Role-taking for Knowledge Building in a Blended Learning course

Paola Francesca Spadaro, Nadia Sansone, Maria Beatrice Ligorio

Università degli Studi di Bari

spadaro.paola@gmail.com

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Abstract

This paper focuses on role-taking effectiveness during blended learning activities. Two roles have been studied: the tutor, acting during forum-discussions, and the editor, in charge of supervising a collaborative writing task. A quantitative analysis was conducted to verify the impact of the two roles in terms of: a) participation to online activities, b) students' preference for one of the roles and c) students'perception about the relevance of roles in acquiring academic skills.

48 in-service teachers attending a blended course responded to a 9-items semi-structured questionnaire. Their participation was measured by counting their reading and writing activities. Results show that the highest participation is obtained when participants could play both roles. Participants prefer one or the other role based on specific motivations reported on the questionnaire. The motivations were categorized by using four theoretical metaphors: behaviorist, cognitive, constructivist, and socio-constructivist motivations. Lower participants report more behaviorist motivations whereas higher participants have socio-constructivist argumentations. Both roles are perceived as useful to foster participation and improve communication and

collaboration skills. Nevertheless, the role of the editor is perceived as more useful than that of the tutor in promoting both online and offline participation and individual learning.

1 Introduction

Scientific literature has shown that collaborative learning relies on the right combination of task features, group composition and individual characteristics (Hogan and Tudge, 1999; Schellens *et al*, 2005). As part of this powerful mix, role-taking seems to cover a special position, because it outlines functions and responsibilities guiding individual behavior and regulating intra-group interaction (Hare, 1994). The way role is conceived by scholars is no longer a static interpretation of a social dimension (for instance the role of a father or the role of a student), but it becomes a temporary "position" occupied during individual and group activities. For instance, a role can require to a student a particular and situated way of playing the role of the teacher by taking certain responsibilities (Brown and Campione, 1990). Many roles can be organized around specific tasks in order to: a) support constructive interaction and facilitate learning (Topping, 2005), b) stimulate group cohesiveness and sense of responsibility towards group work (Mudrack and Farrell, 1995), c) support coordination within the groups (Johnson, *et al*., 1992).

What determines these effects is the capability of role-based activities to prompt well-structured tasks and provide a sort of scaffolding to cooperative learning approaches (O'Donnell, *et al*., 2005; Slavin, 1999). Along this line of thought, many authors suggest that a sense of active participation to learning processes boosts students' motivation and therefore has a positive impact on academic success (Smith *et al*., 2005). Role-based activities provide a structure promoting participation, regardless of the students' sense of self- or group-efficacy (Fior, 2008). Besides, it seems that covering a role makes students aware of the group's interactive processes and of their own attitudes towards individual or group working. Researches on role-taking activities in Computer Supported Collaborative Learning (CSCL) show that roles make it possible to manage the knowledge-building process by placing great attention on coordination procedures (Schellens *et al*, 2005). Finally, students covering a role seem to be more focussed on learning goals than students playing no role (Strijbos *et al*., 2004).

2 Objectives, context, and participants

The aim of this paper is to compare the impact of two types of roles covered online: a) the tutor, whose task is to guide and monitor a web-forum discussion

concerning the learning materials; b) the editor, who monitors the building of a collaborative text which will be his/her group's benchmark assessment test. The specific research questions guiding the study are:

- Did the role-taking impact active participation?
- Were the roles perceived as useful to acquire specific abilities and socio-cognitive skills?

The study was conducted within a Master course meant to develop teachers' professional skills as students' advisers. The course was inspired by the blended approach (Bonk and Graham, 2006) and designed to pursue a twofold aim: a) maintaining the relevance of face-to-face (ftf) meetings as contexts within which the educational mission can be effectively delivered; b) empowering computer based resources as tools to support collaborative knowledge building (Ligorio and Sansone, 2009).

The Master was attended by 70 participants and it was divided into 10 units. Each unit included a series of three ftf lessons and one subsequent online session lasting about 15 days and carried out on the platform Synergeia[1]. During the ftf lessons, the teacher introduced and discussed the learning materials and defined the tasks to be performed online. Participants online were divided into subgroups of 9 to 14 people. The online activities were divided into two parts: a) subgroups first discussed – for 10 days - in-depth a specific research question given by the unit's teacher and referring to the learning materials; b) right after - for 5 days - the groups collaboratively produced a final text. The tutors were most active during the first part of the activity. They were in charge of:

- Keeping the discussion focused on the given research question,
- Monitoring the active participation of all the participants,
- Stimulating the reading of scientific materials,
- Giving social and emotional feedbacks to the group.

