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To assign or not to assign? Role taking in higher education

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Abstract

The study here presented focus on Role Taking, a collaborative learning strategy considered as effective to support learning and participation. It's aims at exploring students' perceptions about the efficacy of having a role assigned compared to having chosen a role. As such, it was adopted in a university course about "Knowledge Technologies", held during the third year of the undergraduate course for Social and Cultural Educators. 42 voluntary students (M=4; F=38; average age 22) took part into the activities. Divided in groups, students worked around topics concerning educational potentials or issues relating to ICTs. During the activities, students covered a specific role: Some of them choose the role, some others had the role assigned from the teacher. Data analysis shows that, in students' opinion, an assigned role is more effective in terms of quality of learning, social dynamics and satisfaction with the experience.

Keywords: Online Collaborative Learning; Role Taking; Higher Education; Collaborative Knowledge Building

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Introduction

The study here presented focus on Role Taking, a collaborative learning strategy considered as effective to support learning and participation, both online and in face-to-face educational contexts (De Wever, Schellens, Van Keer, & Valcke, 2008; Strijbos & De Laat, 2010). Its effectiveness relies to the possibility to enhance actual collaboration around the assigned tasks, often requesting students to exchange ideas, discuss and debate specific learning issues (Cacciamani, Cesareni, Martini, Ferrini, & Fujita, 2012). As such, Role Taking is deemed to be particularly useful in collaborative online learning in which students are asked to discuss around learning content and produce new knowledge.

Theoretical framework

In line with the main socio-constructivist theories (Jonassen, 1994; Pontecorvo, Ajello, & Zucchermaglio, 1995; Varisco, 2002) applied to digital environments (Laurillard, 2008; Trentin, 2005; Wenger, 1998), students' interaction needs to be first promoted and then structured according to specific scaffolds. Various studies (Cesareni, Cacciamani, & Fujita 2016; Delfino, Manca & Persico, 2006; Sansone, Bortolotti, & Buglass, 2016; Strijbos, Martens, Jochems, & Broers, 2004; Weinberger, Stegman, & Fisher, 2010) have indeed showed that it is not guaranteed that – when involved in collaborative online contexts – students will effectively participate, by providing valid contributions to the group activities. Effective and significant collaborative learning requires structured interactions drawn around scripts assigned to students. These scripts should be well defined and anchored to precise pedagogical models (Cesareni, Ligorio, & Sansone 2018; Laurillard, 2008; Ligorio & Sansone, 2016).

Many learning strategies proved to be useful to promote active and constructive participation. Among them we here focus on Role Taking. Literature shows how Role Taking is effective in supporting collaborative knowledge-building and socio-relational processes be-

tween group members (De Wever et al., 2008; Sansone, Ligorio, & Dillenbourg, 2011) especially when combined with other strategies such as a specific attention to the characteristics of the assigned task, an appropriate configuration of the digital environment, an adequate composition of the groups.

In particular, Role Taking is considered as a useful scaffolding tool for effective collaborative learning (De Wever et al., 2008; Ligorio & Sansone, 2016; Strijbos & De Laat, 2010) since it is based on the provision of collaborative scripts; these scripts – or task assignments - seems to help students: Taking on duties and responsibilities, optimising and supporting the cognitive and social building of knowledge, and activating different forms of reasoning and interaction. Moreover, supporting social interaction through Role Taking seems to assist the acquisition of individual and social agency, enabling every member of the group to participate and grow (Ligorio & Sansone, 2016). In this sense, Role taking was used as a powerful strategy in the course here described. The course, in fact, is bases on the Trialogical Learning Approach (Paavola & Hakkareinen, 2005) whose main goal is to promote individual and collective agency while students are engaged in the collaborative creation of a shared object. According to this theory, a significative learning is only possible when the educational experience is well structured around specific design principles supporting collaboration and a flexible use of mediating tools (Sansone et al., 2016a; Sansone, Cesareni, & Ligorio, 2016; Sansone, Cesareni, Ligorio, M. Bortolotti, & Buglass, 2019).

