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A Community of Practice: An Intervention Model based on Computer Supported Collaborative Learning

Comunidades de práctica: un modelo de intervención desde el aprendizaje colaborativo en entornos virtuales

ABSTRACT

This paper describes the results of a research study on the establishment of a Community of Practice through social eLearning and Computer Supported Collaborative Learning (CSCL). The sample consisted of 20 adult women of gypsy origin of various ages, educational level and work activity residing in Extremadura (Spain). The study makes a contextualization and then describes the design, implementation and evaluation of a training scheme in social eLearning about Equal Opportunities and Social Leadership. This is followed by an analysis of the content of the course forums, according to the dimensions of the «Community of Inquiry» model (CoI) which is one of the most promising theoretical perspectives on e-learning and collaborative and constructivist approaches developed in hundreds of studies during the last decade. And finally, the study evaluates the learning experience, using triangulation as procedure for data analysis. The most important research results are: a) the validity of the design and implementation of the training, b) the forming of an effective Community of Practice for Roma women in virtual learning environments, and c) the significant changes in the participants that can favor the cultural promotion of women. It provides a new model of ICT-based educational intervention in CSCL, aimed at improving training for and promotion of sociocultural groups in situations of social exclusion.

RESUMEN

Este artículo describe los resultados de investigación de un estudio sobre la conformación de una comunidad de práctica a través de e-learning social y aprendizaje colaborativo en entornos virtuales (CSCL). La muestra está formada por 20 mujeres gitanas adultas y residentes en Extremadura (España) heterogéneas en edad, nivel formativo y actividad laboral. El estudio parte de la contextualización y posterior diseño, implementación y evaluación de una acción formativa de e-learning sobre igualdad de oportunidades y liderazgo social. Posteriormente, analiza el contenido de foros del curso, según las dimensiones del modelo «Comunidad de Indagación» que es una de las perspectivas teóricas más prometedoras sobre e-learning y enfoques constructivistas colaborativos y que ha sido desarrollada en cientos de estudios durante la última década. Y, por último, evalúa la experiencia formativa, utilizando la triangulación como procedimiento para el análisis de datos. Se destacan como resultados la validez del diseño y aplicación de la acción formativa; la conformación efectiva de la comunidad de práctica de mujeres gitanas en entornos virtuales de enseñanza-aprendizaje colaborativos; y los cambios significativos en las mujeres participantes que favorecen su promoción sociocultural. Se aporta un nuevo modelo de intervención socioeducativa con TIC basado en CSCL, destinado a la mejora de la formación y a la promoción sociocultural de los grupos en situación de exclusión social.

KEYWORDS / DESCRIPTORES

E-Learning, community of practice, digital literacy, digital inclusion, collaborative learning, virtual learning environment, social change, women.
E-Learning, comunidad de práctica, aprendizaje colaborativo, alfabetización digital, inclusión digital, entorno virtual de aprendizaje, cambio social, mujeres.

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1. Introduction

Virtual learning environments offer a series of possibilities for collaborative processes in which students actively produce knowledge, formulating ideas that are shared and constructed as from the reactions and responses of others (Resnick, 2002). A new centre of interest is arising in educational sciences around the so-called Computer Supported Collaborative Learning (CSCL) that became an emerging paradigm of educational research in the 1990s in which a variety of studies were carried out that have in common an interest in understanding how Information and Communication Technologies (ICT) can facilitate collaborative development processes in teaching-learning situations, and how collaborative learning environments can improve and favour interaction, teamwork and consequently the result of the learning process of the participants (Rubia & al., 2009; Rubia, Jorrín & Anguita, 2009).

Collaborative learning is characterised by being active; the teacher is a facilitator; teaching and learning are shared experiences; the students must assume responsibility for their learning; they are encouraged to reflect on their cognitive processes, and social skills and teamwork are developed by means of the construction of consensus (Krischner, 2001). Collaborative learning leads to a more profound level of critical thought, shared understanding and a more prolonged retention of the material learnt (Garrison, Anderson & Archer, 2001; Johnson & Johnson, 1999). It also provides opportunities for the development of social and communicational skills, positive attitudes towards people, group cohesion and the building of social relations.