During the second part, the editor took over and was responsible for the collaborative product by:

- Guiding the collaborative writing of a text that will be assessed by the teacher, which will assign the same grade to each group member,
- Reviewing the final text and submitting it to the teacher.

Every participant could play both roles in turn during the course but because of organizational and time matters, not all the participants could play both roles.

3 The Data

The data collected included:

- A semi-structured questionnaire composed by 9 items. The participants

[1] http://bscl.fit.fraunhofer.de

were asked to state a) their preferred role (dichotomised answer); b) the reasons for their preference (open-ended question); c) the perceived usefulness of each role (5-item Likert scale answer).
- Online writing activities: notes and other materials (documents, link, and slides) posted on Synergeia produced by each participant in the digital folder concerning each learning unit.
- Reading activities: the total notes and materials read by the participants.

Writing and reading activities could be counted by the means of some special tools available within Synergeia. These tools gave information about who created and read each material posted within each folder.

4 Method

The impact of role-taking on online activities was analysed through two dimensions: a) participation to the online activities and b) perception of the role played.

4.1 Participation to online activities

Participation to the online activities was calculated by counting how much each participant wrote and read during each unit. Specifically, individual writing activity was standardized based upon the total writing activities carried out for that unit by the subgroup the participant belonged to. The reading activity, instead, was standardized considering the total reading activities of all the students of the course. The writing standardization was introduced in order to compensate possible subgroups variations; whereas reading was assumed to be independent on the subgroup's trend.

Having calculated the cut-off values of quartiles (Q) on the total number of objects posted and read (p) by participants, we considered participation as:
- insufficient: p<1°Q;
- sufficient: 1°Q <p>2°Q;
- good: 2°Q <p>3°Q;
- excellent: 3°Q <p>4°Q.

4.2 Perception of played roles

At the end of the course, 48 participants (75% of the total) filled in the semi-structured questionnaire. One open-ended question asked the participants what role they preferred and why.

These answers were analysed through content analysis. We found the four themes emerged could be described by using a theoretical metaphor:

- Behaviorist motivation: the role is chosen because of the specific behavioral requests implied by features considered intrinsic of the role (i.e. "it is more reflexive");
- Cognitive motivation: the role is perceived as strongly connected to personal skills and preference ("I like to coordinate");
- Constructivist motivation: the role is perceived as promoting active participation to the course ("the role of tutor is more involving");
- Socio-constructivist motivations: the role is perceived as promoting the development of collaborative skills ("the role allowed me to be a coordinator for my group").

The set of Likert-questions inquired how much the roles were considered useful in relation to the following aspects: participation to online and offline activities, improvement of learning skills, improvement of discussion skills, improvement of team-working skills, understanding of the course goals. Frequencies and means analyses were conducted on the answers to these questions. Finally, Chi-square tests and Student's t test were applied to calculate statistical differences between lower and higher participants and about the perception of the roles' utility.

5 Results

5.1 Participants and active participation in online activities

To simplify the description of results, we will call "higher participants" (HPs) those who reached a good or excellent value in participation and "lower participants" (LPs) those who had a sufficient or insufficient value. We found 51% of the participants was HPs and 49% was LPs.

In order to encourage role-taking, covering of at least one role was included as an element of the final course assessment. Despite this condition not all the participants engaged in such activity. HPs usually performed at least one of the roles (97%) and many of them (84.8%) performed both roles, while the 19.4% of LPs did not hold any role for most of the units (χ^2=25.54; df=9; p<.01).

Who is generally HP or LP all through the online activities is also HP or LP when playing a role, therefore the participation means is constant all through the course.

5.2 Participation and role preference

44% of the participants responding to the final questionnaire tend to prefer the role of tutor, the 35% preferred the role of editor and the 21% liked both roles.