Aims of the study

This study aims at exploring students' perceptions about the efficacy of having a role assigned compared to having chosen a role. In particular, this paper sets out to identify any possible differences regarding:
- students' perception of the group collaboration
- students' perception of being able to cover the role
- students' satisfaction with the learning experience.

Method

Context and participants

The course here described is a university course about "Knowledge Technologies" (a.y. 2018-2019), held during the third year of the undergraduate course for Social and Cultural Educators, in the Department of Educational Sciences, at the University of Bologna (IT).

42 voluntary students (M=4; F=38; average age 22) took part into the activities. The course lasted eight weeks. Divided in groups, students worked around topics concerning educational potentials or issues relating to ICTs, by reflecting on their main dimensions, deepening theories and constructs, and in the end producing a shared object: A learning scenario. The group-work was mediated by different tools and environments able to support collaboration and discussion.

The whole learning activity was structured into two modules (Tab. 1): 1) research/documentation activity: Each group chose an ICT-related topic and analysed its possible potentialities and issues by compiling a research format supplied by the teacher; 2) design proposal:

Table 1. Modules and features of the course

Module	Topic	Artefact	Materials and Inputs	Digital Environments
1 Research/ documentation activity	Educational topic chosen by the groups and relating to ICTs in daily life	Research report: problematical analysis of the potentialities and criticalities of the digital tool	• Lessons • Research articles • Research schema/format	• Web Forum • Wiki (Google Doc) • Google Suite shared folder
2 Design proposal	Learning design	Learning Scenario	• Lessons • Educational design examples • Educational design schema	• Web Forum • Wiki (Google Doc) • Google Suite shared folder

Following the previous research, each group designed a learning unit addressed to a specific target by using a didactic design schema[1] supplied by the teacher.

The teacher supported the collaborative learning process both during the face-to-face lessons and within the digital environments.

Procedure

During the course, students were divided in groups of three to four members which they compose autonomously. In each group, students took a specific role (Ferrari, 2015):

- *leader*: In charge of organizing the group-work;
- *secretary*: Monitoring the group final output, keeping track of the discussion;
- *outsider/critic friend*: Cchallenging the groupmates with alternative visions and "prolific doubts" (Cesareni et al., 2018, p. 152);
- *animator/facilitator*: Promoting the group participation and interaction.

In 6 groups (23 students, from now on defined as Subgroup A), the roles were assigned randomly from the teacher, while in other 5 groups (19 students, from now on defined as Subgroup B), the roles were freely chosen from the students, in agreement with the other members of their own group. Before taking the role, the students received details and explanation on how to perform it, as well as on the timing of the group output to be produced. Each role, be it assigned or chosen, was taken from the beginning to the end of the learning experience.

Data collection and analysis

At the end of the experience, students were asked to answer to an anonymous semi-structured online questionnaire. To the aims of this study, the questions listed in Table 2 were considered. Specifically,

1. The design schema comprised the dimensions that the students had to include in their proposal, such as title, topic, learning context of application, learning aims and objectives, tools and resources, timing, assignments, evaluation criteria.

two key learning-related dimensions were investigated: Social collaboration (items section d-8 and section e-9.b) and students' satisfaction (items section b-6).

