SOME CONSIDERATIONS ON THE CREATION AND MANAGEMENT OF VIRTUAL COMMUNITIES AS LEARNING CONTEXT PROVIDERS

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Abstract

Based on the existing theoretical body of knowledge of post-modern (constructivisms) and contextual (communities) learning paradigms and in our previous research [1], this presentation pretends to discuss some ideas for the strategic management of learning contexts embodied as virtual (learning) communities, namely that:

- The creation of a (virtual learning) community is a collective exercise of imagination based upon the principles of collective construction and of collective transaction.

- The management of a community, envisioned as a learning context, involves the management of the technological, relational and pedagogical contexts of the "non-place" in which the community develops.

For that purpose, it proposes to present:

- A brief review of the community learning paradigm in the light of three complementary perspectives: the fragmentary and imaginary character of modern identities and communities (the desconstructivist approach); the new forms, concepts and indicators of community in virtual reality (the [social]constructivist) and the concept of context as a transactional relationship (contextual approach).

- The theoretical assumptions and considerations that translate our view about the creation of virtual learning communities.

To conclude, it will elaborate on some general guidelines for the creation and management of virtual learning communities resulting from the observation of the phenomenon of managing online learning communities.

Keywords: Virtual learning communities, learning contexts, community creation, managing learning contexts.

1 INTRODUCTION

In opposition to the mechanistic learning paradigm, we defend the community paradigm which proposes the serendipity of discovering unknown or unrecognized relationships and connections as the ideal learning context. Moreover, in this ambit, we consider that the conception and deployment of virtual learning communities (VLC) as learning contexts, allows the (re)alignment of the learning process from content to context. In this sense, and having recognized the impossibility of managing other people learning, we metaphor the management of learning as the management of the learning context [2].

Therefore, and following the propositions that emerged from the attempt of answering the question of "how do virtual (learning) communities emerge", - by that meaning learning contexts- which seem to suggest that context is generated by the individuals (learners) through shared anticipations, a first iteration of an answer points towards the development and maintenance of the connection and sharing between people.

VLC are here understood as inscriptions of multidimensional learning contexts generated by the learners as transactional spaces of collaborative learning and co-construction of knowledge. These virtual worlds seem to develop in those "non-places" where people, with a bidirectional bond of association and commitment, transact, (re)create and construct meaning(s), evolving from resource sharing to collective enterprise. Thus, to manage learning contexts seems to involve the not easy task of solving the complex interconnection between needs.

This presentation will discuss some ideas for the strategic management of learning contexts embodied as virtual (learning) communities, namely that:

- The creation of a (virtual learning) community is a collective exercise of imagination based upon the principles of collective construction and of collective transaction.

- The management of a community, envisioned as a learning context, involves the management of the technological, relational and pedagogical contexts of the "non-place" in which the community develops.

It will conclude with an attempt to elaborate on some general guidelines for the creation and management of virtual learning communities (VLC).

2 CONTEXTUAL LEARNING PARADIGM: DIFFERENT APPROACHES OF COMMUNITY

2.1 A deconstructivist approach: fragmented and imagined communities

Personal identity may be understood as expressing the relationship between personal identity (our individual atributes) and social identity (atributes of belonging to social categories) [3], thus enclosing the paradox of the duality "equallity vs. difference".

Identity seems to constitute a process of deconstruction and reconstruction of personal projects and lifepaths evoking relational elements and interacting with other previously structured identities. In both its cognitive and affective dimensions, identity develops from the social and cultural contexts of belonging, thus, relating to its own process of search [4]. In this ambit, the multiplicity of identification processes existing in modern society, enhances the existence of simplified and fragmented identities [5]. Moreover, in an approach emphasizing the constructionistit, symbolic and interactive dimensions of reallity and subjectivity, identity construction emerges as fragmented communities .

In the line of work of classic sociology, the concept of community has not been rigorously defined. Furthermore, in this line of thought [6], all communities are considered as imagined and differentiated according to the way in which they are imagined. The conception of horizontal and transversal communities has gained force and the challenges and representations revealed by the conceptions of identity and of imagined community in nowadays societies, require the creation of (re)new(ed) forms of collective life.

In the current days, with all the technology available, the concept changes according to the context and its use has increasingly widespread and varied. Furthermore, communities are now based in global, contextual and specialized relationships, and the use of technology has brought the possibility of new models of community [7].

