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The impact of scripted roles on online collaborative learning processes

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Abstract This paper illustrates the experience gained within an online course, where a collaborative technique, namely Role Play, was used within an asynchronous text-based environment to trigger collaboration and interactions among students. In a pilot study, the technique was analyzed using an evaluation model and two different means: on the one hand, the content analysis carried out by the researchers of the messages exchanged by the students during the Role Play; on the other, a questionnaire aimed at investigating students' impressions concerning the technique itself. The aim of the study is twofold: to understand the impact of the proposed roles on the online learning process, and to investigate whether roles facilitated members' awareness of the overall process itself.

Keywords CSCL · Collaborative technique · Role play · Scripted roles · Evaluation

Setting the scene

Collaboration is to date extensively adopted to support learning processes; this applies to face-to-face learning contexts, as well as to online learning situations. In both these situations, in order to facilitate and encourage collaborative dynamics, it is quite common to adopt collaborative strategies or techniques to foster collaboration and exchange. In particular within the CSCL research field, attention has been recently devoted to the use of either collaborative techniques, or "patterns" or "scripts", which are all instruments able to provide—at different levels of granularity—guidance to students and a structure to the online collaborative activity (Kanuka and Anderson 1999; Dillenbourg 2002; Hernández-Leo et al. 2005; Jaques and Salmon 2007; Persico et al. 2008; Fischer et al. 2009). In particular, a collaborative technique (i.e. Discussion, Peer Review, Role Play, Jigsaw, Case Study, etc.) is usually content independent and serves as scaffolds to activities (which on the other hand are content dependent); thus the technique usually specifies: the phase repartition and timing of a learning activity; the nature of the task to be performed and the work distribution among students and

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groups; the social structure of the group(s) (in terms of size, composition, etc.); the mode of interaction among participants and groups (Persico and Pozzi 2006).

Among other collaborative techniques, Role Play is being increasingly appreciated as a useful technique to foster virtual learning processes (Lombard and Biglan 2009; Schellens et al. 2005; De Wever et al. 2008; Strijbos and Weinberger 2010). During a Role Play participants are involved in a real scenario and asked to play a particular role (assigned by the teacher or chosen by the learners themselves), so that they assume a particular point of view and maintain the argument during the discussion with peers. Roles can be rotated or remain the same during the activity.

In this paper a pilot study is described, which focuses on the use of the Role Play as a technique to structure collaboration during a CSCL activity. The dynamics and interactions raised by the Role Play in the experimental context have been analysed and evaluated using a mixed approach, based on the analysis of the messages exchanged among the students during the Role Play, and gauging data from a questionnaire aimed at investigating the students' impressions of the Role Play itself. The aim of the pilot study is twofold: to understand the impact of the various proposed roles on the components of the online learning process, and to investigate whether those roles facilitated members' awareness of the overall process itself.

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Background

Roles played by members of a group, which have been studied for decades in the psychology and sociology research fields, are now becoming an object of discussion within the CSCL field as well (Strijbos and De Laat 2010). In this particular field, two perspectives have been assumed: some researchers focus on roles as they spontaneously emerge while people are interacting during a collaborative learning activity ("emerging roles"), some others concentrate on roles scripted by the designers to foster interaction and collaboration within the group ("scripted roles") (Strijbos and Weinberger 2010).

Generally speaking, roles have been attributed several positive effects: they would allow for more efficient and productive work (Cohen 1994), would improve task performance and satisfaction (Zigurs and Kozar 1994), would prevent problems of non-participation (Cohen 1994), and would even promote individual responsibility and group cohesion (Mudrack and Farrell 1995), as well as positive interdependence and individual accountability (Brush 1998).

Since all these elements are crucial and desirable within a group learning experience, roles are increasingly adopted in CSCL contexts and this has produced a large variation of what constitutes a role (Strijbos and De Laat 2010). Such variety has been from time to time captured by authors with different categorizations: "content-oriented" roles versus "process-oriented" roles (Strijbos et al. 2004), roles as "assigned" versus roles as "performed" (De Wever et al. 2008), etc. Recently, Strijbos and De Laat (2010) have proposed a very interesting conceptual framework to synthesize the contemporary conceptualization of roles, by identifying three levels of the role concept: micro (role as a "task"), meso (role as a "pattern"), and macro (role as a "stance"). The authors provide examples drawn from the literature for each of the three levels, thus enlightening once again the variety of roles adopted in the various experiences.