Table 2. The Role Taking Questionnaire

Section	No.	Question	Type
a)	3	Was it beneficial to have a role assigned by the teacher? (question addressed to Subgroup A) Was it beneficial to choose a role by agreement amongst your group members? (question addressed to Subgroup B)	Likert scale (1: Not at all – 5: Very)
	3.a	Why?	open question
	3.1	To what extent do you think you managed to fulfil the role assigned/agreed with the group?	Likert scale (1: Not at all – 5: Completely)
	3.2	Did you find it hard to "get into/maintain" the role?	Likert scale (1: Not at all – 5: Very)
	3.2.a	Why?	open question
b)	6	Score your level of satisfaction with the whole teaching-learning experience just received	Likert scale (1: Completely unsatisfactory – 5: Very satisfactory)
c)	7	Score the effectiveness of the online Role Taking activity regarding your learning experience	Likert scale (1: Not at all effective – 5: Very effective)
d)	8	Considering the online collaborative learning activity, how satisfactory do you consider the level of collaboration established with your peers?	Likert scale (1: Not at all satisfactory – 5: Very unsatisfactory)
e)	9.a	Report any difficulties you may have encountered when organising the work	open question
	9.b	Report any difficulties you may have encountered regarding relations with the members of your group	open question
f)	14	Strong points of the learning experience	open question
	15	Weak points of the learning experience	open question

First, close questions of the two subgroups were compared in a descriptive way. Moreover, means of these items were computed and differences between Subgroup A and B were analyzed using the Student T-test, in order to check whether the differences between the two groups are statistically significant. The open questions have been categorized through a content analysis. Response percentages of subgroup A and B were therefore compared in a descriptive way.

Results

Thirty-eight students answered the questionnaire (90%). At first glance (Fig. 1 and 2), the chance to choose the role to be taken would appear to be much more beneficial: 94% of students considered being able to decide their role as positive or very positive versus 76% of students having the role assigned from the teacher. No students considered as not positive at all to choose the role, compared to 19% of students having been the role assigned.
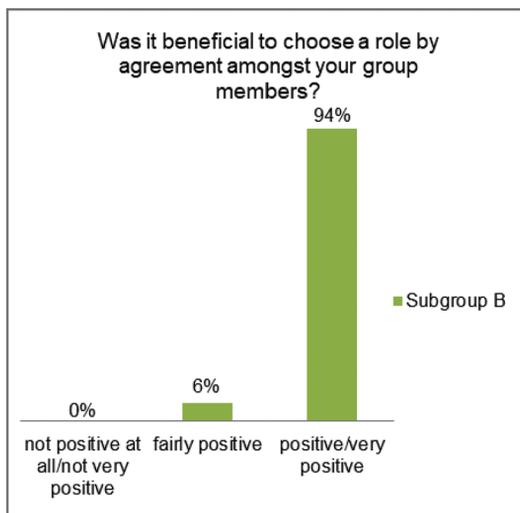
Figure 1. Students' perception about chosen roles
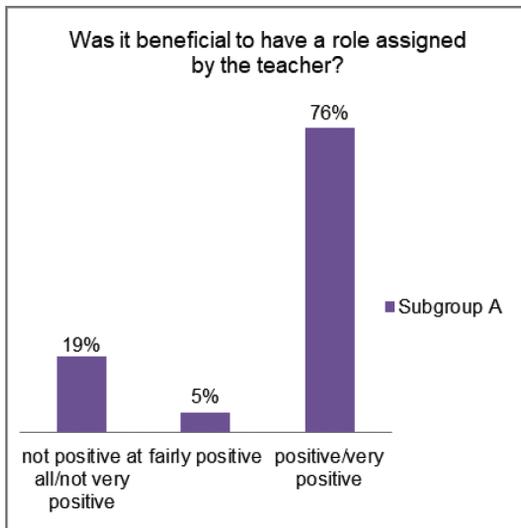
Figure 2. Students' perception about assigned roles

From the open answers (a section n. 3.a), it emerges that Subgroup B students consider the chance to choose their role as enabling them to:
– totally adapt to their personal characteristics, thus respecting their limits and potentials (53% of students);
– fulfil the duties implied by the role in a more active way, contributing to the success of the group-work (26%);
– grow in motivation and in sense of collaboration, also thanks to the feeling of "freedom" and "autonomy" implied by being given a choice (21%).