2.2 A (socio)constructivist approach: new forms and concepts of communities

In the current moment of transition between modernity and post-modernity, we are facing the reinvention of the concept of community and the different shapes it may assume. Currently, communities do not exist outside the structural constraints of social formations, being defined by their ephemeral nature and by its changing composition, thus belonging to a network of communities.

Moreover, with the development of web technology, it was not long before the transposition of this social phenomenon migrated to the web. The web thus catalyzes the creation of new forms and structures of sociability that converge on the creation of multiple fragmented and decentralized communities that share the same transnational imagined space: an imagined post-tribal space, a meta-social mediator, in which technology promotes the sharing and passage of an isolated social to the tribal and digital collective.

In this context, a more constructionist approach to community makes sense, as collective action carries crucial symbolic dimensions for understanding the process of construction and reconstruction of individual and collective identity. Thus, the concept of community is increasingly expressed as a concept of virtual character, identifiable as a future-oriented collective and open in a spatiotemporal sense.

Virtual communities (VC) emerge and develop as complex and self-organized systems, which constitute cultural formations in which the bi-directional bond of commitment and association produces and reproduces the living tissue of the community [8]. Even though VC have specific characteristics such as permeable boundaries, the possibility of high social diversity, relationships based on shared interests, geographically dispersed connections and content specialization, it can be said that they fit into most definitions of community, even in their most traditional sense ([9]; [2]; [10]; [7]). With multidisciplinarity, various definitions of VC have emerged, encompassing both sociological and technological perspectives, which point to different elements, attributes and aspects. In our previous work ([11] in [2]), we believe we have arrived at a definition of virtual community broad enough to be applied to different community spaces:

"A virtual community is a circumscribed group of people that act and interact in cyberspace in a shared, meaningful, and negotiated context, for a stable period of time, while driven by common goals and guided by common norms and values" (p. 145).

As we become involved in the community, our identity, knowledge, values and beliefs are influenced by these communities. Knowledge exists in individuals but is also distributed between the historical-cultural context in which we live and the communities in which we engage, being mediated by the tools we use and gaining meaning through connecting objects ([12]). We constantly enculturate in different communities, but the aspects and problems we deal with, originate, are defined and solved within the constraints of the activity we have undertaken and the context in which it has emerged. Thus, it is only possible to explain cognitive activity, and consequently learning, in relation to its context.

In a more socio-constructivist conception, this is a fundamental aspect for community development, emphasizing the mediating role assumed by psychological tools and discourse, which generates transformative communication, produced through interaction, enabling the community to promote, amongst others, contextual learning.

2.3   A contextual approach: learning communities as learning contexts

Opposing the more traditional we defend the community, which defends the crucial role of context in learning. Thus, since it is no longer possible to neglect the role of context in any attempt to manage learning through VLC, the question that arises is: what is context?

In its essence, the context represents a human choice and creation ([13]). The context is an achievement, a performance, being much more than a predefined construct that emerges from and with the interactions of all actors. Thus we understand that the context constitutes a real identity (and even an entity), which can only be perceived through its interactions with the individual, which organize not only the context but also the experience of the individual. Looking at the definition of context itself, it is seen as a synonymous of contexture, that is, as the connection of the parts of a whole, a web, a fabric that more than emerging from the interactions between all the web actors, *is* the interactions themselves.

As we have previously proposed "to a large extent, context is the interactions. Context is what the learner *feels* like the context of the learning experience." ([2], p.12, in [2]). So, context is here understood as a fluid and permanently evolving learning zone, defined by the individuals, by their individual and shared goals, by their interactions.

In the (socio)constructivist paradigm, where creating meaning is creating knowledge and creating one's own knowledge is learning, learning management is above all a metaphor. To the extent that we cannot manage the learning of others, we understand learning management as the management of learning contexts and, in this sense, that is an adaptive exercise [2]. Drawing on these conceptions, in a socioconstructivist view, the learning context becomes crucial and the idea of contextual learning develops, taking into account the situational character of actions within an articulated network of socio-cultural meanings.

In a broader sense, context represents everything that individuals find as relevant to the performance of a certain task and to create meaning from it, that is, learners create a meaningful context for an activity and "the context they create consists of whatever knowledge they invoke to make sense of the task situation" ([14], p.32)

Thus, the conception of a relationship between contextual constraints and knowledge creation seems to be gaining more consistency, in the line of a perspective in which cognition and learning are understood as rarely out of context. Further, we can then say that all activity is (re)contextualized, in

the sense that no activity can exist regardless of the way in which it is contextualized by actors, that is, "the perception of task describes the relationship between context and student experience" ([15], p. 162).