Among those who work in the research thread of "scripted roles", De Wever et al. (2010) have investigated the kind of impact different scripted roles may have on knowledge building. Behind their investigation is the assumption that some roles, if

appropriately designed and then actually played by members of a group, can be particularly effective to support a productive knowledge building process, in that they may help learners to give explanations and construct arguments (Strijbos and Weinberger 2010).

The pilot study presented in this paper can be located in the same research thread. During the experience, the authors have proposed a set of roles to a class of students while carrying out a collaborative learning activity within an online course. As a matter of fact the study, similarly to that conducted by De Wever et al. (2010), investigates the impact of roles on the collaborative learning process, but differs from that in the kind of proposed roles. In particular in this study roles, instead of being oriented to "promote high-level interaction and enhanced collaboration" (De Wever et al. 2010), have been conceived in such a way to orient students' opinions and points of view. This has been made on the assumption that, by helping students keeping different perspectives on topics, one can avoid "opinion flattening" and encourage richer interaction. The effects of these roles are then evaluated by analyzing the content of the messages exchanged, to see whether they helped to develop enriched, effective interaction.

Besides, since roles are told to be able to support students' awareness of the ongoing process (Mudrack and Farrell 1995), the study also investigated this aspect. This is done by asking students, after having performed the Role Play, to give accounts of the process, as they had perceived it.

In the following sections this experience is described in details and the results are discussed, with the aim to address the following two research questions:

- What kind of impact do "opinion centered" roles have on the collaborative learning process?
- Do these roles facilitate members' awareness of the overall group process?

Research context

This study is rooted in the context of "SSIS", the Italian system for teacher training.[1] In 2007 SSIS Liguria commissioned from the Istituto Tecnologie Didattiche—CNR a course on "Educational Technology" (called "TD-SSIS") for student teachers. The main aim of the course was that of making students familiar with the most important issues related to the introduction of ICT in schools. The course was based on a blended approach, where topics were introduced during face-to-face lectures, and then discussed and further studied during online collaborative modules. The TD-SSIS Liguria 2007 community consisted of 159 post-graduate adults who were diverse in terms of background, interest and expectation for the course. The large size of the learning community required the creation of smaller "classes" working in parallel (20/25 persons each), so as to allow collaboration.

Given the pilot nature of this study, the authors chose to concentrate on one of the classes only, which was composed of 22 students (17 females and 5 males with different backgrounds) and tutored by one tutor. The class was not chosen for specific characteristics, as all the classes were in principle homogenous.

[1] SSIS is the acronym for "Scuole di Specializzazione all'Insegnamento Secondario", that is the Specialization Schools for Secondary Teaching, the institutions that are responsible for teacher training in Italy.

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The Role Play proposed in the course was the second learning online activity: after a first module, which was partially devoted to socialization among the members of the community (the whole class) and with the CMC system, and after a learning activity based on a Jigsaw, students were proposed a Role Play. In particular the main objective of this activity was that students were to become aware of the concept of "webquest" and were able to evaluate the adequacy of a webquest in relation to specific learning objectives. As a consequence, during this activity students—aggregated into three sub-groups—were asked to pretend to be three groups of teachers, whose school principal had asked them to analyze and evaluate a certain number of webquests. Since the Role Play imposed the analysis of the selected webquests to be carried out from very specific perspectives, i.e., by playing specific roles, at the beginning of the activity each student/teacher chose a role from a list of nine characters provided by the tutor.