Subgroup A students, on the other hand, consider the fact of having assigned a role as enabling them to:
– testing themselves in a different role from the one they would normally undertake (29%);
– have an easier start-up the working process, with regard to work scheduling and management, especially within a group whose members do not know each other well (24%);
– be more careful and responsible in complying with the specific nature of the assigned role (24%);
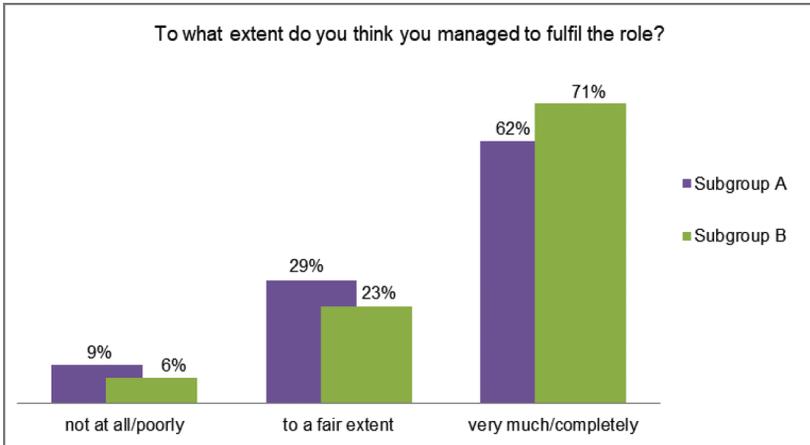
Figure 3. Students' perception about their personal Role Taking

- reduce conflict between group members, by encouraging a positive and cooperative climate within the group (12%);
- reach a greater clarity in the subdivision of work (11%).

Moving to the question investigating students' perception of being able to cover the role (Fig. 3), less difference can be observed between the subgroups: 71% of students who chose the role believed that they completely managed to cover the role, compared to 62% of students having a role assigned.

The T-test analysis confirmed that there was no difference between the mean of Subgroup A (*M* = 3.90) and Subgroup B (*M* = 4.18): *t*(36) = -0.94, *p* = ns.

When considering the perception of difficulty in getting into/maintaining the role (Fig. 4), it is interesting to notice how 70% of subgroup B students found it not hard, compared to only 38% of subgroup A students, most of whom (62%) considered it hard. The T-test analysis showed a nearly significant difference between the mean of Subgroup A (M = 3.14) and Subgroup B (M = 2.35): t(36) = 1.76, p = .08.

Subgroup A students refer difficulties regarding:
- the need to adapt their behaviour to a role considered as not in line with their personal characteristics (41%);
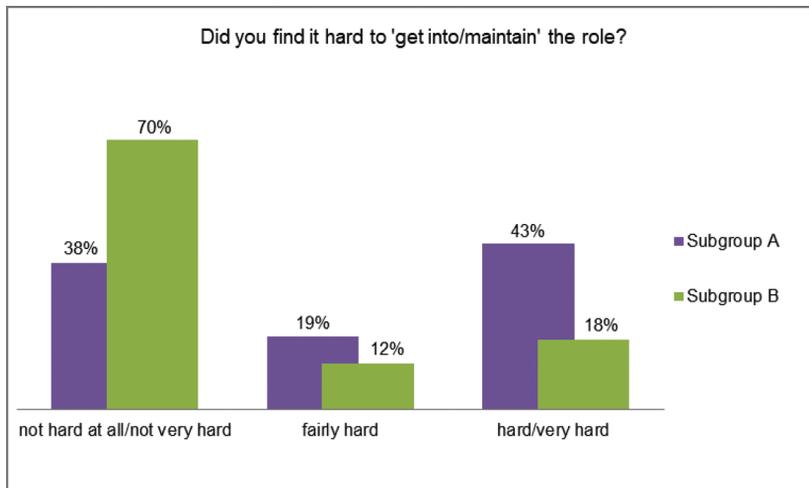
Figure 4. Students' perception about their maintaining the role

