



COMBINED EVALUATION OF ON-LINE LEARNING COMMUNITIES

D. DOMÍNGUEZ FIGAREDO
UNED, C/ Senda del Rey, 7, 28040, Madrid, Spain.

L. ALONSO DÍAZ
Universidad de Extremadura, Avda Elvas, s/n, 06071, Badajoz, Spain.

Abstract: This article shows the results of a research that analyzed the grouped and individual learning generated in an on-line community of students. As a methodological innovation, the study combines strategies proceeding from two different approaches that seem to be adequate for the analysis of social processes in the cyberspace. On the one hand, from a qualitative approach, it has been analyzed the contents of textual data generated in the interactions of a specific virtual community members. And on the other hand, it has been used the analysis of social networks with the aim of describing the reticulated morphology of the chains of messages sent to the forum. For the analysis of contents it has been used the software AQUAD v.6, and the analysis of networks has been carried out with UCINET v.6. The article shows the main steps followed to recover the textual data from the computer platform and how they have been processed to be used in both programs. The conclusions provide information about the role of the tutor/moderator during the on-line interaction, about the process of the students' construction of learning and on the validity of some of the used didactic strategies. Finally, the suitability of using combined (mixed) methods to analyze educational processes in the cyberspace is submitted to discussion; and, specifically, how the analyses based on the networks structure support the results of other usual methods on the analysis of on-line teaching and learning processes.

Key words: Online knowledge assessment; virtual communities; content analysis; social network analysis; blended analysis methodology.

Topics: Knowledge management; Pedagogical and didactical issues.

1 Analysis (not only) qualitative of communities of training in line

From our own experience working with e-learning methods, in this article we deepen in the analysis of virtual communities learning processes from qualitative and reticulated methodological perspectives (Domínguez, 2003; Domínguez and Alonso, 2004). In virtual scenarios, there are communication processes and styles of behaviours that differ from the face-to-face scenarios, so the educational needs to design, analyze and validate training are also different in every situation. During on-line educational process, the combination of qualitative and reticulated techniques facilitates the development of specific methods that are highly adjusted to the cyber-space necessities.

Since the Internet emerged as a significant social phenomenon, many studies are considering the use of qualitative research methods –especially virtual ethnography- to analyze interactions in the cyberspace. Those studies are mostly focused in synchronous exchange contexts, as chats or instantaneous messages. The virtual ethnography not only allows knowing directly behaviours and personal/groupal socialization models in this technological scenario; but also it allows transforming the methods used, and, therefore, reorganizing the epistemological suppositions adopted to sustain the relationship with technology (Hine, 2000). This last statement is especially important in educational interactions, where the communication technology is a central criterion to design intervention strategies (Jonassen, Peck and Wilson, 1999).

Ethnography offers great possibilities for on-line education. Its application in relation to educational theories -the instruction design and teaching processes, basically- is usually as a method of research that analyzes the negotiation of meanings, the assumption of roles or the construction of identities. However, in our study we will use the ethnography fundamentally as systematic process of data collection useful to understand: the apprentices' strategies when they access to the studied area, their socialization and role in the group, their way of generating and processing information to create knowledge, especially when it is developed by groupal interaction. Nevertheless, the e-learning experience shows that the best on-line

learning practices occur on the virtual communities that maintain their links, at least, during the learning process. Another aspect that has emerged through this experience is that the best on-line practices not only use one specific tool, as it seems to be useful the combination of some communicational resources, which are used for the instructional process (Guardia and Sangrá, 2004). And, among all, virtual forums seem to constitute the main media, where the highest number of exchanges among students, teachers and some other agents responsible for the monitoring process occurs (Blazento and Alonso, 2004).

Deepening in those educational dynamics developed in virtual forums, firstly we have opted for an exclusively qualitative approach of research, with the ethnography and the participant observation as main methods. However, as the results showed more complex realities –mostly related to specific behaviours of virtual forums-, we confirmed the insufficiency of this approach. What is useful at first to analyze social relationships in synchronous media, as chats, does not seem to be sufficient in non synchronous media. When the contacts occur during a chat, the textual content of the messages is linear, in the sense that a message is followed by another message and so on. However, the communication dynamic is different in a virtual forum. Forums allow linking chains of messages deferred in time, so people can follow existing subjects or create new ones according to their motivations. This difference between communication records according to the medium implies significant variations for the educational analysis.

