Social networks as spaces for informal teacher professional development: challenges and opportunities

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Abstract: With the spread of the Web 2.0 there has been a proliferation of web-based communities for learning, across platforms that enable the creation of virtual communities. However, unlike business, the emergence of educational networking is still beginning. Recent research shows that social networks are powerful educational tools that offer teachers the opportunity to develop their knowledge and competences, contributing to lifelong learning and professional development in informal settings. In order to investigate the potential of educational networking as a source for teachers' growth, a social network named PROEDI (http://www.proedi.com) was created in the beginning of 2011. In this project, the Interconnected model of teacher professional growth (Clarke and Hollingsworth, 2002) was the basic framework for the analysis of professional growth in informal settings. In this paper, the conceptual framework of the research is presented, as is some evidence obtained on the analysis of discussion forums created inside the community that underpin a discussion on the challenges and opportunities that social networking offer for teacher education.

Keywords: social networks; teacher professional development; educational technology; lifelong learning; web-based communities.

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1   Introduction

The arise of Web 2.0 allowed web users to assume a new attitude and role when accessing the internet not only for searching information but above all to interact, collaborate, produce and publish contents (Lisbôa and Coutinho, 2011a). In such a context, social networks are powerful tools not only for social, political and business ends but also for educational purposes, particularly for the professional development of teachers (PDT), an ongoing process in which the importance of lifelong learning in formal, non-formal and informal settings is widely recognised. In fact, in the Web 2.0 paradigm, social networks emerge as powerful tools for communication, interaction and collaborative knowledge construction enhancing the professional growth of teachers through the promotion of the e-skills and ICT integration in the real classroom (Barbosa, 2012).

The research problem that inspired the project raises from the verification that there is a gap between the ubiquity of information technologies in society and in education, as well as misfits in the existing models for teacher professional development facing the challenges and opportunities offered by a high technological society where the opportunities for informal professional growth are easy to implement and carry out. Are teachers able to exploit the educational potential of digital technologies in order to promote their own professional growth in informal settings? What type of activities are suitable to promote professional growth in virtual environments where learning is collaboratively constricted and shared?

In this article, we begin defining social networking and pursue delimiting the concept of teacher professional development focusing the attention in the conceptual models that, according to the literature, explain teacher's change and professional growth, we will centre the analysis in the Interconnected Model of Professional Growth (Clarke and Hollingsworth, 2002) as we consider it to be the more adequate to explain the professional growth in informal settings like social networks. We finish presenting PROEDI an educational networking environment created for the PDT in the beginning of 2011 (Lisbôa and Coutinho, 2011b) as well as some evidence obtained on the content analysis of discussion forums created inside the community that underpin the discussion on the challenges and opportunities that social networking offer for the professional development of teachers.

2   Social networking

The virtual social networks are becoming a reality in the current context, where information is its core. Amassing a significant number of people from different cultural backgrounds that meet and bond together towards common goals becomes fundamental in building a cyberculture.

There has been a significant number of theorists who attempt to conceptualise social networks and explain its emergence in the context in which we live. Castells (2003), for example, believes that today's social networks have assumed an important role whether we like it or not. They not only represent forms of expression of a particular group, but also work as a necessary contribution so people from different places and cultures can access and disseminate information, and perhaps construct knowledge.

According to Aguiar (2006), social networks need to be understood as a social phenomenon in constant evolution, because only then can we realise the importance and influence of social networks. Its base is built on hierarchical relationships, by the constant flow and exchange of information between a universe of people who have an affinity or that are embodied in related causes. Aguiar (2006) attempts to characterise the network not only as an area of aggregating people, but also as a more robust and representative organisation, as explained below.

> "More than structures of relationships, social networks are interaction methods that always aim at some kind of real change of the individual, in the collective, and/or in the organisation(s) involved: this means that the elements of its structure (nodes, links, bonds, roles) are inseparable from its dynamics (frequency, intensity and quality of flows between nodes)." [Aguiar, (2006), p.11]

Reading carefully Aguiar's statement, we believe the idea about what social networking is meets Franco (2008) and Palácios's (1996) assertions, because it is very clear that social networks are different from network processes (hierarchies). Besides being horizontal relationships, social networks are alternatives capable of responding to the demands of flexibility and connectivity by contributing to the decentralisation of the existing spheres of activity and social articulation, gaining new meanings, and most importantly, with great potential application in different contexts, such as the professional development of teachers (Lisbôa, 2010).