– feelings of inadequacy in the fulfilment of the assigned role (23 %);
– unspontaneously adapting interpersonal communication to suit the assigned role (18%);
– the risk of trespassing into the groupmates' roles when considered as more in tune with their personality (18%).
   Subgroup B students, on the other hand, refer difficulties regarding:
– conflicts spreading around respecting other people's roles and their decisions (37%);
– a general lower compliance to the defined schedules and group management (27%);
– greater uncertainty and difficulties when subdividing and managing group work (27%);
– a certain less participation and cooperation by some members (9%).
   The last Figure (Fig. 5) reports the percentage of students referring to be very satisfied with the learning experience, with the Role Taking effectiveness, and with the group collaboration.
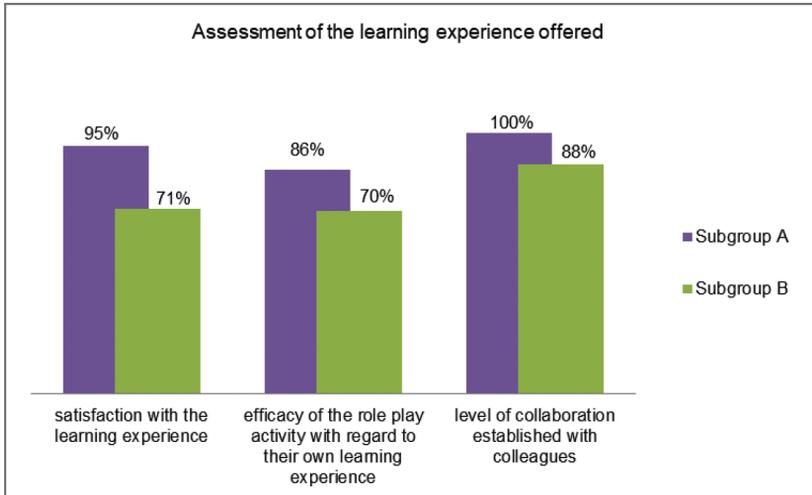
Figure 5. Assessment of the learning experience by the two subgroups

As concern satisfaction with the learning experience, the students having the role assigned from the teacher report a quite better experience, with 95% of them being very satisfied with the whole learning experience versus 71% of the students having chosen the role. This is confirmed by the T-test analysis which showed a significant difference between the mean of Subgroup A ($M = 4.52$) and Subgroup B ($M = 4.12$): $t(36) = 2.49$, $p = .02$.

Being "forced" to take a role assigned by the teacher seems to increase the fluidity of the whole learning experience, with regard to the quality of intragroup relations, seen as necessary to the joint task (100%), and to the perceived efficacy of the online Role Taking for the individual learning (86%). However, T-test analysis showed no statistical difference both as concern the perceived efficacy [$M\text{subA} = 4.05$ and $M\text{subB} = 3.76$, $t(36) = 0.95$, $p = $ ns] and the level of collaboration [$M\text{subA} = 4.38$ and $M\text{subB} = 4.24$, $t(36) = 0.60$, $p = $ ns].

Subgroup A students consider that having a role assigned:
– stimulate each groupmate to be more careful in complying with the specific nature of the role assigned (27%)

- – enables students to test themselves in a role different from the one they would normally choose to undertake (27%);
- – reduces conflict between group members and encourages a positive and cooperative climate within the group (19%);
- – makes easier to start-up the working process, with regard to work scheduling and management, especially within a group whose members do not know each other well (15%);
- – lead to a greater clarity in the subdivision of work (12%).
   Subgroup B students seems to imply:
- – conflicts spreading around respecting other people's roles and their decisions (27%);
- – a general lower compliance to the defined schedules and group management (27%);
- – greater uncertainty and difficulties when subdividing and managing group work (26%);
- – a certain less participation and cooperation by some members (20%).

Discussion and conclusions

In a descriptive way, results seem to suggest that choosing a role would be the preferable learning condition, since a chosen role enables students to exploit their individual characteristics, encourages group motivation, and supports collaborative work. Yet, when asked to express their overall satisfaction, this freedom seems to be related to growing issues concerning group collaboration and individual responsibilities: More internal conflicts, less respect for the groupmates' roles, more delegation of responsibility, less interest in the project work.