Some specific behaviours that are considered with scarce educational potential during offline situations seem to be decisive to articulate much of the knowledge generated in a virtual forum. In our investigations we have seen frequently some messages with irrelevant educational content that, however, acquire a central importance in forums, as they gather communications, generate debate and reflection. Ardèvol, Bertran, Callén, and Pérez (2003) state, with regard to their ethnographic research: “(...) we did realize that there is not a direct relation between participation, quantity of interventions and level of information that the members of the group can offer about their experience (p. 84). Then, the explanation to those deviations in the communicational contingencies and reciprocities in the cyberspace and some others found in educational forums, as the absence of relations between number of emitted messages and obtained answers or among the typology of the speech, more or less structured, and the resolution of doubts in the group- are not accurately solved in the ethnographic research, and this leads to look for other complementary approaches that allow enriching the educational study of virtual communities.

The analysis of social networks (ARS) can fill this kind of gaps. Apart from of the positivist reasoning, the structural and ARS methods allow explaining the significance of a message inside the net of a virtual forum. And, also considering the personal attributes of the participants, the ARS provides relevant keys that can explain the processes of socialization in a specific community. Considered as nodes in a communicational net, some messages in virtual forums can be analyzed for their contents using techniques of analysis of soft qualitative data, but their relevance as part of the relational matrix of all the messages to the forum has a justification in terms of centrality, connectivity or degree of intermediation of that node with the others. In that sense, the ARS does not interfere in the classic qualitative methods, however it enriches the analysis providing information on the state of the question that help to reflect about the educational social process that occur in the group.

2 Discursive and textual analyses of virtual forums

This paper shows a case study of three virtual forums with independent subjects in the general contents of the Social Education Studies. The three forums have equal number of participants. The moderation corresponds to different tutors with different participation-strategies. In that sense, it will be specially interesting to contrast how the style of every tutor provokes (or not) different forms of intervention.

A first level in the qualitative analysis of the forums, supported by AQUAD v.6¹, consists in discovering the intentionality of messages. Generally speaking, orientations are linked to the main subject of every forum, but cases of reflexive processes more generic, of resolution of doubts, of moderators' animation to the study and, finally, of gratitude also occur.

A second level is related to the fact of reflecting about the contents that generate doubts in the students. In the forum 1, the problem was related to administrative aspects. As this issue was not answered by the tutors, therefore the students sent recurrent messages to the forum, so they could be answered by their own partners. Other matters exposed in the forums were those of the proposals design (absence of

¹ *Aquad* v.6., © Günter L. Huber, Universität Tübingen (Alemania) 1990-2003, <http://www.aquad.de/spa/spav.html>.

references or questions on the virtual platform where the educational action was developed). Finally, the activities and the contents of the matters of training did not appear to be were problematic questions.

The third and final level of qualitative analysis is related to the kind of contents that generates reflection among the students. These contents are the related with the activities prepared to develop in the forums, the provided additional contents and, finally, the students' monitoring. When the tutors propose questions as in the form of activities, many students answer reflexively, considering new complex and interpretative arguments, and so enriching the program with additional contents and generating more elaborated opinions. Likewise, when the tutors consider additional contents regardless of the evaluation processes, these not always generate reflection among the students. In that case, debate is only developed when the subjects cause controversy or are tendentious, since they need a positioning of the students and these feel encouraged to take part in the discussions voluntarily.

3 Reticulated analysis of virtual forums

Lately, the analysis of virtual forums through ARS has been applied to explore personal communications technologically mediated. Probably, the most representative analysis of this category has been the one developed by the work-group of Jeffrey Heer (2004) from the University of California (Berkeley, EE.UU.), where it is represented the social net of the company ENRON through ARS and techniques of data mining; for that, it was used information proceeding from the employees electronic mail to understand which causes provoked the company bankruptcy in 2002. Many other studies have also analyzed organizational dynamics using reticulated analyses of e-mails, but just a few have used data proceeding from virtual forums.

Our research works with data proceeding from three virtual forums of the three subjects mentioned previously. In the ARS accomplished through UCINET 6 and NetDraw 1.0², we have considered the attributive features of gender and the independent interventions. With the analyses results, we can advance some independent interpretations for each forum.