Three peculiarities characterizing the proposed roles need to be underlined: a) roles were scripted, but not "assigned" (i.e., students received instructions concerning how to perform each role, but they were free to choose the role they preferred, provided that this had not been already selected by a colleague). Roles were not assigned as—given the target population of adults—it was thought that being too imperative could cause learners' annoyance; b) the proposed roles can be conceived as "patterns" according to Strijbos and De Laat's framework (2010), as they consisted of multiple tasks aimed to help students' adopt certain perspectives and opinions on webquests during the discussion (see Table 1); c) roles were designed according to the following criteria: two roles—i.e. the school principal and the rapporteur—had responsibilities related to the interaction process (respectively: discussion coordination and discussion synthesis), while the other roles were aimed to orient students' opinions and attitudes and were deliberately conceived in such a way to convey divergent points of views on webquests (the techno-loving teacher versus the techno-sceptical one; the efficient-minded versus the bureaucrat, the coach versus the defeatist, etc.) (see Table 1).

In the end the three groups were composed as illustrated in Table 1.

During this activity, the webquests were discussed by the students/teachers, who argued their positions according to the roles described in Table 1. At the end of the activity, each group produced a shared document containing the analysis, which took into account the different viewpoints played.[2]

After the Role Play, the course ended up with a third online activity, based on a Discussion among the same three groups as the previous module.

The CMC (Computer Mediated Communication) system used to carry out the online activities was Moodle,[3] an OpenSource computer conferencing system that can easily be configured in forums and topics.

Research methods and means

In order to analyze the nature of the interaction that occurred while performing the Role Play, an evaluation model was used.

In analogy with the main proposals recently put forward in CSCL literature concerning evaluation (Henri 1992; Hara et al. 2000; Rourke et al. 2001; Lally 2002; Lipponen et al.

[2] The activity was based on a proposal by Bernie Dodge, Ed Tech Department, San Diego State University, called "A WebQuest About WebQuests—Middle School Version" http://webquest.sdsu.edu/webquestwebquest-ms.html. The original roles have been modified according to the objectives of the study.

[3] http://www.moodle.org

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Table 1 Description of roles and roles chosen within the three groups

	Coach	Bureaucrat	Defeatist	Wise	Techno-sceptical
Role description	Is very fond of group activities and discussions; likes webquests whenever they foster exchange and debate within the group	Is diligent as far as rules are concerned, cares about formal aspects; likes webquest to the extent to which they are well-defined and adherent to the school curriculum	Rather pessimistic character, spreads mistrust, hyper-critical of schools and technologies, and—consequently—of webquests	Fond of activities able to foster high-level cognitive skills, willing to allow students to express their creativity; likes webquests whenever they promote information analysis and synthesis, as well as whenever they encourage creative expression	Hates computer and Internet, is against any adoption of technology enhanced learning as this will turn to be a waste of time. Consequently he dislikes webquests
Group 1	X	X	X	X	X
Group 2	X		X		X
Group 3	X	X	X	X	X

	Techno-loving	Efficiency-minded	School principal	Rapporteur
Role description	Keen on computer and Internet, likes technology-enhanced learning activities, esp. "rich" webquests containing animations, graphics, multimedia, links, etc	Is diligent as far as time is concerned, likes webquests to the extent to which they are concise, not very rich but well-focused on a specific learning objective	Coordinates the discussion, solicits those who are late, poses questions, stresses points of convergence and/or divergence	Is in charge of taking minutes of the discussion and then collecting all the opinions in a unique, shared document
Group 1	X		X	X
Group 2	X	X	X	X
Group 3			X	X

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2003; Martinez et al. 2003; Daradoumis et al. 2004; ICALTS Kaleidoscope JEIRP[4]; Schrire 2006; Strijbos et al. 2006; Weinberger and Fischer 2006), the model (Pozzi et al. 2007) is based on both quantitative and qualitative data, the former being automatically tracked by the CMC system, the latter deriving from content analysis of the messages exchanged among participants, which is carried out by a human agent. The model, partially inspired by Garrison and Anderson's proposal (2003), has been tested and subsequently modified according to the results obtained (Persico et al. 2009), thus achieving a four-dimensional approach which includes the *participative*, *social*, *cognitive* and *teaching* dimensions.

In the model, each dimension is defined by a set of relevant indicators that can be used to evaluate it; these are summarized in Table 2. An extensive description of the proposed indicators can be found in Persico et al. (2009).