However, in students' opinion an assigned role is more effective in terms of quality of learning, social dynamics and satisfaction with the experience, since it simplifies and speeds up the sharing of tasks and the initial distribution of the work between group members, thus containing intragroup conflicts. Furthermore, the opportunity to test themselves in a role different from the one they would normally undertake is a challenge that seems to lead to further learning outcomes.

These differences between the two subgroups are however only partially confirmed by the statistical analysis of the T-test. The significances indicate that Subgroup A has more difficulty in taking the role but that the overall experience is more satisfactory. Nevertheless, it should be noted that the non-significance of some items is probably due to the small number of components of the two groups.

In conclusion, we are well aware that the nature of this study does not allow any generalization of the here said results, being it based on a non-experimental method with a small number of participants. Yet, the overall experience led from the author, which is also the teacher of the course here described, provided her with some useful suggestions to re-design the activity:

- Supporting a better balancing between classroom and online activities, by also planning a longer time to perform online group work (Sansone & Ritella, 2020), thus enabling artefacts to be revised and improved in response to peer feedback (Cesareni et al., 2018; Li & Grion, 2019; Sansone & Cesareni, 2019; Serbati, Grion, & Fanti, 2019);
- Engaging the students in a "learning by modelling" (Palincsar & Brown, 1984) experience, envisaging that the members of each group take turns in the various roles for each module of the course; in this way, each student will experience the effects of and the contents and process skills associated with each role (Cesareni & Cacciamani, 2015; Sansone et al., 2011; Strijbos et al., 2004);
- In view of the difficulties here registered in somesocial dynamics – especially for subgroup B –, further digital tools will be used in order to provide students with more chances to synchronously and friendly interact, thus facilitating their collaboration and group management (Cacciamani et al., 2012; Cesareni et al., 2018; Ligorio & Sansone, 2016; Mazza & Ligorio, 2017).

References

Cacciamani, S., Cesareni, D., Martini, F., Ferrini, T., & Fujita, N. (2012). Influence of participation, facilitator styles, and metacognitive reflection

on knowledge building in online university courses. *Computers & Education*, *58*(3), 874-884. doi: 10.1016/j.physletb.2003.10.071.

Cesareni, D., & Cacciamani, S. (2015). Assunzione di ruolo e funzioni conversazionali in un corso universitario "blended". *TD – Tecnologie Didattiche*, *23*(3), 139-147.

Cesareni, D., Cacciamani, S., & Fujita, N. (2016). Role taking and knowledge building in a blended university course. *International Journal of Computer-Supported Collaborative Learning*, *11*(1), 9-39. doi: 10.1007/s11412-015-9224-0.

Cesareni, D., Ligorio, M.B., & Sansone, N. (2018). *Fare e collaborare. L'approccio trialogico nella didattica*. FrancoAngeli.

Delfino, M., Manca, S., & Persico, D. (2006). *Apprendimento online: proposte metodologiche*. Guerini e Associati.

De Wever, B., Schellens, T., Van Keer, H., & Valcke, M. (2008). Structuring asynchronous discussion groups by introducing roles: Do students act in line with assigned roles?. *Small Group Research*, *39*(6), 770-794. doi: 10.1177/1046496408323227.

Ferrari, L. (2015). *Costruire esperienze didattiche di online collaborative learning*. Edizioni Junior.

Jonassen, D. H. (1994). Thinking Technology: Toward a Constructivist Design Model. *Educational Technology*, *34*(4), 34-37.

Laurillard, D. (2008). Technology enhanced learning as a tool for pedagogical innovation. Journal of Philosophy of Education, *42*(34), 521-533. doi: 10.1111/j.1467-9752.2008.00658.x.

Li L., & Grion V. (2019). Power of Giving Feedback and Receiving Feedback in Peer Assessment. *The All Ireland Journal of Teaching and Learning in Higher Education (AISHE-J)*, *11*, 2. Retrieved from: https://ojs.aishe.org/index.php/aishe-j/article/view/413/671.

