RUSC Revista de Universidad y Sociedad del Conocimiento
Universities and Knowledge Society Journal
http://rusc.uoc.edu

ARTICLE

Virtual dialogues and exchanges. The social and cognitive dimensions of interactions among students

Analía Claudia Chiecher
achiecher@hotmail.com
Researcher, National Council for Scientific and Technical Research, Argentina,
and Assistant Lecturer at the National University of Río Cuarto, Argentina

Danilo Silvio Donolo
donolo@gmail.com
Researcher, National Council for Scientific and Technical Research, Argentina,
and Tenured Lecturer at the National University of Río Cuarto, Argentina

Submitted in: May 2012
Accepted in: February 2013
Published in: July 2013

Recommended citation

CHIECHER, Analía Claudia; DONOLO, Danilo Silvio (2013). "Virtual dialogues and exchanges. The social and cognitive dimensions of interactions among students" [online article]. *Universities and Knowledge Society Journal (RUSC)*. Vol. 10, No 2. pp. 285-300. UOC. [Accessed: dd/mm/yy].
<http://rusc.uoc.edu/ojs/index.php/rusc/article/view/v10n2-chiecher-donolo/v10n2-chiecher-donolo-en>
<http://dx.doi.org/10.7238/rusc.v10i2.1534>
ISSN 1698-580X

Abstract

This article focuses on the topic of interactions among peers in virtual environments. The analytical approach considers both the cognitive dimension and the social dimension (addressed more recently in the literature) of interactions.

The study was conducted on 28 groups of students (15 formed by undergraduates and 13 by graduates) who interacted with each other in electronic forums to perform an academic task within the framework of the subjects that they were taking.

From the analysis of the dialogues among the students in the 28 group forums, it was possible to construct 7 categories in order to classify the interventions by their main purpose or goal, namely: *1)*

Original title: *De diálogos e intercambios virtuales. La dimensión social y cognitiva de las interacciones entre alumnos*

social and/or off-topic interventions; *2) organisation to perform the task*; *3) progress in drafting the answer*; *4) requests for help*; *5) acceptance of the collectively produced answer*; *6) answers to requests for help;* and *7) sharing the instruction and/or its interpretation.*

The distribution of the different types of intervention in each group was similar and homogenous; there were no differences between undergraduate and graduate students. In all cases, a majority of social interventions was found, followed by organisation interventions and, to a lesser extent, progress in drafting the answer. The remaining interventions were irregular and infrequent.

A higher intervention-per-student average was also found in the graduate student groups. In contrast, no differences in the intervention-per-student average were found when taking group size into account.

The final considerations stress the need to know more about communication in virtual environments in order to contribute to the design of innovative proposals that broaden the opportunities for learning in such environments.

Keywords
dialogue, virtual learning environments, social dimension, cognitive dimension

De diálogos e intercambios virtuales. La dimensión social y cognitiva de las interacciones entre alumnos

Resumen

El artículo focaliza la atención en el tema de las interacciones entre pares en entornos virtuales. La perspectiva de análisis atiende tanto a la dimensión cognitiva de las interacciones como a su dimensión social (de más reciente consideración en la literatura sobre el tema).

Se trabajó con 28 grupos de alumnos (15 de grado y 13 conformados por alumnos de posgrado) que mantenían interacciones en foros electrónicos en torno a la realización de una tarea académica propuesta en el marco de las asignaturas que cursaban.

El análisis de los diálogos entre alumnos en los 28 foros grupales permitió la construcción de siete categorías que clasifican las intervenciones conforme a su propósito o finalidad principal; a saber: 1) intervenciones sociales y/o ajenas a la tarea; 2) organización para realizar una tarea; 3) avances en la redacción de la respuesta; 4) solicitudes de ayuda; 5) aceptación de la respuesta elaborada en grupo; 6) respuesta a solicitudes de ayuda y 7) socialización de la consigna y/o su interpretación.

La distribución de los distintos tipos de intervenciones en cada grupo fue similar y homogénea, sin diferencias entre alumnos de grado y de posgrado. En todos ellos se registró una mayoría de intervenciones sociales, seguidas de intervenciones de organización y, en menor proporción, avances en la redacción de la respuesta. Las restantes intervenciones fueron irregulares y muy poco frecuentes.

Se observó también mayor promedio de intervenciones por alumno en los grupos de posgrado. En cambio, no se observaron diferencias en cuanto al promedio de intervenciones por cada alumno considerando el tamaño de los grupos.

Las consideraciones finales enfatizan la necesidad de conocer más sobre la comunicación en entornos virtuales, puesto que ello contribuirá a diseñar propuestas innovadoras, que amplíen las oportunidades de aprendizaje en estos entornos.