3 Teacher professional development

According to Coutinho (2009a), the innovative nature of pedagogical practices using ICT, if not accompanied by training that can lead to practical and reflexive activities on teachers, couldn't, by itself, bring great changes in the teaching practices. This idea that there is a clear discrepancy between what teachers believed to be the potential of ICT and its use in education is advocated by Costa and colleagues (2008) in an extensive review of literature on scenarios for the professional development of teachers (PDT).

The integration of ICT into the curriculum is not simples nor easy (Coutinho, 2010): recent research shows that teachers' need specific training and time to reflect on the importance of using the technologies as teaching and learning tools (Coutinho, 2009b).

According to Justi and van Driel (2006), educational researchers agree on considering teachers' professional development as one of the ways to improve education. However, according to the same authors, "there is no consensus about how such a process occurs because it was only in the last decades that the nature and development of teachers' knowledge started to be understood by educational researchers" (p.437). Bell and Gilbert (1996) stress professional development as a fundamental piece of the formative jigsaw of the teacher, which implies not only the performance of different teaching activities but also the development of convictions and conceptions that will underpin these activities.

According to Sprinthall et al. (1996), there are three general models for explaining teachers' development: the craft, the expert, and the interactive. The first model advocates that teachers change attitudes and pratices as a result of becoming experienced teachers and so professional growth emerges from classroom experiences.

The expert model assumes that changes are the results of training programmes by more experienced professionals; however as stated by Justi and van Driel (2006, p.438) "the outcome of such changes are generally 'measured' at the end of the training. This situation may be compared with the application of a test to students at the end of the teaching of a given curricular topic, in which good results cannot be associated with the learning of the topic".

Finally the interative models prioritise that teacher's knowledge building is the result of experiencing active meaningful learning activities that foster effective changes in teaching practices. As stated by Barbosa (2012) the teacher must be the first to believe that the changes happened by looking at the outcomes of students in order to incorporate this knowledge at the cognitive and behavioural level, which will be reflected in their beliefs, values, attitudes and even teaching practices. Within this perspective, one of the interactive models proposed for teachers' professional growth was the one by Clarke and Hollingsworth (2002), called the Interconnected model of teacher professional growth (IMTPG). Their model is represented in Figure 1 and briefly explained below.

Figure 1   Interconnected model for teacher professional growth
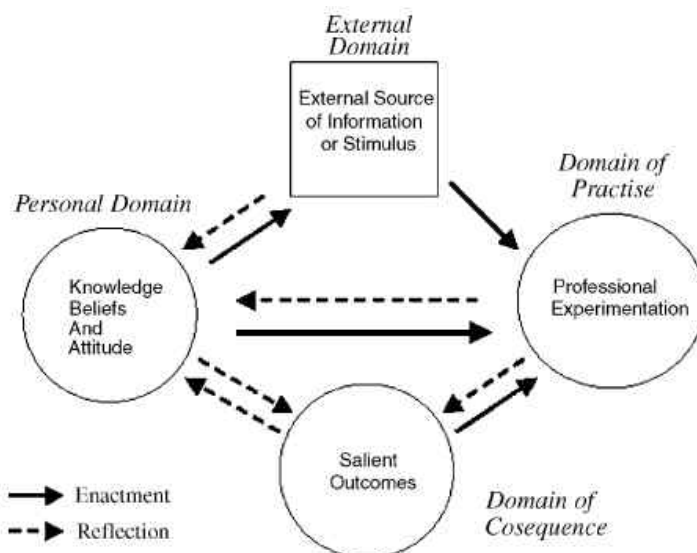
Source: Clarke and Hollingsworth (2002, p. 951)

According to this model, the teachers' world is constituted by four distinct domains:

1   personal domain (knowledge, beliefs and attitude)

2   domain of practice (professional experimentation)

3   domain of consequence (silent outcomes)

4   external domain (external source of information or stimulus).

