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CHRONOTOPES IN LEARNER-GENERATED CONTEXTS A REFLECTION ABOUT THE INTERCONNECTEDNESS

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Chronotopes in learner-generated contexts. A reflection about the interconnectedness of temporal and spatial dimensions to provide a framework for the exploration of hybrid learning ecologies of doctoral e-researchers

ABSTRACT

This work is concerned with a reflection on the construct of "chronotope" (Bakhtin, 1981) as a conceptual tool suitable for illustrating the affordances of emerging Web 2.0 learning ecologies of doctoral researchers. For the purposes of this work, the chronotope is considered as an analytical lens suitable for illustrating the movements of PhD researchers across shifting space/time configurations (affordances) arising from scholarly environments increasingly permeated by digital mediation. The conceptual framework under construction looks at the intersection of time and space being produced by self-directed PhD students, engaged in sifting the learning opportunities provided both by institution-bounded and self-organized learning ecologies in the open Web. The focus is on the role that personal technologies – especially social Web tools and environments – play in the function of supporting academic identity building in the course of a doctorate and in affecting the boundary crossing activities undertaken by PhD e-researchers in their efforts to draw opportunities from hybrid (analog/digital; formal/informal) learning ecologies. The developmental phases of a doctoral journey (Gardner, 2009), along with the interweaving of past-present-future in the "identity-trajectory" of PhD students (McAlpine & Amundsen, 2011), are adopted to provide a preliminary frame for the object of study. It is argued that the notion of chronotope, understood as multiple and variously appearing institutional constraints and individual motivations, can help to make sense of the extent to which this new 'species' of doctoral e-researcher is able to co-evolve within the academic culture of the local research training environments.

KEYWORDS

learning ecologies, chronotopes, doctoral students, social Web

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INTRODUCTION

This paper examines how the time factor, in its interconnectedness with space factor, affects the construction of the theoretical framework of a study exploring emerging learning ecologies of doctoral students. The inquiry investigates a sample of PhD researchers, mainly across Italian universities, focusing on the adoption of tools and services in the open Web as complementary "potential forms of assistance" (Luckin, 2010) in their doctoral journey.

Recent research analysing the doctoral experience (McAlpine & Amundsen, 2011; Gardner & Mendoza, 2010) provides accounts of a considerable diversity of activities being undertaken by individual PhD students, beyond the influence of the crucial relationship occurring between the apprentice researchers and their supervisor(s) (Shulman, 2004): from building networks outside their local academic environment to searching for different kinds of support and engaging in self-directed tasks (Jazvac-Martek, Chen & McAlpine, 2011). Such diversity can also be considered within an ecological approach to doctoral education (Cumming, 2010), which takes into account both the increasingly numerous academic and extra-academic factors and stakeholders currently dealt with by doctoral candidates. Furthermore, empirical studies show that Web 2.0 tools have started to affect the behaviours of apprentice researchers (British Library/ JISC, 2009-2011; James, Norman, De Baets et al., 2009; Zhu & Procter, 2012). They generally show a high degree of flexibility but more rarely demonstrate an active use in the adoption of social media. Moreover, tools and environments in the open Web are seen as providing useful ways of supporting needs associated with the different phases of a doctoral experience (Zaman, 2010) and enabling PhD students to find new "learning partners" (Flores-Scott & Narad, 2012). These applications are facilitating

"emerging Web 2.0 learning ecologies" (Williams, Karousou & Mackness, 2011), defined as *loci,* in which new kinds of learners – "*silent experts* in how, where and by whom want to be educated" (ibid.) – strive to balance "emergent and prescriptive learning" by coping with "openness and constraint" provided by the open Web and by institution-led educational opportunities.

These self-organized learning ecologies are seen as providing particular "opportunities for learning" (Barron, 2006) and interactions enabling a "greater agency" (Luckin, Clark, Garnett et al., 2010, p. 74) by individual learners in the construction of "learner-generated contexts" (ibid.). Recent research on postgraduate students (Gourlay & Oliver, 2012) has given some empirical evidence of the sophisticated degrees of "adaptability, agility and resilience" (ibid.) required for students to be engaged with diverse technologies permeating the "conventional" higher education context. However, issues related to the creation of new spaces and time-frames by doctoral students are, to date, underesearched. The research project to which this paper is related sets out to explore the extent to which doctoral students in Italian universities are able to draw new learning opportunities from the adoption of emerging technologies available on the open Web. The study will first describe current and new uses of technologies and other kinds of resources by individual students in their doctoral activities. Secondly, it is designed to illustrate how a niche of PhD candidates – named as "doctoral e-researchers" – use and co-construct alternative or complementary learning spaces and temporal configurations, as they are absorbing conventional practices and tacit norms from a defined research training setting.

This paper aims to contribute to the construction of a conceptual framework useful for researching "hybrid" (physical/ virtual) (Kazmer, 2005) and "personal learning

ecologies" (Andrews & Haythonthwaithe, 2011) of individual doctoral students. These apprentice researchers are considered in their effort to reap the benefits of the social Web (Boulos & Wheeler, 2007) to complement the opportunities for learning being provided by the respective, conventional research training contexts.

The interplay of spatial and temporal affordances of "learning ecologies" is considered here as a crucial issue for highlighting the inherent features of learning ecologies as complex and evolving systems and revealing characteristics of agency on the part of individual learners. It is argued that the spatiotemporal matrix defined by the notion of "chronotope" (Bakhtin, 1981), along with an ecological approach to the topic being researched, can be functional for this purpose and can shed light on sense-making practices of self-directed learners striving to shape their "identity-trajectory" (McAlpine & Amundsen, 2011) as future researchers.