Palabras clave

diálogo, entornos virtuales de aprendizaje, dimensión social, dimensión cognitiva

Introduction

The relationships between knowledge construction and social interaction have been a topic of interest to scholars from different theoretical backgrounds. Thus, from a Piagetian perspective, it is accepted that knowledge is constructed in social situations, and that the decisive mechanism of knowledge construction is sociocognitive conflict (Perret Clermont & Nicolet, 1992). In contrast, from a Vygotskyan perspective, the concept of *zone of proximal development*[1] (ZPD) stands out in particular. The definition of the concept reflects a situation of interaction that is both fruitful and beneficial to the learner (Vygotsky, 1988).

When considering distance education, we have to acknowledge that this educational mode has not always allowed for fluid interaction among students at every stage. The opportunity to engage in dialogue in mediated environments has only become a real possibility in recent years. Today, asynchronous tools enable people to participate and exchange information anywhere, anytime. This means that every participant can work at their own pace and take the time they need to read, reflect, write and review before sharing issues or information with others (Sigalés, 2002). However, while it may seem attractive, it is also necessary to consider that text-based asynchronous communication poses a particular challenge in terms of getting students to become really involved in collaborative work. This type of communication imposes a series of constraints (absence of visual contact, gestures, signs of approval or silence, etc.) that, together with not coinciding in place or time, can lead to a feeling of solitude among students, thus diminishing their capacity to strike up interpersonal relationships. In turn, this inhibits the development of the kind of open dialogue that supports and fosters a critical and constructive exchange of ideas (Onrubia et al., 2008).

On numerous occasions (and in our own experiences in the field of distance education), we have found that students' skills and competencies for interacting in a virtual environment vary. Thus, some groups function and work collaboratively, with equal participation of their members in a climate of cooperation and friendliness, while others manifest serious difficulties, mainly relating to the minimal social, attitudinal and relational abilities of their members to undertake group work (Chiecher & Paoloni, 2011; Chiecher & Donolo, 2011).

Given the characteristics of virtual environments, it seems crucial to address the impact that interactions not only have on knowledge construction (possibly the most studied aspect), but also on their members' social or relational aspects, and on the best way to foster fruitful exchanges.

Cognitive presence and social presence

Regarding the issues mentioned thus far, Garrison et al. (2000, 2003) and Rourke et al. (2001) suggested the existence of three major dimensions that overlap in the analysis of online interaction: *cognitive presence*, *social presence* and *teaching presence*.

1. The *zone of proximal development* is defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1988).

Cognitive presence is defined as "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse within a community" (Garrison et al., 2003); it is the dimension with the closest link to students and their roles within a virtual learning community.

Social presence is defined as "the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people through the medium of communication being used" (Garrison et al., 2000, 2003; Rourke et al., 2001). This dimension is also linked to students' actions within virtual environments, and particularly refers to those of a social or relational nature.

Lastly, *teaching presence* is related to the design, facilitation and management of cognitive and social processes (Garrison et al., 2000, 2003; Rourke et al., 2001); it is the dimension with the closest link to the roles of teacher or instructor in the teaching-learning process.

The three above-mentioned dimensions interplay and overlap in the teaching and learning processes that take place within the framework of virtual communities. This article particularly addresses the interplay between the two student-related dimensions: cognitive presence and social presence.

Historically, the tendency has been to focus attention on the cognitive aspects of interaction, that is to say, on the dimension linked to knowledge construction. A number of issues are addressed from this perspective, such as the presence of sociocognitive conflicts, the emergence or non-emergence of requests for help, the existence or non-existence of divergent points of view among students, and the discussion or debate that might be generated as a result. More recently, the ability to work more effectively in groups has begun to be recognised as a key skill. When social presence is low, group members feel disconnected and group dynamics suffer. When it is high, participants feel more committed to the group process (Aragon, 2003; Mycota & Duncan, 2007; Wheeler, 2005).

In other words, while the affective and social dimension of communication does not appear to have any direct relationship with course content, meaning that it may be undervalued and considered as an interference in the learning process, an increasing number of researchers are now recognising its importance as a support for students' cognitive processes (Aragon, 2003; Cobb, 2009; Johnson & Johnson, 1999; Mycota & Duncan, 2007; Pérez et al., 2007; Rourke et al., 2001; Villasana & Dorrego, 2007; Santos, 2011; Tolmie et al., 2010; Wheeler, 2005, among others)..

Working together… without being together

There is consensus on pointing out that getting students to work in groups is simply not enough to generate any positive effect on knowledge construction. Indeed, there are myriad factors that may impact on and modulate the effect of interactions (Casanova, 2008; Johnson & Johnson, 1999).

In order to talk of group learning, being able to observe certain interpsychological mechanisms in their dynamics seems necessary. Such mechanisms might account for teamwork and potentially good outcomes. Casanova (2008) and Casanova et al. (2009) underscore three of these mechanisms: 1) positive interdependence among members; 2) shared construction of meaning; and 3) psychosocial relationships.

Positive interdependence among members is defined as mutual dependence among participants for performing a task and attaining group objectives. Interdependence implies that every participant has a high level of responsibility for their own and others' learning.

