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The Mutual Assessment System in Teamwork: The Value of the Individual Grade

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Teaching-learning based on cooperative learning is grounded on a methodology that is currently one of the most widely used within formal education classrooms. Recently, special attention has begun to be paid to a fundamentally relevant aspect of the assessment of the learning of university students within their group performance: their individual grades obtained from teamwork. In addition to describing the individual grading system that is used to assess individual contributions, this study analyses the perceptions of 99 university students regarding the benefits that the system has for students' learning process. A system of evaluation based on self-assessment, co-assessment and peer-assessment was implemented in a Spanish university. The results collected using a specially designed questionnaire led to the conclusion that improvements were achieved in the teaching-learning process, in manifesting positive attitudes and in improving students' ability to learn to learn. In conclusion, students feel that they are granted greater control over their final grade and, as a result, perceive that their involvement in the task increases and their capacity for self-criticism develops.

Introduction

Cooperative learning is an active methodology that is being used on a more regular basis in university classrooms to assess students when they work in teams. This is thought to be occurring in response to the demands of the European Higher Education Area (Barton, Bruce, & Schreiber, 2018; Seric & Pranicevic, 2018). Over the last few years the ability to work effectively within a team setting has become one of the most important competences in the training process at each level of education (Putpuek & Kiattikomol, 2017; Puzio & Colby, 2013). It is considered to be a widely transferable and useful skill both in the process of learning and in employment.

Education in the twenty-first century is making more frequent use of collaborative and cooperative teaching methods, centred on students' proactive

involvement in activities. Modern day education faces challenges that cooperative learning methods are best suited to tackle (Buchs, Gilles, Antonietti & Butera, 2016; Davidson, Major, & Michaelsen, 2014; González & Díaz, 2005; Herrmann, 2013; Masran & Azizi, 2018). Students at university frequently carry out teamwork, which aims to help them develop skills such as communication, dissemination of information, working effectively with a variety of different personalities, allocating tasks and responsibilities, and working together with others in a tight timeframe to produce work of value (Kolb & Kolb, 2005; León, Felipe, Mendo, & Iglesias, 2015).

The consensus on cooperative methodologies is that they make people rethink the difficulties of recognizing the contribution, involvement and learning achieved by individual members of a team in a group project (Cebrián, Serrano, & Ruiz, 2014). What

is traditionally called *collaborative evaluation* (Blanco, 2009) or *shared evaluation* is subject to a certain amount of criticism concerning aspects such as the difficulties in monitoring (evaluating) the abilities acquired by individual team members. Given that this cooperative learning methodology is usually implemented in team-based projects that make up a large percentage of the final grade for the individual students, a number of doubts arise regarding certain aspects of this way of teaching and grading. The following questions lead us to reflect on the best way to assess teamwork:

- Is it fair that all the students in a team receive the same final grade?
- Is the level of effort and involvement the same for each member?
- Is it necessary to recognise individuality in teamwork?

Background Literature

Since the first academic publications that included this concept, cooperative learning has been understood as the instructional use of small groups of students who work together to maximize their own learning and that of others (Johnson, Johnson, & Holubec, 2013). Achievement of goals by team members is positively correlated with these cooperative learning structures. Consequently, the participants understand that they will only achieve the proposed goals if the other team members also achieve them (Johnson & Johnson, 2014). Therefore, individual responsibility constitutes one of the fundamental elements of the functioning of work teams (Johnson & Johnson, 1989). Each member takes responsibility for completing their share of the task and also for helping others to achieve the common goal.

As shown by Brown and Glasner (2003) and Cebrián et al. (2014), one of the fundamental principles that define a mode of collaborative (or cooperative) assessment consists in getting every member of a learning team to actively participate. In certain instances where this process has been carried out, for example, in the study by Altun (2015), positive results were achieved in students' learning when they engaged in written or verbal reflection because those who received feedback had the possibility of discovering the areas in which they could start to make improvements.

