considerably more efficient, and adaptation is not always possible:

We try to be attentive to emerging demands and initiatives. However, it is not always possible to react on time, or you do not always realise what is proposed or the possibilities of accommodating it on the platform at the time of interest. [...] give an example] We were interested in creating a community for news related to education and PE, but it seemed to us that this would distort the initial intentions of MultiScopic. We have now formed a group called “pedagogical debates” to accommodate to these concerns. [...] But now it is too late, because the people who were cut off in their day have now become disconnected from MultiScopic. [Personal interview with manager 8, February 2012]

The managers recognise that, in the beginning, these personal initiatives were perceived as risks to the development of the initial ideas and were thus cut off. The democratic nature of a vCoP was understood after some time.

4. DISCUSSION

The analysis of the data from the framework proposed by Engeström (1987) reveals the changes in a system of collective activity based on certain tensions. Engeström & Sannino (2016) limited a system of collective activities mediated by artefacts and oriented to objects, which were considered in the network of relationships with other activity systems and were subjected to the multiplicity of perspectives and interests (source of problems and innovation) that transform over long periods of time. Thus, contradictions are sources of change and development (i.e. tensions within and between activity systems) when the object and motive of the activity are reconceptualised to incorporate a broader possibility (expansive transformations).

The results indicate a process of successive expansive learning derived from different tensions. Table 3 summarises the identified phases and the tensions and expansive transformations of the process exemplified with some of the evidence based on the participant responses.

Phases	Collective Activity System	Tension	Expansive Transformation	Problems or Side Effects
I Design	InCorpora group (Instructional Designers)	Among designers' ideas e.g.: <i>'in concretising our ideas on different topics, many points of view seem to appear. It is not very clear how to put into practice some of the pedagogical principles that we try to follow'</i>	Basic common ideas about education and PE e.g.: <i>'There have been hard debates, but I think they are necessary. We have ratified some common principles and resolved many gaps on our vision on PE'</i>	Break-up in the group e.g.: <i>'In the end, we have not all clearly seen the project of dissemination of our work'. 'We will continue with the face-to-face seminars, but not with the internet adventure'.</i>

<p>II Adjustment to the technological possibilities</p>	<p>InCorpora group and IT experts</p>	<p>Among designers' ideas and the prospects of using digital tools e.g.: <i>'IT experts find it easy to use this website, but there is no one to clarify with. It is not operative to change the information on a weekly basis'</i>.</p>	<p>Adjustment of initial ideas. Creation of new ideas suggested by the technological possibilities e.g.: <i>'In the web page designed for us, the possibilities of Ning give us opportunities to share and debate about the educational practice. We can consider multifocal research'</i>.</p>	<p>Change in initial objectives. e.g.: Initial objective: To develop the Embodied Pedagogy Seminar online. Objectives after seeing the possibilities of the Ning social network - to disseminate the way of understanding PE. - to maintain contact with former members of the seminar - to develop an open and transparent 'multifocal' research procedure</p>
<p>III Attempt to control the Community development</p>	<p>InCorpora managers and participants</p>	<p>Between the ideas of the developers and practices and needs of the participants e.g.: <i>'I know that many of the things we design are not working [...], but I don't give up on them'</i>.</p>	<p>Learning of new work dynamics under environments with written, asynchronous and ubiquitous relationships e.g.: <i>'It is important to be attentive to the dynamics of the platform and the interests of the participants'</i>.</p>	<p>Loss of some participants e.g.: <i>'There was interest in creating news [...] the people who were cut off in their day have now become disconnected from MultiScopic'</i>.</p>
<p>IV Openness to the Community</p>	<p>InCorpora managers and participants</p>	<p>Between the ideas of the developers and the practices and needs of the participants e.g.: <i>'New possibilities are opening up'</i>.</p>	<p>Opening to new managers e.g.: <i>'New and very interesting groups are being created, which give MultiScopic a new life'</i>.</p>	<p>Progressive change of the initial purposes e.g.: <i>'We have been giving up, or rather postponing, many of the objectives we set'</i>.</p>
<p>VI Dissolution of the instructional designers and managers' initial purposes in the community</p>	<p>InCorpora managers and participants</p>	<p>Among participants e.g.: <i>'Now in some groups, there are tensions to see how the activity of the group is oriented'</i>.</p>	<p>Dissolution of the managers' initial ideas e.g.: <i>'The network starts redirecting and repositioning you'</i>.</p>	<p>Abandonment by the managers e.g.: <i>'Now that the project takes 'life of its own' away from the initial purposes, I am no longer motivated to continue with it'</i>.</p>

Table 3. Phases, tensions and transformations with examples of the MultiScopic design and development process

In image 2, this process is schematised; the ovals represent the systems of collective activity, and lines with arrows at their ends, the tensions.