According to the model, change occur through the mediating processes of 'reflection' and 'enactment' (represented as arrows linking the domains), but the multiplicity of possible pathways between domains reflects the complexity of teachers' professional

development. Moreover, the authors explain that the term 'enactment' was chosen to distinguish the translation of a belief or a pedagogical model into action from simply 'acting', on the grounds that acting occurs in the domain of practice, and each action represents the enactment of something a teacher knows, believes or has experienced [Clarke and Hollingsworth, (2002), p.951]. Although recognising the importance of the domain of practices as the most crucial for determining changes at classroom level, the model brings some new concepts such as mediation, collaboration, interactions between colleagues, concepts that offer multiple possibilities of application, not restricting professional growth only to contexts of classroom, but also including informal contexts such as virtual communities or social networks aimed at the DPP (Barbosa, 2012).

The model locates change in any of the four domains and the type of changes reflects differently in each one; for instances, to try a different methodology in the classroom occurs in the domain of practice, but it represents the mobilisation of something a teacher already knows or believes at the personal level and determines changes in perceptions of impacts/consequences. Through the mediation of the processes of reflection and action (enactment) changes happen in one domain, but, as all domains are interconnected, change in one domain enhances changes all over other domains as well.

We provide the example of PROEDI social network, which aims to explore new approaches to training and professional development of teachers who emerge from the context of the paradigm known as Web 2.0; participating in the PROEDI social network, teacher's get acquaintance with Web 2.0 tools, have the opportunity to learn to use how to handle these tools using the tutorials provided and also can join discussion where the use of these tools in pedagogical contexts are discussed and problematised. We believe these inputs can induce changes in teachers' attitudes towards technologies and a more positive mood regarding the integration of these technological tools into their curricular pratices.

4   Social networks and PDT: the PROEDI social network

Networks can serve as a means of expression and communication by professionals in any field. In education, they have been accepted by many of the communities of teachers. Of course, there are those who are resistant to change and prefer the 'traditional' way to communicate and build knowledge.

Nevertheless, this reality has been modified. There are many teachers who seek it to enhance knowledge and, above all, improve digital literacies. This is a recurrent need considering that we live in a society where knowledge is no longer the central issue. What matters now is how and where to find the most reliable information and apply that knowledge in various experiential situations.

In this context, social networks have gained much attention from researchers trying to understand and identify these spaces within the logic of 'learning ecologies', where the teacher can independently seek their professional growth and development. A space that takes into account their experiences, expectations, allowing a collaborative learning, where support, solidarity, teamwork and interaction constitute the differential that may encourage you to experiment, try cases and, who knows, change their practices and attitudes towards the new.

When we search for studies that focus in social networks as spaces for educational networking we verify that very few initiatives analyse the development of teachers ICT skills. Challenged by this issue, we implemented the social network PROEDI as an initiative to support and encourage Portuguese speaking teachers to independently pursue their training in ICT.

The social network PROEDI (http://www.proedi.ning.com), whose goal was already specified, was designed on November 2010, having gone through a process of evaluation of graphical interface and usability that lead to the actual version (Lisbôa and Coutinho, 2011b) that was launched online on January 15, 2011. On January 18, 2011, the first topic of discussion was launched in the forum entitled 'emerging concepts' whose thread was to question the educational potential of social networks in teacher professional development seeking to hear in firsthand from members if social networking could become a propelling means of multiple learning. As a way of helping members in the discussion, the e-moderator recommended some additional readings that were uploaded to the platform for members use.

From there we moved to its disclosure, and we gradually started to create other issues for discussion. PROEDI currently has 366 members – most of these are teachers of different grade levels and curricular subjects – 17 discussion forums, 31 videos, seven published events, and in the digital library there are 57 publications ranging from e-books to scientific papers, nine tutorials illustrating the use of some Web 2.0 tools, and four created groups (Web 2.0 applications; ICT in mathematics, ICT in language teaching and ICT in the teaching of geography). These groups were created from the request of a member under the justification that it would be an initiative to not only bring together the professionals of the same curriculum component, but also serve as input for the discussion of methodologies and pedagogical strategies in the context of the classroom, in a more specific way.

In order to evaluate if PROEDI social network allowed for community members to collaboratively constructed knowledge in the process of interacting with one another inside the virtual community, several partial analytical studies were carried out focusing in the analysis of the interactions observed in the main asynchronous communication tools used, namely the discussion forums. In the following lines, we present the conceptual models that guided the analysis and discuss the main results obtained identifying relevant contributions to the process of teacher professional growth.