The article will firstly present the rationale, focusing on the construct of chronotope as a spatiotemporal matrix suitable for revealing the dynamics of individual's doctoral experience over time and diverse spaces. Secondly, it will discuss three theoretical strands in the background section: 1) the time factor in the doctoral journey; 2) learning ecologies as sources of learning opportunities featured by space and time markers; 3) key instances of application of the notion of chronotope to research on technology-mediated learning contexts. Thirdly, it will outline key elements for a theoretical framework, building on the theoretical strands previously discussed. Finally, some provisional conclusions will be drawn, prefiguring further research and discussing advantages and disadvantages of the use of metaphors in research.

RATIONALE

There are different options for analysing time factor in a digitally-mediated doctoral journey. It could be analysed as a resource, being interpolated between instructional time planned in learning design and time management learner's skills (Romero & Barberà, 2011). Studying time as a resource focuses on the organizational characteristics of doctoral journey and their effects on individual learning timeframes, considering the chronological value of time use for enabling self-efficacy in learners (Odaci, 2011). Otherwise, it would be possible to focus on the time affordances of specific ICT tools – so far an underesearched area (Bates, 2010) – as adopted for doctoral activities.

This study identifies individual, self-directed doctoral students as unit of analysis. Focus on the time factor is related to how PhD students "construct time to generate learning opportunities" (Bloome, Beierle, Grigorenko et al., 2009, p. 313) rather than to how much time is given to academic learning. So, attention is concentrated on time as process rather than on time as quantity. The work underlies the assumption that "space is made in time" (Lemke, 2004) and considers time as context of learning activity, "as produced and productive, rather than a container for action or a passive background for ongoing activity" (Brown & Renshaw, 2006, p. 249). A qualitative perspective of analysis of the time factor in emergent learning ecologies is endorsed in order to reveal the "goal orientation" (Riemann, 2009) of self-directed learners (doctoral researchers) making sense of the shifting places and shifting timescales which they are co-constructing and across which they are moving along their learning path (doctoral journey). In other words, the time factor in the doctoral experience is holistically examined as a meaning-making matrix, in which time and space markers help us to gain insights on qualitative

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features of the experiences of doctoral students, grappling with multiple spaces and exposed to a range of resources. The construct of "chronotope" (Bakhtin, 1981) is considered as providing a holistic view of "how people conceptualize their collective and individual movement through time and space" (Bloome et al., 2009, p. 324). In essence a chronotope "characterizes the typical ways in which narrative genres move the scene from place to place" (Lemke, 2004). In fact, this notion was devised and developed by Bakhtin in his seminal construction of the problems of literary forms. In narratives the chronotope represents the particular interconnectedness of temporal and spatial indicators as key features of a literary genre in a text. At the same time, it accounts for authors' and characters' world views, for their capacity to act upon (e.g. in Goethe's novels the hero co-emerging "along with the world") or to be acted upon (e.g. in Greek romance, the unchanging character of the hero), and for their cognitive strategies and degree of freedom to change the historical situation in which they are contextualized. In a text, chronotopes are always multiple and changing, and often interwoven and competing, allowing its "knots" of meaning "to be tied and untied" (Bakhtin, 1981, p. 15).

The particular chronotope characterizing a specific learning environment has been formulated as an ongoing process, being shaped and re-discussed within a dialogical context being nurtured by a range of voices (Brown & Renshaw, 2006). Unlike novels, in which chronotopes indicate moves from one scene to another one, in a learning process participants negotiate their own identities as authors arising from symbolic moves across different time-space configurations. As in novels, in everyday life and in educational contexts, chronotopes are generally "messy, complicated, incomplete, multiple, and competing" (Bloome et al., 2009, p. 324). Moreover, new chronotopes are emerging, for instance in "our use of

educational media" (Lemke, 2004), which it is worth understanding "for effective design of educational environments" (ibid.).

It is important to notice that the focus in this study is on understanding how doctoral students "construct time to generate learning opportunities" (Bloome et al., 2009) rather than on identifying learning patterns in the doctoral experience, as has been explored elsewhere (e.g. Boud, 2008; Flores-Scott & Narad, 2012). However, in the background this paper takes into account the Bakhtinian approach to learning (Koschmann, 1999) as a social, dialogical and historically situated process. In such a process, the exposure of the individual to multivoicedness and outsideness, as well as the personal struggle against diverse degrees of power relationships in the dialogue with others, help to increase learning and produce personal growth. This view is aligned with a socio-cultural approach to the notion of learning ecologies (Barron, 2006) and to a conceptualization of context as learner-centric (Luckin, 2010), in which a learner's intentions and motivations make sense of the multiple interactions occurring between the individual and other people and resources, through the enabling mediation of technology.

BACKGROUND

THE DOCTORAL EXPERIENCE AND THE TIME FACTOR

As a process of change, a doctorate has to do with the transition "from a good course taker to an independent researcher" (Lovitts, 2005) and typically involves a sense of becoming, well expressed in the metaphor of the "doctoral journey" (Baptista & Huet, 2012). In their learning path, individual PhD students develop academic dimensions such as "knowing", "acting" and "being" (Barnett &