An analysis of the situation from the specific and situational context of the university classroom shows that students are not completely in favour of having their coursework evaluated by group grading systems. They occasionally express concerns about the difficulties involved in working as a team and how it does not allow for the assessment of individual contributions. One of these difficulties is a perceived lack of control over the group assessment, an aspect that leads to disinterest and a lack of motivation when it comes to students taking responsibility for their personal contributions (Sridharan, Muttakin, & Mihret, 2018). This factor often determines the quality of teamwork and hinders the development of professional and personal skills. When this type of cooperative learning makes up a large part of the assessment process, it becomes necessary to design systems capable of differentiating between the contributions that each team member makes to the assignments.

In the international context, a number of pilot projects involving differentiated assessment have been carried out in university classrooms in order to analyse the individual contribution that each member of a cooperative learning team makes to the learning process as a whole. In fact, noteworthy authors in the field, such as Gueldenzoph and May (2002) and Ohland et al. (2012), claimed that from the lecturer's point of view, self-assessment and peer-assessment are extremely useful tools for managing teamwork in the classroom as a way to create better learning experiences.

An example of this is presented in Tsay and Brady's study (2010), which was carried out at a university in the city of Boston. In addition to implementing learning structures that follow the cooperative learning methodology in the classroom, a peer-assessment system was also established. Following an explanation of this innovation by the lecturer, students were asked to give a qualitative assessment of the way in which each member of the team, including themselves, had contributed to their final course project. From the results of the respective statistical analyses, the authors concluded that there was a positive and significant relationship between students' participation and contribution to their cooperative work team and the subsequent peer-assessment that was carried out. Similarly, other recent

studies in which peer-assessment was used, conducted by Sridharan et al. (2008), demonstrated how communication skills among members of cooperative teams improved, as did the quality of their individual contributions.

Oakley, Felder, Brent and Elhajj (2004) also offered a valuable tool for carrying out assessment among members of the same learning team, which includes assessing themselves, while it can also be used to help them improve their experience of working as a group. The fundamental purpose of the rubric created by the authors of this study is to determine which members of the team have been active and cooperative and which of them have participated the least. The evaluation form names each of the six attributes that define a good contribution to a team project (covering aspects such as team meetings, effort made, responsibilities taken on, contributions, consideration and respect for the opinions of others, and cooperative ability). This assessment system was designed in such a way that, once the students have completed the rubric, they can go back to their team and discuss the results for each member. As an alternative to this mode of peer-assessment in team-based learning, authors such as McGourty and De Meuse (2001) proposed that students fill in the forms anonymously and share them through an online service. Amongst other arguments in its favour, this is said to be a more favourable procedure because students would be more likely to express their true opinions about the contributions made by their teammates if granted anonymity.

The pilot projects outlined above are grounded on a system of cooperative work among students in a team that is based upon a structure that relies on interdependence. In this regard, and concerning the way in which rewards are distributed, León del Barco (2002, p.15) understood this structure as referring to a 'way of distributing reinforcements and incentives among group members. Therefore, under an interdependent work structure, achievement incentives are awarded according to the individual learning of each member of the team. Yet, how are they to be quantified in numerical terms? This is, without doubt, one of the essential areas conditioning the implementation of the individualized assessment of teamwork.

Objectives

To date, a large number of studies have explored the benefits and favourable implications that cooperative learning has for many different academic and personal variables. However, differentiating the individual contributions that each member of the cooperative teams makes to the common tasks to be carried out by the team is of considerable relevance to be able to recognize their individual effort and responsibility. In fact, identifying the individual responsibility and degree of involvement of each group member is one of the most challenging tasks faced by lecturers who apply the cooperative learning methodology in their classrooms.

The aim of this study is therefore to describe a specific pilot project carried out in the university setting, in which three modes of assessment (hetero-assessment, self-assessment and peer-assessment) were put into practice in order to determine each student's contribution to their team. In a second phase, and after conducting the experiment, an empirical study was carried out with the aim of analysing the (favourable or unfavourable) perceptions of the university students involved in this study as regards individualized assessment framed within a team.