5   Lessons learned

Since the creation of the PROEDI social network one and a half years ago, our main research concern was to understand and verify if this online environment enhanced the PDT of the participant members of the community. Several studies were carried out since then focusing mainly in the analysis of the asynchronous communication established inside the discussions forums created for the debate of topics both launched by the researchers or the community member.

Our choice in the selection of discussion forums to conduct our study is due to two reasons: first, because with this tool there is greater participation and interaction among members, and second, because we fully corroborate what some authors say, as for example, Applebee (1984) and Fulwiler (1987), when they emphasise that by the nature of forum contributions we can clearly see that the way members think and communicate

is rigorous, providing more reliable parameters for reflection about complex and deep issues assuming, therefore, an increased importance to evaluate the construction of knowledge.

The first two studies, one already published and the other being published, were based on the community of inquiry model (Garrison et al., 2001) to analyse the teaching and cognitive presence, respectively (Lisbôa and Coutinho, 2012a; 2012b). The community of inquiry model predicts that online learning results from the interaction between three types of factors: cognitive presence, social presence and teaching presence. Among these stand out the teaching and cognitive presence as the essential components for this to occur in a virtual community by providing evidence of the quality of the discussions/interactions, and also allowing a process evaluation of the organisation of critical thinking and reflections from community members over time. The cognitive presence can be developed during the following stages:

1   triggering event

2   exploration

3   integration

4   resolution.

The teaching presence can be identified and analysed taking into account three categories:

1   design and organisation

2   facilitating discourse

3   direct instruction.

In view of these phases and categories, a set of evaluation grids were developed by the authors of the theoretical model, which were adapted and used in both studies noted above (Anderson et al., 2001).

In the first study, the teaching presence was analysed, and the analysis corpus was constituted by the 39 contributions of the forum entitled 'Experiences with the use of ICT'; in the second, we analysed the cognitive presence, and 103 contributions were used as input for analysis from the forum entitled 'Importance of educational technology'. In our analysis, we realised that the tools developed by the authors were effective in evaluating both cognitive and teaching presence in the context of asynchronous computer-mediated communication. In terms of results, we can see that the cognitive presence is the component that allows participants in a community to construct meaning, providing opportunities for individuals to establish relationships with other existing knowledge, acquiring skills of analysis and critical reflection. Regarding the teaching presence, the data obtained in our study have proved to be less encouraging because the role of the e-moderator should have been more intervening, and it was not clear in the analysis. In fact, as mentioned in the literature, it should have been the "element that mobilizes and encourages the group to participate, helping them learn to socialize by exchanging information and developing skills and abilities" [Lisbôa, (2010), p.31]. Nevertheless, this was not observed in the analysis of interactions in this specific forum, but we admit it was the e-moderator's strategy to check the level of group autonomy in managing their learning, i.e., what the literature refers to as an exercise in a shared

leadership, characteristic of networks/online communities, whose relations are hierarchical (Franco, 2008). However, the data also show that a teaching presence can very well happen in a social network not necessarily and only by effective intervention from the e-moderator, but mostly by the students' commitment and willingness to learn. We do not dismiss its importance, on the contrary, we believe that the attitude of some may have been influenced by the constant questioning of the e-moderator that would gradually instil in teachers critical thinking, and also a desire to participate and feel recognised for their participation. We believe that the teaching presence may be the result of the students' continuum desire to learn; when faced with a particular theme they are motivated to discuss and add new knowledge about the subject under discussion. With respect to the e-moderator, this component can only be glimpsed over the constant monitoring of students' participation emitting constant feedback, thereby aiming to keep the group motivated.

Yet, when we compare the results of our research with other previous research in the field, we find that the data obtained in our analysis ratifies what has already been reported by other authors who address this issue, for example the study by Garrison et al. (2001). With regard to the cognitive presence, it was concluded that there is a significant increase in the first stage (triggering event) towards the second (exploration), decreasing significantly in the subsequent stages: integration and resolution. According to the theorists mentioned above, this can be explained by the fact that the second phase is characterised as a time for sharing information, and, as these environments are by nature democratic, people feel free to talk or share ideas and information unlike the later stages that require more time for reflection and a more theoretical and conceptual approach of the topic being discussed. As to the teaching presence, we conclude that the results of our study are in line with what the literature suggests, i.e., in a social network or virtual community that component can independently exist of the effective participation of the e-moderator (Anderson et al., 2001).