Coate, 2005), where the dimension of "being" is intended as any embedded forms of knowing and acting in the world and is often neglected in research training design (Whiteman & Oliver, 2008). Such dimension is highlighted in the notion of "identity-trajectory" (McAlpine & Amundsen, 2011a) in which the integration of past-present-future is continuously evolving and interweaving across the three main strands of "intellectual" (the link with the tradition and the perspective of future contributions to knowledge), "networking" (the web of connections being intertwined beyond the academic boundaries) and "institutional" (the set of tasks and responsibilities in which a PhD student is located). Elsewhere, this process of becoming is described as featured by three fluid developmental phases (Gardner, 2009), in which the individual doctoral student gradually gains greater autonomy: from more structured and guided tasks (e.g. coursework, exams) toward more unstructured and self-directed activities (e.g. decisions on the dissertation, future employment choices). The idea of "identity-trajectory" can also be related to the Bakhtinian construct of "ideological becoming" (Bakhtin, 1981), which provides a powerful tool for making sense of the whole student experience and the pedagogical orientation in a doctoral journey. This construct refers to the development of one's own way of viewing the world (from the Russian meaning of the word 'ideologhìa'), rather than a mere political view (Freedman & Ball, 2006, p. 4). The individual is engaged in the progressive emotional and ideological transformation of the individual consciousness, through the mediation of the enabling (digital) environment, by interacting with different voices and struggling with "various kinds and degrees of authority" (Bakhtin, 1981, p. 345). Individual doctoral students have to cope with the diversity, multivoicedness and ever-evolving nature of the academic setting in which they are situated. This suggests a possible interpretative frame of emergent profiles of doctoral e-researchers,

in which the capacity to create new spaces of academic socialization can lead to reshaping the fundamental relationship between the apprentice researcher and the supervisor and variously affect the intellectual, networking and institutional strands of activities, across the diverse developmental phases of a doctoral journey. The need to frame the enabling conditions of the Web 2.0, defined as "an artefact evolving according to shifting user engagement" (Brown, 2012, p. 50), leads to a consideration of the ecological metaphors and their capacity to describe learning environments and collective and individual agents shaping (and being shaped by) them.

LEARNING ECOLOGIES AND THE SPACE FACTOR

While, in general, ecological views draw attention to the "cyclical and emergent nature of human activity" (Andrews & Haythonthwaithe, 2011, p. 159), the proper notion of "learning ecology" is defined as a "new, self-catalytic system" (Seely-Brown, 2000), characterized by a dense fabric of intellectual interactions occurring everywhere and among diverse subjects, producing and expanding the core competences of a local context. An ecological approach to e-learning in higher education (Ellis & Goodyear, 2009) appears to meet the purpose of describing the entanglements of formal/ informal, analog/ digital spaces characterizing the doctoral experience of PhD researchers coping with a range of technologies and support services. The ecology metaphor has been inflected differently according to socio-technical approaches, focusing on the mutual influence of people and technologies (Nardi & O'Day, 1999; Andrews & Haythonthwaithe, 2011) or socio-cultural approaches, exploring the relationships between learners and the intricacies of the local environment (Barron, 2006; Luckin, 2010; Pachler, Cook & Bachmair, 2010). Diverse approaches produce

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a different focus on spatial features and the role of populations or agents for individual change in local ecosystems. For instance, the seminal conceptualization of the "information ecologies", defined as the interconnected system of "tools, people, values and practices in a local environment" (Nardi & O'Day, 1999, p. 49) relates the concept of "locality" to participants in each setting who "construct the identities of their technologies through the rhythms and patterns of their use" (1999, p. 55). In such systems "keystone species" (librarians in their example) are organisms playing a crucial role in the functioning of the ecology, even if their work is invisible and peripheral. They preserve the key functions within the ecosystem (modes of knowledge distribution), assuring sustainability and "balance found in motion, not stillness" (p. 53), for instance introducing new technology-mediated practices. Building on these socio-technical stances, Andrews & Haythornthwaithe (2011) focus on "personal learning ecologies" to draw attention to the current "on-the-ground lived experiences of students and teachers", being affected by the spread of social media tools, the ownership of personal devices and the changing nature of user engagement, evolving along with the digital artefacts. In their view, higher education students can be thought as an emerging "keystone species", able to co-evolve with their environment and respond to the pressures of technological change. Along these lines, Williams, Karousou & Mackness (2011) point to "Web 2.0 learning ecologies" as *loci* in which self-directed learners strive to balance "emergent and prescriptive learning" by coping with "openness and constraint" being provided by the open Web and by institution-led educational opportunities. Highlighting the tensions occurring between the self-directed learner and the constraints of institution-bounded learning is a key issue in researching doctoral e-researchers. Likewise, it is important to think of the learning opportunities in the social Web as a product and process coupled with the development of individualized forms of mass communication (Pachler et al., 2010). Otherwise, Pata & Laanpere (2011) provide a vision of learning ecologies *as* biological systems rather than metaphors and discuss the construct of "hybrid learning ecosystems" to highlight the tensions between formal educational assets and "open learning ecosystems" where digitally literate learners are dwelling in the social Web. On the other hand, Barron describes 'learning ecology' as the "set of contexts found in physical or virtual spaces that provide opportunities for learning" (2006, p. 195), which may include formal, informal, and non-formal settings. In her view, a learning ecology encompasses a range of environments closely linked to physical or virtual spaces and characterized by a specific collection of elements founding specific conditions for learning. In fact, each context provides a "unique configuration of activities, material resources, relationships, and the interactions that emerge from them"(ibid.).

In this study we prefer to think of learning ecology of doctoral e-researchers as plural and hybrid (institutional/personal) (Pata & Laanpere, 2011), where the distinction between formal, institutionally organized learning ecologies and informal, "open learning ecosystems" (ibid.) provides a dialogue of tension and interdependence rather than polarization. Likewise, hybridity of spaces characterizing these emergent learning ecologies is also considered, the term "hybrid spaces" being based on Kazmer's (2005) view of the mutual influences between analog and digital spaces in blended learning instances. This tenet is aligned with discourses aiming to link the physical and the digital and acknowledging "the significance of the changes that technology can make to the potential of everyday spaces" (Luckin, 2010, p. 9). This approach helps to attribute an equal status to analog and digital spaces and, in particular, fits the features of a doctoral experience grounded in conventional university settings, in

which – apart from the mediation of technology through services such as e-mail and a digital library – the role played by the institutional e-learning platforms is quite scarce and the weight of the "personal learning ecologies" of PhD students can represent an element of discontinuity in research training practices.