In the forum 1 (figure 1), the best connected one is the number 9, with an output degree of 6 and an input degree of 7, so this node is higher than the tutor and the person number 8. It is significant that the node 3 has the third greatest input degree, but that it occupies the last place in the general estimation due to the absence of outputs. The "linking person" of this net it is also the number 9, followed by the tutor in the degree of betweenness. The net contains 2 cliques with the persons 7, 8 and 9 and the tutor, 7 and 8; this shows the significance of the nodes 7 and 8 in the group participation.

² UCINET 6 for Windows, © 1999-2003 Analytic Technologies Borgatti, S.P., M.G. Everett, and L.C. Freeman, <http://www.analytictech.com/downloaduc6.htm>. NetDraw 1.0, © 2002 Steve Borgatti, borgatts@bc.edu.

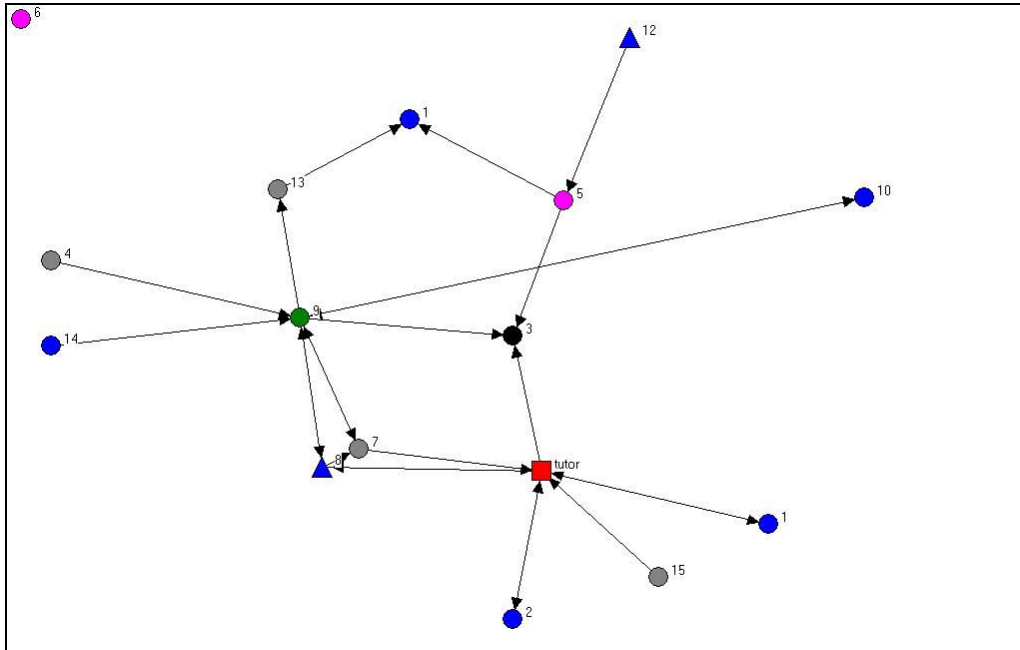


Figura 1. Grafo del foro 1

The forum number 2 (figure 2) is certainly the most singular of the three analyzed. The participation is really gathered, and, according to the intervention dynamics, not all the participants are interconnected. The forum lacks cliques, so that it is impossible to establish interdependent contacts to work together, however everyone receive every intervention at the time. The three tutors capitalize the protagonism and occupy the highest degree of position and intermediation.