Shared construction of meaning through language is defined as the joint production of knowledge, goals, plans, ideas and concepts. Indicators of this mechanism are requests for and offers of explanations, the presentation of arguments, negotiation, coordination and mutual regulation of contributions, and points of view held and roles played in interactions, among others (Casanova et al., 2009). It is undoubtedly the dimension with the closest link to the cognitive and knowledge construction process.

Lastly, *psychosocial relationships* are defined as setting the conditions for stimulating interaction by means of expressions of reinforcement, encouragement and support among members. As mentioned earlier, while the affective and social aspects are not linked to task content, they do indeed support cognitive and meaning construction processes.

The functioning of the three previously mentioned interpsychological mechanisms can be appreciated when analysing dialogue among students in a virtual environment. If these mechanisms are very apparent in a group, then it is to be assumed that the group has high potential to attain good outcomes for the objective that needs to be met and the learning that needs to be constructed. In contrast, a group with weak interdependence and minimal psychosocial relationships will find it hard to attain positive outcomes with regard to knowledge construction.

Method

This study falls within the methodological approach known in the sphere of education as design studies (Rinaudo & Donolo, 2010). The instructional design implemented in the different groups consisted in proposing an academic task (of specific characteristics) that had to be performed in group-work mode in a virtual environment.

The content of the proposed task varied, since it was adapted in all cases to suit the core topic of the course or the subject in question. However, the characteristics of the proposed task were common to every group. For example, it had to be performed collectively, it represented an authentic task[2] that was likely to arise in a real-life working context, was extensive over time, provided opportunities for room for manoeuvre and choices, etc.

The work groups – 28 in total – had a group forum as a means of communication and exchange to perform the proposed task. Every dialogue and exchange that took place within the groups was recorded. The interactions among the students constituted the unit of analysis on which this article focuses.

2. Authentic tasks are defined by Brown et al. (1989), in the sense applied to them here, as coherent, purposeful and meaningful in the context of a culture. Or, drawing on notions put forward by Woo and Reeves (2007), we talk of *authentic tasks* by referring to those activities that situate learning in realistic contexts, which are done be several people who commit themselves to defining the task, sharing resources and views, negotiating, summarising their own and others' thoughts, thus completing, polishing or refining the task on the basis of what is shared (Woo & Reeves, 2007).

Group work and participants

The 28 groups on which the study was conducted were formed by a total of 120 undergraduate and graduate students; of these, 62 were taking three subjects in the third, fourth and fifth years of their respective bachelor's degree courses at the National University of Río Cuarto (UNRC), Argentina, and the remaining 58 were graduate students on two fourth-level postgraduate courses.

The undergraduate students took the curriculum subjects of their respective bachelor's degree courses in a regular, face-to-face manner. In the subjects for this study, a complementary virtual experience (the key aspect of which was to do a group activity in a virtual environment) was proposed. The students' participation in it was a requirement to obtain the necessary regularity of attendance in the subject. In contrast, the graduate students were mostly university lecturers who, besides their teaching work, were enrolled on a fourth-level distance learning course. Thus, while it was an unexpected proposal for the undergraduate students, it was not for the graduate students, since they had chosen to take their courses in distance learning mode.

As mentioned above, the 120 students were divided into 28 work groups by their lecturers (15 formed by undergraduates and 13 by graduates). The size of the groups varied between 3 and 7 members in each. The following table shows the distribution of the groups by the number of members.

Groups with 3 members	8
Groups with 4 members	9
Groups with 5 members	8
Groups with 6 members	1
Groups with 7 members	2
Total	**28**

Table 1. Distribution of groups, by number of members.

Most of the work groups had between 3 and 5 members (89%), whereas only a small percentage (11%) had 6 or 7.

Data analysis

Unit of analysis. When describing the problems associated with analysing asynchronous discussions, Gros and Silva (2006) mentioned the one associated with units of analysis. In this study, *thematic units* were taken as the units of analysis. Thematic units are defined as "a single thought unit or idea unit that conveys a single item of information extracted from a segment of content" (Budd et al., 1967, cited in Rourke et al., 2001; Gros & Silva, 2006). In other words, within a single message, it is possible to observe more than one thematic unit.

The choice of this unit of analysis responds both to the objectives of this study and to the nature

of virtual discourse, which is characterised by the variety of ideas, topics and content included in each of the students' messages.

Category construction. The data analysis consisted in producing a category system in order to classify all the thematic units recorded by their purpose or goal.

In order to construct the categories, deductive and inductive procedures were combined. Regarding the deductive procedures, the starting point was topic-related theory and certain existing studies in which categories had already been defined (Casanova, 2008; Casanova et al., 2009; Chiecher & Donolo, 2011; García & Perera, 2007; Rourke et al., 2001). Regarding the inductive component, categories were created on the basis of the data, following a process of fit, definition and redefinition. In other words, the categories were defined in accordance with the data and the interventions recorded.

