Assessing Team Member Effectiveness among higher education students using 180° perspective

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ABSTRACT

Higher education institutions are increasingly aware of the advisability of training students in teamwork, as professional organisations require their employees to integrate in complex projects with other colleagues. Nevertheless, assessing the acquisition of teamwork skills by students is not an easy task. This research evaluates a project implemented with students on the Bachelor's degree in Business Administration in which the evolution of teamwork skills was tracked while they were doing a team-based assignment. For this purpose, the CATME-BARS scale was employed to evaluate the teamwork skills in peer-assessments during the semester. In addition, the SLPI was used for evaluating leadership. The teamwork dimensions that emerged as significant gave priority to social interdependence over the knowledge, skills, and abilities of the teammate. The student profile was revealed as a key factor. The free-rider problem was detected in the Erasmus students (exchange students). Belonging to more demanding groups and the self-perception of leadership had a positive effect on teamwork effectiveness. In our results, gender and job experience did not influence teamwork effectiveness. Some students underwent a process of personal maturation thanks to the reflection on this soft skill. The research carried out highlights the importance of teamwork ability in university students.

1. Introduction

In Europe, the Bologna process established the European Higher Education Area to facilitate student and staff mobility, to make higher education more inclusive and accessible and make higher education in Europe more competitive worldwide (European Ministers of Education, 1999). As part of this process, the outcome-based educational programmes (basically, disciplinary content) were transformed into skills programmes. This change brought about the subordination of the disciplinary contents to these skills. According to Lasnier (2000), skills constitute a complex and integrative know-how, which involves a completely different way of organising the curriculum and the teaching and learning approaches.

When designing curricula, two types of skills that students should develop must be specified. On the one hand, specific or hard skills are those belonging to a field or degree and are focused on the achievement of a specific graduate profile. On the other hand, soft skills respond to those competencies that are key and transferable in relation to a wide variety of personal, social, academic and work contexts throughout life. In this sense, they form a fundamental part of the professional and training profile in most degree courses (Burch et al., 2015; Hernández-March et al., 2009; Palma et al., 2011; Pereira et al., 2019; Yashin et al., 2018). Within these skills, it is worth highlighting teamwork ability, which is included by a large majority of European universities in their curricula (Fidalgo-Blanco

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et al., 2015). There is no doubt of its importance and the role it plays during the students' learning journey, as well as their future employability. As human resources give organisations a competitive advantage, employers take into account the ability to work in multidisciplinary teams (Brown et al., 2020; Drake et al., 2006; Murray & Lonne, 2006; Ritter et al., 2017).

Hence, a key question in higher education is how to assess the acquisition of this soft skill by the students. One of the major concerns for lecturers is the correct assessment of this competency, given that the level of participation is not always the same for all team members (Anson & Goodman, 2014; Witt et al., 2019). Planas-Lladó et al. (2018) demonstrate that peer assessment is useful in reducing this difficulty associated with group work. In addition, including the perspective of each student during the process of acquiring this competency through self-assessment can also provide relevant information when evaluating this soft skill (Wilson et al., 2018). The combination of self-evaluation and peer assessment is designated 180° evaluation (Bisquerra et al., 2006) and has previously been used in the assessment of this skill in higher education (Kemery & Stickney, 2014; Planas-Lladó et al., 2021; Sridharan & Boud, 2019).

The object of this research is the development of a 180° evaluation process for teamwork skills of students taking the Bachelor's Degree in Business Administration (BBA). The research project was integrated in the academic performance of the marketing management subject, as students were required to carry out a project in teams. During the semester there were three different skill assessments in which students evaluated their own teamwork ability as well as their teammates'. Moreover, students received specific training on teamwork as part of the research project. The aim of this research is double: i) finding out the factors affecting the improvement in teamwork effectiveness in BBA students over the marketing course. Specifically, we studied gender, the class group, the exchange programmes (in Europe, we have the Erasmus + programme), job experience, and the association with the leadership skill; ii) testing the effect of the project to enhance teamwork skill among students. To tackle both research goals, we combined a quantitative analysis based on the assessments of all the students in the course, and a qualitative analysis drawn from a reduced group of students wishing to enhance their teamwork training who volunteered. The choice of this multimethod approach helped us capture many more perspectives regarding the research project, and to better calibrate the assimilation of the personal training provided. Furthermore, this research project was thought to contribute to the cross-cutting programme in soft skills development promoted by our university.

The paper is structured as follows. First, we frame the importance of teamwork skills in the current professional landscape. We also present in more detail the soft skills programme that the university of origin is implementing in all its degrees. Next, we introduce the instruments deployed for assessing soft skills. Those scales are the Comprehensive Assessment of Team Member Effectiveness (Loughry et al., 2007) and the Student Leadership Practices Inventory (Kouzes & Posner, 2012). Subsequently, we describe the research hypothesis. The methodology section contains the way data were collected as well as the steps followed in the research project. It also includes the description of the quantitative and qualitative analysis. Next, the results are presented and discussed. Finally, limitations are highlighted, and some future research lines are proposed.