Description of the Pilot Project

From the foregoing, it is clear that the practice of assessment and the need to improve the method of understanding and implementing these assessment processes in a university setting is of undeniable importance. Thus, this article now goes on to describe a pilot project carried out by a group of lecturers who teach at a Spanish university in one of the compulsory subjects programmed for the first year of the Bachelor's Degree in Primary Education. These lecturers have been implementing cooperative learning methodologies in the university classroom and reflecting on the best way to evaluate this methodology for several years. Therefore, the pilot project presented in this study arose from their intention to find an answer to the following question: how do you carry out an individual assessment of members of a team so that their final grade reflects the different individual contributions made by each member?

Prior to the implementation of the mutual assessment pilot project, four principal objectives were established: 1) First, to identify and recognize the effort and individual contributions made by each team member to the work carried out by the group as a whole. 2) At the same time, to encourage the team to achieve shared results under the slogan *no individual is better than everyone together*. 3) From the motivational perspective, stimulating the interest of each student so that they would perform well in their personal contributions to the team, i.e., *team joint responsibility*, was established as an essential objective. 4) In view of the format of this type of assessment, the last objective focuses on carrying out a fair assessment by establishing a relationship between self-assessment, peer-assessment and hetero-assessment.

In the course in which this educational action takes place, the work carried out in the randomly assigned teams accounts for 50% of the final grade. It is therefore clear how important this is to students. In response to this problem, a system of mutual assessment among team members (self-assessment and peer-assessment) was designed. This system makes it possible to calculate the weight (or value, translated into numerical terms) of the individual's contribution to the task. The individual grade of each student is determined by multiplying this result by the grade given by the lecturer (hetero-assessment).

Within the mutual-assessment system, students carry out their own self-assessment and peer-assessment using the criteria set out in a specially designed rubric. Broadly speaking, following the work of Oakley et al. (2004), the criteria are specified in the following terms: commitment, responsibility, contribution, collaboration and respect. More specifically, self-assessment offers the results regarding the extent to which the student considers they have fulfilled each of the criteria stated in the rubric. Peer-assessment, which is based upon the need for student participation in the assessment process, gives students the opportunity to take part in designing and applying the assessment without the lecturer losing the necessary control over the evaluation of the student (Han, 2016; Lee & Lim, 2012). In this sense, as asserted by authors such as Sadler (2010), student participation in peer-reviews should be a central component in the design of university courses.

This mode of assessment was applied in accordance with the following formula: $grade = product \times process$. In addition, the guidelines proposed by Morales Vallejo (2008) were used to sequence each of the steps that students should follow. In the first stage, the lecturer assesses and grades the task (the product or learning outcome obtained), which would represent the process of hetero-assessment. Secondly, the team members assess each other through peer-assessment and, lastly, they assess themselves and their contribution to the assignment through self-assessment. To do so, they used a rubric specially designed for this purpose, which was given to each student at the beginning of the semester (see Appendix 1). The rubric is educational and provides the students with feedback, thus allowing them to continuously adjust to the learning process, so that they can achieve their proposed goals (Dunn & Mulvenon, 2009). From this peer-assessment and self-assessment, each student obtains a total grade, which is the sum of all the evaluations received. This grade is then divided by the average grade awarded to the group by the lecturer and an individual coefficient is thus obtained. Lastly, the individual grade is obtained by multiplying the grade that the lecturer has awarded for the task by this individual coefficient.

The procedure itself has its advantages because applying this method of assessment makes it possible to develop, among other aspects, the ability to learn to learn in a group of students. The skills practised in the self-assessment and peer-assessment process are of fundamental importance in encouraging permanent learning and in the development of individuals with the capacity to work autonomously (Sambell & McDowell, 1998). In addition, as members of a team, the students have the chance to develop their observational skills, since they are required to evaluate their teammates' contributions. The benefits reported by lecturers are also evident, since they use peer-assessment to encourage their students to take responsibility for the performance of their team and to increase their motivation towards their learning process (Ohland et al., 2012).

Once the assessment pilot project had been designed and implemented, the development of the second part of the study began. This second stage was focused on empirical research, in which the aim was to gain a deeper understanding of the students'

perceptions regarding the system of individual grading within the context of work carried out by cooperative learning teams.