Assuming that learning ecologies are conceptualized as hybrid and embedding clusters of learning opportunities, it is necessary to clarify the extent to which the notion of context and learner's agency (capacity to act in the world) are related. Luckin (2010a) provides an extensive discussion on the different theoretical perspectives about contexts for learning. She holds a view on context in its close interplay with learning and technology and builds on the socio-cultural perspective from Cole (1996), who uses the metaphor of "weaving" to sustain an interpretation of context merging the activities and their surrounding circumstances (in a time-bounded manner), against a view of context as a container. In this perspective, Luckin (2008; 2010) develops the learner-centric framework of "ecology of resources", that "considers the resources with which an individual interacts as potential forms of assistance that can help that individual to learn" (Luckin, 2010, p. 159). Her goal is in the identification of the components (people, technologies, frames) supporting the educational experience of learners and in any related adjustment in order to provide learners with the appropriate scaffolding. The learner's intentions are the axis from which the context can be interpreted as unified lived experience, making sense of the multiple interactions between people, activities and resources. A context is always "local to a learner", as it consists of an individual's subjective experience of the world, which is always spatially and historically situated (2010, p. 18). In this view, technology plays a mediating role that can help "to make these connections in an operational sense" (ibid.). Emerging technologies have

a peculiar role as mediation tools: they are seen as fostering the production of "learner-generated contexts" (Luckin, Clark, Garnett et al., 2010, p. 74), which provide students with the opportunity to achieve "greater agency" (ibid.) in defining goals and boundaries of their learning contexts. The model of "ecology of resources" was created with the wider aim of designing "technology-rich learning experiences". For the purpose of this study it provides an individual-based perspective for looking at learning ecologies as sources of opportunities. Moreover, it considers static and dynamic representations of the interactions occurring among learners and "potential forms of assistance" (alias "resources") drawn from such learning ecologies. The context, as represented in the "ecology of resources", is therefore understood as a unique configuration of potential forms of assistance, produced and developed by the individual learner. Learners are urged by hybrid learning ecologies and are engaged in sifting resources and enacting interactions with them on the basis of their own intentions and changing needs. In the effort of combining and merging learning opportunities, an individual learner creates and crosses shifting spaces and times that constitute particular characteristics of emerging "learner-generated contexts". Moreover, the configuration of these shifting spatial and temporal dimensions is likely to reveal the "image" of individual self-directed learners striving to orient themselves across learning ecologies. It is argued that both these aspects can be holistically examined using the analytical tool of the chronotope, which shares with ecological views the perspective of human activity as cyclical and emerging.

THE CHRONOTOPE AS APPLIED TO (DIGITALLY-MEDIATED) LEARNING CONTEXTS

The chronotope construct (Bakhtin, 1981) has been extensively applied to literary, art and

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cinema criticism and, more recently, to fields such as organizational studies and educational research. Here, as a mere example, it is worth recalling the prototypical genre of "road chronotope" and its inherent motif of the "encounters" shaping the path of the primary characters in narratives, such as Greek romance adventures and "road movies". This kind of chronotope has apparent links with the ideas of doctoral journey, 'identity-trajectory' and 'ideological becoming'. However, the goal of this study is related to the exploration of shifting spatial and temporal dimensions of hybrid learning ecologies.

A range of empirical studies have variously applied the construct of chronotope to (technology-mediated) learning contexts (e.g. Lemke, 2004; Brown & Renshaw, 2006; Matusov, 2009; Bloome, Beierle, Grigorenko *et al.* (2009); Ligorio & Ritella, 2010; Compton-Lilly, 2010; Loperfido & Ligorio, 2011; Hakkarainen, Ritella & Seitamaa-Hakkarainen, 2011; Rajala, Hilppö, Lipponen et al., in press). In the following paragraphs, attention is drawn to a short selection of these studies, reviewing them as functional in the construction of the theoretical framework in mind. Brown and Renshaw (2006) refer to the particular chronotope characterizing a specific learning environment as an ongoing process, shaped and re-discussed within a dialogical context being nurtured by a range of voices. These researchers apply Bakhtin's construct to classroom activities and adopt the "chronotope" as a means to uncover how students' participation in the classroom is inflected through interaction among past experiences, ongoing involvement and still-to-be-accomplished objectives. They use the notion of chronotope to reveal the shifting identities of students as they emerge in the interplay of time and space in a collaborative learning approach. They discuss the co-presence of competing chronotopes in classroom activities: for instance, a cooperation-based approach suggested by the teacher versus the specific,

individual interpretation of such approach on the part of students, with respect to past achievements, present problems and foreground perspectives. In some cases learners act as "local heroes" whose actions have an apparent influence on the spatial/temporal matrix. In fact, these researchers conceptualize the chronotope as "creative spaces in which identities, both personal and collective, may be imagined, enacted, or contested" (Brown & Renshaw, 2006, p. 249). What it is particularly relevant in this perspective is the connection highlighted between space-time configurations prescribed by the school environment and the capacity of the individual student to affect it and therefore to act upon the environment of the location. Bloome et al. (2009) expand such a pedagogical use of chronotope, focusing on the opportunities for learning that can be designed. They build on Lemke (2004), who stresses the role of chronotope in providing descriptions of the "typical patterns of organization of and across activities in space and time" and in highlighting features of cultures, subcultures and communities of practice. To this end, focus is drawn to "make a distinction between individually held chronotopes, shared chronotopes, and publicly held chronotopes" (Bloome et al., 2009, p. 325).