After configuring the category system, the dialogues of 2 out of the 28 groups underwent assessment by an external assessor, who independently classified each of the interventions again.[3]

The two exchange sequences subjected to external assessment were chosen because they were the longest and thus contained the highest number of thematic units; one was from an undergraduate student group and the other from a graduate student group. After the categories created had been externally assessed, an index representing the percentage agreement between the author of the category system and the external assessor was calculated. In the first assessment, the index of agreement was 94% and 81% for the undergraduate and graduate groups, respectively. By fine tuning perspectives and providing the grounds for decisions, in the second assessment, the index of agreement reached 99% and 98% for the undergraduate and graduate groups, respectively.

Results

Classification of the interactions among students

From the analysis of the discourse and dialogues among the students in the 28 group forums, it was possible to construct 7 categories in order to classify the interventions by their main purpose or goal, namely: *1) social and/or off-topic interventions*; *2) organisation to perform the task*; *3) progress in drafting the answer*; *4) requests for help*; *5) acceptance of the collectively produced answer*; *6) answers to requests for help;* and *7) sharing the instruction and/or its interpretation.*

The distribution of the interventions is shown in the chart below:

3. The external assessor was given two files containing the thematic units in the dialogues of each group, as well as the categories created for their classification. The external assessor's job was either to assign each intervention to one of the categories created, or to propose changes, adjustments or new categories if he/she considered it necessary to do so.

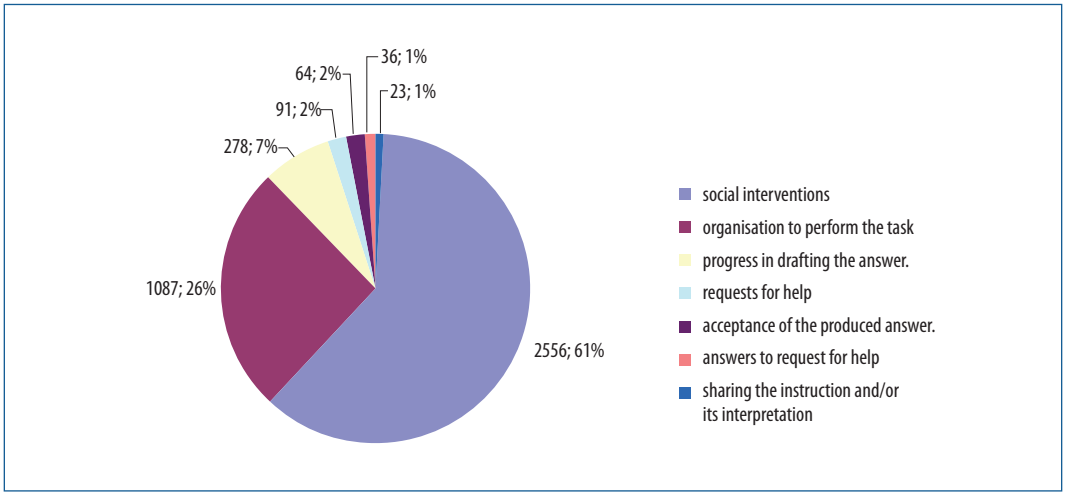

Chart 1. Distribution of interventions, by purpose

As can be seen, *social interventions* are clearly in the majority, accounting for 61% of the total interventions analysed. In order of frequency, they are followed by *organisation interventions to perform the task* (26%) and those whose purpose was to pool *progress in drafting the answer* (7%). The remaining interventions (*requests for help*, *answers to requests for help, sharing the instruction* and *acceptance of the answer*) had much lower frequencies (each accounting for 1% or 2%). As we shall see later, this frequency distribution is similar and homogenous in practically every group.

Described, defined and exemplified below is each of the previously mentioned intervention categories:

1) Social and/or off-topic interventions. Their goal is social and relational. Within this category is a variety of interventions having different purposes, though all of them share the common characteristic of being unrelated to the academic task itself. Thus, included here are: saying hello and goodbye, addressing a member by his/her name, addressing the group as a whole, manifestations of humour, the use of emoticons, expressions of feelings, apologies and thanks, comments on personal life situations, etc. Below is an illustrative example taken from the students' discourse: "I had to rush out to the children's clinic; my youngest child had a fever and a terribly sore throat… but now I'm going to get started on your great job!!!!!!!"[4]

2) Organisation interventions to perform the task. The goal of these is for fellow group members to reach an agreement on the best way of proceeding to perform the task collectively, to suggest deadlines to progress towards the answer, to suggest ideas or potential topics to be covered, or to share useful materials for the joint construction of the answer. For example: "If possible, try and upload it before Tuesday so that we're not too pushed for time…"

4. The quotations are translations from the original textual fragments of the students' discourse in Spanish in the group forums.

3) Progress in drafting the answer. The purpose of these messages is to contribute to specific progress in presenting an answer to the task. In general, one student produces and writes part of the answer and uploads it or posts it to the group forum, either as an attachment or as part of the body of the message, for consideration by his/her fellow group members. For example: "Attached is what I've produced so far on the Option 1 Activity proposal."

4) Requests for help. Questions, expressions or concerns aimed at fellow group members, relating to unresolved issues regarding the content on which they are working, or the instruction that they need to address. For example: "I'm a bit lost, so tell me what I've got to do."