The reasons for the preference were analyzed through 4 categories (see the

Method section), and we found them equally distributed in our sample (χ^2=4.07; df=3; p>.1). In particular, 27.7% of the respondents prefers a role on the basis of intrinsic characteristics attributed to that role. 34% of the participants explains that some features of the role were tuned with the personal characteristics like cognitive or relational styles. For the 23.4% of participants the motivation was based on the perception of the role's usefulness in terms of development of individual skills and promotion of a more active participation to the course. Finally, 14.9% prefers one of the roles because they considered it useful to acquire new social and collaborative skills.

A high correlation was found when we compared the motivations for the role preference to the participation level ($\chi^2 = 9.79$; df = 3; p <.05). In particular, those preferring a role on a behaviorist base were mostly LPs (69.2%), while those preferring a role because of cognitivist or socio-constructivist motivations were HPs (respectively 81.2% and 85.7%). On the other hand, HPs and LPs did not differ significantly when comparing participants choosing a role because of constructivist reasons (respectively 54.5% and 45.5%).

5.3 The perception of role's impact on socio-cognitive skills

The questionnaire also included 6 questions regarding the perception of role-taking usefulness for social and cognitive skills. The first question was about the impact of role in promoting active participation to online activities. Figure 1 shows that no one perceived the roles as useless and a few participants considered the roles as just useful. Most of the respondents perceived both roles as very or very much useful. The role of editor was perceived as significantly more useful than the tutor (t=-2.356; df=47; p<.05).

The second question inquired whether role-taking affected participation to offline activities. Most of the participants declared to perceive the roles as sufficiently (tutor 34% and editor 31%) and very useful (tutor 29% and editor 34%) for the offlime encounters. Again the editor was perceived as significantly more useful than the tutor (t=-2.067; df=47; p<.05).

To understand the purpose of the Master, very often the roles were perceived as sufficiently useful (36% the tutor; 37% the editor) or very useful (35% the tutor; 23% the editor).

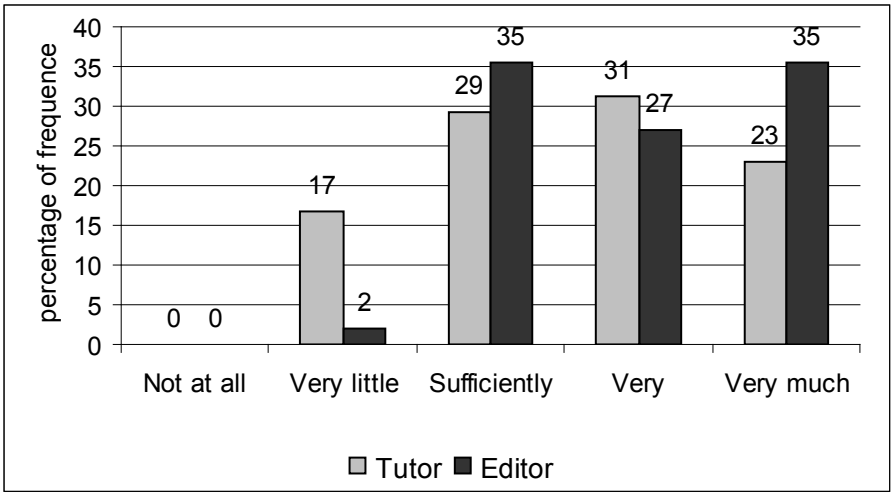

Fig. 1: How much do you think covering a role contributed to improve your participation to the platform?

It was also asked if the roles helped improving the ability to work in groups. A very few participants considered the role-taking "not at all" useful (6% about the tutor and none about the editor). The roles were judged mostly as "sufficiently" useful (36% tutor and 25% editor), and "very useful" (35% tutor and 40% editor). There is, therefore, a tendency to perceive the role of tutor as less useful than the editor.

The role of editor seems to be more useful than the tutor also to improve individual learning skills (Figure 2) ($t = -3.139$; $df = 47$; $p < .01$). The frequencies of lower value (not at all, very little, sufficiently) were in fact higher for the tutor. On the contrary, the question about the editor received the highest frequencies of higher value (very useful and very much useful).