Method

Participants

The sample was made up of first-year teaching students from a Spanish university. Non-probability sampling was used because of causal or accidental accessibility and therefore a convenience sample was employed. All the students attending one of the last theoretical sessions of the course were included. Ninety-nine valid responses to the questionnaire were obtained from the total of 127 students participating in the pilot project. The difference between the two figures was due to the fact that in some cases students failed to fill in part of the questionnaire and were excluded. Participants were between 18 and 25 years of age. Of the 99 university students, 62% were female and 38% were male.

Instrument

In order to achieve the objectives of the study, data collection was carried out using a questionnaire developed ad hoc for the study. The authors of the research initially formulated the items based on a previous literature review. An external review of the items was conducted by four experts and three university students. A series of modifications were then made to the questionnaire, which resulted in a reduction in the total number of questions and some slight variations in their wording. The final version of the questionnaire consisted of 13 items. A Likert scale was used for measurement, with four response options that ranged from “completely disagree” (1) to “completely agree” (4). The reliability of the responses was calculated using Cronbach’s alpha, the result being a score of 0.80.

Procedure

Towards the end of one of the sessions of the course included in the study, the students were provided with a link to the online version of the questionnaire and were given 8–12 minutes to complete it. Before starting to answer the questionnaire, the students were instructed on how to complete it and they were told that its purpose was for

use in a research study linked to the method of assessment of cooperative work upon which their course had been based. Their participation in the study was entirely optional, they were encouraged to respond to the questions as truthfully as possible and they were assured that their responses would remain anonymous.

After collecting the data, they were submitted to a statistical analysis, using the IBM SPSS Statistics 22.0 software package, in accordance with the objectives of the study and the type of data obtained. The data analysis techniques used were predominantly descriptive. On the one hand, the relative frequencies of each response, the central tendency (the mean) of the descriptive statistics and the dispersion (standard deviations) were calculated. On the other hand, a cross-reference table with two columns was prepared. These were used to differentiate the percentages of favourable and unfavourable responses for each of the indicators in the questionnaire.

Results

First, the highest degree of agreement was found on the need to carry out a self-assessment (3.57), a peer-assessment of the contributions of each team member (3.50) and an individual assessment of the contribution made by each person to the joint work (3.52). Similarly, there was also a high level of agreement on the perception of the rubric as an element that facilitates self-assessment and peer-assessment (3.48) and the evaluation of peers without allowing friendship to interfere in the process (3.46). In contrast, the lowest level of agreement among students was detected in the increased motivation that this assessment system generated in them (2.97) and in the increase in the level of commitment to their own learning (2.92).

Conversely, the highest degree of dispersion was detected in each student’s perceived obligation to commit themselves to the task they were responsible for carrying out within a work team ($SD = 0.86$). Opinions also varied considerably with regard to the preference for having an individual assessment system ($SD = 0.80$). The lowest degree of dispersion in the students’ opinions was seen in exactly the same questions for which there tended to be greater agreement in the mean scores (the need to carry out an

individual assessment, $SD = 0.54$; the need to self-assess individual effort, $SD = 0.50$; and, lastly, the need to co-assess work within a team, $SD = 0.54$).

In parallel, the results expressed in Table 2 can also be highlighted. From the point of view of this sample of first-year university students, the distribution observed in most of the questions leans towards agreement with the content. In other words, they consider it necessary to differentiate the Individual Grades (I.G.) of each group member because not everyone contributes in a similar way or makes the same effort. Apart from a small percentage, the

majority of the students stated that the individual grading system allowed them to be aware of the personal contributions that each member made to the teamwork (96%) and required them to be brave and honest when evaluating the work of the others (96%). However, there is no such categorical agreement on other questions about the perceived objectivity of the system (85%), whether this mode of assessment is preferred over another that does not differentiate between individual contributions (72%) and whether individual grading improves the work done by each team member (69%).