We consider that part of the solutions for learning is the creation and development of learning activities that give meaning to content, that is, **contexts**.

Inspired by the postulate that learning is a social and contextualized process, and focusing on the crucial relationships that are established through it, the main aspect of the framework we propose is the conception that the individual engages in VLC in order to participate in the social practices of these same communities while learning.

It is in the current scenario of space virtualization that an alternative learning paradigm is inscribed, and that takes on the contours of community-centered models that support the development and construction (individual and collective) of knowledge within collaborative work. Thus, in a paradigm that views learning as a social process of knowledge construction through interaction and constructive activities, VLC are assumed as multidimensional contexts, of an intellectual nature (representing an inexhaustible source of information), social (providing opportunities to construct a transactional space for collaborative learning) and cultural (by bringing together different cultural experiences and encouraging changes in dominant discourse), that facilitate and sustain learning by promoting interaction, collaboration and belonging in the construction of a collective culture.

The design and management of virtual learning contexts through VLC, brings new opportunities for learning and represents the beginning of potential changes in the pedagogical scope. We consider that VLC may represent an important alternative to the more traditional teaching-learning contexts, and current technology makes them more tangible today than in the past.

3 VIRTUAL LEARNING COMMUNITIES AS LEARNING CONTEXTS: OUR VIEW AND ASSUMPTIONS

We have previously ([1]) studied the complex phenomenon of VLC development, under the paradigm of constructive, situated and socio-cultural mediated learning. In the attempt to answer the question "how to generate and manage virtual learning communities" based on the theoretical assumptions enunciated from relevant theory and on the observation conducted [1], we have enunciated some assumptions about VLC creation and management.

3.1 VLC result from the mutual interaction of both technological and social dimension

The biggest challenge of web-based learning scenarios is the construction of contextually rich VLCs that promote collective learning. The generation of VLC requires effective technology support to mediate the interactional transactions between its members, thus contributing to their effective participation in the social practices of community, in order to promote the negotiation of meanings and the creation of boundary objects that allow individuals to give individual meaning to collective knowledge. Hence, It is becoming increasingly clear that the answer to this question has two interconnected dimensions, sociopsychological and technological ([11] in [2]; [16]).

3.2 VLC develop in virtual settlements while supported by contextual, global and content specialized relationships

Virtual settlements give communities a sense of territoriality, being defined by minimum levels of technology mediated technology, of public communication, of active members and of continuity of participation ([17]). For a VLC to emerge the presence of affective bonds between the members of the virtual settlements is essential.

3.3 In VLC relationships are based on shared interests, developing in a culture that promotes the social and shared construction of collaborative and negotiated activities.

VLC seem to differ from real communities in that their members perceive their relationships as being based on shared interests, in which their ties may be geographically dispersed and specialized in particular content, developing a culture that promotes the shared construction of knowledge [7].

Hence, this ability to support social interaction seems to be the key component of our connection to VLC.

3.4 Knowledge and learning are distributed in the communities where individuals enculturate, being mediated by the used tools and gaining meaning through boundary objects

We can say that knowledge exists in individuals but also in the socially negotiating minds, in relationships, in the artifacts they created and used, and in the theories and models used to produce them. Thus, knowledge and learning are distributed among the communities, being mediated by the tools built and used and gaining meaning through boundary objects. We can then say that people act and create meanings within communities in which cognition depends on the existence and use of mediation tools .

3.5 VLC characterize by the existence of a collective project, a shared understanding of rules and by the presence of a sense of belonging

We think of VLC as self-organized and decentralized social units, in which individuals share knowledge, experiences and information and collaborate in problem solving to achieve common goals. When members of these units share goals, interests, values, and work toward common goals, communities emerge ([18]; [19]). It is from this interdependence, in the collective journey towards a common, negotiated and shared goal, for which there is a commitment among the members, that the collective identity believed to be the source of the sense of belonging that can be generated in these groups can emerge ([20]; [21]) and is responsible not only for the degree of attraction exerted by the community in its members, but also for maintaining it.

In short, the paradigm underlying the previous assumptions argues that community-based learning provides individuals with a learning context conducive to the social and collective construction of knowledge.