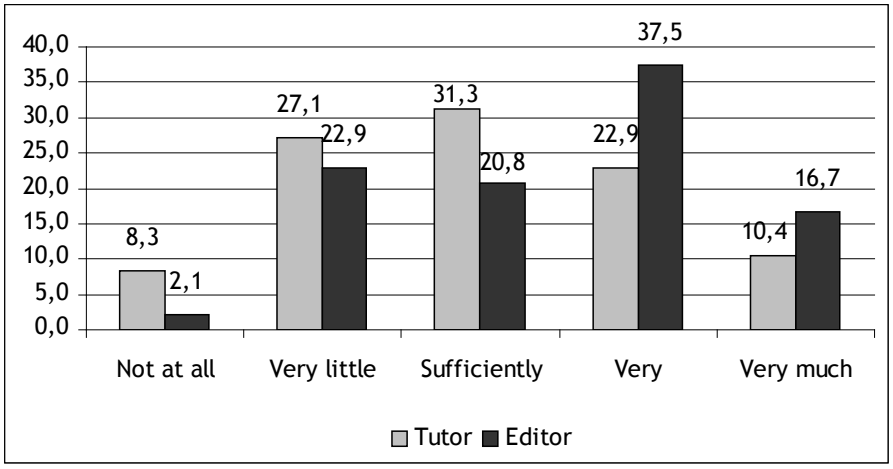

Fig. 2: How much do you think covering a role contributed to improve your learning skills?

The last question inquired about the usefulness of role-taking on the acquisition of collaborative discussion skills. Answers show that both tutor and editor were generally perceived as useful for these skills. But while the tutor was "very" useful for 22.9% of participants, the editor reached 31.3%. On the other hand, the tutor was perceived as "very much" useful in 33.3% of cases and the editor in 27.1% of the cases.

Conclusions

Participants attending the Master showed different levels of participation online depending on how many roles they covered during the course. Those who achieved higher standards of participation covered both roles proposed during the course, proving a general interest in the learning assignments and in role-based activities. However, all through the 10 units composing the course each participant kept a stable level of participation, therefore playing the roles cannot be considered as a stimulus for active participation per se.

Since not all the participants covered both roles we assume that the reasons to prefer one of them were given on the basis of an indirect experience of the role – for instance, by observing their peers playing the role.

Analyzing the answers gathered about the motivation for preferring one of the roles, we found that a high level of participation is associated to cognitive and social-constructivist reasons, whereas a low level of participation is connected to the behaviourist point of view. One of the main conclusions we can

draw from this finding is that role-taking supports active participation and a sophisticated perception of the learning process.

The roles – especially that of the editor - were perceived as useful to improve participation to classroom and online activities, although many participants did not see as always possible the application of the skills acquired online to the offline context.

In terms of understanding of the course's goals, both roles were perceived as very useful although the tutor was not perceived as "extremely" useful, probably because this type of role is not perceived as directly focused on learning. This result is aligned to the perception of the impact roles may have on learning skills. Again, the tutor is perceived as less useful to acquire "transversal" capabilities, such as team-work.

Differences between the perception of roles could be attributed to the peculiarities of roles. In our course, the tutor is active during the forum discussion. This activity may not be perceived as essential for the learning process. Whereas, the editor supports the group in preparing the product based on which the group will be assessed. This activity is probably perceived as a relevant part of the course consequently the editor is perceived as a facilitator for setting up a network between the participants focussed on producing a final artefact, meant for assessment and representing the activity of the group.

About the discussion skills, the tutor is perceived in a dichotomised way: either as not useful at all or extremely useful. This result may suggest that for those judging the tutor as not useful the task of the tutor was not really clear. Schellens *et al.* (2005) found that roles may impact the learning processes depending on how clear is the role for the students. The tutor may be less clear because it concerns communication and social tasks which need specific training to be well performed and to be understood how it relates to learning. Furthermore, the tasks assigned to the tutor were less clearly associated to the specific goals of the educational activity participants were performing.

Therefore, the editor is preferred over the tutor because perceived as better supporting learning. This is an interesting result when compared to the great attention the role of tutor online receives by the specialized literature and suggest to us some interesting ideas about the design of role-based activities.

Especially, when the roles are designed in close relationship to activities participants are familiar with, they may be perceived as relevant and effective. When based upon innovative activities – such as group discussions around a research question - the roles should be introduced with a specific training, beside a clear description of the structures and tasks implied.

Further analysis should be performed to look at how participation changes along the different units as consequence of playing a role. Such analysis may clarify whether it is the implementation of the role to stimulate participation

or whether it is high participation that helps to understand the implications of covering a role.

In general, we believe more detailed studies about role-taking in blended courses may give interesting hints for improving the efficacy of learning through participation.

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