Ligorio, M. B., & Sansone, N. (2016). *Manuale di didattica blended. Il modello della "Partecipazione Collaborativa e costruttiva"*. FrancoAngeli.

Mazza, S., & Ligorio, M.B. (2017). Sviluppo di un metodo per l'analisi comparativa di Learning Management System. *Psicologia dell'Educazione*, *3*, 87-120.

Paavola, S., & Hakkareinen, K. (2005). The knowledge creation metaphor. An emergent epistemological approach to learning. *Science & Education*, *14*, 535-557. doi: 10.1007/s11191-004-5157-0.

Palincsar, A.S., & Brown, A.L. (1984). Reciprocal teaching of comprehension, fostering and monitoring activities. *Cognition and Instruction*, *1*, 117-175. doi: 10.1207/s1532690xci0102_1.

Pontecorvo, C., Ajello, A. M., & Zucchermaglio, C. (1995). *I contesti sociali dell'apprendimento*. LED.

Sansone, N., Bortolotti, I., & Buglass, S. (2016a). The Trialogical Learning Approach in Practice(s): Reflections from Pedagogical Cases, in *Qwerty, Open and Interdisciplinary Journal of Technology, Culture and Education*, *11*(1), 99-120.

Sansone, N., Cesareni, D., & Ligorio, M. B. (2016b). Il Trialogical Learning Approach per rinnovare la didattica. *TD Tecnologie Didattiche*, *24*(2), 82-91.

Sansone, N., & Cesareni, D. (2019). Il peer-feedback collaborativo per il miglioramento continuo dei prodotti, *Giornale Italiano della Ricerca Educativa*, Numero Speciale, maggio 2019, 139-155.

Sansone, N., Cesareni, D., Ligorio, M. B., Bortolotti, I. & Buglass, S. L. (2019). Developing knowledge work skills in a university course. *Research Papers in Education*, *35*(1), 23-42. doi: 10.1080/ 02671522.2019.1677754.

Sansone, N., Ligorio, M.B., & Dillenbourg, P. (2011). Progettare il Role Taking a sostegno del Collaborative Knowledge Building. *QWERTY*, *6*(2), 288-304.

Sansone N. & Ritella, G. (2020). Formazione insegnanti "aumentata": integrazione di metodologie e tecnologie al servizio di una didattica socio-costruttivista. *QWERTY*, *15*(1), 70-88. doi: 10.30557/QW000023.

Serbati, A., Grion, V., Fanti, M. (2019). Caratteristiche del *peer feedback* e giudizio valutativo in un corso universitario blended. *Giornale Italiano della Ricerca Educativa*, Numero Speciale, maggio 2019, 115-138.

Strijbos, J. W., Martens, R. L., Jochems, W. M. G., & Broers N. J. (2004). The effect of functional roles on group efficiency: Using multilevel modelling and content analysis to investigate computer-supported collaboration in small groups. *Small Group Research*, *35*, 195-229. doi: 10.1177/ 1046496403260843.

Strijbos J. W. e De Laat M. F. (2010). Developing the role concept for computer-supported collaborative learning: An explorative synthesis. *Computers in Human Behavior*, *26*(4), 495-505. doi: 10.1016/J.Chb.2009. 08.014.

Trentin, G. (2005). Apprendimento cooperativo in rete: un possibile approccio metodologico alla conduzione di corsi universitari online. *TD – Tecnologie didattiche*, *36*(3), 47-61.

Varisco, B. M. (2002). *Costruttivismo socio-culturale*. Carocci.

Weinberger, A., Stegman, K, & Fisher, F. (2010). Learning to argue online: Scripted groups surpass individuals (unscripted groups not). *Computers in Human Behavior*, *26*, 506-515. doi: 10.1016/j.chb.2009.08.007.

Wenger, E. (1998). *Communities of practice: Learning, Meaning and Identity*. Cambridge University Press.