2. Background

2.1. The importance of teamwork skills

A group of people is not a team. A team is a group of people with a high degree of interdependence geared toward the achievement of a goal or completion of a task. In other words, they agree on a goal and concur that the only way to achieve the goal is to work together (Parker, 2008). In recent years, teamwork has become one of the most important enablers for achieving positive and cost-effective results in a variety of organisational environments (Urionabarrenetxea et al., 2021). In fact, effective teamwork leads to increased productivity, more effective use of resources, cost reduction, improved quality, innovation, better customer service and more rapid commercialisation of products (Procter & Currie, 2004; Xyrichis & Ream, 2008). As organisations are becoming increasingly dynamic and unstable, the reliance on teams to deal with these situations emerges as more critical (Baker et al., 2006; Ginting et al., 2020). Therefore, understanding the nature of teamwork and the best way to train the necessary skills is of vital importance for the success of organisations (Salas et al., 2000; Stout et al., 1997; Symons et al., 2012). Its importance and the need to know how to develop this competency in students studying for the degree in Business Administration is clear.

Beyond the common aim to be achieved and the required technical skills, there are other skills that favour the development of appropriate teamwork (Cohen & Levesque, 1991). Salas et al. (2005) proposed that the core components of teamwork include team leadership, mutual performance monitoring, backup behaviour, adaptability and team orientation. Stevens and Campion (1994) also proposed 14 knowledge, skill and ability requirements (KSAs) for teamwork. Rousseau et al. (2006) specified the teamwork behaviours that are most likely to facilitate accomplishment of the collective task. Johnson et al. (2000) listed five essential attributes of successful business teams: attitude, uniqueness, communication, creativity and play. The major difference between successful teamwork and unsuccessful teamwork is largely based upon team members sharing common goals and working together to achieve them (van Mierlo et al., 2006). As Tarricone and Luca (2002) point out, social interdependence is the basis for the collaboration and communication skills necessary to promote a positive and effective team environment. Therefore, we can deduce that there is a strong relationship between social interdependence theory and the success and functionality of a team.

Aware of this demanding need for training students in soft skills useful for their future professional performance in teams, the university we teach at promoted an ambitious project for the whole range of degrees. This university is a public institution located in a Spanish city. The need for this cross-cutting programme was more acute as the university is focused mainly on engineering careers, where hard skills had been practically the only teaching outcome. Currently, the soft skills programme is implemented in all degree courses, both at undergraduate and master's level, and it promotes the acquisition of 13 skills that are developed organically

throughout each course. Specifically, soft skill number 6 corresponds to "Teamwork and leadership", and it is understood as the way to achieve common goals among all the teammates. Sharing becomes the critical term, as a good performance of this skill involves sharing knowledge, commitment and responsibility. Given that the academic literature differentiates between teamwork and leadership skills, we also distinguished both in our research project.

2.2. Assessing teamwork and leadership ability

Different systems have been used to measure teamwork ability in both business and educational organisations (Britton et al., 2017; Cano et al., 2009; Rosen et al., 2011). One of the most worked upon is Comprehensive Assessment of Team Member Effectiveness (CATME), developed by Loughry et al. (2007) for college students. The aim of this scale was to identify how members of the same team could help each other to become more effective. The researchers found 29 specific types of team member contributions that clustered into five categories: i) Contributing to the Team's Work; ii) Interacting with Teammates; iii) Keeping the Team on Track; iv) Expecting Quality; and v) Having Relevant Knowledge, Skills and Abilities. Each contribution was measured with three items. In total, the full instrument has 87 items and a high internal consistency. Each item is measured using Likert scales from 1– Strongly disagree to 5–Strongly agree. Some years later, a shorter version with 33 items was developed. Even so, it was a rather complex system to use for peer assessment, as it required evaluating 33 items for each teammate. Ohland et al. (2012) developed a BARS version of the CATME instrument. Based on the five dimensions, a BARS tool shows students what constitutes good performance and poor performance for each of them. In this way, students only assess five items for each member in the group. This version is known as CATME-BARS and is the one used in our research. The reasons for this selection are its validity performed in different studies, it is easier to use in the peer assessment process, and it is self-explanatory for the participant.

Due to the high degree of interrelation of teamwork ability with the leadership skill and the proposal made by our university, in the study we also included the evaluation of this second skill. Nevertheless, there are other examples in the literature where the development of both soft skills by students is analysed jointly, e.g. the study by Ginting et al. (2020). To assess leadership ability, we used the scale created by Kouzes and Posner (2012) for higher education settings designated as Student Leadership Practices Inventory (SLPI). These authors believe that leadership can be learned and is not something innate. Thus, students can still learn to be leaders if they are given the right guidelines and steps. Kouzes and Posner (2018) focused on individual leadership skills and found that there are Five Exemplary Leadership Practices: i) Model the Way: leaders should behave in the same way as they encourage others to behave; ii) Inspire a Shared Vision: enlist others in a common vision by appealing to shared aspirations; iii) Challenge the Process: search for opportunities by seizing the initiative and looking outward for innovative ways to improve; iv) Enable Others to Act: based on trust, leaders must create a safe environment for people to collaborate, experiment and engage; v) Encourage the Heart: celebrate values and victories by creating a spirit of community. Six items measure every practice. In total, there are thirty items. The response scale for every item range from 1–Rarely or Seldom to 5–Very Frequently. We chose the SLPI, as it has been validated by over three million survey respondents around the globe (Kouzes & Posner, 2012).