4 GUIDELINES FOR THE MANAGEMENT OF LEARNING COMMUNITIES AS LEARNING CONTEXT

Learning in virtual settings requires more flexible and facilitating practices that recognize the importance of community development to promote learning. In a first exercise to find answers to two key questions in the wider scope of learning management in virtual environments,: 'how do VLC emerge?' and 'how do you manage VLC?', our previous experience allowed us to find clues that we believe could positively inspire the strategic management of VLC ([1]).

4.1 How do VLC emerge?

Different modes of belonging (involvement, alignment and imagination ([22]) seem to be the mainstay of communities. Thus, it seems to us that it is possible to say that the generation of a community is a collective exercise of imagination. Further, we consider that it is from the relationships and transactions generated with, from and in the context of this collective identity-imagery exercise that the community emerges. And it emerges from the combination of two fundamental principles we have ellaborated previously ([1]; [12]): the principle of collective construction and the principle of collective transaction.

4.1.1 Principle of collective construction

Takes as crucial the role of social construction of artifacts (as mediators of community enculturation), among which we frame identity and knowledge. In a first essay of this principle, we would say that the generation of VLC is translated by the existence of processes under construction that aspire to the (re)new(ed) symbolic configurations (in the form of collective identity and knowledge) through which the collective inscribes dominant modes of belonging.

4.1.2 Principle of collective transaction

Refers to the reciprocal nature of influence between actors and contexts. Assuming action is something to act on rather than an act of creation, experience is a transaction between actors and contexts. More, individual, activity and context are (re)co-constructed through this reciprocal

interaction, hence (re)creating identities. In a first essay of this principle, we would say that the generation of VLC reflects the existence of practices of reciprocal influence, with transformational character, which allow the inscription of modes of collective action

In the genesis of these two principles is our previously enunciated **assumption of anticipation** which proposes that: "the generation of virtual (learning) communities is mediated by shared anticipations inscribed in the form of (implicit or explicit) orientation for the future of collective action" ([1], p. 303).

It thus becomes clear that the reciprocity on which we elaborated in the collective transaction principle, facilitates the translation of shared anticipations, which constitute boundary objects (by acting as structuring and cross-border elements), enabling communication and coordination from different perspectives, mediating action and, negotiating and creating meaning. It is through this collective mechanism of synchronization and integration, that we have called **anticipation**, that the community builds a collective understanding, that is, creates meaning about the connectivity of its context as a coherent whole whose future correlates with the co-constructed present.

4.2 How to manage VLC?

Designing and using VLC as learning contexts, requires to the change the focus of our learning approaches from teacher to learner, product to process, content to context. In this sense, w understand learning management as context management. Thus, and following the previous propositions, which seem to suggest that it is individuals who generate context through shared anticipations, the answer to this question seems to point to the development and maintenance of connection and sharing between people.

Understood as inscriptions of multidimensional learning contexts generated by learners as transactional spaces of collaborative learning and knowledge co-construction, VLC seem to develop in those non-places where people, with a bidirectional bond of association and commitment, transact, (re)create and construct meanings), evolving from common resource sharing to real collaborative enterprise.

Managing the learning context seems to involve the not easy task of resolving the complex link between needs, activities and outcomes, either by reinforcing or breaking the patterns of collective understanding that emerge with the community. Thus, it involves the management of 3 different context dimensions, on which we briefly ellaborate: technological, relational and pedagogical.

4.2.1 Managing the technological context dimension

We consider that the management of VLC as learning contexts, would benefit from resorting to an ill-structured platform that promotes the construction of shared networks of knowledge through the intertwining of different conceptual plans. Furthermore, we uphold the privileged use of platforms that are constructivist, collaborative, contextualized, active, reflexive and conversational that, by facilitating the access to shared resources and to tools for the social construction of knowledge, promote the collective construction of knowledge and its social legitimation, thus offering the conditions for significative learning. In our perspective, the support and maintenance of a learning context that promotes the collective mechanisms of VLC generation, such as anticipation, transaction and construction, demands platforms that fulfill some (socio)technical requirements:

- Features that present specific solutions for the management and organization of the teaching-learning process, of content edition and distribution, of communication (syncronous and assyncronous) and of the support of activities (individual and collective).

- Social features that enable to sustain, facilitate or create value (sharing), based on the users social behavior (e.g. mechanisms of social networking).

- A default configuration that contemplates spaces for collective sharing (blogs/forums), collective bibliographi repositories (supporting library), multipurpose spaces for collective publication (creation and repository of produced content), spaces for collective enterprise (incubation of community projects.