These effects are strengthened when collaborative learning is applied in flexible environments and in the face of complex tasks within authentic contexts, as these conditions also increase the efficiency of the social building of knowledge (Jonassen, 1991; 1994). Although different variables exist (e.g. group size and composition, characteristics of the task, learning styles) that have been identified as factors influencing the efficiency of collaborative learning, all of them are related in one way or another to a basic element: social interaction (Kreijns, Kirschnerb & Jochems, 2003). If collaboration is present, then social interaction exists; and vice versa, without social interaction there is no real collaboration (Garrison, Anderson & Archer, 2001). The mere grouping together of students does not guarantee collaboration, which means that instructive design is essential for its development. A cognitive approach promotes «epistemic fluidity», i.e. the capacity to identify and use different forms of knowledge, to understand its various forms of expression and assessment, and to assume the perspectives of others that operate with different epistemic structures. It is achieved by means of collaborative tasks so as to describe, explain, predict, argue, criticise, assess and define concepts or realities. In a direct approach collaborative techniques are used to structure a task within a learning activity (e.g. Jigsaw). Finally, in a conceptual approach use is made of positive interdependence; the interaction promoted within the group itself; the individual responsibility to learning; teamwork skills; and a reflection on the execution of the group itself (Kreijns, Kirschnerb & Jochems, 2003).

The scientific community agrees on the importance and congruence between e-learning and collaborative constructivist approaches. One of the most promising theoretical perspectives is the «community of inquiry» (Coi) (Garrison, Anderson, & Archer, 2000), which has been developed in hundreds of studies over the last decade (Arbaugh & al., 2008). This theoretical model maintains that the construction of knowledge in virtual teaching-learning environments (VTLE) takes place by means of the development of a community that is characterised by three «presences»: teaching, social and cognitive. In the absence of face-to-face interaction, participants in virtual learning environments must strive to recreate the social processes of the building of knowledge that take place in the negotiation of meanings in the classroom.

«Teaching presence» refers to the curriculum and organisational design, the facilitation of a productive discourse, and direct teaching developed in VTLE in a context of collaboration between teachers and students (Anderson & al., 2001). «Social presence» allows one to understand how VTLE participants project themselves as «real» people, especially in asynchronous communication contexts based on texts (e.g. forums) that show attachment, group cohesion and communicative opening-up; these elements are necessary to establish a feeling of confidence and belonging to a community orientated towards the building of knowledge. Finally, «cognitive presence» is included through a series of four cyclic phases that begins with a trigger event that promotes exploration, integration, and resolution. They define critical and creative thought processes (Shea & al., 2010).

Garrison, Anderson & Archer (2000) propose a conceptual on-line learning model that encourages interaction between teachers and students with the aim of building, facilitating and validating understanding, and developing skills that aim at the continuity of

training, encouraging simultaneously cognitive independence and social interdependence. The essential characteristic of this model lies in its communicational and interactive potential. It establishes that learning processes will be more profound and meaningful when the three «presences» mentioned come together. These dimensions are characterised by the fact that they can be provided to the community by the different participants even beyond their specific roles of students or teachers, which assumes a flexible model that allows the capturing of the horizontal dynamics of a community.

The objective of the research presented in this article is the forming of a Community of Practice of gypsy women by carrying out a virtual training action on equal opportunities and social leadership so as to encourage the socio-cultural promotion of this group of women. In order to do so a virtual training action was designed, implemented, and assessed, and it was analysed whether the Community of Practice had been formed together with its predominant characteristics. The whole of this inquiry process was carried out with a qualitative research approach within the framework of CSCL and the social perspective of e-learning (Planella & Rodríguez, 2004; Ros, 2004; García-Martínez, 2007).

2. Material and methods

2.1. Methodology

The dialogue approach of research into CSCL has been used; it is based on the idea that learning is a socially organised activity. The unit of analysis is a group of people who interact to achieve a shared goal. The key concepts are mediation, appliances and tools, and social practice so as to encourage collaborative learning (Ludvigsen & Mørch, 2010). It is located on the central axis of this research and is connected with the socio-critical paradigm, with Research-Action (RA). As a support it uses the case study method transposed to virtuality and takes cyberspace as a field of study (Hine, 2000; Olsson, 2000). This perspective forces the reformulation and adaptation of certain re-elaboration techniques (Hine, 2000) owing to the characteristics of the field of study itself.