2.3. Research hypothesis

Peer assessment to evaluate teamwork is very common in the literature (Loignon et al., 2017; Planas-Lladó et al., 2018). However, not all authors focus on the development of the teamwork ability through the semester comparing the scores obtained at the outset and at the end using CATME-BARS. Some examples can be found in the research of Lau et al. (2014) and Petkova et al. (2021). Following these authors, we expect to have a better assessment of teamwork ability using the CATME-BARS scale. In all the following hypotheses, we relate different variables with the improvement in teamwork effectiveness by the end of the semester.

In terms of gender, we can find a variety of studies. On the one hand, Konak et al. (2015) found that teamwork self-efficacy did not correlate with gender. On the other hand, Hotapeti et al. (2020) does find differences between men and women in the assessment of teamwork ability. We propose the following hypothesis:

H1.   Being a female student will be positively related to their improvement in teamwork effectiveness by the end of the semester.

Planas-Lladó et al. (2021) showed that effective teamwork is related to higher grades. Petkova et al. (2021) suggested that student's grade aspirations are positively related to the level of improvement in teamwork effectiveness. So, if there were several groups of students in the same course, but with different profiles, we can understand that those groups with better students will obtain a superior improvement in teamwork effectiveness. The second hypothesis is as follows:

H2.   . Belonging to a special group will be positively related to their improvement in teamwork effectiveness by the end of the semester.

In Europe, the Erasmus + Programme was launched some 30 years ago. This Programme helps organise university-level students exchanges within Erasmus + Programme countries. An Erasmus+ grant can be awarded as a contribution to travel and subsistence costs. By studying abroad with Erasmus+, students can improve communication, language and inter-cultural skills and gain soft skills highly valued by future employers. In this context, we want to contrast the following hypothesis:

H3.   Being on an Erasmus + Programme will be positively related to their improvement in teamwork effectiveness by the end of the semester.

If students are working or have worked, they may have developed the teamwork skill during their practice in a real company.

Konak et al. (2015) developed an online survey that measured only the students' self-reported perceptions about their teamwork self-efficacy, attitudes and interest. In this study, teamwork self-efficacy did not correlate with job experience. Instead, the perceptions of other members in the team can be different as they observe a development of this skill thanks to their current or previous job experience. As a conclusion, we propose the fourth hypothesis:

H4. Job experience will be positively related to their improvement in teamwork effectiveness by the end of the semester.

Teamwork and leadership skills are highly interrelated and can be analysed conjointly (Ginting et al., 2020). Kouzes and Posner (2012) state that an efficient leadership contributes to create high-performing teams and enhance motivation and the willingness to work hard. When there is a role model in the team able to inspire others, it will be more plausible that the teammates joined in a shared task. Salas et al. (2005) propose team leadership as one of the key factors to improve teamwork. According to these authors, the leader will influence team effectiveness through his or her ability to set or reinforce performance expectation by way of monitoring and backup behaviour. The research conducted by Planas-Lladó et al. (2018) suggested that student teammates who made an unequal distribution of marks for the global assessment were in fact recognizing that some of them had performed a greater contribution as team leaders. For our research, we hypothesized that those students with a greater self-perception in leaderships will be more likely to improve their teamwork skills. Therefore, the last hypothesis is:

H5. Self-assessment of the leadership practice will be positively related to their improvement in teamwork effectiveness by the end of the semester.

3. Methodology

3.1. Data collection

The present research was carried out in the Marketing Management course component of the Faculty of Business Administration of our university. This subject was taught for two degrees: the Bachelor's degree in Business Administration and the double degree in Business Administration and Telecommunications Engineering. In the former, the subject is taught in the 3rd year, while in the latter it is taught in the 4th. Both courses have the same syllabus. It should be noted that students on the double degree are required to have higher university entrance qualifications. The total number of students enrolled in the course that year was 164, of which 147 (89.6%) belonged to the Business Administration degree and 17 (10.3%) to the double degree. The Business Administration degree has a High Academic Performance (HAP) group to which 41 students belonged (25%). The features of this group are: i) the teaching of several subjects (including the subject of study) is in English; ii) Spanish students are required to have academic records with very high grades; and iii) they have to certify a knowledge of English at B2 level. Therefore, we distinguished among three categories of students regarding class group: those studying the double degree in Engineering, those in the BBA HAP group, and the rest of the BBA students. This latter will be referred in the research as the Spanish BBA, as the teaching language was Spanish.

One of the subject assignments consisted of developing a marketing plan for the launch of a new product or service in a supermarket. This exercise is especially useful from a teaching point of view, as it encourages students to apply the contents explained in class to a specific case. This is a project to be carried out in teams of four students, as it is a challenging assignment for them. It is the longest project undertaken by the students so far in the Bachelor's Degree (it lasts 4 months) and they are required to reflect the business reality as much as possible in every step (Witt et al., 2019). The weekly class schedule was distributed as 4 h of theory and 1 h 15 min of team work to complete the project. During this time, the lecturer was available to answer any questions regarding the preparation of the marketing plan and also conducted periodic reviews of the work done by the different teams. Due to the high level of academic requirements, the students have to work on the marketing plan both in and out of class.