In this study, the corpus of the coded messages was 209 (total number of messages exchanged by students during the Role Play).

As already mentioned, the indicators concerning the participative dimension (see Table 2) were gathered directly from the data tracked by Moodle, whereas the analysis of

[4] ICALTS (Interaction and Collaboration AnaLysis supporting Teachers and Students Self-regulation) is a Jointly Executed Integrated Research Project of the Kaleidoscope Network of Excellence, website at http://www.rhodes.aegean.gr/ltee/kaleidoscope-icalts/

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Table 2 dimensions and indicators of the evaluation model (Persico et al. 2009)

Dimension	Category	Code	Indicators
Participative	Active participation	P1.1	Sent messages
		P1.2	Uploaded documents
		P1.3	Attended chats
	Reactive participation	P2.1	Read messages
		P2.1	Downloaded documents
	Continuity	P3.1	Time distribution of session duration
		P3.2	Regularity in reading
Social	Affection	S1.1	Expressions of emotions that may be revealed either by verbal dissertation or through graphical/orthographical solutions, e.g. repetitions, use of punctuation, use of capital letters, emoticons
		S1.2	Expressions of intimacy that may be revealed by the use of sarcasm, humour, irony, etc.
		S1.3	"Self-disclosure" acts that may be revealed by presentations of personal anecdotes or by admission of self-vulnerability
	Cohesiveness	S2.1	Occurrences of vocatives or more in general references to other people in the group
		S2.2	Expressions reinforcing group cohesion that can be revealed by either expressions of group self efficacy, or use of inclusive pronouns or adjectives
		S2.3	Greetings, phatics, salutations
Cognitive	Individual knowledge building	C1.1	Reporting of right contents
		C1.2	Recognition of a problem or expression of doubts
		C1.3	Explanation or presentation of a point of view
		C1.4	Provision of information or ideas sharing e.g. description of events, accounts of personal experience or real-life stories, etc.
		C1.5	Contribution to brainstorming e.g. by adding an item to a list
	Group knowledge building	C2.1	Expressions of disagreement that can be revealed by contradicting others
		C2.2	Expressions of agreement that can be revealed by referring to others' messages or by integrating others' ideas
		C2.3	Suggestions to others and/requests for confirmation e.g. through "explorative acts" such as: "Am I right?", "Is that so?"
		C2.4	Offers of knowledge or competence to others
		C2.5	Connections between ideas or summarizations
		C2.6	Creation or contribution to the creation of new, shared meanings
	Meta-reflection	C3.1	Reflections on the learning process that may be revealed by attempting to evaluate one's own knowledge, skills, limits, cognitive processes
		C3.2	Intentional control of the learning process, revealed by planning, monitoring or adjusting one's own cognitive processes
Teaching	Organizational matters	T1.1	Activity planning
		T1.2	Methodological proposals e.g. suggestions about the division in groups, proposals of communication rules and netiquette
		T1.3	Organizational proposals e.g. proposing to open a new conference, or organizing a meeting
		T1.4	Offers or requests of logistical information

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Table 2 (continued)

Dimension	Category	Code	Indicators
	Facilitating discourse	T2.1	Identification of areas of agreement/disagreement, syntheses of discussion
		T2.2	Consensus seeking/achievement
		T2.3	Creation of the climate for learning, encouragement, acknowledgement of participant contributions
		T2.4	Solicitation of discussion and reminders of deadlines
	Provision of instruction	T3.1	Presentation of contents, introduction of new knowledge
		T3.2	In depth analysis of specific topics
		T3.3	Description of new activities
		T3.4	Confirmation of understanding or diagnoses of misconception through assessment and explanatory feedback

