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## e-Learning and Team-based Learning. Practical experience in virtual teams

Pilar Ficapal-Cusí<sup>a\*</sup>, Joan Boada-Grau<sup>b</sup>

<sup>a</sup> Open University of Catalonia (UOC). and Internet Interdisciplinary Institute (IN3). Av. Tibidabo 39, 08035 Barcelona, Spain.

<sup>b</sup> Rovira i Virgili University (URV) and Internet Interdisciplinary Institute (IN3). Carretera de Valls S.N., 43005 Tarragona, Spain.

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### Abstract

This paper analyses the execution and evaluation of team-based learning in a virtual learning environment. It describes the methodology and the results of a practical experience in the Management Skills subject of the Degree in Business Administration and Management offered at the Open University of Catalonia (UOC). The aim is to gain experience in designing an effective model that fosters team-based learning for the acquisition and evaluation of generic competencies via group e-learning.

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*Keywords:* Team-based learning; e-learning; collaborative process; generic competences; synchronous and asynchronous communication.

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### 1. Introduction

Teamwork is one of the most sought-after competencies in the work environment. Work teams are acquiring an increasingly important role in the functioning of organisations (Gil, Rico, & Sánchez-Manzanares, 2008). They integrate and coordinate the tasks that individuals perform, they support and motivate their members, and they foster organisational learning. They are a more effective tool for obtaining greater returns within an organisation than those obtained by individuals alone (Alcover, Gil, & Barrasa, 2004). However, the literature shows that they do not achieve optimum levels of performance if the cooperation agreements between their members are not satisfactory

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\* Pilar Ficapal-Cusí. Tel.: +34 -932-532-300; fax: +34-934-176-495.  
E-mail address: [pficapal@uoc.edu](mailto:pficapal@uoc.edu)

(Salas, Burke, Fowlkes, & Priest, 2004) or if there is a lack of ability to collaborate effectively and work more efficiently (DeChurch & Mesmer-Magnus, 2010). Rousseau, Aubé, & Savoie (2006) have established a set of behaviours adopted by the members of a team whose objective is to facilitate the execution of common tasks. It consists of seven dimensions: (1) cooperation; (2) communication; (3) psychological support; (4) conflict management; (5) work organisation/planning; (6) resource management, and; (7) support for innovation. These dimensions are grouped under two factors: the first factor, namely interpersonal support, and the second factor, namely teamwork management.

This approach can also be applied to collaboration among students. On the one hand, teamwork enables learning to be more proactive and, on the other, it allows more content to be collectively covered (Johnson, Johnson, & Stanne, 2000). Collaborative learning is an innovative didactic approach in the higher education setting. Team-based learning may be considered as a continuous process through which team members collectively acquire or construct new knowledge (Russ-Eft, Preskill, & Sleezer, 1997), obtain and process information in order to improve the team's performance and outcomes (Edmondson, 1999), and develop a group product through the experience of working together (Argote, Gruenfeld, & Naquin, 2000). The advantages of teamwork have been reported in many studies (Roberts, 2005). One of the benefits is that it results in the improvement of generic competencies, among which are teamwork competencies (Guitert, 2011).

In this respect, training in generic competencies, one of which is teamwork, is crucial to improving the employability of university students. It will be necessary to establish learning strategies that permit the basic principles, skills and behaviours to be developed. These should enable each team member to perform tasks effectively and to have relevant attitudes in order to promote the effective functioning of the team. In order to achieve optimal administration and management, this methodology aims to have greater impact on the process than on the outcome (Stahl, Koschmann, & Suthers, 2006).

Collaboration is also one of the distinctive characteristics of e-learning (Garrison, 2006). The use of flexible and innovative distance learning methodologies, the intensive use of information and communication technologies (ICTs), and the acquisition of competencies in a collaborative and active learning environment are some of the factors explaining the considerable growth of e-learning in recent years (Andrews & Haythornthwaite, 2006).

Based on this general framework, the application of team-based learning approach to e-learning is proposed. It allows students to practice using the content in collaborative experiences that facilitate active learning. It means that a range of group tasks and activities need to be designed to improve learning and promote the development of self-managed learning teams (Michaelsen & Sweet, 2008). The students' participation leads to a common solution to the problems posed in the classroom. This methodology entails modifying the role of the lecturer, the core aspect of which becomes the design and management of the instructional process. For their part, students take responsibility for the acquisition of knowledge and skills in an autonomous manner in order to contribute to the progress of the group work. In this respect, the rationale of this methodology is based on providing the groups with suitable guidance and training, designing tasks and activities that promote learning, giving appropriate and regular feedback, and making the students responsible for the quality of their work (Michaelsen & Sweet, 2008).