Table 1. Descriptive statistics: Means and SD

	Mean	SD
Item 1. Teamwork needs to be graded on an individual basis.	3.52	.542
Item 2. When working in a team not all members work equally and it is only fair to give individual grades.	3.24	.693
Item 3. Self-assessment is a necessary part of teamwork.	3.57	.497
Item 4. Peer-assessment is a necessary part of teamwork.	3.50	.543
Item 5. Receiving an individual grade for working in a team has been more motivating for me.	2.97	.783
Item 6. Receiving an individual grade has made me more committed to my team.	2.92	.862
Item 7. With individual grading, the work of each team member is valued.	3.22	.652
Item 8. I prefer an individual grading system as part of teamwork over assessment that does not differentiate between the contributions made by each member.	3.03	.797
Item 9. Individual grading allows teammates' work to be assessed objectively.	3.10	.714
Item 10. The rubric has helped me with the self-assessment and peer-assessment of our teamwork.	3.48	.579
Item 11. I have been able to assess my teammates without it interfering with our friendship.	3.46	.678
Item 12. Individual grading makes me aware of my own personal contributions to the team.	3.39	.569
Item 13. This grading system requires me to be brave and honest when I am grading my teammates.	3.39	.668

Scale from 1 to 4.

Table 2. Descriptive statistics: Frequencies

	Completely agree (N)	%	Agree (N)	%	Disagree (N)	%	Completely disagree (N)	%
Item 1. I.G. is necessary	51	52.6	44	45.4	2	2.1	0	0
Item 2. I.G. is fair	37	38.1	48	49.5	11	11.3	1	1
Item 3. Self-assessment is necessary	55	56.7	41	42.3	0	0	0	0
Item 4. Peer-assessment is necessary	50	51.5	44	45.4	2	2.1	0	0
Item 5. Greater motivation	28	28.9	38	39.2	31	32	0	0
Item 6. Greater commitment	27	27.8	40	41.2	25	25.8	5	5.2
Item 7. Contributions assessed	31	32	57	58.8	6	6.2	2	2.1
Item 8. Prefer I.G.	31	32	39	40.2	26	26.8	1	1
Item 9. Assessment objectivity	27	27.8	56	57.7	11	11.3	3	3.1
Item 10. Accessibility of rubric	51	52.6	42	43.4	4	4.1	0	0
Item 11. No interference with friendships	53	54.6	38	39.2	4	4.1	2	2.1
Item 12. Awareness of contributions	42	43.3	51	52.6	4	4.1	0	0
Item 13. Bravery and honesty	44	45.4	49	50.5	1	1	3	3.1

Table 3. Descriptive statistics: cross-reference table with favourable/ unfavourable responses

	Favourable responses (%)	Unfavourable responses (%)
Item 1. I.G. is necessary	98	2
Item 2. I.G. is fair	87.6	12.3
Item 3. Self-assessment is necessary	99	0
Item 4. Peer-assessment is necessary	96.9	2.1
Item 5. Greater motivation	68.1	32
Item 6. Greater commitment	69	31
Item 7. Contributions assessed	90.8	8.3
Item 8. Prefer I.G.	72.2	27.8
Item 9. Assessment objectivity	85.5	14.4
Item 10. Accessibility of rubric	96	4.1
Item 11. No interference with friendships	93.8	6.2
Item 12. Awareness of contributions	56.9	4.1
Item 13. Bravery and honesty	95.9	4.1

Discussion and Conclusions

In addition to presenting the description of a pilot project involving mutual assessment in cooperative learning teamwork in a university class, the aim of this study was to analyse, in statistical terms, the students' perceptions regarding the benefits of this assessment system. Broadly speaking, the impact of this mutual assessment system is evident on three different levels: in the teaching–learning process, in the manifestation of positive attitudes, and in the development of the students' ability to learn to learn.

The progress detected in the teaching–learning process is reflected in the perception of the individual effort that each team member puts into the personal contributions that they have made towards the group project and their joint responsibility. By acknowledging each other as individuals, team members feel that they have greater control over their final grade and, consequently, their involvement in the task increases. This aspect is further underpinned by the results of the research carried out by authors such as Demir (2018). Moreover, the fact that they must assess both their involvement in and their dedication to the work contributes to the development of their capacity for self-criticism, which leads them to introduce continuous improvements in their learning process. In this respect, the results of studies such as the one by Cavas, Chicano, Luna and Molina (2010) demonstrated that the use of self-assessment and peer-assessment techniques as tools to facilitate learning and to stimulate the knowledge, skills and abilities listed in the framework of the European Higher Education Area are well accepted by students.