When presenting the subject on the first day of class, the plan for the teamwork skills development was explained. Two working levels were set out. There was a first level of general participation that involved training and assessment. All the students enrolled in the course attended a 1.5-h seminar on teamwork skills. In addition, the students were asked to fill in three surveys: one at 4 weeks after the start of the semester, one in the middle, and the third at the end of the semester. The first survey consisted of a 180° assessment of teamwork effectiveness using the CATME-BARS questionnaire (Ohland et al., 2012). In addition, the initial questionnaire included four sociodemographic items: gender, class group, whether they were an Erasmus student (exchange student), and whether they had job experience. The second survey consisted solely of the SLPI (Kouzes & Posner, 2018) to self-assess leadership skill. The third survey evaluated the CATME-BARS questionnaire, in terms of both the 180° evaluation and self-assessment. At the end of the semester, a personal report was sent for each student. The document included the individual results of the three surveys, so that the evolution during the semester could be tracked. The report was distributed by e-mail.

The second level of participation was intended for students who wished to enhance their teamwork skills. After this intensive plan was explained, the interested students had to apply by submitting their curriculum vitae and a motivation letter. Twenty-five applications were received. After studying the documentation submitted, all the applicants were admitted. The actions with the 25 students selected were of two types. On the one hand, each student had two interviews during the semester with one of the authors. These interviews were intended to contribute to improving teamwork and leadership skills through personalised coaching. The first interview was held after the first survey, so that the results of the CATME-BARS 180° assessment served as the basis to begin the coaching session. The aim was to identify one or two points of improvement and draw up a simple action plan designed to strengthen those points. The second personalised interview took place at the end of the semester. The progress in acquiring the skill was assessed. Finally, the students attended a 10-h course specialising in teamwork ability. The course was designed with a fundamentally practical

methodology and consisted of three sessions. The first included a team activity, which served as the basis to present a series of concepts about the skill. The second session focused on a critical analysis of the film *Remember the Titans* (Yakin, 2000). The instructor selected some scenes to analyse the way to handle the team conflicts. The last session revolved around teamwork skills through discussion of the Harvard Business School Medisys case (Donnellon & Margolis, 2009). This brief case portrayed a real situation where a cross-functional team faced a serious problem when finishing a demanding and difficult project. The course ended with the delivery of a report in which the student had to reflect on a series of questions related to his/her performance in the skill. All the information collected in this process was used for the qualitative analysis. Fig. 1 shows the actions taken during the course, as well as the different instruments and analyses implemented for the research.

3.2. Quantitative variables

To determine the factors that most influenced improvement in teamwork effectiveness, OLS analyses were performed using R software. For this purpose, 2 different types of models were designed (models 1 and 2). The following variables, grouped into three categories, were considered:

a) Variables of improvement in teamwork effectiveness during the marketing course. This improvement is calculated as the difference between variables of teamwork effectiveness at the end of the semester and at 4 weeks after the start of the semester. They were assessed by the other members of the team, using the CATME-BARS scale. The improvement in teamwork effectiveness were the dependent variables of the OLS regressions in both models (1 and 2).
b) Descriptive variables. Gender, class group, international exchange student status (Erasmus student) and job experience at any company were taken into account in models 1 and 2.
c) Self-perceived variables on leadership skills. They were only included in model 2. Leadership was assessed according to the SLPI.

The gender variable was codified in this way: 0 indicated male, and 1 indicated female. The class group was implemented in dummy coding taken the BBA Spanish group as reference. In consequence, we defined two dichotomous variables: HAP group and Engineering group.

In relation to the SLPI, a confirmatory factor analysis was carried out. The standardised loading factors for many of the SLPI indicators were found to be below 0.6. As it is advisable to exceed this threshold value to avoid reliability problems in the measurement (Bagozzi & Yi, 1988), we decided to limit each of the five SLPI leadership practices to only one indicator. This item would act as a proxy variable to assess the corresponding practice. The item that seemed to the authors to fit best with the content of the practice was chosen. This way, for the Model the Way practice, SLPI16 was selected ("I seek to understand how my actions affect other people's performance"); for Inspire a Shared Vision, SLPI27 ("I speak with passion about the higher purpose and meaning of what is being done"); for Challenge the Process, SLPI13 ("I search for innovative ways to improve what is done"); for Enabling Others to Act, SLPI4 ("I Foster cooperative rather than competitive relationships among people I work with"), and for Encourage the Heart, SLPI15 ("I express appreciation for the contribution that people make").

3.3. Qualitative analysis

At the end of the semester, the 25 students who participated in the interviews and in the course were asked to write down those aspects that had been of most value to them. The documents collected were used to carry out a qualitative analysis of these texts. The working protocol established by the grounded theory was followed (Charmaz, 2006; Strauss, 1987). This way, the texts were coded in order to catalogue the emerging themes related to the training received on teamwork ability (Seale, 2010). The analysis revealed
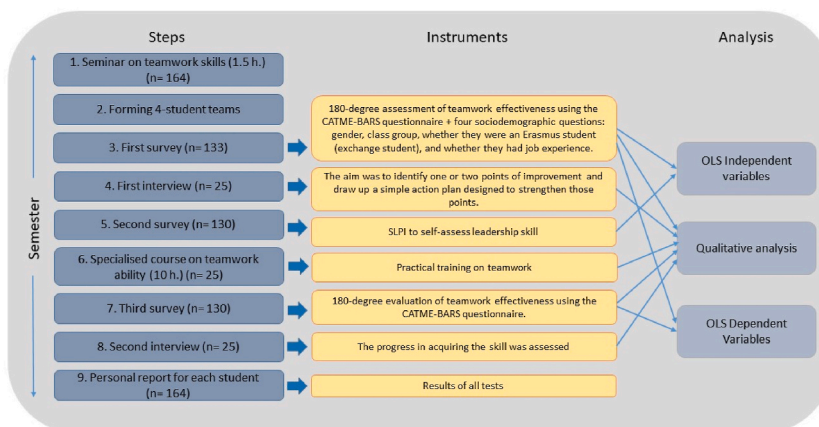

Fig. 1. Research methodology.

several relationships between the categories detected, with which a network of concepts was constructed. This tool helped to further refine the findings of the qualitative analysis (Ryan & Bernard, 2000). The text analysis and the network of concepts were performed with Atlas. ti.