Based on the Murphy (2004) collaboration model, two studies were also carried out (Lisbôa and Coutinho, 2012c, 2012d). The model is a theoretical framework developed by the author to evaluate the learning process in virtual communities that mainly use asynchronous communication tools. In the model's logic, interaction and collaboration are triggering elements for the development of an enabling climate to the joint construction of knowledge. These elements represent a process continuously evolving developed through six phases:

1   social presence

2   individual perspective articulation

3   reception

4   co-construction of shared perspectives and meanings

5   construction of shared objectives and purposes

6   production of shared artefacts.

In the first study (Lisbôa and Coutinho, 2012c), which had as documental base 83 contributions of the forum entitled 'Wiki and Blog as educational tools', the results show that social presence is the element of support in a virtual community because it helps to extract the cold and impersonal environment often present in those contexts, where face

to face contact is virtually non-existent. In addition, it tends to bring more members, thus promoting group engagement, causing them to develop a sense of belonging. It is a necessary requirement for them to see the space as theirs, and motivate and involve themselves not only with their learning, but also as an entire network of learners and together seek the solution of a problem or achieve a common goal for the group, whose collaboration takes on added value. However, when we come to analyse and interpret the phases that ideally should reflect more involvement and commitment of the group to achieve higher levels of collaboration, we realise that achieving this is still a challenge in these environments, where participation is not in itself a guarantee of cooperation, i.e., we must go further, we must question and instigate the group, whether by presenting challenges or even asking for feedback. In our study, these attitudes were more incisive in the e-moderator's contributions, which not only helped the discussion maintain its focus, but also helped with other information sources, aiming to enrich them further. In the second study aimed to analyse the 49 contributions of the forum 'emerging concepts' (Lisbôa and Coutinho, 2012d), it was revealed that social presence is very important because it prepares members for collective activity through the creation of a favourable environment, making them feel free to disagree with their colleagues' opinions with strong and solid arguments; share views through their own ideas or resorting to other sources of information, so that they feel safe and comfortable to express their ideas and points of view, respecting the diversity of opinions and, above all, demonstrating they are motivated to participate in discussions (Lisbôa and Coutinho, 2011a). It became clear that the members were available to learn in the network, since they made themselves clear in their contributions for the need to establish concrete goals and, more importantly, demonstrate effort in achieving them.

According to the Murphy (2004) model, the most advanced stage of collaborative learning is materialised in the creation of shared artefacts, which in the literature can take many different shapes, such as a document or new knowledge. In the specific case of our study, the final product was a synthesis that portrayed the main concepts and conclusions reached by forum members after repeated discussions, and which systematisation was the responsibility of the network's e-moderator. At that stage it was possible to identify 13 evidences demonstrating that the involvement of members in the discussion contributed for the verification of the construction of shared artefacts.

If we compare our study with the one performed by Murphy (2004), we find some similarities. In our study, we could also see that social presence is an important phase for the community members to feel free to participate in discussions. In addition, our study also ratifies what the author points out when he observes that the phases 'of construction objectives and shared purposes' and 'production of shared artefacts' still constitute a major challenge in these environments. However, it is important to highlight that despite the difficulty in producing shared artefacts, it was possible to verify and glimpse the creation of shared artefacts in one of our studies, where the contributions of the forum 'emerging concepts' (Lisbôa and Coutinho, 2012d) were analysed. We believe that this result is due largely to the participation of the e-moderator, which Murphy's (2004) studies have never accredited a special importance.

Another study (Lisbôa and Cotinho, 2012e) evaluated the participation of the e-moderator on the network, using the model proposed by Salmon (2000). The e-moderation model proposed was not designed independently; on the contrary, it presents a complex interaction between cognitive, motivational factors and social

processes (Lisbôa and Coutinho, 2010). One of their assumptions is that people can learn in interaction with other people mediated by ICT, because for Salmon (2000) success comes from the integration of technological nature and collaborative mediation. The model is presented in scale form, containing two types of skills, respectively: moderation in the virtual environment (e-moderator), and technical support. For the author, there must be a perfect harmony between the technical and human factors, in order to guarantee the flow of information and, finally, the production of knowledge, which can be accessed through the following stages:

1   access and motivation – "This is the stage of adjustment to the tools, methodology, and the group moderator" [Adão et al., (2004), p.4]

2   online socialisation – starts with the activity of exchanging information between peers, aiming at the creation of an environment conducive to learning

3   exchange of information – when there is exchange of information and consequently there is an increase in interactivity

4   knowledge building – at this stage, the collaboration is an element that plays a prominent role, giving the opportunity to the participants to expand their horizons and knowledge

5   development – is the apex of the model whose goal is to develop in participants critical and reflective thinking, under a constructivist learning perspective.