Secondly, regarding the improvements made in motivation and the manifestation of positive attitudes, a point that should be highlighted is the noticeable increase in the active involvement of students and their commitment to their work team. This supports the findings of the study by Ohland et al. (2012). Authors such as Cadavid and Parra (2010) also drew the same conclusions in their studies of school-age children. Group members comprehend that all the other members of their group are as responsible for the contributions to the group assignments as they are. Additionally, they accept that their involvement in the tasks entails individual consequences for their grades and therefore understand that their commitment should increase because of this. As concluded in the

study by Yuan and Kim (2017), offering students a predetermined structure based upon peer- and self-assessment allows them to get more involved in the process at a behavioural as well as an emotional level.

Finally, the perceptions of the students analysed in this study show that progress is made in reinforcing the ability to learn to learn. This phenomenon is supported by diverse studies such as those by Sambell and McDowell (1998) and Hwang, Hung and Chen (2014), which showed that students are capable of developing more effective learning strategies. This ability comes mainly from the individual responsibility of the students and their ability to assess themselves and their peers independently. An example of this is seen in the high percentage of students who indicate that, as a result of individual grading in teamwork, they have become more aware of their personal contributions, which in turn has helped them in the processes of self-regulation and personal development. Rodríguez and Hernandez (2012) also came to the conclusion that offering students a greater role in their own assessment process is an essential requirement for sustaining an assessment model based upon self-regulated learning.

This assessment methodology immersed in a particular teaching–learning process enables young university students see their learning content from a social perspective rather than in an isolated way (León et al., 2015; Mendo, León, Felipe, Polo, & Iglesias, 2018). It also allows them to feel like active members of a team in which they have individual as well as group responsibilities. In studies such as the one conducted by Wancek et al. (2014), in which the effectiveness of team-based learning is put to the test with secondary school students, it is clear that students have the opportunity to consider their own thoughts and those of their teammates. Consequently, they achieve a greater understanding of the content of their learning. In addition, studies such as those carried out by Persons (1998), Ginsburg-Block, Rohrbeck and Fantuzzo (2006) and McMaster, Fuchs and Fuchs (2006) showed a positive correlation between academic achievement and peer-learning.

Having a mutual evaluation instrument that includes peer-assessment and self-assessment is very useful for students' learning. Specifically, it offers them the chance to learn those behaviours that are important to achieve a good general performance within a cooperative work team. Other studies (Anson &

Goodman, 2014; Lee & Lim, 2012; Sridharan et al., 2018) that have implemented similar systems of peer-assessment have demonstrated that the system fostered authentic learning. Authors such as Lee, Kim and Byun (2015) recommended using this strategy in the process of fostering student support and encouragement, especially in higher education, so that students can develop their social skills.

Ultimately, when students work together and are offered the possibility of differentiating between their individual grades, the results translate to obvious improvements in their self-esteem and social skills through the establishment of interactive relationships, mutual support, and taking into consideration the perspectives and opinions of others (Buchs & Butera, 2015; Johnson & Johnson, 1999; Mendo et al., 2018). It should be noted that there is no single teaching-learning or assessment method to achieve the best academic results at university. Rather, it is the duty of each lecturer to adapt their teaching methods to different situations, to the characteristics of their group of students and to the way that their students learn (García & González, 2013).

Even though the findings positively support the implementation of peer-assessment processes in cooperative university work, the possible biases that are detected when students must evaluate their teammates and are aware that this process could affect the summative assessment of the course should be taken into consideration, as demonstrated by the results of the recent study conducted by Sridharan, Tai and Boud (2018). Different authors (Bloxham, den-Outer, Hudson, & Prince, 2016; Tai, Ajjawi, Boud, Dawson, & Panadero, 2018) have therefore recommended training students beforehand so that they can carry out adequate peer-assessments. To do so, they should be provided with detailed assessment rubrics that contain objective criteria as well as being given explicit examples of work in which the correct assessment format has been used and applied to specific contexts.