3.4. Sample characteristics

The sample was formed from the data collected in the general measurements carried out during the semester. For a student to be included in the research, there were two requirements. On the one hand, the student had to have completed the three surveys at the beginning, middle and end of the semester. On the other hand, data from the 180° evaluation carried out by at least one of their group mates, both at the beginning (4 weeks after the start of the semester) and at the end of the semester, had to be available. According to these criteria, the sample finally dropped from 164 to 107 students (Fig. 1).

The sample consisted of 49.53% women. Regarding the different class groups, 54.21% attended the BBA in Spanish, 31.78% were part of the HAP group and 14.02% studied the double degree in Business Administration and Telecommunications Engineering. In addition, 42.99% of the sample had job experience and 17.76% were Erasmus students (see Table 1).

4. Results

4.1. Contrast of hypotheses

First, descriptive statistics were obtained for all variables (Table 2). It should be noted that the mean of the "Improvement in IT" (0.15) is the highest of the dependent variables while the mean of the "Improvement in EQ" is the lowest (0.005). The mean of the rest of the dependent variables are 0.12 for "Improvement in KSA", 0.05 for "Improvement in KTT" and 0.04 for "Improvement in CT". When analysing the variables related to leadership obtained by self-assessment, the highest means of all were for "Leadership - EH" (4.34), "Leadership - EOA" (4.19) and "Leadership - MW" (4.03). At the same time, the two remaining variables had the lowest mean of all the variables used. These variables referred to "Leadership - ISV" (3.45) and "Leadership - CP" (3.57). Regarding the standard deviations, they were higher in the scores obtained by leadership compared to the differences calculated to obtain improvement in teamwork effectiveness.

Secondly, ten OLS regression models were carried out, two for each dependent variable. Model 1 included the descriptive variables as covariates, and Model 2 added the self-perceived variables on leadership skills. The results are shown in Table 3. Only two models obtained statistically significant scores in F tests ($p < 0.10$ and $p < 0.05$). The explanatory power of the models (R^2) is 0.104, in the case of Interacting with Teammates model 1, and 0.161 in the case of Keeping the Team on Track model 2. These results provide evidence of the validity of the estimated models. The variance inflation factor scores for all variables in all the models are well below the critical value of 10, so the absence of multicollinearity can be assumed (Aldás & Uriel, 2017).

Thirdly, Table 4 summarises the comparison of all hypotheses. The outcomes didn't establish any differences in terms of gender. Thus, H1 was totally rejected. The Engineering group (Business Administration and Telecommunication Engineering) had the greatest impact on the results. These students performed better than the Spanish reference group in interacting with the rest of the team. So, H2 was partially supported. Being an Erasmus student negatively affected two behaviours: interacting with the rest of the team and keeping the team on track. The results indicate that teammates who worked with an international exchange student perceived a significant tendency for these students to have a low level of interaction and work follow-through. Therefore, H3 was partially rejected. The outcomes did not establish any differences related to job experience (working or having worked). Consequently, H4 was totally rejected. Finally, the self-perception of leadership on improvement in teamwork effectiveness was only significant for keeping the team on track. Specifically, only the practice of inspiring a shared vision positively affected. Thus, H5 was partially supported.

4.2. Qualitative assessment

The qualitative analysis of the texts submitted by the 25 students who participated in the 10-h course identified three sets of responses. The first grouped judgements about the training received; the second covered various aspects of the teamwork ability, and the third included considerations about the importance of personal development to improve this skill. Eighteen out of 25 responses explicitly contained a positive assessment of what they had learned during the project. The satisfaction of expectations and learning about real professional life situations were highlighted:

> I think it has been a very interesting and different course, where we have been able to open our minds to situations that we may encounter tomorrow when trying to work, manage or lead a team. [19] [1]

Another relevant aspect was the positive assessment of the practical activities to enhance learning:

> In my opinion, the things that have given me the most out of this course are the case studies. From the real case of a corporation to the example in the movie, I found it very easy to understand the concepts, in a very entertaining and interesting way. I think I will remember these aspects much more because of the relationship they made with the cases. [10]

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[1] Participants' comments are quoted according to the numbering assigned to each participant.

Table 1
Descriptive statistics.

		Frequency	%
Gender			
	Female	53	49.53
	Male	54	50.47
Class group			
	BBA – Spanish	58	54.21
	BBA – HAP	34	31.78
	BBA – Telecom	15	14.02
Erasmus			
	No	88	82.24
	Yes	19	17.76
Job experience			
	No	61	57.01
	Yes	46	42.99
N		107	

Table 2
Descriptive statistics of the variables.

