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Exploring educators' professional learning ecologies in a blended learning environment

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Abstract
In recent years the concept of learning ecology has been interpreted in different ways to highlight its potential for learning and professional development. However, there are several aspects that still deserve to be understood such as, eg, the role that the different contexts come to play within a learning ecology. For this purpose, this paper presents and discusses the results of a study exploring the learning ecologies of educators in a blended programme delivered in higher education. The participants in the study were 85 professionals in the field of education aged between 28 and 58 years. The research design adopted here can be defined as a convergent mixed method where both quantitative and qualitative data were collected through an e-portfolio. The study found that educators in the sample had different postures, of whom some more aware of their professional roles or Self than others. Moreover, different professional identities seemed to be linked to different learning ecologies, where elements like formal or informal education, cultural artefacts, personal experiences, colleagues or work experiences played a different role. Formal education emerged as having a questionable function, while colleagues came up as a crucial resource.

Introduction

The concept of learning ecologies is a relatively new construct which has received greater attention in recent years (Harvey, Coulson, & McMaugh, 2016) due to the widening of contexts of learning, which increasingly include not only formal education but also informal learning activities, work experiences, cultural artefacts, personal contacts, etc. The acceleration of knowledge production processes (Siemens, 2007), the globalisation of knowledge socialisation (Reed *et al.*, 2010) and the augmented complexity of knowledge itself (Barron, 2006), require empowered learners to be able to consciously shape their learning ecologies, especially for professional purposes and development (O'Sullivan & Taylor, 2004). Digital media, of course, have played a pivotal role in this transformation process. Social network sites provide an exemplary case of how digital technologies support extended opportunities to learn by weakening the boundaries

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Practitioner Notes

What is already known about this topic

- The concept of learning ecology goes beyond formal education including different contexts, relationships and resources that are fundamental for personal development.
- Digital technologies enhance a better hybridisation between formal and informal learning.
- e-portfolio is a suitable instrument to document the different elements of a learning ecology.

What this paper adds

- A problematisation of the learning ecology construct in the light of professional development with a focus on educators' professional identity.
- The understanding of those elements over formal education contributing to educators' professional development.
- The role of visual inputs within the e-portfolio affording the development of professional awareness.

Implications for practice and/or policy

- Rethinking formal education for educators strongly bridging theory and practice.
- Using instruments and tools that facilitate the emergence of professional learning ecology.
- Attributing more value to the role of colleagues as resources in the development of stronger learning ecologies.

between formal and informal, personal and professional, friendships and professional belonging (Manca & Ranieri, 2013, 2016). That said, there is still a relatively low level of understanding of how learning ecologies work, how they impact on the development of learning agency, especially for professionals who need a personalised approach to learning (Giampaolo, 2017), and how they influence the building up of professional identities. Moreover, research should better highlight the extent to which learners are aware of their learning ecologies as well as whether learners' learning ecologies are suitable (or not) to the development of professional awareness.

This study attempts to tackle some of the issues mentioned with the aim of contributing to the current debate on learning ecologies. Prior to describing the methods and the main findings, the paragraph below provides the theoretical ground for the analysis.

Theoretical framework

The term "ecology" has been associated to learning since the beginning of the new Millennium through the work of Brown (2000) who defines it as "an open, complex, adaptive system comprising elements that are dynamic and interdependent" (p. 19) and involving overlapping communities of interest in constant evolution and largely self-organised. Grounded on Brown's (2000) analysis the concept evolved through the work of other scholars who highlighted different characteristics of this construct such as spaces, contexts and processes (Barron, 2006; Jackson, 2013; Lemke, 2000; Richardson, 2002; Siemens, 2007).

According to Siemens (2007), a learning ecology is an adaptable space where learning occurs to respond to the several and different needs of users, thus generating chaos. Barron (2006)

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interprets a learning ecology as "the set of contexts found in physical or virtual spaces that provide opportunities for learning" (p. 195), including unique configurations of resources and interactions. Lemke (2000) refers to a learning ecology as a system of interdependent processes: people who are consciously engaged in them reflect on what is going on, who is participating, and how elements are interdependent. Similarly, Jackson (2013) suggests that a learning ecology is "the process(es) I create in a particular context for a particular purpose that provide me with opportunities, relationships and resources for learning, development and achievement" (p. 14).