Table 1. Dimensions, categories and indicators of Community of Inquiry (CoI) model (Garrison & Anderson, 2005)

SOCIAL PRESENCE			
Affective	**Open Communication**		**Cohesive**
Expression of emotions Use of humor Self-disclosure	Continuing a thread Quoting from others' messages Referring explicity to others' messages Asking questions Complimenting, expressing appreciation Expressing agreement		Vocatives Addresses or refers to the group using inclusive pronouns Phatics, salutations
COGNITIVE PRESENCE			
Triggering Event	**Exploration**	**Integration**	**Resolution**
Evocative (inductive)	Inquisitive (divergent)	Tentative (convergent)	Committed (deductive)
TEACHING PRESENCE			
Instructional design and organization	**Faciliting discourse**		**Direct Instruction**
Setting curriculum Designing methods Establishing time parameters Utilizing medium effectively Establishing netiquette Making macro-level comments about course content	Identifying areas of agreement/disagreement Seeking to reach consensus/ understanding Encouraging, acknowledging, or reinforcing student contributions Setting climate for learning Drawing in participants, prompting discussion Assessing the efficacy of the process		Present content/questions Focus the discussion on specific issues Summarize the discussion Confirm understanding through assessment and explanatory feedback Diagnose misconceptions Inject knowledge from diverse sources, e.g., textbook, articles, Internet, personal experiences Responding to technical concerns

2.2. Sample of the study

The incidental sample is that of a virtual learning community of gypsy women (N=20) with heterogeneous levels of study.

2.3. Procedure

Three distinct parts of the research can be established. In the first part a study is carried out that is intended to contextualise and subsequently design, implement, and assess an e-learning practice based on CSCL and that aims to train gypsy women in Equal Opportunities and Social Leadership. In order to assess the appropriateness of the initial design, it was submitted to the opinion of four experts on the subject by means of a «Design Assessment Pattern for Experts» to include five assessment sections: the pedagogical approach, the contextual framework, the selection of didactic strategies (methodological, of motivation, and of learning), the designing of the formative action, and interactivity, support, and communication elements. The second study is based on a content analysis of the forums of the formative action designed to confirm the dimensions of the «Community of Inquiry» model (Garrison & Anderson, 2005) that lead to the forming of a Community of Practice. The third study is based on the assessment of experience. Triangulation as a data analysis procedure was implemented so as to obtain the results of the assessment of the formative action from a descriptive-interpretative analysis of data from the assessments of students, external experts, and the teachers taking part in the course. The data for this analysis were obtained from participative observation during the carrying out of the formative action, from a semi-structured interview, and in depth in classroom and on-line modes to the teachers-tutors and the communicational discussion group with participants after teaching the course (Flecha, Vargas & Dávila, 2004). Two questionnaires complement this last part of the study: a questionnaire to assess the formative action applied to the students and a questionnaire on the didactic assessment of the model and the teaching strategies used which is aimed at external experts.

3. Analysis and results

If we take into account the three parts of the study indicated in the procedure, we obtain in the first place a complete design of the virtual formative action «Equal Opportunities and Social Leadership». As far as the designing and planning of the latter is concerned, the ADDIE generic design model (Branch & Merril, 2012) has been followed from the stages of conception, analysis, design, production, and assessment. The second study carried out is that of the forming of the Community of Practice according to the model of CoI and the CSCL, in which it can be observed that of the three presences the one considered most important for one of the objectives of the research is that of the analysis of «Social Presence» because of its special significance within a CSCL context. A high percentage has been identified of messages belonging to this dimension, in particular those referring to the category of «cohesion». It can be said that a learning community identity is created, integrating the others within the discourse and recognising them as part of the same. Taking into account the full analysis of the categories making up Social Presence and the data on the evolution of the categories of this dimension, it can be affirmed that the basis of the Community of Practice has been established and that on the completion of the formative action its shaping can be witnessed.