Variable	N	Mean	St. Dev.	Min	Max
Dependent variables					
Improvement in CT	107	0.04	0.68	−2.50	2.50
Improvement in IT	107	0.15	0.73	−3	2
Improvement in KTT	107	0.05	0.74	−2.50	2.00
Improvement in EQ	107	0.005	0.67	−1.50	2.00
Improvement in KSA	107	0.12	0.68	−2	2
Independent variables					
Gender	107	0.50	0.50	0	1
HAP group	107	0.32	0.47	0	1
Engineering group	107	0.13	0.34	0	1
Erasmus student	107	0.20	0.42	0	1
Job experience	107	0.45	0.52	0	1
Leadership - MW	107	4.03	0.91	2	5
Leadership - ISV	107	3.45	0.97	1	5
Leadership - CP	107	3.57	0.95	1	5
Leadership - EOA	107	4.19	0.79	2	5
Leadership - EH	107	4.34	0.74	2	5

Notes: CT: Contributing to the Team's work (*CATME*); IT: Interacting with Teammates (*CATME*); KTT: Keeping the Team on Track (*CATME*); EQ: Expecting Quality (*CATME*); KSA: relevant Knowledge, Skills, and Abilities (*CATME*); HAP: High Academic Performance; MW: Modelling the Way (*SLPI* item #16); ISV: Inspiring a Shared Vision (*SLPI* item #27); CP: Challenging the Process (*SLPI* item #13); EOA: Enabling Others to Act (*SLPI* item #4); EH: Encouraging the Heart (*SLPI* item #15).

As for the second group of categories, 10 aspects related to teamwork ability were identified. All of them had been dealt with in class, so that the comments reflected a certain degree of assimilation. Among these aspects, the theme of knowing how to work in a team and the desirability of identifying the different character traits of the people in the team stand out.

> I found this activity particularly interesting, because not only were different ways of managing a team presented, but also the importance of the different types of people we have to coordinate was highlighted. And it was this that caught my attention. [7]

> Teamwork is based on psychology, being able to act according to a situation, knowing how to deal with people taking into account their way of being and being able to adapt decisions to the context, improving the efficiency and coexistence of the team in which one is. [15]

Other key aspects for teamwork to be properly enhanced, especially communication, empathy and leadership traits, were also very much present in the students' responses.

> It has made me understand the qualities when working with a team (competent, benevolent, compassionate, psychological security) as these are characteristics that I never took into account because I was more focused on finishing a job as soon as possible than on relating (communicating) with my work team. [5]

Other considerations reflected in the texts were the distribution of tasks to be performed, psychological safety, interpersonal conflict management and purposeful work performance. The comments highlighted the relevance of these aspects for the participants when they must face teamwork in the near future.

Finally, several comments related to the learner's own personal development of this ability were pointed out. If the group of

Table 3
OLS Regression models of the Improvement in the CATME dimensions.

	Dependent Variable:									
	Improvement in CT		Improvement in IT		Improvement in KTT		Improvement in EQ		Improvement in KSA	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Gender (reference = Male)	−0.032	−0.066	−0.040	−0.069	0.012	0.011	−0.011	−0.026	0.105	0.095
Group (reference = Spanish BBA)										
HAP group	0.118	0.138	0.221	0.248	0.246	0.271	0.096	0.115	−0.127	−0.109
Engineering group	0.266	0.219	0.528*	0.475*	0.339	0.231	0.106	0.019	0.101	0.053
Erasmus student	−0.313[+]	−0.234	−0.350[+]	−0.289	−0.486*	−0.433*	−0.288	−0.267	−0.246	−0.211
Job experience	−0.001	−0.013	0.202	0.214	0.059	−0.021	0.078	0.028	0.029	0.020
Leadership - MW		0.162*		0.060		0.151		0.080		0.043
Leadership - ISV		−0.133		−0.036		0.164*		0.077		0.040
Leadership - CP		0.139*		−0.074		0.007		−0.058		−0.068
Leadership - EOA		0.112		0.030		−0.023		−0.132		−0.005
Leadership - EH		−0.166		0.114		−0.019		0.202*		0.089
Constant	0.044	−0.392	0.008	−0.471	−0.006	−0.993*	−0.013	−0.682	0.131	−0.298
Observations	107	107	107	107	107	107	107	107	107	107
R^2	0.047	0.140	0.104	0.134	0.079	0.161	0.030	0.103	0.056	0.076
F Statistic	0.999	1.570	2.350*	1.490	1.730	1.840[+]	0.616	1.100	1.200	0.787

Notes: [+]p<0.10; *p < 0.05.
CT: Contributing to the Team's work (*CATME*); IT: Interacting with Teammates (*CATME*); KTT: Keeping the Team on Track (*CATME*); EQ: Expecting Quality (*CATME*); KSA: relevant Knowledge, Skills, and Abilities (*CATME*); HAP: High Academic Performance; MW: Modelling the Way (*SLPI* item #16); ISV: Inspiring a Shared Vision (*SLPI* item #27); CP: Challenging the Process (*SLPI* item #13); EOA: Enabling Others to Act (*SLPI* item #4); EH: Encouraging the Heart (*SLPI* item #15).

Table 4
Contrast of the hypotheses.