Understanding learning ecologies as processes means giving importance to learning agency, self-directedness (Brockett & Hiemstra, 2018) and self-regulation (Zimmerman, 2000). These concepts are close to the construct of capability, which Eraut (2009) defines as the skills, the quality and the attitudes that a person brings to a situation and that allow him/her to interact with the situation.

Richardson (2002) defines the construct of learning ecologies between formal and informal learning situations, influencing Jackson's (2013) model. In formal contexts, a learning ecology is structured by teachers who design and implement learning activities to achieve specific objectives. Although the level of teachers' control could vary, a learning ecology in formal contexts has the explicit objective of learning. Differently in everyday life and workplaces, learning ecologies grow with individuals establishing objectives, interactions and collaborations. In an informal learning ecology, "learning is not the explicit objective", but an unconscious product of the experience. The perspectives of formal and informal education go across a continuum where the processes of learning are completely determined by the institution or completely provided by the learner, generating four possible categories of learning ecologies (Table 1).

Moreover, Jackson (2013) identifies the components of a learning ecology. He explains how the integration and interdependence of the personal contexts, resources, relationships, learning processes, will and capabilities create the ecology for a specific learning purpose (Figure 1).

Jackson's model provided the ground for this study since its components are suitable to effectively describe professional learning ecologies of practitioners in the field of education. Therefore, it was used for the design of an e-portfolio aimed at supporting educators' professional reflection and development (Strivens, 2007). The integration with digital technologies facilitates e-portfolios storing and sharing of knowledge, skills, tools and resources that frame individuals' learning ecologies and that are recognised as fundamental for their professional growth (Guder, 2013).

Through the analysis of data collected using the e-portfolio, this study aims at investigating educators' learning ecologies and professional identities conceived as "the concept which describes how we perceive ourselves within our occupational context and how we communicate this to others" (Nearly, 2014). Specifically, it focuses on the following research questions:

(RQ1) How do participants represent their professional identities? Why?
(RQ2) Does a relationship exist between different learning ecologies and different professional identities?

Method

The research approach adopted in this study is a convergent mixed method design (Creswell & Plano Clark, 2011): quantitative and qualitative data were concurrently collected, while their analysis was firstly kept distinguished and then mixed to better interpret the findings. As Creswell (2012) explains, "a basic rationale for this design is that one data collection form supplies strengths to offset the weaknesses of the other form, and that a more complete understanding of a research problem results from collecting both quantitative and qualitative data" (p. 540).

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Table 1: Categorisation of learning ecologies (adapted from Jackson, 2013, p.12)

LEARNING ECOLOGIES	*CONTEXTS*
A) TRADITIONAL FORMAL EDUCATIONAL LEARNING ECOLOGY The context, purpose, goals and objectives, together with content (resources), process and relationships are all determined by the provider.	FORMAL/LEARNING-CONSCIOUS LEARNING (school, college, university and corporate training)
B) ENQUIRY, PROBLEM- & PROJECT-BASED LEARNING ECOLOGIES Pedagogic processes encourage learners to create their own processes for learning, to define and explore problems and discover resources and solutions for themselves.	
C) SELF-DIRECTED BUT SUPPORTED LEARNING ECOLOGIES Content, goals and the learning process are largely determined by the contexts learners choose or generate for themselves but support in the form of advice and guidance is given to facilitate learning and achievement.	
D) SELF-DIRECTED & SELF-MANAGED LEARNING ECOLOGIES Purpose, goals, contexts, content, process, resources and relationships entirely determined by the learner.	INFORMAL/TASK-CONSCIOUS LEARNING (work, family, solving everyday problems)