Research projects such as this one are of the utmost importance in the field of educational research, and their application to any other domain is not only feasible but also absolutely necessary. An equitable evaluation of the different contributions made by the members of the same team to joint success has been shown to improve students' motivation, as also

evidenced in this study. In turn, students consider that this type of evaluation is fairer for all the team members. The contributions of this research become all the more valuable because if effective peer-assessment, hetero-assessment and self-assessment processes can be deployed in the university classroom, the influence of cooperative interaction among students could be much greater.

Regarding the limitations of the study, the pilot project described here has focused on a specific group of university students. Therefore, it was not possible to compare the results obtained here with those from other samples. In addition, and following the results of different studies (Furman & Robinson, 2003; Hanh, 2016), an interesting avenue of research could be opened up for future studies involving the analysis of the particular factors that influence students' perception as they perform peer-assessments. Such a line of study is warranted by the fact that there are still doubts about the criteria to be used to evaluate their teammates.

References

- Altun, S. (2015). The effect of cooperative learning on students' achievement and views on the science and technology course. *International Electronic Journal of Elementary Education*, 7(3), 451-468.
- Anson, R., & Goodman, J.A. (2014). A peer assessment system to improve student team experiences. *Journal of Education for Business*, 89(1), 27-34.
- Barton, G., Bruce, A., & Schreiber, R. (2018). Teaching nurses teamwork: integrative review of competency-based team training in nursing education. *Nurse Education in Practice*, 32, 129-137.
- Blanco, A. (2009). *Desarrollo y evaluación de competencias en educación superior*. Madrid: Narcea.
- Bloxham, S., den-Outer, B., Hudson, J., & Price, M. (2016). Let's stop the pretence of consistent marking: Exploring the multiple limitations of assessment criteria. *Assessment & Evaluation in Higher Education*, 41(3), 466-481.
- Brown, S., & Glasner, A. (2003). *Evaluar en la Universidad*. Madrid: Narcea.