the cognitive, the social and the teaching dimensions is based on "manual" content analysis. The unit of analysis chosen for the coding procedure was the "unit of meaning"[5] and each unit could be assigned one indicator. This implied that in case of doubt (where for example a unit could be considered "borderline" between two indicators) a choice was required. There was no limit to the number of units per message. The coding process was carried out by two independent coders. Each coder read each message, segmenting it into units and finally classifying each unit as belonging to a certain indicator category (Persico et al. 2009). Since one of the two coders had also been involved in the definition of the evaluation model (Pozzi et al. 2007), she trained the other one (the training lasted about 40 h). After training, the two coders worked separately and afterwards the inter-rater reliability was calculated (i.e., the agreement between the two). To do this, a sample of messages was selected and coded by both (about 10% of the total messages). The sample was chosen by selecting messages distributed in time (namely, at the beginning, in the middle and at the end of the activity). The inter-rater reliability was calculated using Holsti coefficient considering the agreement on each unit of meaning. This was 0.85 (percent agreement 0.82).

Moreover, since one aim of the study was to investigate students' impressions regarding the process enacted during the Role Play, it was decided that the same dimensions and indicators could be used to address this issue. So, a questionnaire was developed and given to students at the end of the activity, aimed at capturing their impressions concerning the level of the participative, the social, the cognitive and the teaching dimensions developed by each group during the Role Play.

The questionnaire included four structured questions: students were asked to attribute marks to each of the four dimensions with a Likert scale (range: from 1 = min. to 5 = max); moreover, under each dimension, students ordered the indicators, by specifying which indicator was dominant and which played a minor role (A = major role; B = medium role; C = minor role). This allowed a picture of the opinion of the students concerning the extent to which the Role Play triggered the four dimensions and the related indicators, and made it

[5] "One of the issues under discussion is the choice of the unit of analysis to perform content analysis. Researchers can consider each individual sentence as a single unit of analysis (Fahy et al. 2001). A second option is to identify a consistent "theme" or "idea" (unit of meaning) in a message and to approach this as the unit of analysis (Henri 1992). A third option is to take the complete message a student posts at a certain moment in the discussion as the unit of analysis (Gunawardena et al. 1997; Rourke et al. 2001)" [Wever de et al. 2006, pg. 9].

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possible to see whether students developed awareness of the learning process by juxtaposing the results obtained from the questionnaire itself, with the data gathered from the interaction analysis.

Results

In the following, the results obtained from the interaction analysis and those coming from the analysis of the questionnaires are described separately. In the Discussion, an overall reflection will be carried out based on the results obtained from the two analyses.

Results from the interaction analysis

Looking at the results obtained from the interaction analysis of the messages exchanged during the Role Play, one may draw some interesting information. Figure 1 is descriptive: it illustrates the number of units detected by the coders for each category of indicators. Values at the bottom of the table illustrate data of the participative dimension.

Data in this figure (which consider the class as a whole) show that all the dimensions and indicators have been developed to some extent. In particular, data on participation suggested that all the students contributed to the discussion and that contributions were on average quite numerous (eight messages per student), but the levels of contribution were quite differentiated (range: 3–24 messages). The analysis also points out that the social dimension (especially indicator S2) reached good levels, while S1 (affection) remained quite unexpressed; moreover, as one may note in Fig. 1, as far as the cognitive process is concerned, C2 (group knowledge building) reached the highest values, whereas the metacognitive component (C3) was almost absent in this Role Play. Lastly, the teaching dimension was—to some extent—supported, since all three indicators (T1, T2 and T3) are present.

Looking at the level of development of each indicator through the lens of the roles at play, provides further useful information as shown in Fig. 2.

Figure 2 shows that—apart from a few exceptions—indicators within each dimension followed similar trends independently of the role performed: in particular S1 is always rather low and is always lower than S2, which in contrast is quite high; the cognitive

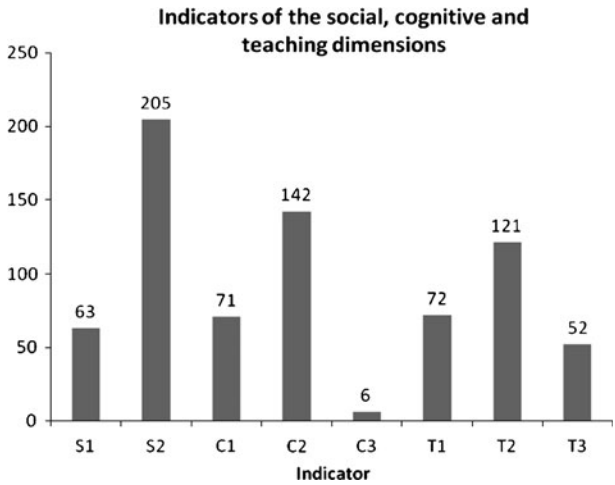

Fig. 1 Indicators and data obtained from the analysis of the messages exchanged during the Role Play