5) Acceptance of the collectively produced answer. The goal of these is to notify fellow group members that they agree with the collectively produced answer and consider the assigned task (or part of it) to be complete. For example: "Right, so let's go ahead with this. As far as I'm concerned, we can upload the work."

6) Answers to requests for help. Information that the students give to their fellow group members in response to a request for help. For example: One student asks: "I can't see activity 2 in the place where it should have been uploaded. Is it because I can't see it, or because it's being uploaded today?"

Answer: "R. uploaded it yesterday. I don't think we should be able to see the post […] because it was someone else who did it."

7) Sharing the instruction and/or its interpretation. The purpose of these messages is to let fellow group members know about the personal interpretation made of the instruction that collectively they have to address, with the intention (sometimes implicit) of seeking to compare them with other students' interpretations and thus being able to see whether or not there is any agreement. On occasions, the students literally copy the work instruction to the forum, as a way of initiating exchanges among fellow group members, by putting what they have to do on the table. For example: "The activity for this week is to choose a test."

Interactions among students within the undergraduate and graduate groups. Similarities and differences

The fluidity and complexity in the dialogues varied from group to group. Thus, the number of thematic units recorded in each group varied between a minimum of just 12 (in graduate student group 18) and a maximum of 272 (in graduate student group 22).

However, here it is fitting to introduce two considerations. First, the *deadline* for performing the task was different for the undergraduate and graduate groups; for the former, the proposed deadline was 31 days, whereas for latter, the activity deadline was 14 days for one group and 21 days for another. And second, it should be noted that the *number of members* varied from group to group.

These clarifications are fitting because, in order to compare the fluidity of the dialogue in the different groups, it seems necessary to ensure that the groups are effectively comparable. It is reasonable to think that the higher the number of members, the higher the probability of finding more messages and, therefore more fluidity and variety in the dialogue. It is also reasonable to think that the deadline for performing the task may affect this aspect, as the longer the time available, the higher the probability of finding more interventions.

For this reason, an attempt was made to find a measure that would enable the groups to be compared to each other with respect to the dialogues generated by their members. That measure is the *daily intervention-per-member average*.

Chart 2 shows the daily intervention-per-member average within each group.

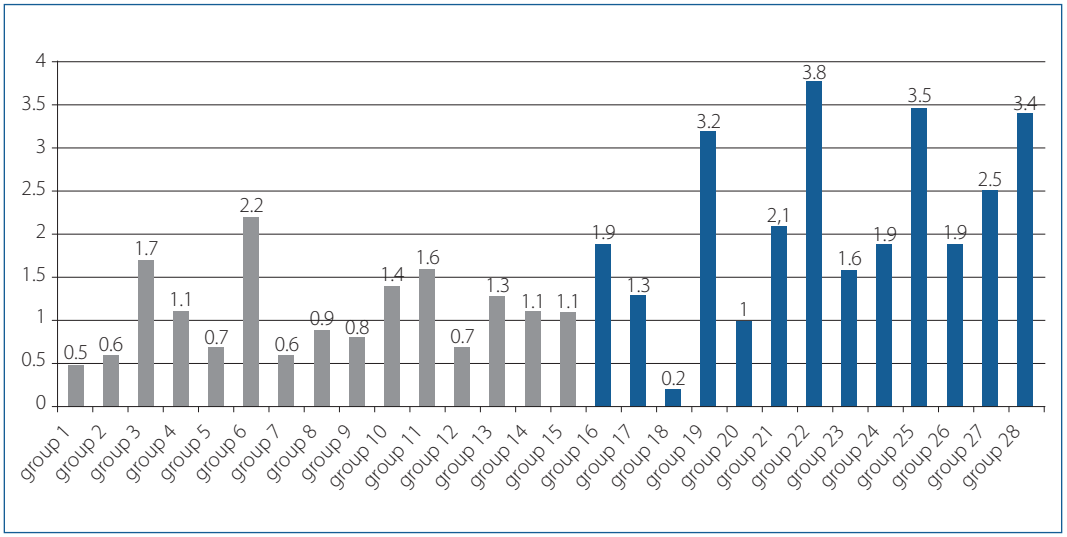

Chart 2. Daily intervention-per-member average in the undergraduate and graduate groups.

As can be seen, the tendency towards a higher number of interventions per student among the graduate student groups is notable (groups 16 to 28). Thus, in the graduate student groups, each member made an average of two interventions per day, whereas in the undergraduate student groups, each member made an average of just one intervention per day.[5] Nevertheless, if we examine the distribution of the previously enumerated types of intervention in each group, we find that the discourse structure is similar and homogenous in all of them.

Chart 3 shows the distribution of the different types of intervention in each of the 28 groups.

5. In contrast, an analysis of the relationships between group size and the number of interventions did not yield any positive results. In other words, the daily intervention-per-member average does not appear to bear any relationship to the number of members in a group.