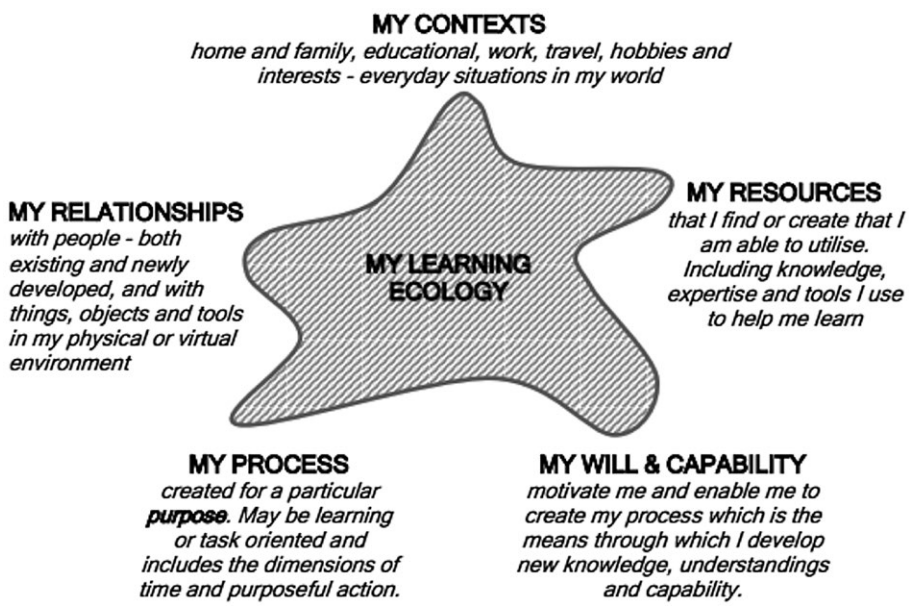

Figure 1: Components of a learning ecology (from Jackson, 2013, p. 14)

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Research context

The context for the study was provided by the 1-year programme for "Professional Socio-Pedagogical Educators", a blended training course delivered by the University of Florence in 2018–19 and addressing educators already working in the socio-educational field. The programme was developed with the aim of providing educators with opportunities to consolidate their professional experience through theoretical and methodological knowledge. It was designed considering four main parameters (Bachmair, Pachler, & Cook, 2011):

- The learning environments, from formal educational practices to everyday life.
- The relationship between the learner and the object of learning, from mimetic reproduction to personal reconstruction.
- The individual expertise of the learner, from school curriculum to the spontaneous competence developed in everyday life.
- The variety of different forms of representations, from written texts to dynamic images.

Those parameters were differently regulated to allow learners to participate in the development of the programme, approaching their professional experiences as part of the curriculum and combining formal technological infrastructures with informal pieces of learners' digital and non-digital life.

Consistently with these assumptions, each module in the course was structured into four phases:

- Phase 1––Activation, to encourage learners to mobilise previous professional experiences through an incidental case for bridging the new and preexisting knowledge.
- Phase 2––Documentation, to provide learners with conceptual knowledge to support reflective processes through asynchronous video lectures.
- Phase 3––Application, to facilitate knowledge appropriation through practice, ie, carrying out e-tivities requiring one to apply the concepts developed through the documentation phase.
- Phase 4––Final reflection, which is a second step analysis of the incidental case presented at the beginning for further reflection in the light of theories and methods appropriated in the previous phase. Reflections are shared, revised and finally stored in the e-portfolio (see also below).

Participants

The participants in the study were 85 professionals in education (M = 20, F = 65) aged between 28 and 58 years and working in Tuscany (Italy). Approximately half of them (42) had a high school diploma, 38 had a bachelor's or master's degree and 5 a PhD. They worked in organisations of different sizes: 22 in organisations with fewer than 30 employees, 26 in organisations with between 30 and 100 employees, 37 in organisations with more than 100 employees. The length of their service varied with a predominance of workers (52) with a professional experience of less than 10 years, followed by workers (27) having between 10 and 20 years of experience and only 6 with more than 20 years of service. Their professional role can be shaped within four main categories: social workers (34), employees in services addressing people with special needs (24), nursery or school educators (11), employees in services for elderly people (4). Twelve worked in other sectors always related to education.

Instrument: the e-portfolio

The e-portfolio intended to stimulate and support learners in connecting different elements, such as informally acquired knowledge, workplace experiences, course contents and assignments, and to reflect on their learning outcomes, including new professional skills and competences (Istenic Starcic, 2008; Jones, 2010). It was structured into four activities to be implemented during the course:

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- Activity 1. "Me as an educator": starting with a visual stimulus like an image, participants were invited to reflect on the elements that contributed to the development of their professional identity (at the beginning).
- Activity 2. Reflection: participants were requested to re-elaborate their personal reflections developed at the end of each module according to the feedback received from peers and post them within the e-portfolio (throughout the course).
- Activity 3. Working portfolio: this section consisted of learners' selection of the most significant e-tivities carried out during the course (almost at the end).
- Phase 4. Storytelling: to make sense of the overall learning experience, participants were solicited to reconnect all elements collected in the e-portfolio through the technique of storytelling, placing the experience of the course within the wider trajectory of their professional life (at the very end).