In this dimension a number of references to «affective communication» can be observed; in other words explicit indicators appear that show that the students share a socio-emotional sphere that is essential to the communicative function and to the cohesion of a community, and that likewise they constitute the basis of collaborative learning. This category includes the expression of emotions and feelings, which in the face of the impossibility of establishing visual and intonation clues show themselves by means of the written resources of punctuation, emoticons, and capital letters. Taking into account the visual environment in which it is developed, affective communication becomes a key element for the satisfactory operation of collaborative work (Garrison & Anderson, 2005). The indicators studied in this category show that there is an important degree of confidence in which the group strengthens the relationships between them as the formative action progresses. Another of the categories related to Social Presence is «open communication», the study of which results in the appreciation of a strong level of commitment in the process of reflection and critical discourse (which is closely related to the cognitive dimension) on the themes that are intended to be worked on during the course. The third category related to Social Presence is «cohesion» and it is here where in reference to the indicators established by Garrison, Anderson, and Archer (2000), three types of interventions can be found that it is important to emphasise.

- The first group of interventions located belong to formalisms in communication such as introductions, greetings, and farewells.
- A second group of interventions in which the

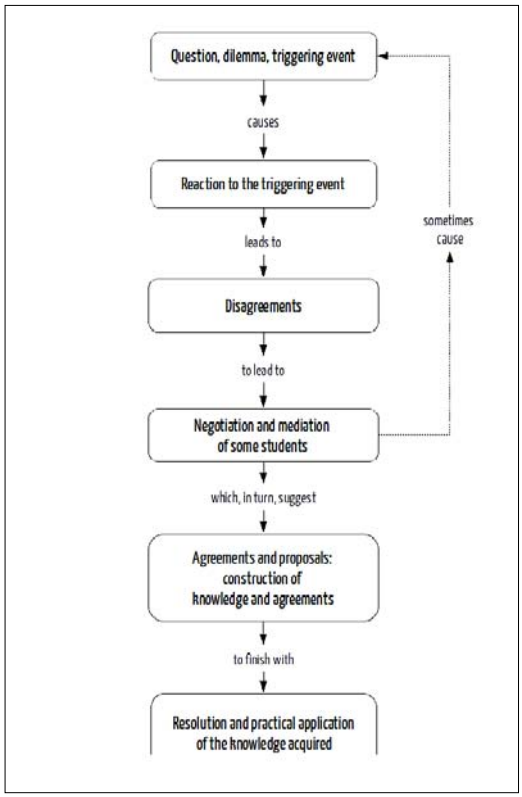

Figure 1. Different moments of response in the development of forums (cognitive presence).

student or students declare themselves to be identified within the group through expressions such as «us, our, the group, the community, classmates, friends», among others. As we have seen in the analysis carried out, expressions of this type are numerous. It is stressed that the fact of belonging to the same ethnic group has contributed towards cohesion in this formative action. A shared repertoire is identified in which they recognise each other, in principle based on their cultural identity; this generates one of the aspects present in any Community of Practice (Wenger, 2001).

• Thirdly, it is appropriate to place the intervention where the students make proposals or suggest themes, whether these are related to this formative action or not, that include the whole group. This group of interventions can be found within one of the forums. These aspects, which are characteristic of an informal relationship, refer to themes treated outside work and proposed activities (Crook, 2000) that must develop in the formative action, and play an important social role in the forming of the Community of Practice. If one of the themes originates in a proposal from one of the students to «make the forum their own» in order to debate themes related to joint interests, this denotes a rapprochement to the idea of a joint enterprise in the search for common objectives (Wenger & al., 2002) as an element of the Communities of Practice. On the other hand, another of the themes is that of the search, proposed by one of the students with the agreement of the remainder, for the joint commitment that determines another of the essential aspects of the Communities of Practice (Wenger, 2001).

On putting into practice the didactic model proposed it should be emphasised that taking students from the level of the exchanging of ideas and reflections to the joint construction of knowledge, referred to «Cognitive Presence», is a task that entails difficulties in virtual teaching. It is observed that the students participate in the exchanging of opinions and the sharing of ideas, but that it is more difficult to go deeper into knowledge of some themes by means of debate on the forums. A response pattern was detected that is shown in the following diagram:

After inquiring into this characteristic that has been detected, it can be seen that this may be due to two factors:

• Many of the forums analysed are opened on the initiative of the students, who share a teaching role that on occasion leads to a lack of guidance and orientation in the debate established.