## **2. Methodology**

This paper presents a practical experience of team-based learning in an e-learning context. It is based on dealing with and resolving situations that the students will face in the work environment, and on the subsequent critical analysis of the functioning of the team. The students are therefore encouraged to explore and develop individual and group competencies.

### *2.1. Objectives*

The experience has the following objectives:

- To develop learning strategies that promote the effective functioning of the team (principles, skills, behaviours and attitudes).

- To develop action strategies and processes to deal with and resolve a particular work-related situation cooperatively in small groups.
- To promote the development of self-managed learning teams.
- To design a shared evaluation process based on individual performance and the functioning of the group.
- To generate processes of reflection to enable the students to internalise and then generalise the concepts, skills, attitudes and procedures developed to other situations that they will face in the work environment.

## 2.2. *Sample*

Team-based learning was applied to the Management Skills subject, mostly as part of the Degree in Business Administration and Management offered at the Open University of Catalonia (UOC). It was applied to all the virtual classrooms in that subject, with a total of 540 students and 9 lecturers.

## 2.3. *Instructional process stages*

There are three instructional process stages: design, execution and evaluation. The aspects considered in the design stage were: (1) setting objectives, designing the expected learning outcomes and the performance indicators; (2) organising and scaffolding the tasks, bearing in mind the situations that the teams are likely to encounter in the work environment; (3) the process of revising, adapting and reformulating the students' needs and abilities, and eliciting prior knowledge; (4) identifying and fine-tuning the learning resources and the synchronous and asynchronous communication systems required for the activity to be carried out; (5) producing the documentation, setting the deadlines by which the work has to be done, and establishing the methodology that has to be followed (group size, performance indicators, rules and instructions); (6) designing the shared evaluation, meaning that the students take part in their own process of learning and evaluation (Watts & Garcia, 2006) based on individual performance, the team outcomes and the contribution that each team member makes to the group work, and; (7) establishing the feedback guidelines.

Of note in the execution stage were: 1) group formation and role allocation, and; 2) planning, organisation and execution of the activity by the students. The students formed groups (4-5 members) according to shared interests, and each one created its virtual interaction and information exchange space in the classroom. After the team had been formed, its members proceeded to allocate the coordinator role. The practical exercise implemented was the analysis of a situation arising from a specific case. The case was about a critical situation within an organisation and the disagreement among departmental directors about possible solutions. The directors' personal traits and each department's own objectives gave rise to a situation to which it was hard to find a shared solution. In this context, each student took on the role of one of these directors so that they could constructively reach a consensus. The tasks were performed via synchronous and asynchronous communications systems and by following the method proposed in the learning materials about the organisation of meetings: planning, purpose, participants, participation and perspective.

The final stage, that of evaluation, consisted of feedback from the meeting and of evaluation by the members of each team. The students had to produce a description of the procedure (role played and functioning of the team), analyse the most relevant aspects by thinking back to what happened and what should have happened, and conduct a shared evaluation of individual and group performance by applying the indicators proposed in the rubric. In addition, the evaluation of the effectiveness of the functioning of the team was conducted by means of a 10-item questionnaire. It was created on the basis of the evaluation rubric for this competency, and is related to the dimensions of the internal functioning of teams (Rousseau, Aubé & Savoie, 2006). As an instrument of evaluation and guidance, this questionnaire was made available to the students from the start of the practical exercise. The goal was to encourage group evaluation of each team members' contributions (their own and others') to the effectiveness and efficiency of the team.

## 2.4. Results

Out of a total of 540 students, 359 took part in the practical exercise (66.5%). The evaluation of competencies was based on the level of mastery (1 to 4) of the competencies required in the activity. In addition, the evaluation of the effectiveness of the functioning of the team was conducted by means of a 10-item questionnaire (Table 1).

Table 1. Evaluation of team-based learning (n=359). (Strongly agree: 4; Strongly disagree: 1)

Items	Mean	Agreement percentages for items (%)			
		Strongly agree	Agree	Disagree	Strongly disagree
1. We functioned as an effective team.	3.49	54.8	39.8	5.2	0.3
2. Communication facilitated the functioning of the team.	3.55	59.9	34.9	4.9	0.3
3. Every member had a say and everyone's opinions were respected.	3.70	73.8	22.5	3.2	0.6
4. A reasonable amount of time was invested to set objectives that every team member was able to understand and handle.	3.42	53.6	36.6	8.4	1.4
5. The proposed objectives satisfy the individual interests of the team members And another entry.	3.66	69.5	28.5	1.2	0.6
6. There is fluid communication and appropriate feedback.	3.54	59.7	34.9	5.2	0.3
7. All the activities to be carried out are defined.	3.61	66.6	28.2	4.6	0.6
8. The tasks were properly allocated and distributed among team members.	3.31	49.9	33.1	14.7	2.3
9. The way in which problem analysis, decision making and planning were performed.	3.48	54.8	39.5	4.6	0.9
10. The ultimate objective was taken into account.	3.76	77.8	20.5	1.4	0.3
		4	3	2	1
Evaluation of competencies acquired*.		37.2	45.8	15.6	1.2

\* 4: Mastery of knowledge and practices, and integration of behaviours; 3: Knowledge and practices acquired, and fluid application; 2: Questionable and not very skilful mastery; 1: Weak practice or mastery.