Procedure

For the purpose of the study, the focus was on the relationship between learning ecologies and professional identity, explored through the activity "Me as an educator", which entailed two main steps: first, choosing one image representing one's own professional identity, and explaining why; second, creating a map of the own professional identity, locating the selected image at the centre of the map and all around the elements contributing to the shaping of the professional Self. This activity was jointly designed with experienced educators who selected significant images and suggested considering seven elements, ie, formal education, non-formal/informal education, personal experiences, professional experiences, relationship with colleagues, relationship with tutee and cultural products (Figure 2).

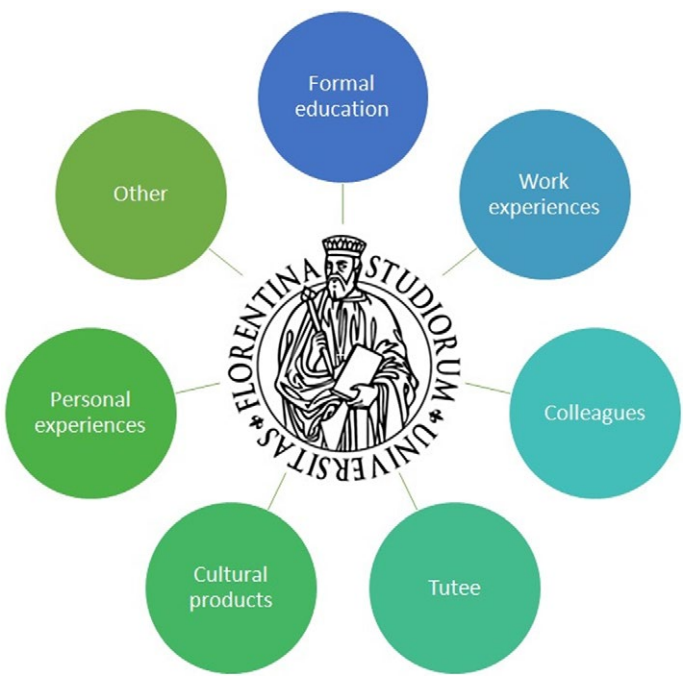

Figure 2: Mapping learning ecologies

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Data analysis

For each participant, the selected image was coded as well as the elements mentioned in the map. Quantitative data were analysed through descriptive statistics like relative frequencies and the transformation of these values into percentages. Motivation examination linked to the image choice was based on a thematic analysis (Silverman, 2013). Two researchers separately and iteratively analysed them and through a negotiation process, they identified different educators' professional postures as described below.

Results

(RQ1) How do participants represent their professional identities? Why?

To answer the first research question, the authors took into consideration both the frequency of participants' image choice (Table 2) and the related motivations. The image with the highest value represents a rugby team, while the second most chosen image is an outstretched hand. Then follow images with values of less than ten. Lastly, the image of chess, a competitive game, chosen by only one participant. Figure 3 shows all images available for the choice.

Concerning participants' motivations for their image choice, the thematic analysis allowed researchers to identify four postures, meant as data-driven categories of professional identities

Table 2: Frequency of image choice

Image	*Frequency*
Rugby	23
Outstretched hand	17
Child at a microphone	9
Stairs	8
Ingredients	7
Gears	6
Mirror	5
Binoculars	5
Ice hiking	4
Chess	1

Figure 3: Visual inputs to reflect on professional identity

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Table 3: Frequency of professional identity

Typology	*Frequency*
Self-referential	42
Reflective	21
Relational	13
Transformative	9

(Table 3) and relying on the different balance between the Self (ie, the professional) and the other (ie, the tutee).The postures are: self-referential, reflective, relational and transformative.