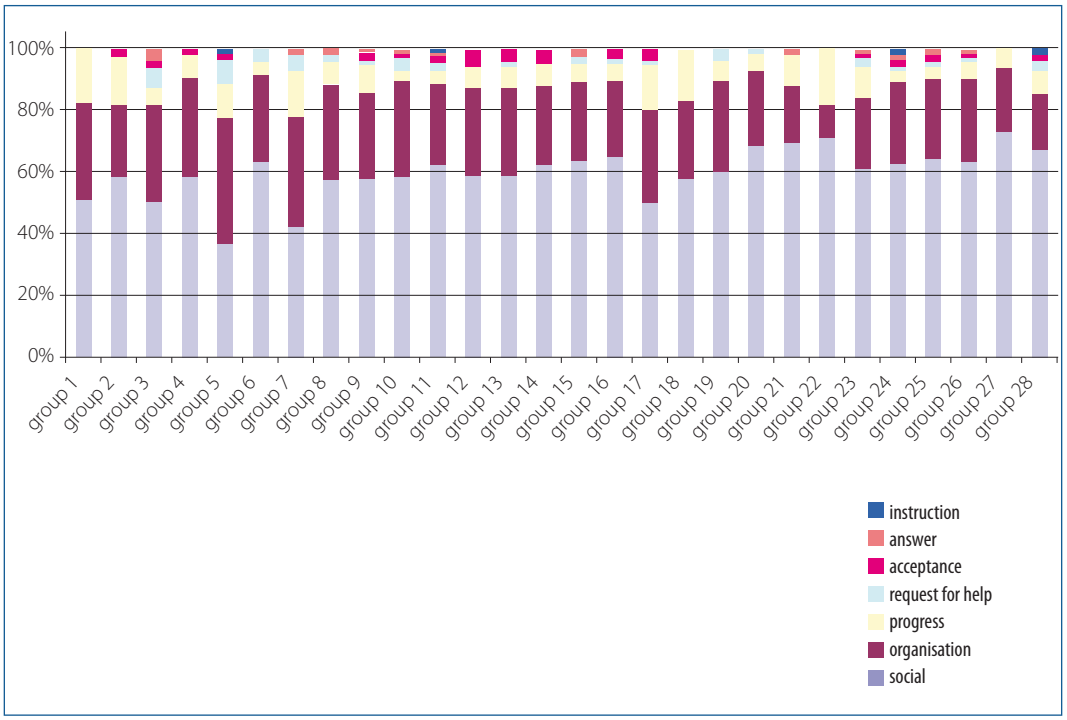

Chart 3. Distribution of interventions in the 28 student groups

The dialogue structure within the groups was, as we can see, very similar in each one. In general, *social interventions* were the most numerous. In the groups, they accounted for at least half of the total interventions, which is logical if we consider that many of the messages contained greetings, references to the group (using the Spanish terms *grupo, chicas, compañeros*, etc., whose equivalents in English are *group*, *girls*, *fellow students*, etc.) and references to one or several fellow students by their names. These three types of social intervention were clearly the most numerous, although there were also many in which the participants manifested expressions of humour and emotions, used emoticons, commented on personal life issues, etc.

Secondly, *organisation interventions to perform the task* were quite frequent in each group, and accounted for between 18% and 40% of the total interventions in each one.

Thirdly, *progress in drafting the answer* interventions regularly appeared in the 28 groups, and accounted for between 3% and 18% of the total interventions in each one.

Fourthly, the remaining interventions (*requests for help*, *answers to requests for help, acceptance of the answer* and *sharing the instruction*) had much lower frequencies and were only identified in some of the groups. Thus, out of the total of 28 groups, *requests for help* were recorded in 24, *answers to requests for help* in 13,[6] *acceptance of the answer* in 20, and *sharing the instruction* in 14.

6. Observed closely, there were requests for help that the students directed at their fellow students in 20 groups, yet answers to requests for help were only recorded in 13. This does not mean that many of the requests went unanswered, but simply that answers to the students' request for help were given by the lecturer, who constantly supervised the work going on within the groups.

Final considerations

Taking the pedagogical value of interactions among students as the starting point, this article analysed the forum-based dialogues of 120 students divided into 28 groups.

The key contribution of this study is the construction of categories that enable the manner in which social and cognitive dimensions are manifested and articulated in virtual dialogues to be described. While the frequential behaviour of each identified category in the groups analysed was the main focus on this occasion, we believe that it is a promising point of departure for future in-depth investigation into the findings reported.

We envision at least two future lines of research. First, an assessment of the fit and relevance of the categories for analysing dialogues generated within other work groups in virtual environments. And second, an in-depth study of the relationships between the social presence of participants in a virtual experience, and the impact that this dimension has on the construction of meaning.

As the path that remains to be travelled is unknown, it seems fitting to mention three notable findings of this study.