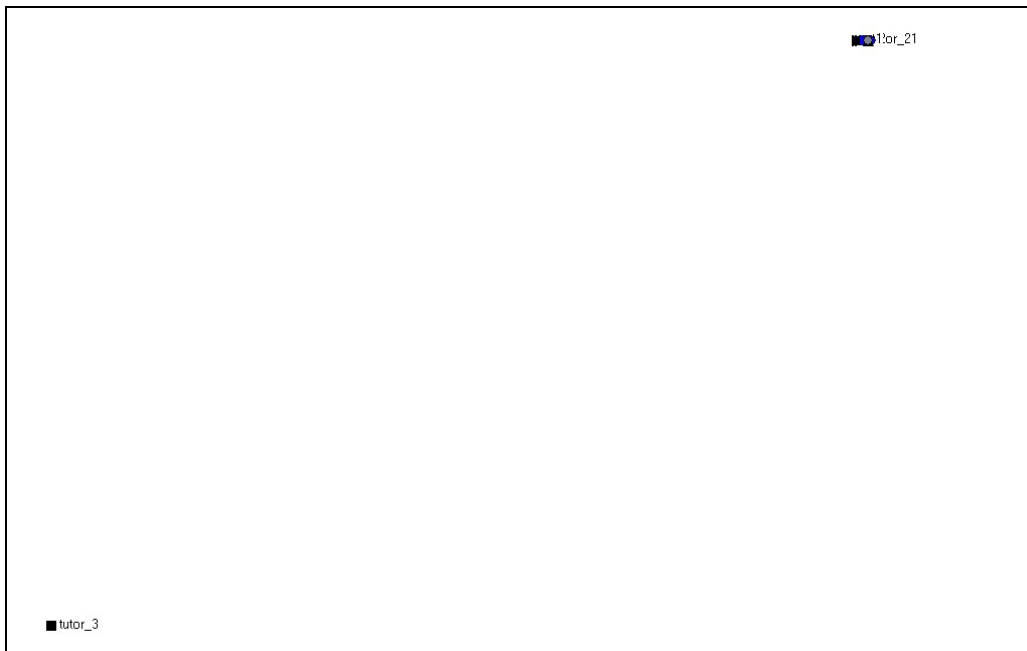


Figura 2. Grafo del foro 2

Finally, the forum number 3 (figure 3) has a perfect radial structure, with the tutor as axis of communication and contact. Logically, he is the best connected node and, for the same reason, it is impossible to create cliques or sub-groups regardless of his figure.

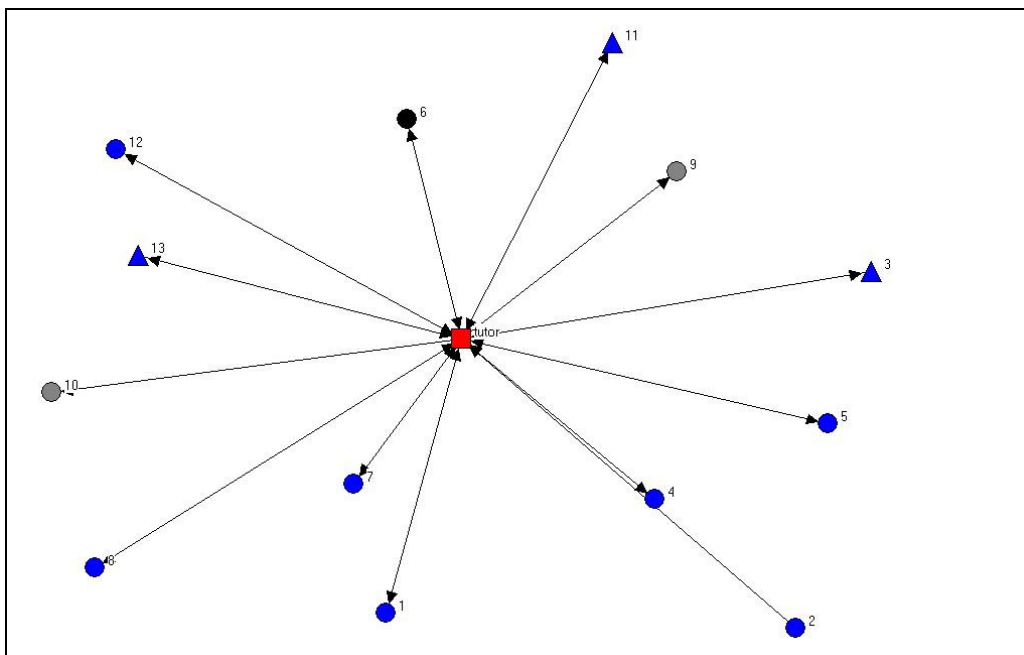


Figura 3. Grafo del foro 3

4 Conclusions

Our conclusions can be interpreted from two perspectives. On the one hand, from the point of view of the students' learning –and the possibilities of developing this learning around virtual forums: (1) The moderation style is conclusive to generate different dynamics and participation. When forums are moderated by academicians who evaluate the learning process, their dynamics are foreseeable. Then, the debate can be generated from explicitly considered open questions, with a certain controversy degree. Anyway, students tend to be dependent on the moderation style, so the relationship model suggested by every moderator is the key to generate different interaction styles. When evaluation tasks are not specifically suggested (for instance, discussion groups, synthesis, case studies, contrasts, schemes or plan, role games, working projects, simulations, etc.), knowledge generation depends on personal and grupal reflection processes; another point to highlight here is that reflection can be encouraged in different degrees by the forum moderator.(3) Groups considered as one all can be divided up in other groups (cliques), so that it can be favoured community relation and transfers among autonomous versus collective working forms. In that sense, it seems adequate to consolidate enough levels of grupal interaction, as well as to develop adequate subgroups, depending on the negotiation of meanings and affinities previously shown. Forums with radial structures, opposite to reticulated ones, avoid the information flow among-all-the-members before cliques creation. Equally, groups excessively gathered around tutors' interventions lack the required argument to negotiate divisions more or less operative.