4.2.2 Managing the relational context dimension

We consider that part of the success of the experiences of managing learning contexts in virtual settings is in the analysis of the community relational network [1]. In this sense, we propose the

implementation of some procedures that, in our perspective, could facilitate the transactional process intrinsic to the generation of VLC:

- Sociometric analysis procedures: the regular development and implementation of sociometric analysis procedures can be valuable tools for managing (virtual) learning contexts, enabling the context manager to explore the group's internal relational structure by providing a overview of the social positioning of each member, making it possible to effectively reorganize the relational dynamics of the community, restructure the proposed pedagogical activities and exercise adaptive leadership throughout the evolutionary cycle of the community.

- Procedures for assessing community evolution: knowing and understanding the models of group development can provide the context manager with tools to recognize the context of the group, in order to be able to design an intervention conducive to its positive evolution, both in terms of activities and interactions. These procedures can be implemented through various instruments, such as content analysis mechanisms or surveys that translate community evolution scales reporting stages of collective development, and that should be administered in a phased and regular manner and translated into context management practices, driven by a situational coherence approach to adjust management to the changing context.

4.2.3 Managing the pedagogical context dimension

Having elaborated earlier on the concept and characteristics of VLC (cf. [23]; [11]; [1]; [12]) we consider that they configure shared spaces in which individuals learn, through collaborative activities, to solve problems and within these, to find, choose and implement a certain solution. It is by progressing in the individual and collective learning, that individuals socially construct knowledge. Learning in virtual communities seems to be operationalized through the development of a collaborative inteligence that results from mutual engagement and shared enterprise. The scenery of virtual learning contexts or, if we would prefer, of deploying virtual worlds in education, must walk towards integrating and heuretic models. Thus, those models require some changes to overcome the difficulties of the traditional models in use nowadays.

- Towards heutagogy: those self determined and contextually rich learning experiences, based on significative interactional processes, that envision the collective construction of knowledge, have proven to be more effectiv, thus, these experiences are framed by the contextual learning paradigm ([23]; [24]; [12]), which is decisively and implicitly closer to the heutagogy models that approach learning as a significative experience [1]. In this approach, the learner determines the content and the way of learning, hence promoting self-determined learning within the double-looping process that characterizes transformative learning.

- Teachers as boundary objects: in this perspective the role of the teacher includes giving away a major part of the control of the teaching-learning process (to the learners), facilitating the creation of learning contexts that promote discovery, communication and collaboration, evolving into VLC. Thus, more than a facilitator of the learning process, the teacher is required to act as a boundary object, becoming one of the structuring elements that link the different conceptual plans of the various actors around which the community negotiates meaning and builds a shared understanding.

- Activities as shared enterprise: in this paradigm activities can be conceived as instruments for the change of dominant practices. We further consider that the effective management of the heutagogical context of this "non place" involves the implementation of learning strategies (interaction, action and presentation) centered on building processes (discussion, collaboration and sharing) that promote a sense of belonging (imagination, alignment and connection) to the community.

5   CONCLUSIONS

Tough recognizing the importance of the technological component of virtual learning contexts, its effectiveness, in our perspective, its intrinsically linked to the social and didactic aspects of the teaching-learning process.

The strategic management of learning contexts, here understood as virtual learning communities, is a collective exercise of imagination based on the principles of collective construction and of collective transaction, thus involving the management of the technological, relational and pedagogical contexts of the non-place where the community develops.

Furthermore, we consider that managing the heutagogic context of VLC requires an integrative model in which learning is conceived as a participatory process that has learning at its core through negotiation and resource sharing, involving all stakeholders in the community.

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REFERENCES

[1]   Afonso, A. P. (2009). *A gestão das comunidades de aprendizagem enquanto geradoras de contextos de aprendizagem (um estudo de caso)*. Tese de doutoramento em Ciências da Educação, Coimbra. http://hdl.handle.net/10316/12155

[2]   Figueiredo, A. D. & Afonso, A. P. (2006). "Context and learning: a philosophical framework".. In A. D. Figueiredo & A. P. Afonso. (2006). *Managing Learning in Virtual settings: The Role of Context* (pp. 1-23). Hershey, USA: IGP.

[3]   Neto, F.. (1985). Identidades migratórias. *Psiquiatria Clínica, 6(2)*, 113-128

[4]   Giddens, A.. (1991). Modernity and self-identity: self and society in the late modern age. CA: Stanford University Press.