The first notable finding is related to the social presence observed in every group. Indeed, the most frequent interventions in each one were those relating to social, off-topic aspects. As mentioned earlier, when social presence is high, participants feel more committed and involved in the group process. When it is low, group dynamics and functioning suffer (Aragon, 2003; Mycota & Duncan, 2007; Wheeler, 2005). The concept of social presence has also been related to the quality of online learning and to student satisfaction on virtual courses (Cobb, 2009) Likewise, social presence is critical for supporting cognitive presence, as represented by interventions that are more directly related to knowledge construction. On the basis of these arguments, the fact that a large number of social interventions was observed within the groups therefore seems significant.

The second notable finding is related to the presence, within the groups, of signs that might account for some of the interpsychological mechanisms occurring within the framework of teamwork (Casanova, 2008; Casanova et al., 2009). Indeed, the progress in drafting the answer, requests for help, answers to requests for help and sharing the instruction and/or its interpretations interventions could function as indicators of *the shared construction of meaning* mechanism. For their part, social interventions would reflect the manifestation of mechanism linked to setting the conditions for stimulating interaction by means of expressions of reinforcement, encouragement and support among members. Lastly, organisation interventions to perform the task and those through which students manifest their acceptance of the collectively produced answer might illustrate *mechanisms of interdependence* among members.

The third notable finding is linked to the fluidity of dialogue within the framework of the different groups. As indicated earlier, the students' participation in virtual dialogue in the undergraduate groups was lower than in the graduate groups. This raises a number of questions that could potentially be addressed in future analyses: Do the different student characteristics have an impact on this aspect? Is it because they had more time to do the activity, meaning that their participation was more spread out and less frequent? Do these students engage less in dialogue because they are less accustomed and less predisposed to virtual dialogue?

In short, knowing more about the communication processes and the way in which discourse flows in virtual environments will contribute to the design of innovative proposals that broaden the opportunities for learning in such environments. This study was oriented in that direction.

References

ARAGON, S. (2003). "Creating social presence in online environments". *New Directions for Adult and Continuing Education*. No 100, pages 57-68.
<http://dx.doi.org/10.1002/ace.119>

BROWN J.; COLLIN, A.; DUGUID, P. (1989). "Situated cognition and the culture of learning". *Educational Researcher*. Vol. 18, No 1, pages 32-42.
<http://dx.doi.org/10.3102/0013189X018001032>

CASANOVA, M. (2008). *Aprendizaje cooperativo en un contexto virtual universitario de comunicación asincrónica: un estudio sobre el proceso de interacción entre iguales a través del análisis del discurso*. Doctoral thesis. Doctorate in Communication Psychology. Universidad Autónoma de Barcelona. 251 pages.

CASANOVA, M.; ÁLVAREZ, I.; ALEMANY, I. (2009). "Propuesta de indicadores para evaluar y promover el aprendizaje cooperativo en un debate virtual". *Edutec, Revista Electrónica de Tecnología Educativa*. No 28, pages 1-18.

CHIECHER, A.; DONOLO, D. (2011). "Interacciones entre alumnos en aulas virtuales. Incidencia de distintos diseños instructivos". *Pixel-Bit, Revista de Medios y Educación*. No 39, pages 127-140.

CHIECHER, A.; DONOLO, D. (2011). "Innovar en la enseñanza de grado. Crónica de una experiencia de trabajo grupal en entornos virtuales". *RED, Revista de Educación a Distancia*. No 29, pages 1-19.

CHIECHER, A.; PAOLONI, P. (2011). "Trabajo en equipo en contextos de educación a distancia mediados por TIC: una propuesta para medir la dimensión social en grupos virtuales". In: *XI Coloquio Internacional de Gestión Universitaria de América del Sur*. 7-9 December 2011. Florianópolis: Universidad de Santa Catarina.

COBB, S. (2009). "Social presence and online learning: a current view from a research perspective". *Journal of Interactive Online Learning*. Vol. 8, No 3, pages 241-254.

GARCÍA, C.; PERERA, V. (2007). "Comunicación y aprendizaje electrónico: la interacción didáctica en los nuevos espacios virtuales de aprendizaje". *Revista de Educación*. No 343, pages 381-429.

GARRISON, R.; ANDERSON, T.; ARCHER, W. (2000). "Critical inquiry in a text-based environment: computer conferencing in higher education". *The Internet and Higher Education*. No 2, pages 87-105.

GARRISON, R.; ANDERSON, T.; ARCHER, W. (2003). "A theory of critical inquiry in online distance education". In: M. MOORE & T. ANDERSON (eds). *Handbook of Distance Education*. New Jersey: Lawrence Eilbaum Associates. Chapter 8, pages 113-128.

GROS, B.; SILVA, J. (2006). "El problema del análisis de las discusiones asincrónicas en el aprendizaje colaborativo mediado". *RED, Revista de Educación a Distancia*. No 16, pages 1-16.

JOHNSON, D.; JOHNSON, R. (1999). *Aprender juntos y solos. Aprendizaje cooperativo, competitivo e individualista*. Buenos Aires: Aique. 328 pages.