Hypotheses	Results
H1. Female students - Improvement in TW	Totally Rejected
H2. Special group of students – Improvement in TW	Partially Supported
H3. Erasmus students - Improvement in TW	Partially Rejected
H4. Job experience – Improvement in TW	Totally Rejected
H5. Self-assessment SLPI - Improvement in TW	Partially Supported

categories previously analysed reflected the acquisition or assessment of a clearer knowledge of a dimension of the skill, the comments of this group rather underlined the personal awareness of the need to improve this skill. Nine of the 25 participants included such allusions in their responses. Some of these comments revealed the discovery of personal difficulties in teamwork. All of them made a clear connection between personal development in teamwork and the ability to lead others:

> I have learned how important personal development is, learning to manage yourself and to lead yourself in order to be able to manage and lead other people. I would like to highlight the emotional intelligence taught in the course, to know what others expect from you and how you could provoke in others the attitudes you want. [19]

> It has helped me realise small details that go unnoticed but that have a great influence on others, such as the way you speak, the way you say things, knowing how to listen, etc. [14]

The texts also included comments on the personal interviews held during the project. One of the participants reflected how this interview had helped her grow in self-esteem and decide to overcome her shyness:

> I think that, in my particular case, the personal interview before the course was very useful. In it, the teacher showed me the grade given to me by each of the participants of the marketing plan work group. So, this helped me to realise the aspects that I have to improve, as well as aspects in which I perceived myself as inferior to how the others really perceive me, as far as abilities and skills are concerned. This interview was also very useful for me because it made me realise the need to open up to others. I consider myself to be a rather shy person, and they made me realise that in the world of work you mustn't be self-conscious, and that you need to communicate openly for everything to work. [17]

5. Discussion

Universities are making a great effort to include soft skills in their curricula. However, it is not an easy task to provide reliable assessment methods that capture the real level or the achievement improvement. The university where we teach promotes a cross-cutting programme so that every student is helped to develop a series of soft skills among which teamwork and leadership are included. The main goal of this research was to study the teamwork skills assessment based on a series of quantitative variables,

personal interviews, and specific training, while we contributed to the institutional project of our university. Following Kouzes and Posner (2012), we consider that the soft skills are not innate and students can still learn how to work in groups if they are given the right guidelines. As the CATME-BARS scale offers the explanation for every dimension and score, we found it as a good guide for students. The quantitative and qualitative analyses performed in this research provide insights into the factors affecting the improvement in teamwork effectiveness of the students. In this regard, the 180° evaluation has been useful for obtaining information about the development of the skill. The profile of the students is very important. Being an Erasmus student has a negative effect on improvement in teamwork effectiveness. However, belonging to more demanding groups and the self-perception of leadership have a positive effect. We also discovered that gender and job experience have no influence on improvement in teamwork effectiveness. Finally, some students underwent a process of personal maturation thanks to the reflection about this soft skill.

5.1. Use of 180° evaluation

The improvement in teamwork effectiveness dimensions that were significant are related to the enhancement of communication within the team ("Interacting with Teammates") and making sure that teammates are doing appropriate progress ("Keeping the Team on Track"). It should be noted that the highest means of all dependent variables were for "Improvement in IT" (0.15), "Improvement in KSA" (0.12) and "Improvement in KTT" (0.05). In these three dimensions there was more room for improvement and being significant as Petkova et al. (2021) pointed out. However, "Improvement in KSA" is not significant in any model (1 and 2). As a consequence, both significant dimensions prioritise social interdependence over the knowledge, skills and abilities of every member (Stevens & Campion, 1994; Tarricone & Luca, 2002; van Mierlo et al., 2006). These results may reflect the greater emphasis attributed to social relationships among students over teamwork competence, given that in our sample all the participants had had little experience working in teams for long-term academic projects. In this regard, we worked with the improvement of the peer assessment as the dependent variable, as it can be considered a more objective measure (Lau et al., 2014; Loignon et al., 2017; Planas-Lladó et al., 2018).

The only variable related to leadership skill found to be significant is "Inspiring a Shared Vision" in the dimension "Keeping the Team on Track". The relationship is positive. So, to make sure that teammates are doing appropriate progress is necessary to enlist others in a common vision by appealing to shared aspirations (Kouzes & Posner, 2018). In other words, to envision the future by imagining exciting and ennobling possibilities contributes to monitor team's progress and give teammates specific and constructive feedback. As Planas-Lladó et al. (2021) point out, there are differences, as teamwork ability is acquired by students whether there is a clear leader in the group or not. Salas et al. (2005) also highlighted leadership as one of the five most important core components of teamwork. However, leadership could be measured by peer assessment as well, to better reflect the team reality. How to develop and assess this competency is also a key question for students studying for the degree in Business Administration (Flanagan & Palmer, 2021).

5.2. Profile of the students

The student profile was proved critical in our results. The fact that differences were found between groups seems to be related to the composition of the groups rather than to a lack of coordination between lecturers (Tan & Vicente, 2019). In fact, the Business Administration and Telecommunications Engineering double degree group was much smaller than the reference and HAP groups (15 students compared to 58 and 34, respectively) (Aggarwal & O'Brien, 2008) and the students are required to have better grades. The double degree group might stand out in "Interacting with Teammates" as it was the smallest group and perhaps also because it was the first promotion. It should be noted that the work plan, the objectives and the questionnaires to be completed were clearly explained to all the groups using the same material (Carson & Glaser, 2010; Planas-Lladó et al., 2018).