[5]   Estanque, E.. (2000). Entre a fábrica e a comunidade: subjetividades e práticas de classe no operariado do calçado. Porto: Afrontamento

[6]   Anderson, B.. (1991). Imagined Communities: reflections on the origin and spread nationalism. New York, Verso.

[7]   Wellman, B. & Gulia, M.. (1999). "Virtual communities as communities: Net surfers don't rid alone". In M. Smith & P. Kollock. (eds.). *Communities in cyberspace* (pp. 167-194). London: Routledge

[8]   Bauman, Z.. (1995). "Searching for a centre that holds". In M. Featherstone, S. Lash & R. Robertson. (eds.), *Global Modernities* (pp. 140-153). London: Sage

[9]   Recuero, R. C.. (2003). *Comunidades virtuais – Uma abordagem teórica*. Retrieved from: http://www.bocc.ubi.pt/pag/recuero-raquel-comunidades- virtuais.pdf

[10]   Silvio, J.. (1999). *Las comunidades virtuales como conductores del aprendizaje permanente*. Retrieved from: http://www.funredes.org/mistica/castellano/ciberoteca/particip antes/docuparti/esp_doc_31.html

[11]   Afonso, A. P. (2006). "Communities as context providers for web-based learning". In A. D. Figueiredo & A. P. Afonso. (2006). *Managing Learning in Virtual settings: The Role of Context* (pp. 135-163). Hershey, USA: IGP.

[12]   Afonso, A.P. (2016). "A Gestão Contextual do "Não-Lugar": geração e gestão de comunidades virtuais (de aprendizagem)". In Maciel, C. et al. (eds). *Educação a Distância: interação entre sujeitos, plataformas e dispositivos*. (pp. 111-140). Coleção: Educação a Distância – EdUmt

[13]   Roque, L. ; Almeida, A. & Figueiredo, A. D.. (2004). Context engineering: an IS development research agenda. In Leino et al. (eds..). *Proceedings of the European Conference on Information Systems, ECIS 2004* [CD]. Turku, Finland: ECIS

[14]   Mercer, N.. (1992). "Culture, context and the construction of knowledge in the classroom". In P. Light & G. Butterworth. (eds.). *Context and cognition: ways of learning and knowing* (pp. 28-46). New York: Harvester Wheatsheaf

[15]   Ramsden, P.. (1988). "Context and strategy: situational influences on learning". In R. Schmeck. (ed.). *Learning strategies and learning styles*. (pp. 159-184). New York: Plenum

[16]   Derntl, M. & Motschnig-Pitrik, R.. (2005). The role of structure, patterns, and people in blended learning. *Internet and Higher Education, 8,* 111–130

[17]   Blanchard, A. & Markus, M.. (2002). Sense of Virtual Community-Maintaining the Experience of Belonging. In *35th Annual Hawaii International Conference on System Sciences (HICSS'02), Vol.8,* pp.270b. From: http://doi.ieeecomputersociety.org/10.1109/HICSS.2002.9944 49

[18]   Chang, C.-C.. (2003). Towards a Distributed Web-Based Learning Community. *Innovations in Education and Teaching International, 40(1),* 27-42. From: http://www.tandf.co.uk/journals

[19]   Jonassen, D. H.. (2000). Preface. In D. H. Jonassen & S. M. Land. (eds.). *Theoretical Foundations of Learning Environments*. (pp. 3-9). Hillsdale, NJ: Lawrence-Erlbaum.

[20]   Rovaib, A. P. (2002). Development of an instrument to measure classroom community. *Internet and Higher Education, 5(3)*, 197–21

[21]   Rheingold, H.. (1993). The virtual community: homesteading on the electronic frontier. New York: Adison-Wesley.

[22]   Wenger, E. C.. (1998). *Communities of Practice: learning, meaning, and identity*. Cambridge: Cambridge University Press.

[23]   Afonso, A. P. (2001). "Comunidades de aprendizagem: um modelo para a gestão da aprendizagem". In Dias, P. & Freitas, C. (Eds.). *Challenges 2001 / Desafios 2001, Actas da II Conferência Internacional de Tecnologias de Informação e Comunicação na Educação*, (pp.427-432). Braga: Universidade do Minho

[24]   Afonso, A. P. and Figueiredo, A. D. (2000). "Web-based learning and the role of context". In IEEE (Eds.), *Advanced Learning Technology: Design and Development Issues*, Proceedings of the International Workshop on Advanced Learning Technologies - IWALT 2000, (pp.270-271). Los Alamitos, Califórnia; IEEE Computer Society