Such a key distinction can help to identify the "institutionally sanctioned chronotopes" (Lemke, 2004) and those chronotopes that are constructed by doctoral students through their self-directed practice in digital environments, for instance for purposes linked to leisure and professional activities and for research purposes. Moreover, it can be argued that some doctoral e-researchers are able to move across different chronotopes (as they move across different learning ecologies) with the goal orientation of moving digital practices from the private/professional sphere (individual and shared chronotope) towards new kinds of "publicly held chronotopes". In other words, some self-directed learners could demonstrate

to create an "expansive chronotope" (Rajala et al. in press). Creating such a transformative chronotope, PhD students expand their agency and the related impact on the historical situation in which they are located, beyond the conventional space/time configuration defined by their formal research training environment. The relation between group work and the perception of space/time while using technology is specifically explored by Ligorio an& Ritella (2010), focusing on a case of collaborative teacher training being developed in a mixed physical/virtual learning environment. They highlight social and cultural factors at work in collaborative activities to gain an understanding of the coordination patterns of technology-mediated activities. The metaphor of diverse musical tempos is used to highlight the coordination patterns of the specific space/time configurations emerging from the analysis of the transitional moments in the collaborative work. The identification of the coordination patterns characterizing the boundary-crossing activities of doctoral e-researchers between institutional and self-organized learning ecologies is just at the heart of the undertaken investigation. Finally, focusing on quality of technology mediation, Hakkarainen, Ritella an& Seitamaa-Hakkarainen (2011) view the chronotope as "an approach that guides one to examine both temporal and spatial implications of technology-mediation". They discuss the original chronotope emerging from a collaborative technology-mediated context and providing learners with "amplified semiotic resources based on temporally integrated (bringing earlier crystallized cognitions to the present) and spatially merged virtual and social spaces of activity" (ibid.). This approach leads us to consider affordances of "learner-generated contexts" as dynamic and dialogical, being co-constructed by participants (Oliver, 2006) and as networked and evolving across space and time dimensions (Hoffmann & Roth, 2005). On the other hand, it is worth noting that the instances reported above refer

to collaborative learning situations organized in formal settings. Otherwise, preliminary findings give evidence that the PhD researchers participating in the inquiry mostly show an isolated mode of study (Esposito, Sangrà & Maina, 2013). Thus, the focus is on the extent to which self-directed doctoral students are originally able to coordinate learning opportunities drawing from hybrid learning ecologies to create a kind of transformative chronotope.

ELEMENTS FOR A THEORETICAL FRAMEWORK

The theoretical strands briefly considered in the previous sections provide some key elements to develop a theoretical framework matching a research question aiming to explore the affordances of emerging learning ecologies of doctoral e-researchers. The provisional achievement is graphically summarized in the Fig.1 below.

The doctoral experience can be framed as a journey in which an "identity-trajectory" is to be unfolded, through the diachronic interweaving of the "intellectual", "networking" and "institutional" strands (McAlpine & Amundsen, 2011a) and across three developmental phases from the status of student towards a more defined autonomy as researcher (Gardner, 2009). The idea of "identity-trajectory" can be coupled to the notion of "individual becoming" (Bakhtin, 1981), in which individual PhD students orientate their intentionality through a dialogical and productive "struggle" with other subjects and multiple resources. Hybrid (physical/virtual; institutional/self-directed) learning ecologies are seen as the emergence of digitally permeated ecosystem, in which hybrid (physical/virtual) spaces (Kazmer, 2002) are closely interconnected, mutually influence one other and also open up to different

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Figure 1. Elements for a theoretical framework.

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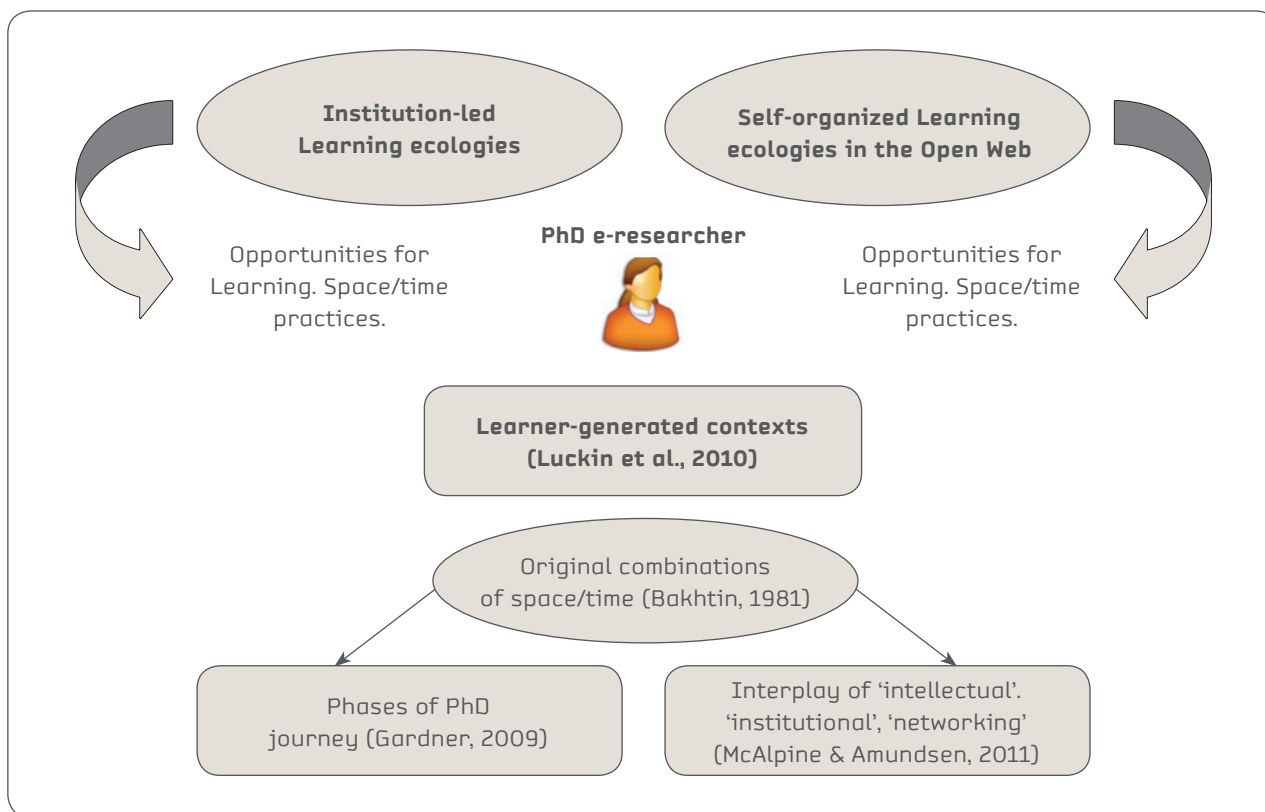
temporal configurations. Institutional and self-directed learning ecologies are thought as complementary, but sometimes overlapping or contrasting sources of learning opportunities. Doctoral students are driven by their motivations and evolving learning needs and strive to filter and re-combine such learning opportunities, in order to produce unique learning contexts. Following Luckin (2010), the learning context being produced is understood as an "ecology of resources" – a matrix in which the prospective researcher shapes, manages and makes sense of the different "potential forms of assistance", be they human or material resources or tools – that are available in their formal and informal learning ecologies. The Bakhtinian chronotope provides an analytical tool that can be useful to gain insights on the extent to which doctoral e-researchers manage their moves across institution-led and self-organized learning ecologies to generate learning contexts. The distinction and