Self-referential

The self-referential educator appears as deeply focused on the Self, usually reporting doing her/his job by chance or personal satisfaction, leveraging on skills coming from other fields: "I work in a socio-educational centre as an operator and I have been entrusted with the responsibility of organising the animation activities. Since I'm passionate about the theatre and performing arts, I put them at the service of the educational work" (P [=Participant] 15). S/he does not seem to be aware of the professional dimension of her/his job and prefers to focus on emotions and the gratification deriving from helping others: "The image that I have chosen is a hand extended towards the other. There is not a specific episode that I'd associate with it. Since childhood I have placed the value of the human dimension above all things. [...] I remember the moment when I thought that I wanted to help others in my life" (P8).

Reflective

The reflective educator is still focused on the Self but for the purpose of self-analysis. The professional experiences in marginalised contexts push this typology to question themselves and their certainties: "Working with mental disease has not only improved my vision of the other, but has also led to a long introspective work, I have abandoned many rigid structures that I inherited from a kind of culture which defines normality according to a series of parameters" (P49). Moreover, s/he tends to reflect on her/his professional trajectory, identifying possible improvements: "I've chosen the image of a person who is climbing stairs, because I found it very representative of my path. [...] My first experience as an educator came to my mind. I was about 20 years old, I was studying psychology, I was in the early years, and [...] I was asked to take care of a minor with behavioural problems... I remember that I did my best to help him... but the reality was that I was totally inexperienced and, despite my good will, I made many mistakes. [...] This work is like a ladder: there's always away to climb a step and improve" (P59).

Relational

In this case the focus is on the relationship itself, meant as a mutual process where both the educator and the tutee are seen as bearers of capacity and wealth, goods that can be exchanged ("The hand's position indicates both giving and receiving, which is an essential dynamic in every human relationship, including our profession of educators", P67). Indeed, the educator underlines the possibility of recognising her/himself in the people and the stories s/he gets to know through her/his work: "I've chosen the image of a girl who is looking at different people [...] In this image, the girl while watching others also sees a reflection of herself that means I recognise myself in every person I meet because what we have in common is being human [...] The reflection of myself in others allows me to know myself better sometimes in my strengths, sometimes in my weaknesses, others in their errors or in their positive sides" (P70).

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Transformative

The transformative educator is more interested in the Other, seen as a person with specific characteristics, skills and attitudes who is engaged in an educational process of growth and transformation ("Often, many young people I worked with, thought their life was just that: the only reality they knew. Many of them ignored alternative horizons, they did not imagine them within their reach: the educator should precisely promote an improvement in the current situation…", P78). This professional seems really conscious of the final target of her/his work and perceives her/himself as a professional who can help but cannot do miracles: "Over the years, I have realised that the work of an educator is very similar to that of a gardener. The seed has already been sown by others, […] then one day you receive the task of taking care of it, helping it to grow to its best […] and everything will depend on the plant itself, how it will decide to grow when you are no longer there to 'give it your care and attention'" (P81).

(RQ2) Does a relationship exist between different learning ecologies and different professional identities?

The second research question aims at exploring whether a relationship exists between different professional identities and different learning ecologies. To answer this question an analysis of the occurrences of the elements of a learning ecology (ie, non-formal/informal education, personal experiences, cultural artefacts, users, colleagues, formal education, work experiences) included in the e-portfolio mapping activity (see above), was carried out according to the four educator typologies. The results suggest that different levels of association exist between elements of a learning ecology and educator's postures. In the descriptive analysis (Figure 4), it may be observed that in the case of the self-referential professional elements of formal education, followed by work experience, prevail when compared to other components; for the reflective professional type elements relating to cultural artefacts, followed by non-formal education, predominate compared to formal education or other informal components; in the learning ecologies of relational educators elements like colleagues, work experience and non-formal education seem to dominate the others. Finally, transformative professionals mainly refer their learning ecologies to colleagues and work experiences.