• Most students had never taken part in a formative action of this kind. Together with the low digital literacy level of some of the students, this may have contributed towards the fact that the resolution phase is not always reached.

The educational activity carried out by means of the forum by the teachers of the course, the «teaching presence», is essential if the phase of the resolution and building of knowledge is to be reached. This didactic dimension entails the assuming of different roles by the teachers, such as debate facilitators, moderators, guides-advisers, experts answering individual and group questions, managers, etc. The study of this dimension includes all the categories and indicators in the teaching carried out in the formative action. It is important to stress that on the virtual forums studied a greater participation by students than by tutors has been detected, thus inverting the tendency in classroom teaching in which teachers intervene and participate more than students, concentrating more on the teaching process than on that of learning. It has even been affirmed that teaching presence is not restricted to the teacher and that students have at times taken on this role:

• In one of the themes we can observe the horizontality with which one of the tutors intervenes in a

theme opened by one of the students as a member of the group to exchange roles, with the teacher assuming the part of student and vice versa. Here «horizontal» student-teacher-student interactive communication can be appreciated.

• In some other themes, especially those opened by the students, some indicators can be identified to show the interchanging of roles between some students and others, assuming a teaching role that is shared between them. It may be, especially in one of the forums, that communication among the students occurs without intermediation from teachers and in themes that the former open themselves on their own initiative. We can speak of «vertical» interactive student-student communication according to whether one role or another is adopted. On the other hand, it can be seen that the confluence of the three presences is necessary in order to achieve a Community of Practice with an educational meaning. It can be affirmed that this model and its categories cross over between the different dimensions; in the study it is the Social Presence that establishes the basis by giving meaning to the administration of knowledge through emotions, maintaining this throughout the formative action, which the cognitive presence has needed from the basis created by the social presence and from the teaching presence so that the stage of the final resolution is reached in the knowledge building process. In other words, if the practical research stages are to be completed it is necessary for affective communication and the didactic dimension to gather strength. All this comes together in the relationship that Garrison & Anderson (2005) establish in the representation they make of these dimensions, in which the three Presences are related and are essential for maintaining that community of active study by means of the creation of an atmosphere of collaborative learning.

Finally a study was carried out to assess the application of the formative action for the shaping of the Community of Practice through virtual environments so as to obtain three dimensions. As far as the first dimension is concerned, the «didactic» one, the teachers consider that the keys to success were the participation, motivation, and dynamism of the students.

For the students the possibility of carrying out a university formative action by using a virtual campus has been assessed as a good opportunity that is both motivating and enriching. Research provides three essential axes based on experience as keys to the pedagogical designing of e-learning actions from a social and collaborative learning perspective: participation, motivation, and learning. As to the strengths of the experience, two key constructs stand out: motivation and participation. The biggest weakness observed has to do with the time needed to teach the course, both the virtual component and the classroom sessions. As to the pedagogical design, it has been assessed as an adapted design that is demanding and profound and suitable for the target students, the didactic strategies of

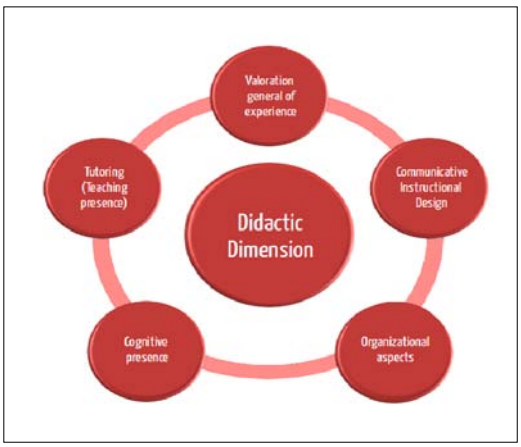

Figure 2. Didactic dimension.

whom have been rigorously complied with but without excessive rigidity. The tutors report surprising results, given the obstacles from which we originally started out, owing to the characteristics of the students. Although the results have been positive, the students criticise their own work in the last stage of the course in which a reduction in their participation has been detected that has discouraged them somewhat. If we go deeper into the reasons for this lack of motivation, it can be traced to participants who left the course for professional and/or personal reasons. If we specify the resources used, forums clearly predominate in the interventions. This has been the key resource for interaction and communication between the participants and for sharing and building knowledge together. As for the process of communication that occurs during the course by means of the tools used for this purpose, it is constituted as a motivating process in which learning has come about among equals (Aubert & al., 2008) and in collaboration, sharing knowledge and experiences.