MYCOTA, D.; DUNCAN, R. (2007). "Learner characteristics as predictors of online social presence". *Canadian Journal of Education*. No 30, pages 155-170. <http://dx.doi.org/10.2307/20466630>

ONRUBIA, J.; COLOMINA, R.; ENGEL, A. (2008). "Los entornos virtuales de aprendizaje basados en el trabajo en grupo y el aprendizaje colaborativo". In: C. COLL & C. MONEREO (eds). *Psicología de la educación virtual*. Madrid: Morata. Chapter X, pages 233-252.

ONRUBIA, J. (1999). "Enseñar, crear zdp e intervenir en ellas". In: C. COLL, E. MARTÍN, T. MAURI, J. ONRUBIA, I. SOLÉ & A. ZABALA (eds). *El constructivismo en el aula*. Barcelona: Graó. Chapter 5, pages 101-123.

PÉREZ, M.; SUBIRA, M.; GUITERT, M. (2007). "La dimensión social del aprendizaje colaborativo virtual". *RED, Revista de Educación a Distancia*. No 18, pages 1-21.

PERRET CLERMONT, A. N.; NICOLET, M. (1992). *Interactuar y conocer. Desafíos y regulaciones sociales*. Buenos Aires: Miño y Dávila. 290 pages.

RINAUDO, M. C.; DONOLO, D. (2010). "Estudios de diseño. Una perspectiva prometedora en la investigación educativa". *RED, Revista de Educación a Distancia*. No 22, pages 1-29.

ROURKE, L.; ANDERSON, T.; GARRISON, R.; ARCHER, W. (2001). "Assessing social presence in asynchronous text-based computer conferencing". *Journal of Distance Education*. Vol. 14, No 2, pages 1-18.

SANTOS, G. (2011). "Presencia social en foros de discusión en línea". *Pixel-Bit, Revista de Medios y Educación*. No 39, pages 17-28.

SIGALÉS, C. (2002). *El potencial interactivo de los entornos virtuales de enseñanza y aprendizaje en la educación a distancia* [online article]. UOC. [Accessed: 10 October 2011].

TOLMIE, A.; TOPPING, K.; CHRISTIE, D.; DONALDSON, C.; HOWE, C.; JESSIMAN, E.; LIVINGSTON, K.; THURSTON, A. (2010). "Social effects of collaborative learning in primary schools". *Learning and Instruction*. No 20, pages 177-191. <http://dx.doi.org/10.1016/j.learninstruc.2009.01.005>

VILLASANA, N.; DORREGO, E. (2007). "Habilidades sociales en entornos virtuales de trabajo colaborativo". *Revista Iberoamericana de Educación a Distancia*. Vol. 10, No 2, pages 45-74.

VYGOTSKY, L. (1988) *El desarrollo de los procesos psicológicos superiores*. Mexico: Crítica. Editorial Grijalbo. 224 pages.

WOO, Y.; REEVES, T. (2007). "Meaningful interaction in web-based learning: a social constructivist interpretation". *The Internet and Higher Education*. No 10, pages 15-25. <http://dx.doi.org/10.1016/j.iheduc.2006.10.005>

WHEELER, S. (2005). *Creating social presence in digital learning environments: a presence of mind*? [online article]. University of Plymouth. [Accessed: 4 November 2011]. <http://videolinq.tafe.net/learning2005/papers/wheeler.pdf>

About the Authors

Analía Claudia Chiecher
achiecher@hotmail.com
Researcher, National Council for Scientific and Technical Research, Argentina,
and Assistant Lecturer at the National University of Río Cuarto, Argentina

She holds a doctorate in Psychology (National University of San Luis, UNSL, Argentina), a master's degree in Education and Universities, and a bachelor's degree in Psychopedagogy (National University of Río Cuarto, UNRC). She is a researcher for the National Council for Scientific and Technical Research (CONICET), Argentina. She is the author of books, chapters and articles on learning in virtual environments. She participates as the director and co-director, and as a team member in research projects funded by the UNRC, CONICET and the National Agency for the Promotion of Science and Technology (ANPCyT), Argentina. She is a lecturer on postgraduate courses offered in distance learning mode. She is a supervisor of bachelor's degree, master's degree and doctorate thesis students and grant holders.

Juan B. Justo 925
Río Cuarto, CP 5800
Argentina

Danilo Silvio Donolo
donolo@gmail.com
Researcher, National Council for Scientific and Technical Research, Argentina,
and Tenured Lecturer at the National University of Río Cuarto, Argentina

He holds a doctorate in Education Sciences. He is a tenured lecturer, teaching subjects on the bachelor's degree course in Psychopedagogy in the Humanities Faculty at the National University of Río Cuarto (UNRC). He is a research methodology lecturer on master's degree and doctorate courses. He is an independent researcher for the National Council for Scientific and Technical Research (CONICET), Argentina. He is the author of books and articles on education. He is the director of research projects approved by UNRC, CONICET and the National Agency for the Promotion of Science and Technology (ANPCyT), Argentina. He is a supervisor of master's degree and doctorate thesis students.

Santa Fe 649
Río Cuarto, CP 5800
Argentina

UOC Universitat Oberta de Catalunya