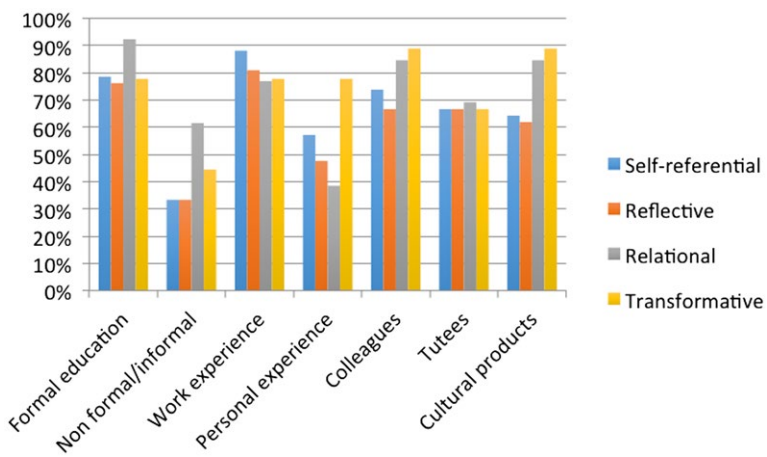

Figure 4: Association level between elements of the mapping activity and professional postures

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Qualitative data, gathered through the in-depth analysis of participants' commentaries of their learning ecology map, corroborate these associations. Self-referential educators sometimes begin their map illustration by describing their formal education path, and then underlining other experiences: "It all started with my studies on Social Service. University courses on psychology, especially social, educational and developmental psychology, were the most significant and influenced my future career. With this preparation I was able to work for several years as a Social Worker with minors, which gave me the opportunity to develop more skills." (P15) Many reflective educators mention cultural products within their learning ecologies; eg, this professional says: "*Seeing Voices* by Oliver Sacks was my first approach to deafness, then in my training the encounters with the 'deaf community' was of great importance. Basically, my idea of an educator is mainly linked to communication and the various deficits connected to it." (P51) Several relational professionals include some non-formal education experiences in their maps, eg, the civil service described as a context for meeting diversity: "I created the map to account for my evolution, starting with my 'zero year', that is the meeting with people with disabilities during my civil service, which was a discovery that changed my life: in fact, I abandoned the law faculty and my job as a surveyor to dedicate myself to this world." (P67) The transformative educator often reports experiences and colleagues who contributed to building her/his professional awareness. For example, this professional remembers her/his first pedagogical coordinator who influenced her/his educational approach: "I was immediately struck by her great passion, working alongside her for five years was a great asset. She gave me criticisms, suggestions, mutual listening in a group and individually, encouragement and a sentence that I still remember: 'look in the mirror in the morning and say you are an educator'. This sentence is fundamental to bring us back to the importance of being aware of our own work, from the words we use to how we relate to each other." (P71)

Discussion

Based on the analysis of data collected through an e-portfolio (Strivens, 2007), this study explored how professional identities take shape within the distributed landscape of learners' learning ecologies (Barron, 2006; Hill, Wilson, & Watson, 2004; Lee *et al.*, 2015; Looi, 2001; Thomas, 2010; Williams, Karousou, & Mackness, 2011). Made up of different elements like personal experiences, human and non-human resources, cultural products and so on (Jackson, 2013), different learning ecologies can lead to different ways of perceiving themselves as professionals. Briefly, educators who are more focused on their Self are predominantly associated with elements such as formal education and work experience; educators who concentrate on their Self in a more reflective way are connected to elements like non-formal education and cultural products; educators who are more inclined towards relationships are mainly associated with elements like colleagues, work experiences and non-formal education; lastly, educators defined here as transformative are more linked to elements like colleagues and work experiences. Although the associations observed through this study do not have any inferential value, on an exploratory level the research results suggest two considerations.

On one hand, it is interesting to observe that formal education had a predominant occurrence only in the case of the self-referential educator, while in other profiles it is less relevant. The self-referential profile is not precisely the ideal type of educator in so far as s/he looks at the tutee in self-referential terms. And yet formal education seems to have a responsibility in shaping these self-centred identities, prompting us to reflect on its limits in the preparation of professionals to whom the link between theory and practice is crucial. At the same time, self-referential educators also tend to mention work experiences among the elements of their learning ecology, which suggests that even professional experience can lead to inappropriate visions of professional roles. The

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implicit knowledge embedded in professional contexts does not necessarily have an educational value.