On the other hand, the teachers, recognising the different academic levels of the students, believe that the construction of meanings has been reached in which each of them made use of this learning in keeping with their previous knowledge. It is pointed out that there may be differences between activities; some may have managed to reach this level and others have

been more «instrumental». The role played by the revitaliser of the course has been a vital one and constitutes a basic pillar for maintaining the motivation and continuous participation of the students, as well as avoiding that feeling of solitude that sometimes characterises some virtual formative actions.

In the «socio-cultural dimension», in general the tutors consider that this experience has been contextualised, taking into account the heterogeneity of the students and their adaption to their situation. It is established that the contents worked on through the activities can be applied to their socio-cultural contexts.

As to «social presence» as an indicator of this dimension, above all the «emotiveness» component must be mentioned, stressing factors such as cultural aspects and even virtuality as determinants of this component and in order to encourage the establishing of the basis of a Community of Practice. Other factors can be mentioned as determinants of this shaping of the Community of Practice, which are among others: the designing of the manner of working, the virtual platform, the system of interactions, the adaptation to the students and their previous knowledge, the subject matter approached, and the dynamics followed in training. On the other hand, a closer look is also taken at the attitudes that the participants must have for the shaping of the Community of Practice. Emphasis is given to predisposition, curiosity, opening-up to new themes, wishing to make progress and change, dedication, motivation, commitment, and the desire to participate. The students confirm that they have felt themselves to be part of a virtual learning community and mentioned fluid dialogue, good communication, participation, dynamism, collaboration and help between classmates, and in particular enjoyment, as the keys to this community feeling. The efficiency of the tutorials

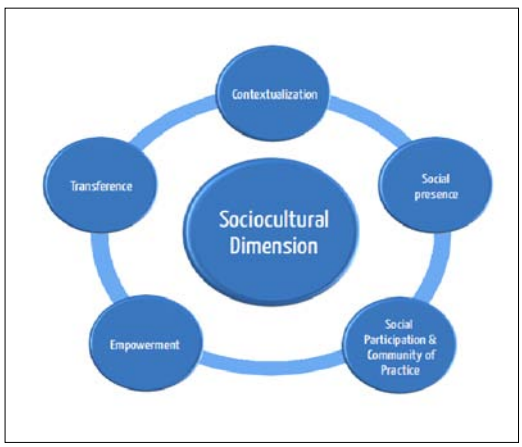

Figure 3. Socio-cultural dimension.

in encouraging these positive relationships and the satisfactory development of the formative action were also noted.

A final matter of vital importance in this dimension is that concerning the assessment of the development of the action by the participants there is evidence of changes and transformations in the latter. The following can be stressed: changes in discourse; opening-up to the possibilities of ICTs as a medium for communication, for getting to know new people, for seeking information and employment, for studying the balancing of work and family life, and even for acquiring new habits; and for purchasing new computer equipment and installing Internet at home. Other elements that should be emphasised are the updating and acquiring of knowledge, personal growth and effort, contact with other people, and overcoming shyness when communicating.

To conclude, starting from the «technological dimension» that has less effect than the previous ones it has been assessed that the technological platform used has been functional and adequate and free from significant incidents in the development of the formative action.