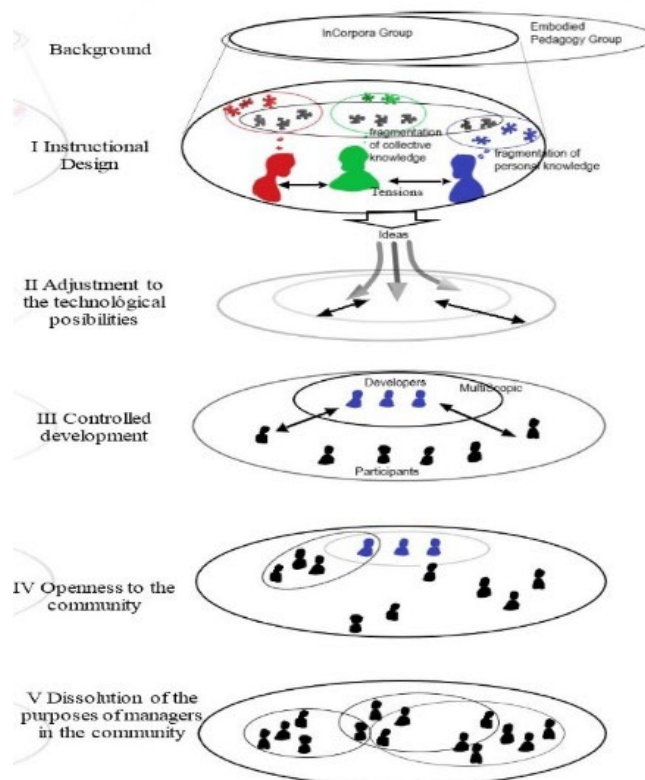


Image 2. Scheme of the expansive transformations in the design and development process of MultiScopic

The different expansive transformations have been observed through the resolution of tensions between purposes and technological possibilities of the developers and between purposes of the developers and participants.

Under different transformations, the sequence of seven expansive cycle actions presented by Engeström (2001) is as follows: (1) questioning, (2) analysis, (3) modelling the new solution, (4) examining and testing the new model, (5) implementing the new model, (6) reflecting on the process and (7) consolidating and generalising the new practice. However, in each phase, some actions are clearer than others. For example, in phase I (Design), the initial purpose of changing the face-to-face dynamics of the EP permanent learning seminar and opening-up to a wider community causes InCorpora members to question their identity, analyse their pedagogical principles and model a solution for a year, which results in some designers abandoning the project. Actions 4, 5, 6 and 7 lead to a new phase with new tensions: in this case, between the purposes of the instructional designers and the possibilities offered by different digital tools (e.g., websites, blogs and social networks). In the second (adjustment to the technological possibilities) and third (controlled development) phases, the seven activities of the expansive cycle become clearer; however, in the fourth and fifth phases, the activities overlap or occur unintentionally. For example, in phase four (openness to the community), the dissolution of the purposes and identity of the managers in the community is appreciated. Each manager starts to follow a

personal process, and the initial common purposes are lost. In addition, actions 4 (examining and testing the new model) and 6 (reflecting on the process) are performed on a personal level in a process that is subjected to resistance to expansive learning. The data indicate that the same person has the original expectations, resignations, resistances and new expectations, thereby maintaining dialogues in constant reconstruction. These data add new nuances to the tension described by Kaulback and Bergtholdt (2008) between the interests of the community founders and participants as well as tensions regarding how communities develop their own interests Barab, McKinster & Scheckler (2004) in a dialogue between the ideal and possible prospects.

This process leads to a discussion on a leap in expansive learning from the initial collective activity system to new collective activity systems. This change considers the falling-out as mentioned by Barab, McKinster & Scheckler (2004) when discussing the tension between diversity and coherence. When the purposes of the group of managers are dissolved among the needs of the community participants, the identity of the community changes (transformation as coined by Lai, Pratt, Anderson and Stigte, 2006), the tendency of diversity and dispersion is extended, and the initial identity is progressively erased. Therefore, in this case, the paradox of the successive expansive transformations of the collective activity system lead to the disappearance of the group that initiates the process, and a new group with new reasons for activity is formed. As per the spatial metaphor of Lave and Wenger (1991), the 'core' is relocated.

In this case, the 'co-configuration' process described by Victor and Boynton (1998) and Engeström (2004) involves building and sustaining a completely integrated system, which can sense, respond, and adapt to the individual experience of the customer. We would be closer to the process called 'intra-organisational co-configuration' (Bonneau 2013), in which the tendencies of the participants start modelling the initial purposes of the group of developers. This co-configuration is validated through different approaches for each manager. Some consider new possibilities, and some act in accordance with the fear of losing participants. Some resign because of fatigue or not wanting to adapt to the new purposes and dynamics of the community. Co-configuration that defines the limits of the imagined ideas and forces the reconfiguration of managers' objectives is marked by the requirement of the tasks, affective and knowledge nexus with the exposed practices, vital and professional phases of the teaching staff or the moment of development of the profession.

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