relationship between private, informally and formally shared chronotopes – as outlined by Bloome et al. (2009) - are adopted to reveal shifting modes and spaces for scholarly activity and interaction in networked environments and can provide the lived experience of this niche of "silent experts" (Williams et al., 2011) coping with conventional and "scripted" or open and networked learning environments. The analysis of the ways in which doctoral students are actually interpreting space and time affordances of hybrid learning ecologies is likely to reveal the extent to which emerging digital mediation is affecting the intellectual, networking and institutional strands of activities, in different phases of the doctoral journey. Furthermore, it can shed light on the capacity of individual doctoral e-researchers to co-evolve along with (or, to a degree, in contrast to) their reference academic setting and discipline culture.

CONCLUSIONS

This paper has provided a reflection on the construct of the chronotope as an analytical lens suitable for illustrating the moves of PhD researchers across competing space/time configurations (affordances) emerging from formal and informal learning ecologies.

The time factor, in its close interdependence with space factor, was here discussed within a perspective considering the interplay of metaphors as a way to inform research (Sfard, 1998). This choice has its own potential and risks. On the one hand the use of metaphors enables "conceptual osmosis between everyday and scientific discourse" (Sfard, 1998, p. 4). On the other hand, this might expose the researcher to a danger of relying on her previous assumptions. As Sfard suggests, it is worth considering a dialogue approach to other kinds of metaphor. This article provides an early attempt to think of an interplay between the metaphors of learning ecologies and chronotope, taking into account a defined research question and with the aim of holistically considering space and time factors. Various issues remain or should be explored more in-depth. For instance, a more focused

consideration of space and time dimensions developing in ecosystems (e.g. Cadenasso, Pickett & Grove, 2005) might provide additional hints for discussing digital ecosystems and related ecological metaphors. As regards the chronotope, although the variety of its applications to a range of research topics continues providing evidence of its analytical richness and flexibility, it is acknowledged that the conceptualization of chronotope is affected by weak analytical precision due to a current lack of systematic definition of the term (Leander, 2001; Bemong & Borghart, 2010). Furthermore, the application of this construct by educational researchers has been harshly criticized by philologists (Matusov, 2009). Such hurdles notwithstanding, it can be said that this notion fits the constructivist grounded theory approach underlying the ongoing study of doctoral researchers' Web 2.0 learning ecologies. In fact, the chronotope does not constitute a prescriptive framework from which to draw hypothesis before undertaking data gathering. On the contrary, it provides the researcher with a repertoire of "sensitizing concepts" (Charmaz, 2006) that can be used to orientate the collection and interpretation of empirical data.

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References

Andrews, R. L. & Haythornthwaite, C. (2011). E-learning ecologies. In E-learning. Theory and Practice. London: SAGE, 143-160.

Baptista, A. V. & Huet, I. (2012). Making sense of metaphors about doctoral students' competences: Analysis of supervisors' voices. Procedia. Social and Behavioural Sciences, 47 (2012), 930-937.

Barnett, R. & Coate, K. (2005). Engaging the Curriculum in Higher Education. Maidenhead: SRHE/Open University Press.

Bakhtin, M. M. (1981). Form of Time and Chronotope in the Novel. In (Holquist, M. & Emerson, C. translators) The dialogic imagination. Four essays by Mikhail Bakhtin. Austin: University of Texas Press, 84-258.

Barron, B. (2006). Interest and self-sustained learning as catalysts of development: A learning ecologies perspective. Human Development, 49, 193-224.

Esposito, A.; Sangrà, A. & Maina, M. (2013). Chronotopes in learner-generated contexts. A reflection about the interconnectedness of temporal and spatial dimensions to provide a framework for the exploration of hybrid learning ecologies of doctoral e-researchers. *eLC Research Paper Series, 6, 15-28.*

Bates, T. (2010). Relevant voices around the world. In Barberà, E. (ed.). Time factor in e-learning. eLC – Research papers Series - Issue 0, 2010, 4-6. Retrieved March 20, 2011 from: http://www.uoc.edu/ojs/index.php/elcrps/issue/view/issue-0

Bemong, N. & Borghart, P. (2010). State of the Art. In Bemong, N., Borghart, P., De Dobeleer, M. et al. (Eds). Bakhtin's Literary Chronotope: Reflections, Applications, Perspectives. Ginko, Academia Press, 3-16.