One of the problems widely experienced in teamwork is free riding (Maiden & Perry, 2011). In our case, the free-rider problem was detected in the Erasmus students, as it negatively affected "Interacting with teammates" and "Keeping the team on track". In other words, the students were not very interested in interacting with each other, could not pay attention to teammates' progress and also avoided discussing team problems. While it is true that the national culture influences the perception of teamwork (Li et al., 2014; Matsunaga et al., 2020), these students may also have other goals in addition to academic study. This issue is usually resolved by giving the students the opportunity to form the teams themselves (Aggarwal & O'Brien, 2008), or else for one of the team members to act as team leader to be able to pressure the free-riders (Saghafian & O'Neill, 2018).

In addition to this, Lo Prete et al. (2021) suggested that students culturally aggregated in teams perform better than students differently aggregated. In our study, the HAP group had the largest number of Erasmus students. Precisely in this group, it was the lecturer who organised the working teams for the marketing plans. The aim was to oblige Spanish students to speak English if they had at least one Erasmus student in the working team. Although students gave themselves high scores on the leadership variables, it seems to have been difficult to deal with the less hard-working Erasmus students. This behaviour of Erasmus students was also confirmed during the personal interviews. Although the HAP group had the highest number of Erasmus students, it has not been penalised in any dimension of effectiveness in teamwork. This may be due to the specific characteristics of the Spanish students in this group, as they are required to have a high academic record and are more cohesive (Urionabarrenetxea et al., 2021).

5.3. Personal development of the teamwork ability

Following the recommendation to provide activities to strengthen the teams (Tan & Vicente, 2019), the qualitative analysis highlighted the importance of being able to integrate personal improvement plans, group dynamics and participatory lessons into the

learning process. If the assignment in teamwork had been longer, students would have been able to better develop the different dimensions of teamwork effectiveness, in particular those related to team interaction and communication (Ginting et al., 2020; McGrath et al., 2000). Even so, the qualitative analysis revealed that a large group of participants became aware of the need to develop this skill. The proximity of the leap into the working world made them appreciate this need for training more.

During the personal interviews, some of the students were able to compare the high scores they had given themselves through self-assessment compared to the low scores given to them by their colleagues in the peer assessment, as happens in other studies (Sridharan et al., 2019). Another important issue that was discussed during the personal interviews was the reason for applying to be part of this group. Some of them pointed out that they were shy and needed help to develop teamwork ability (Takahashi & Saito, 2013). The use of the CATME-BARS scale guided them in doing so. As a result, students underwent a process of personal maturation to improve each of the dimensions of teamwork effectiveness throughout the semester and also acquired a vocabulary and a certain analytical capacity to face the challenges of teamwork with greater confidence (Anson & Goodman, 2014; Wilson et al., 2018).

6. Limitations and concluding remarks

In this research, we develop a 180° evaluation process for teamwork skills in students on the BBA course at our university, based on the CATME-BARS scale. The double aim of the study is: i) to find out the factors affecting the improvement of each dimension of teamwork effectiveness evaluated by peer assessment at the beginning and at end of the course; ii) testing the effect of the project to enhance teamwork skill among students. Our study has both limitations and strengths. One limitation is the validity of our results as we analyse a reduced sample in a specific marketing course. Our findings are not intended to be generalised. In addition to the small sample, we are aware that most teams were not randomly formed. Students gathered by themselves, except for the HAP group. This fact conditions the results, as it introduced a bias of social affinity. Another constraint is related to the academic assignment. The students had to handle several subjects during the semester, and it makes it difficult to focus on one project. Probably in a project-based methodology, where all the subjects are interrelated for working on a single project, teamwork assessment can provide results that are more reliable.

Among the strengths of our research, we consider that conducting the skills development project integrated in the usual course of academic performance provides an added value to class attendance. It is a way of enhancing soft skills, especially when some kind of training is offered. Furthermore, comparing different student profiles (national-international or BBA-Double Degree) has proven to be useful to achieve insights about the different performance of this kind of students. The use of CATME-BARS scale and SLPI was appropriate as showed the students the steps to understand and develop teamwork and leadership skills. The assessments proposed in this research can provide value for those instructors who want to help their students enhance their teamwork ability.

Future research could include several lines. First, we could investigate the same groups of students in the different years of the BBA. This would require coordinating the research with several lecturers in different courses (marketing, accountability, financing, economics …). Second, we could compare students from different Bachelor's Degrees at our university. This way, we could have a larger sample and obtain conclusions depending on the kind of studies and the students' background. Third, we could test other hypotheses or variables. Finally, we could compare the students' scores to those from another culture. In other words, we could compare the scores obtained by Spanish and Erasmus students to check if there are significant differences.

The research carried out highlights the importance of teamwork ability in university students, especially those studying for the BBA. Regardless of whether or not they have experience in peer and self-assessment processes (Fellenz, 2006), use of both can help them develop this skill. This study contributes to the application of the institutional soft skills programme implemented in our university in all degree courses, both at undergraduate and Master's level. In this way, this assessment process can help students to develop their soft skills and help instructors conduct a reliable training on these abilities.

Declaration of competing interest

The authors confirm that there are no relevant financial or non-financial competing interests to report.

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