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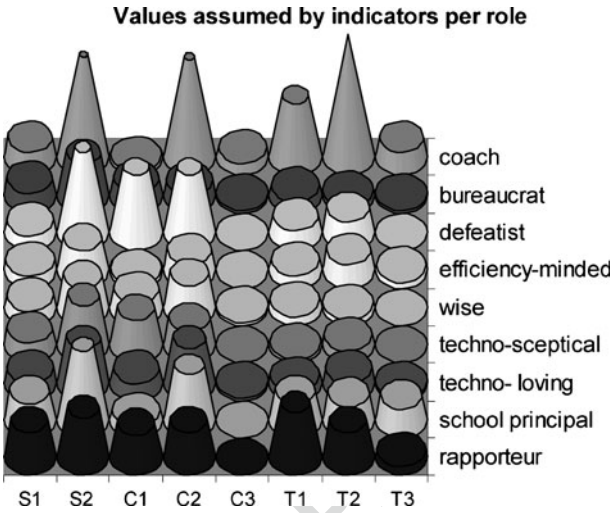

Fig. 2 Weighted values assumed by the indicators per role. The weight has been attributed to compensate the fact that some roles were enacted by 3 students, some others by 2, and one role was embodied by 1 student only (see Table 1)

dimension is rather differentiated but even here one may note that C2 is (often) more developed than C1, while C3 is absent almost everywhere. Finally, the teaching dimension indicators are concentrated on few roles (see peaks in Fig. 2), while the majority of roles failed to register high values.

Going beyond these common trends, it is possible to look at the differences role by role, so as to consider the impact played by roles on the various indicators.

The coaches, on average, were quite active within the overall process: in particular, besides developing a high group cohesion (S2), they were the ones who expressed their own individual positions (C1) the least, while they fostered the group cognitive process (C2) quite strongly. The teaching dimension enacted by the three coach teachers was the most developed in comparison with the one enacted by the other roles (T1, T2 and T3).

The bureaucrat role was not very effective: as a matter of fact, these teachers were not very active overall; they contributed to some extent to the social dimension (but S1 and S2 are not particularly high), and few to the cognitive dimension and (even less) to the teaching component.

The role of the defeatist, on the contrary, was quite successful: it showed, on average, the highest levels of individual knowledge building (C1) and was quite active for group knowledge building as well (C2), thus putting forward the most balanced cognitive process; also the defeatists encouraged group cohesion (S2) in the social process and helped to some extent within the teaching dimension (T1 and T2 indicators).

The efficient-minded and wise teachers follow very similar trends: they contributed to all the aspects of the process but quite tepidly. In particular these two roles developed a weak cognitive dimension.

The techno-sceptical teachers, while definitely being unable to provide a teaching contribution, were not bad as far as the social dimension was concerned (S1 and S2) and even the individual (C1) as well as the group (C2) components of the cognitive process were quite balanced. Almost the same can be said for the techno-loving teachers, who followed more or less the same trends, except for the individual knowledge building (C1), where the techno-loving teachers turned out to be less active than the techno-sceptical ones.

The school principals were active and played a relevant role as far as the overall process is concerned: not only did they—as requested by their role—foster the teaching dimension

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(T1, T2 and T3), but they were also quite good at developing group cohesion (S2) and enacted group knowledge building (C2), both components which were not directly asked for in the role description.

Similarly, the rapporteurs turned out to be very propulsive actors of the process and were the ones who on average maintained the highest levels on the majority of indicators (except for C3).