Bloome, D., Beierle, M., Grigorenko, M. & Goldman, S. (2009). Learning Over Time:

Uses of Intercontextuality, Collective Memories, and Classroom Chronotopes in the Construction

of Learning Opportunities in a Ninth-Grade Language Arts Classroom. Language and Education 23 (4), 313–34.

Boulos, M. & Wheeler, S. (2007). The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education. Health Information and Libraries Journal, 24(1), 2–23.

British Library/JISC (2011) Researchers of tomorrow. A three-year (BL/JISC) study tracking the research behaviour of 'Generation Y' doctoral students. Second annual report 2010-2011. Retrieved June 30, 2011 from: http://www.jisc.ac.uk/news/stories/2011/06/researchersoftomorrow.aspx

Brown, R. & Renshaw, P. (2006). Positioning Students as Actors and Authors: A Chronotopic Analysis of Collaborative Learning Activities. Mind, Culture, and Activity. Vol. 13, No. 3. (1 August 2006), 247-259.

Cadenasso, M.L., Pickett, S.T.A., Grove, J.M. Dimensions of ecosystem complexity: Heterogeneity, connectivity, and history, Ecological Complexity, Volume 3, Issue 1, March 2006, pp. 1-12.Cumming, J. (2010). Doctoral enterprise: a holistic conception of evolving practices and arrangements. Studies in Higher Education, 35 (1), (February 2010), 25–39.

Charmaz, K. (2006). Constructing Grounded Theory: A Practical Guide through Qualitative Analysis. London: SAGE.

Compton-Lilly, C. (2010). Making sense of time as context: Theoretical affordances of chronotopes in the study of schooling and school success (WCER Working Paper No. 2010-11). Retrieved from University of Wisconsin–Madison, Wisconsin Center for Education Research website: http://www.wcer.wisc.edu/publications/workingPapers/papers.php

Conole, G. & Dyke, M. (2004a). What are the Affordances of Information and Communication Technologies? ALT-J, 12(2), 113-124.

Conole, G. & Dyke, M. (2004b). Understanding and Using Technological Affordances: a response to Boyle & Cook, ALT-J, 12(3), 301-308.

Cresswell, J. & Hawn, A. (2012). Drawing on Bakhtin and Goffman: Toward an epistemology that makes lived experience visible. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 13(1).

Cumming, J. (2010). Doctoral enterprise: a holistic conception of evolving practices and arrangements. Studies in Higher Education, 35 (1), (February 2010), 25–39.

Ellis, R. A. & Goodyear, P. (2009). **Students' experiences of e-learning in higher education: the ecology of sustainable innovation. London: Routledge.**

Flores-Scott, E. & Nerad, M. (2012). Peers in Doctoral Education. New Directions in Higher Education, 157 (Spring 2012), 73-83.

Foucault, M. (1967). Of other spaces, heterotopias. Retrieved November 15, 2012 from: http://foucault.info/documents/heteroTopia/foucault.heteroTopia.en.html.

Freedman, S. W. & Ball, A. F. (2006). Ideological becoming. Bakhtinian concepts to guide the study of language, literacy and learning. In Ball, A. F. & Freedman, S. W. (Eds.). Bakhtinian perspectives on Language, Literacy and Learning. Cambridge University Press, 3-33.

CHRONOTOPES IN LEARNER-GENERATED CONTEXTS. #02
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Gardner, S. K. & Mendoza, P. (2010). On becoming a scholar: Socialization and Development in Doctoral Education. Stylus Publishing, LLC.

Gourlay, L. (in press) "Creating time: students, technologies and temporal practices in higher education", *E-learning & Digital Media* 11(1).

Gourlay, L. & Oliver, M. (2012) Curating, combat or coping? Student entanglements with technologies in HE. Paper presentation at SRHE 2012, Newport, UK.

Hakkarainen, K., Ritella, G., & Seitamaa-Hakkarainen, P. (2011). Epistemic mediation, chronotope, and expansive knowledge practices. 9th Conference of Computer-Supported Collaborative Learning (CSCL).

James, L., Norman, J., De Baets, A.-S., Burchell-Hughes, I., Burchmore, H., Philips, A., Sheppard, D., Wilks, L. & Wolffe, J. (2009). The lives and technologies of early career researchers, JISC report. Retrieved July 5, 2011 from: http://www.jisc.ac.uk/publications/reports/2009/earlycareerresearchersstudy.aspx#downloads

Jazvac-Martek, M., Chen, S. & McAlpine, L. (2011). Tracking the Doctoral Student Experience over Time: Cultivating Agency across Diverse Spaces. In McAlpine, L. & Amundsen, C. (Eds) (2011). Doctoral Education: Research-based Strategies for Doctoral Students, Supervisors and Administrators. Netherlands: Springer, 17-36.

Kazmer, M. M. (2005). Cats in the classroom: Online learning in hybrid space. First Monday, 10 (9) (September 2005). Retrieved December 20, 2012 from: http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1278/1198.

Koschmann, T. (1999). Toward a dialogic theory of learning: Bakhtin's contribution to learning in settings of collaboration. Paper presented at the Computer Supported Collaborative Learning (CSCL '99), Palo Alto, CA. Proceedings, 308–313. Retrieved March 20, 2012 from http://kn.cilt.org/cscl99/A38/A38.HTM.

Leander, K. M. (2001). 'This is our freedom bus going home right now': producing and hybridizing space-time contexts in pedagogical discourses. Journal of Literacy Research. 33(4), 637-679.