On the other hand, we consider that the analysis of virtual forums, as the analysis of communications technologically mediated, can be enriched with methodological contributions proceeding from heterogeneous scientific approaches. That requires an essentially different treatment of the available data (texts for the qualitative analysis and relational links for the ARS) for every methodological approach. In this sense, the progress in the discursive analysis can help from the qualitative approaches -not only in contents analysis of virtual ethnography- but also to advance in synergies and reflections with other methods not so common, as it is the case of the advanced ARS in this article.

References

Ardèvol, Elisenda; Bertran, Marta; Callén, Blanca y Pérez, Carmen (2003): Etnografía virtualizada: la observación participante y la entrevista semiestructurada en línea. *Atenea Digital*, 3, pp. 72-92. Disponible: <http://antalya.uab.es/athenea/num3/ardevol.pdf> [Consulta: 22/12/2004].

- Blazento, Fernando y Alonso, Laura (2004): ¿Formación específica para el docente virtual? [En línea] Conferencia presentada a *Eduotec 2004*, Barcelona 17-19 noviembre 2004. Disponible: <http://www.edutec2004.lmi.ub.es/pdf/46.pdf> [Consulta: 29/3/2005].
- Cortazar Rodríguez, Francisco Javier (2004): Chicanos y México-americanos en tres comunidades electrónicas. [En línea] *TEXTOS de la CiberSociedad*, 3. Disponible <http://www.cibersociedad.net> [Consulta: 9/3/2005].
- Domínguez, Daniel (2003): Assessing educational process in cyberspace. En, Méndez, Antonio; Mesa, José Antonio y Mesa, Julián (Coords.) (2003): *Advances in technology-based education: toward a knowledge-based society (vol. II)*. Mérida: Junta de Extremadura, pp. 693-697.
- Domínguez, Daniel y Alonso, Laura (2004): Metodología para el análisis didáctico de foros virtuales. [En línea] Conferencia presentada a *Eduotec 2004*, Barcelona 17-19 noviembre 2004. Disponible: <http://www.edutec2004.lmi.ub.es/pdf/46.pdf> [Consulta: 22/3/2005].
- Gálvez Mozo, Ana (2004): Producción de compromiso y sentido de realidad en los entornos virtuales. Un análisis etnográfico. *Atenea Digital*, 5, pp. 57-78. Disponible: <http://antalya.uab.es/athenea/num5/galvez.pdf> [Consulta: 21/3/2005].
- Garrido, Antoni (2003): *El aprendizaje como identidad de participación en la práctica de una comunidad virtual*. [En línea] Disponible: <http://www.uoc.edu/in3/dt/20088/index.html> [Consulta: 15/7/2003].
- Guardia, Lourdes y Sangrá, Albert (2004): Diseño instruccional y objetos de aprendizaje; hacia un modelo para el diseño de actividades de evaluación del aprendizaje *on-line*. [En línea] Conferencia presentada al *SPDECE 2004*, Guadalajara 20-22 octubre 2004. Disponible: http://spdece.uah.es/papers/Guardia_Final.pdf [Consulta: 19/2/2005].
- Heer, Jeffrey (2004): Exploring Enron: Visualizing ANLP Results. Conferencia presentada al *Applied Natural Language Processing, InfoSys 290-2*. Berkeley (USA): University of California. Disponible: <http://www.cs.berkeley.edu/~jheer/anlp/final/> [Consulta: 2/5/2005].
- Hine, Christine (2000): *Virtual ethnography*. Londres: Sage.
- Jonassen, David H.; Peck, Kyle L. y Wilson, Brent B. (1999): *Learning with technology: A constructivist perspective*. Upper Sanddle, NJ: Merrill/Prentice Hall.
- Mayans, Joan (2002a): *Género chat. O cómo la etnografía puso un pie en el ciberespacio*. Barcelona: Gedisa.