Results from the questionnaires

As already mentioned, the questionnaire was used to gather data on students' impressions on the overall collaborative learning process. In particular, students should grade their perception of the level of development of each dimension during the Role Play (from 1 = min. to 5 = max.). The mean scores attributed by students to the four dimensions were: Participation: 4.45; Social dimension: 4.35; Cognitive dimension: 4.35; Teaching dimension: 4.15.

These scores are high and very close to each other. Participation is considered the most developed dimension, followed by the social and the cognitive dimensions. The teaching dimension—although quite high—is nonetheless the weakest dimension, as far as students' perceptions after the Role Play.

Moreover, as far as the way students perceived single indicators being developed by their group during the Role Play (Table 3), there seems to be certain agreement (55% and 60% respectively) on the fact that individual and group knowledge construction (C1 and C2 indicators) played a major role (A); the same agreement (again 55% and 60% respectively) emerges as far as the importance played by facilitating discourse (T2) and providing instructions (T3), which were perceived as playing a medium role (B). Affection (S2) is perceived by half of the students as a strong indicator (A), while metareflection (C3) is attributed again by the 50% an intermediate role (B). On the other indicators (S1 and T1) there is no clear agreement.

Overall, there are analogies between these results and those obtained from the analysis of the messages exchanged among the students, as both the analyses point at S2 (affection) and C2 (group knowledge building) as the strongest indicators and assign an intermediate role to the teaching indicators (T1 and T2). Individual knowledge building (C1), though, is attributed by students a stronger role (A) in respect to what emerged from the content analysis, and the same applies to metareflection (C3), which was attributed by students an intermediate role, while actually this indicator was rather weak in the messages.

Table 3 Percentages of students answering the question: "According to your impressions, what was the role played by each indicator during this activity?" (A = major role; B = medium role; C = minor role)

	A = major role	B = medium role	C = minor role	Tot.
Affection-S1	30%	45%	25%	100%
Cohesion-S2	50%	30%	20%	100%
Ind.knowl.build.-C1	55%	30%	15%	100%
Group knowl.build.-C2	60%	30%	10%	100%
Meta-reflection-C3	30%	50%	20%	100%
Organiz. matters-T1	35%	45%	20%	100%
Facilitat.disc.-T2	40%	55%	5%	100%
Prov. instructions-T3	20%	60%	20%	100%

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Discussion

In the following, we discuss some final considerations about the Role Play and its impact in the examined experience.

Overall we can claim that the Role Play gave the floor to a rich and variegated process, where all the dimensions of the proposed model (except for C3) were to some extent developed: during the experience, a high degree of cohesiveness (S2) was developed and this is good, even if this result may be influenced by the fact that the Role Play was the second module of the online course, in a moment when presumably the learners had already developed a certain sense of group. On the other hand, it is also evident that the activity was not particularly effective at fostering affection (S1) and this is reasonable given that during a Role Play people are not asked to self disclose, but on the contrary, they have to pretend to be someone else. It is not by chance that the roles that developed the highest values of S1, were the school principal and the rapporteur, whose emotional attitude was not predetermined a priori by the instructions and this probably let students free to express their feelings/emotions, as opposed to the other characters, whose perspectives and attitudes were supposed to stem directly from the role descriptions. This should be taken into account by the instructional designer who should define ad hoc roles (let's say some open-heart character) if the aim is to foster affection. As far as the cognitive dimension is concerned, the Role Play supported a good balance between individual knowledge building (C1) and group knowledge building (C2), with the latter often being higher than the former. The same may not be said for the metareflection (C3), which is almost absent and should have been scaffolded with the presence of roles more oriented to self-monitoring and process evaluation. Finally, as far as the teaching dimension is concerned, the three indicators developed but with no emphasis on one or the other. As a matter of fact, the overall trend emerging from this experience, is quite in line with what had previously emerged within other similar studies (Persico and Pozzi 2010), where it was claimed that CSCL processes seem to follow a certain flow (in terms of social, cognitive and teaching dimensions) independently on the structure or guidance provided to the activity.