To this end, we investigated the discussion forum entitled 'ICT in education', with 68 contributions. The data obtained allow us to verify that the e-moderation practices decisively contributed to urge members to participate in order to build a knowledge network, as well as cooperate in the construction of cultural and material assets in a collaborative way, having as cognitive support the distributed representation, by reducing the social distance between members (Dias, 2007). This was evident especially during 'information exchange' where it was revealed that they were united by common interests, and, therefore, felt at ease to express their appreciation for the contribution of colleagues. It was also possible to prove that human factors (interaction between members and the e-moderation practice), as well as an environment for sharing confirmed that online learning environment is possible when these two types of factors are combined. Finally, we can prove in practice (what the literature points out) that the beam interaction has a significant increase in the 'information exchange' and 'knowledge construction' phases, decreasing the development phase. Although our study revealed an increase of evidences in the development phase, the content of contributions does not mean a real interaction between members, on the contrary, it only shows a demonstration of interest by some members in applying the knowledge acquired on the network in their future practices. It was also revealed that the e-moderator makes a difference in virtual environments, not only providing knowledge management, but also helping members to develop autonomy and begin to be also co-responsible for their own learning and the environment management. We know this will not happen from one moment to another, it is a process that needs to be built over time and will not only count with the effective participation of the e-moderator, but especially with the commitment of each participating member of the network.

When compared to studies conducted in the scope of this theme by Salmon (2000) herself, we can prove in practice what the author refers to. Besides the important role of the e-moderator, learning in an environment with a predominantly asynchronous communication will only have good results when there is perfect harmony between human and technical factors of communication.

Based on this principle, Lisbôa and Coutinho (2010) presented a study which analysed the problem of e-moderation in virtual environments in the light of actor-network theory (ANT). The objective was to reflect that not only individuals have a significant influence on the objects, but also objects influence the shape of human beings to act, possibly changing over time, and thus continue the cycle of influences.

6   Final remarks

Taking as starting point the data obtained in the analysis of contributions in PROEDI social networking forums presented above, we would venture to say that, in fact, the PDT model that most closely suits teacher training in the logic of lifelong learning is the interconnected model, because it not only values institutionalised academic training, but also takes into account the context in which the professional is inserted.

In addition, this model differs from others because it is not limited to analysing the change of teachers as a product at the end of training, similar to the tests applied to students of formal education. The interconnected model recognises that the construction of the teacher's knowledge, member of the PDT, should be based on meaningful and active learning as Clarke and Hollingsworth (2002) predict. This learning process will only be possible due to the presence of interactive models, in this case social network like PROEDI, that contribute to the constant renewal of knowledge against the flow of information and practice experienced by teachers (Justi and van Driel, 2006).

In this perspective, the teacher's knowledge is the result of the construction of all kinds of knowledge [content, curriculum knowledge, pedagogical content knowledge PCK, and technological pedagogical content knowledge – TPACK (Mishra and Koehler, 2006)] from each teacher as a result of their participation in experiences provided by the PDT and also of practical activities executed in classroom (Clarke and Hollingsworth, 2002).

The model is a continuous process and constantly evolving, so the authors emphasise that it must accompany the teachers during their entire career, because knowledge is renewed every day, and there is a need to change our practices and attitudes towards the new. Considering that we live in a world permeated by digital technologies that are constantly renewed, directing the PDT to the development of ICT skills will be an asset for many reasons. Firstly, having in mind the many formal, non-formal and informal contexts where this knowledge can be built. Secondly, by adopting a philosophy very much in vogue in the social context we live that is collaborative learning, where teachers in a joint effort and by sharing experiences seek knowledge and improve their practice, and in the context of the social web. This is a popular option in which, through networks and virtual communities, teachers, regardless of time and space, can meet different cultures and add value both in personal growth and professional development.

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