On the other hand, colleagues and work experiences seem to have a main role in the learning ecologies of transformative educators, ie, the ideal type of educator who is focused on creating the conditions around the tutee that make her/him able to develop her/his human potential. Contrary to the previous case, work experiences may play a positive role, especially when colleagues represent a source of professional knowledge. In other words, it seems that when experienced workers play a role within educators' learning ecologies, the implicit knowledge embedded in professional contexts may have an educational value with positive implications for the learner's agency. It is also interesting that in the other two cases of self-reflective and relational educators non-formal education and/or cultural products have an important role within the space of professionals' learning ecology. Everyday life provides ground to develop knowledge and capacities useful for professional life: from a movie to a song or some reading, from a personal to a vicarious experience. The interplay of different contexts and resources generates meaningful processes for learning (Jackson, 2013; Lemke, 2000). Focusing on colleagues, they seem to be relevant not only for transformative educators but also for relational profiles. Somehow in the learning ecologies of those professionals who have developed a higher level of professional awareness, colleagues represent a key source of professional knowledge supposedly supporting novices in the detection of implicit knowledge embedded in the work context.

All these considerations lead us to conclude that not only are professional's learning ecologies relevant for the building up of professional identity but also that the way that the elements in the learning ecology are assorted and connected influences the development of more or less correct professional postures. Not all learning ecologies seem to be suitable for shaping positive professional postures, nor is formal education a guarantee for this purpose, while colleagues are crucial.

Although this study suggests interesting perspectives on learning ecologies and professional development, its results cannot be generalised since the sample was not randomly selected and it was of limited size. However, looking at the first limitation, it must be said that very often in educational contexts research has to do with authentic settings which make the research itself more meaningful when compared to artificial situations (Silverman, 2013). Since convenience sampling is a type of non-probability sampling, the value of the observed associations is just exploratory in nature. As for the second limitation, the combination of quantitative and qualitative analysis compensates the small size of the sample in so far as while quantitative data refer to limited figures, qualitative data are based on a rich data base of commentaries and texts (Creswell, 2012). The combination of quantitative and qualitative research strategies also balances the third limitation of the study, ie, the fact that the analysis conducted to answer the second research question is not grounded on inferential statistics but on the mixing of descriptive statistical analysis and qualitative analysis. Since the sample was not representative for the reasons mentioned above, it was not possible to apply an inferential statistical test to the variables "types of educators" and "elements from the learning ecologies." However, the qualitative examination of the explanations provided by participants to describe their professional trajectories within their learning ecologies corroborates the descriptive quantitative analysis carried out.

Conclusion

Through the analysis of mixed data collected in the digital space of an e-portfolio, this exploratory study investigated how professionals, particularly educators in a training course at higher education level, develop their identity within the space of their learning ecologies and how their learning ecologies are connected to their professional identities. Online visual inputs worked as

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triggering events for professionals to think about their personal trajectories and the collecting of their reflections within an e-portfolio led to the identification of different profiles associated with different learning ecologies. Briefly, the study found that educators in the sample had different postures, some of whom more aware of professional roles or Self than others. At the same time, different professional identities are linked to different learning ecologies, where elements like formal education or informal education, cultural artefacts, personal experiences, colleagues or work experiences seem to play a different role in terms of relevance. Surprisingly, formal education does not emerge as a positive element within professionals' learning ecologies, while non-formal elements embedded in everyday life or in professional settings seem to enable more aware professional postures suitable to the development of professional learners' agency. Due to the limitations of the study, no generalisations can be made. However, some considerations can be drawn for future developments. First, an important implication for course design is emphasising learners' reflection on authentic situations through both self-reflection and dialogical practices. This should support learners taking a distance from the self-referential postures and introduce a critical approach within the professional practice. Second, encouraging the hybridisation of formal and informal experiences such a formal programme and a community of practice through the network could reinforce the sense of authenticity of learning while enriching expert mentorship. Today, the social network landscape is rich in examples of professional communities exchanging knowledge and expertise on the web. Nurturing such a kind of contamination could open the door to new forms of reflexivity and professional awareness (Ranieri, Manca, & Fini, 2012).

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Statements on open data, ethics and conflict of interest

The authors would like to state that there is no potential conflict of interest in this study and experimental data can be provided upon request. They would also like to declare that the work has not been published previously. It should also be noted that the personal information of the subjects in this study was hidden to protect them. In addition, participation in the research did not affect learners' grades.

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