The students' mean ratings are positive and situated above 3 points (Figure 1). The aspect that the students rated the highest was the orientation towards outcomes and objectives, and the fact that everyone had a say and that all opinions were respected. In comparison to the other indicators, task allocation and distribution among team members (item 8) and time invested to set objectives (item 4) could be improved. In this respect, role allocation and time management in the team formation stage caused the greatest difficulties.

As an element of improvement, the results underscore the need to introduce mechanisms of motivation to foster greater participation in practical exercises like this one. Some 33.5% of the students did not take part in it. Likewise, information about the nature of the activity needs to be provided well in advance so that the objectives and roles can be better established.

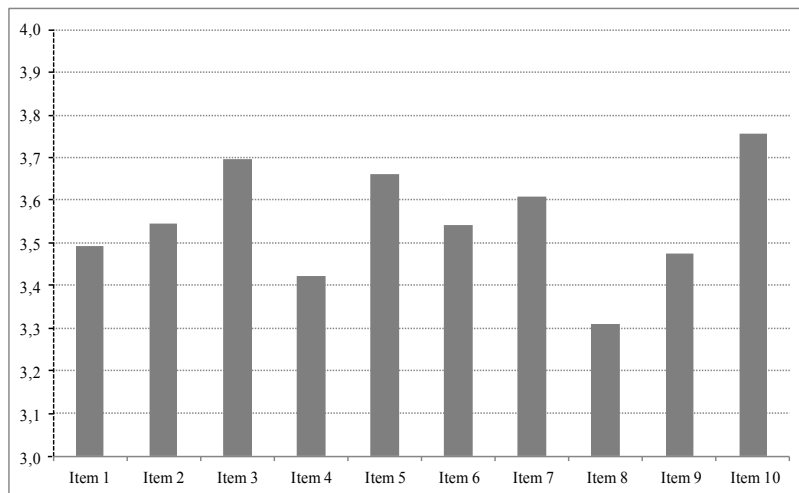


Figure 1. Evaluation of the functioning of teams

The lecturers were heartened by the results, and they suggested improvements that ought to be made, such as issuing earlier notifications about the nature of the practical exercise and extending the methodology to new practical exercises. From the methodology used, evidence is obtained about the acquisition of generic competencies of an instrumental nature (time management and task planning, problem solving, decision making ability and the use of ICT systems), of an interpersonal nature (effective communication, critical thinking and interpersonal relationships) and of a systemic nature (adaptation to new situations and self-directed learning) via e-learning.

### 3. Conclusions and recommendations

In conclusion, it is important to note the following aspects that the execution of this work has brought to light. The lecturer plays an important role, fundamentally in the design and management of the instructional process. The students must be made aware of the objectives and the methodology, as well as the evaluation criteria that will be used to evaluate their level of performance in tasks through regular feedback from the lecturer. It is important for students to share a common mission, set clear objectives and establish collaboration agreements when it comes to defining the group objectives, which, moreover, they must relate to their own. In the first stage, that of group formation, there was found to be a need for group members to put more effort into planning, organisation and time management in order to subsequently meet the deadlines set for task execution.

Interdependence among team members is another important aspect to highlight. It is important for positive interdependence among members to be established, and for each of them to contribute, generate, give feedback and co-evaluate fellow team members. When the working climate within the group and among its members is not good, both coordination and collaboration among its members is affected.

The use and integration of synchronous and asynchronous communication systems provide team members with greater capacity for autonomy and make sharing and accessing information easier for everyone. However, the lecturer needs to play a more proactive role in giving regular feedback to the students.

It is worth noting that this methodology is better suited to evaluating knowledge construction processes than to evaluating outcomes, that automated tutoring is not possible, and that the instructional strategy must address the design of intercommunication activities aimed at fostering the creation of shared knowledge.

There are several aspects related to didactic quality in a virtual environment that need to be analysed, such as the fact that it may afford conceptual sequentiality, organisational autonomy, active learning and cooperative learning. It is also important to note that organisational and methodological designs that do not favour the establishment of

online student-lecturer and student-student interpersonal relationships may generate gradual demotivation and sometimes cause students to drop out of the learning process.

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