4. Discussion and conclusions

The main conclusions and contributions of this complete study refer to five aspects. In the first place, we contribute to a contextualisation and bibliographical revision of e-learning and new keys to the analysis of the factors determining social e-learning in a CSCL context. Secondly, from the approach adopted it is concluded that in order to form Communities of Practice by means of the VTLE a didactic model based on participation, motivation, and learning/interaction should be adopted. This model should justify itself from a globalising and integrating perspective that is constructivist in nature. Thirdly, from the analysis carried out based on the «social, teaching, and cognitive presence» model it can be inferred that a strong sense of community increases the students' participation in the formative action. It can be concluded that the messages referring to cohesion show that identification with the community and the integration of the students within it is generated (it forms the shared repository of the Communities of Practice) and that the interventions carried out outside the course fulfil an important social function (the mutual commitment and the joint enterprise that characterise the Communities of Practice are constituted). The categories of the analytical model cross over the three dimensions, with the «Social Presence» being that establishing the basis

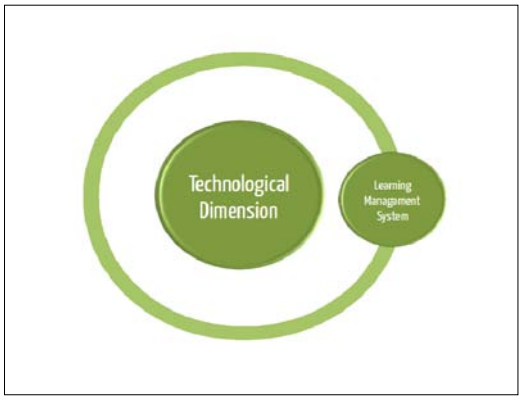

Figure 4. Technological dimension.

for the «teaching presence» and both for the success of the «cognitive presence». It is important for the teachers to create a positive environment so that good cognitive results can be obtained. All the results show that the Community of Practice is formed. It can be concluded that the qualitative content analytical model used is suitable for studying the forming of Communities of Practice in virtual learning environments and that it is a model that is simple to apply. It can be adapted to a variety of pedagogical designs and allows the study of interactions to try to improve them and to exploit the pedagogical and social value. Fourthly, the virtual formative action carried out was appropriate, was successfully implemented, and was defined as innovative in its field of action. ICTs as a medium have helped to provide an opportunity for learning and personal development. From this point of view and fifthly, a new model of social intervention is provided by means of ICTs; it is sustained by a piece of research that aimed to constitute an intervention process designed to improve and promote the way of life of the gypsy women taking part. Changes have occurred in the participants that point to their social and cultural promotion. From this point of view this study confirms that it is necessary to encourage the creation of learning contexts among equals that help in communication between the various participants in a virtual formative action. We believe that by means of this environment of exchange of information obtained from various sources, reflection and the acquiring of new knowledge is possible from a framework of independent learning, always assessing the moment for this acquisition. In short three keys can be indicated: pedagogical design and the principles within which it is established correspond to the results obtained by validating its appropriateness; the Community of Practice of gypsy women from Extremadura has been formed through the VTLE; and it has been accompanied by changes in the participants that point to their socio-cultural promotion.

The results of this research provide specific strategies that can guide the introduction of ICTs in educational practice, in this case from an environment that links what is formal and what is not formal, strengthening these new ways of learning in virtual collaborative spaces. On characterising a virtual community as an analytical tool and studying it from an educational perspective in a VTLE, specific pedagogical strategies are provided that will allow use of the potential of participation in these communities for training purposes (Sloep & Berlanga, 2011). It must be pointed out that this research is not only of scientific value owing to its results, but also of social value in that it makes the study original from the moment when our interest is directed towards studying how ICTs affect social and educational dynamics and in what way. Through them and in the last analysis, it can contribute towards the welfare and general development of a group of gypsy women who experience situations of discrimination that may even be multiple. We point out that the contribution of ICTs to the social development of this community may constitute the objective of further research deriving from this thesis. All the foregoing implies a contribution to the development of the so-called «social perceptive of e-learning» (Planella & Rodríguez, 2004). For this reason, a scenario is proposed in which ICTs are used from a social perspective with the objective of helping to encourage the empowering of gypsy women through learning and thus encourage their social leadership within the ethnic group to which they belong. Given what may be a new learning environment for these students, it is considered important to provide them with an atmosphere that will encourage them to undertake the joint construction of knowledge supported by critical reflection and social interaction with others in a Community of Practice based on CSCL.

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