The different roles, though, contributed in various ways to the process: this is made particularly evident by the participative dimension and by the number of sent messages, which, as we have seen in the previous section, ranged from 3 to 24, depending on the role. This is probably due to the fact that the proposed roles required different levels of effort and were not thought to balance contributions. In case one of the aims in assigning roles is that of equalizing the levels of participation among people, particular care should be taken in conceiving roles in such a way that their enactment requires a comparable amount of effort.

Looking at the "opinion centered" roles and the way they have impacted on the social, the cognitive and the teaching dimensions, we can claim that:

- The coaches interpreted their roles as propulsive to the overall process and oriented their interactions to the group, rather than to the expression of the individual expression. This may be due either to the active attitudes the role itself was intended to convey (see Table 1), or to the natural attitude of the students who chose this role.
- The defeatist, which was supposed to be rather a negative character according to the instructions provided (see Table 1), turned out to act as a positive engine of the process: as a matter of fact, the defeatists developed very balanced levels of individual and group knowledge building. The success of this role suggests that even negative characters can contribute to enrich the overall process.

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- The same may be said for the techno-skeptical, who—despite its negative nature—developed the social dimension and good levels of individual and group knowledge building.
- On the contrary, the burocreat was not particularly propulsive to the process and turned out to be the least active character at a cognitive level. This again may be due to either the definition of the role, which was supposed to be very much oriented to rules and formal aspects (the role may be interpreted by students as not keen on making an effort, but rather as a character disposed solely towards what was strictly and formally necessary to accomplish the task), or to the natural attitude of those people who chose it.
- Finally, the efficient-minded, the techno-loving and the wise, even by taking part in the process, did not show particular attitudes towards any of the dimensions or indicators.

Coming to the roles more oriented to support interactions, namely the school principal and the rapporteur, they both were rather active and this happened not only at the level of the teaching dimension, which was the one they were more in charge of, but contributed also at a social and cognitive level. When considering these results, one should probably take into account that, generally speaking, students who assume leading roles (such as the school principal) or coordinating roles (such as the rapporteur), may be active people, often fond of online communication and collaboration, and these personal characteristics may explain—at least partially—their very good performances. Nonetheless, there is no doubt that in the proposed Role Play both the roles that—by definition—envisaged the students taking up the responsibility of the teaching dimension were played successfully and contributed at the other levels as well (social and cognitive). This should probably lead to thinking of the teaching dimension not only as an important component per se, but also as an engine, able to trigger the cognitive and social dimensions, especially as roles charged with this reasonability will very likely contribute at other levels as well.

As far as the second research question was concerned, which focused on the ability of roles to develop students' awareness of the collaborative learning process, data confirm that students' impressions of the indicators and dimensions developed during the activity, were (at least partially) in line with what was captured by the content analysis of the messages. These analogies confirm that during this activity students developed a certain awareness of the overall learning process.

Unfortunately, the conclusions of this study are not supported by the presence of a control group acting without roles. Given the real context where the study was conducted, it was impossible to organize a control group with no roles and this was one of the main drawbacks of the present experience, which calls for further experimentations.

Conclusions

This paper describes an experience of use of a Role Play during an online CSCL course. The reflections reported in this paper are inspired by the analysis of the data coming from two different sources: On the one hand, the analysis of the messages exchanged by the students during the activity, and on the other, the questionnaire given to students to investigate their perceptions of the activity. Both instruments are based on the same framework, which looks at CSCL processes as composed of a participative, a social, a cognitive, and a teaching dimension.

The results obtained in this pilot study have inspired a number of reflections on Role Play and—more specifically—on how "opinion centred" roles impact on the various components of the collaborative learning process.

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Of course our results should be handled with care for a number of reasons, including the fact that the group of students was small and this makes the results statistically weak, and that there was no control group. In addition to these shortcomings, the data used are certainly influenced by many factors and variables, including, for example, the fact that the topics of the course and the order of the activities may affect their effectiveness, the fact that students may become more and more at ease with the CMC system and the working methods as time goes by, thus changing their levels of performance, and—not least—the fact that student individual attitudes may affect the way roles are interpreted.

However, the results obtained within this pilot study have provided useful hints and indications and have encouraged the authors to carry out further research in this direction, aimed at finding out ways to scale the study up.

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