Lemke, J. L. (2004). Learning across multiple places and their chronotopes. Contribution at the symposium *Spaces and boundaries of learning.* Retrieved December 20, 2012 from: http://www-personal.umich.edu/~jaylemke/papers/aera_2004.htm.

Ligorio, M. B. & Ritella, (2009). The collaborative construction of chronotopes during computer-supported collaborative professional tasks. *International Journal of Computer-Supported Collaborative Learning.* Vol. 5, No. 4. (December 2010). Retrieved May 15, 2011 from: *http://www.springerlink.com/index/P37N1N7033552W31.pdf*

Loperfido, F. F. & Logorio, M. B. (2011). Chronotopes as tools for building identities in universities blended courses. Paper presented at the *III National Congress CKBG* (Collaborative Knowledge Building Group), Bari, 6-8 April 2011.

Lovitts (2005). Being a good course-taker is not enough: a theoretical perspective on the transition to independent research. *Studies in Higher Education*, 30(2), 137-154.

Luckin, R. (2008). The learner-centric ecology of resources: A framework for using technology to scaffold learning. *Computers in Education*, 50, 449-462.

Luckin, R. (2010). *Re-designing learning contexts: technology-rich, learner-centred ecologies.* London, UK: Routledge.

Luckin, R. (2010a). Contexts for learning. In Luckin, R. *Re-designing learning contexts: technology-rich, learner-centred ecologies.* London, UK: Routledge, pp. 3-18.

Luckin, R., Clark, W., Garnett, F., Whitworth, A., Akass, J., Cook, J., Day, P., Ecclesfield, N., Hamilton, T., & Robertson, J. (2010). Learner-Generated Contexts: A Framework to Support the Effective Use of Technology for Learning. In M. Lee, & C. McLoughlin (Eds.), Web 2.0-Based E-Learning: Applying Social Informatics for Tertiary Teaching (pp. 70-84). Hershey, PA: Information Science Reference. doi:10.4018/978-1-60566-294-7.ch004

#02 CHRONOTOPES IN LEARNER-GENERATED CONTEXTS. A REFLECTION ABOUT THE INTERCONNECTEDNESS...

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Esposito, A.; Sangrà, A. & Maina, M. (2013). Chronotopes in learner-generated contexts. A reflection about the interconnectedness of temporal and spatial dimensions to provide a framework for the exploration of hybrid learning ecologies of doctoral e-researchers. *eLC Research Paper Series, 6, 15-28.*

Matusov, E. (2009). Journey into Dialogic Pedagogy. New York: Nova Science Publishers. McAlpine, L. & Amundsen, C. (Eds) (2011). Doctoral Education: Research-based Strategies for Doctoral Students, Supervisors and Administrators. Netherlands: Springer.

McAlpine, L. & Amundsen, C. (2011a). Making Meaning of Diverse Experiences: Constructing an Identity Through Time. In McAlpine, L. & Amundsen, C. (Eds) (2011). Doctoral Education: Research-based Strategies for Doctoral Students, Supervisors and Administrators. Netherlands: Springer, 173-183.

Nardi, B. & O'Day, V. (1999). Information ecologies: using technology with heart. Cambridge, MA: MIT Press.

Odaci, H. (2011). Academic self-efficacy and academic procrastination as predictors of problematic internet use in university students. Computers & Education, 57, 113-119.

Pata, K. & Laanpere, M. (2011). An Ecological Meta-Design framework for open learning ecosystems. Paper presented at the ECER 2011 Conference, "Urban Education", Berlin, Germany, 13-16 September 2011.

Rajala, A., Hilppö, J., Lipponen, L., & Kumpulainen, K. (in press). Expanding the Chronotopes of Schooling for Promotion of Students' Agency. In O. Erstad & J. Sefton-Green (Eds.), Learning lives: Transactions, technologies, and learner identity. Cambridge University Press. Draft retrieved June 20, 2012 from: http://chicago.academia.edu/Documents/in/21st_Century_Education_and_Learning

Reimann, P. (2009). Time is precious: Variable and event-centred approaches to process analysis in CSCL research. Computer-Supported Collaborative Learning. 4, 239-247.

Romero, M. & Barberà, E. (2011). Quality of e-learners' time and learning performance beyond quantitative time-on-task. IRRODL, 12 (5). Retrieved September 20, 2011 from: http://www.irrodl.org/index.php/irrodl/article/view/999

Shulman, L.S. (2004). The Doctoral Imperative: Examining the End of Erudition. In Shulman, L.S. & Hutchings (Eds) (2004).Teaching as Community Property: Essays in Higher Education. San Francisco: Jossey_Bass. 219-233.

Whiteman, N. & Oliver, M. (2008). *Engaging with the research methods curriculum.* Reflecting Education, 4 (1). 63-71. Retrieved May 24, 2011 from: http://eprints.ioe.ac.uk/3120/

Williams, R., Karousou, R. & Mackness, J. (2011). Emergent learning and learning ecologies in Web 2.0. IRRODL, 12 (3). Retrieved April 20, 2012 from: http://www.irrodl.org/index.php/irrodl/article/view/883

Zaman, M. (2010). Doctoral Programs in the Age of Research 2.0. In Anandarajan, M & Anadarajan, A. (2010). e-Research Collaboration. Springer Verlag, 233-246.

Zhu, Y. & Procter, R. (2012). Uses of blogs, Twitter and Facebook by PhD students for Scholarly Communication: A UK study. Paper presented at 2012 China New Media Communication Association Annual Conference Macao International Conference 6-8 December 2012. Retrieved February 16, 2013 from: https://www.escholar.manchester.ac.uk/item/?pid=uk-ac-man-scw:187789

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