Toledo et al., The Mutual Assessment System in Teamwork

- Buchs, C., & Butera, F. (2015). Cooperative learning and social skills development. In R. Gillies (Ed.), *Collaborative Learning: Developments in Research and Practice* (pp. 201-217). New York: Nova Science).
- Buchs, C., Gilles, I., Antonietti, J., & Butera, F. (2016). Why students need to be prepared to cooperate: A cooperative nudge in statistics learning at university. *Educational Psychology, 36*(5), 956-974.
- Cabrera, A.F., Crissman, J.L., Bernal, E.M., Nora, A., Terenzini, P.T., & Pascarella, E.T. (2002). Collaborative learning: its impact on college students' development and diversity. *Journal of College Student Development, 43*(1), 20-34.
- Cadavid, A., & Parra, J. (2010). La autorregulación de los errores en las evaluaciones escritas de niños y niñas en la ciudad de Manizales. *Revista Plumilla Educativa, 7*, 129-144.
- Cavas, M., Chicano, J.F., Luna, F., & Molina, L. (2010). *La autoevaluación y la coevaluación como herramientas para la evaluación continua y la evaluación formativa en el marco del Espacio Europeo de Educación Superior*. Paper presented at IV Jornadas de Innovación Educativa y Enseñanza Virtual. Málaga: Universidad de Málaga.
- Cebrián, M., Serrano, J., & Ruiz, M. (2014). Las e-Rúbricas en la evaluación cooperativa del aprendizaje en la universidad. *Revista Comunicar, 22*(43), 153-161.
- Davidson, N., Major, C.H., & Michaelsen, L.K. (2014). Small-group learning in higher education – cooperative, collaborative, problem-based, and team-based learning: an introduction by the guest editor. *Journal on Excellence in College Teaching, 25*(3&4), 1-6.
- Demir, M. (2018). Using online peer assessment in an instructional technology and material design course through social media. *Higher Education, 75*(3), 399-414.
- Dunn, K.E., y Mulvenon, S.W. (2009). A critical review of research on formative assessment: The limited scientific evidence of the impact of formative assessment in education. *Practical Assessment, Research & Evaluation, 14*(7), 1-11.
- Furman, B., & Robinson, W. (2003). *Improving engineering report writing with Calibrated Peer Review*. Paper presented at the 33rd Annual Frontiers in Education Conference. NJ: IEEE Digital Library.
- García, M.R., & González, N. (2013). El aprendizaje cooperativo en la universidad. Valoración de los estudiantes respecto a su potencialidad para desarrollar competencias. *Revista Iberoamericana para la Investigación y el Desarrollo Educativo, 3*(5), 106-128.
- Ginsburg-Block, M.D., Rohrbeck, C.A., & Fantuzzo, J.W. (2006). A meta-analytic review of social, self-concept, and behavioral outcomes of peer-assisted learning. *Journal of Educational Psychology, 98*(4), 732-749.
- González, G., & Díaz, L. (2005). Aprendizaje colaborativo: una experiencia desde las aulas universitarias. *Educación y educadores, 8*, 21-44.
- Gueldenzoph, L.E., & May, G.L. (2002). Collaborative peer evaluation: Best practices for group member assessments. *Business Communication Quarterly, 65*(1), 9-20.
- Han, S.I. (2016). Analysis of peer evaluation essay in problem-based learning. *Journal of Advances in Education Research, 1*(1), 13-19.
- Herrmann, K.J. (2013). The impact of cooperative learning on student engagement: Results from an intervention. *Active Learning in Higher Education, 14*(3), 175-187.
- Johnson, D.W., & Johnson, R.T. (1989). *Cooperation and competition: Theory and research*. Edina, MN: Interaction Book Company.
- Johnson, D.W., & Johnson, R.T. (1999). Making cooperative learning work. *Theory into Practice, 38*(2), 67-73.
- Johnson, D.W. & Johnson, R.T. (2014). Cooperative Learning in 21st Century. *Anales de Psicología, 30*(3), 841-851. AÑADIDO
- Johnson, D.W., Johnson, R.T., & Holubec, E.J. (2013). *Cooperation in the Classroom*. Edina, MN: Interaction Book Company. AÑADIDO
- Johnson, D.W., Johnson, R.T., & Smith, K.A. (2014). Cooperative learning: Improving university instruction by basing practice on validated theory. *Journal on Excellence in College Teaching, 25*(3&4), 85-118.
- Kolb, A.Y., & Kolb, D.A. (2005). Learning styles and learning spaces: Enhancing experiential learning in

- higher education. *Academy of Management Learning and Education*, 4, 193-212.
- Lee, H.J., Kim, H., & Byun, H. (2015). Are high achievers successful in collaborative learning? An explorative study of college students' learning approaches in team project-based learning. *Innovations in Education and Teaching International*, 54(5), 1-10.
- Lee, H.J., & Lim, C. (2012). Peer evaluation in blended team project-based learning: what do students find important? *Journal of Educational Technology & Society*, 15(4), 214-224.
- León del Barco, B. (2002). *Elementos mediadores en la eficacia del aprendizaje cooperativo: entrenamiento en habilidades sociales y dinámicas de grupo* [Tesis Doctoral]. Cáceres: Universidad de Extremadura.
- León, B., Felipe, E., Mendo, S., & Iglesias, D. (2015). Habilidades Sociales en equipos de Aprendizaje Cooperativo en el contexto universitario. *Psicología Conductual*, 23, 191-214.
- Masran, M., & Azizi, N. (2018). Effects of cooperative learning (STAD) on student achievement in Jawi among year five pupils. *Advanced Science Letters*, 24(7), 5334-5337.
- McGourty, J., & De Meuse, K.P. (2001). *The team developer: An assessment and skill building program*. New York: John Wiley & Sons.
- McMaster, K., Fuchs, D., & Fuchs, L. (2006). Research on peer-assisted learning strategies: The promise and limitation of peer-mediated instruction. *Reading and Research Quarterly*, 22(1), 5-25.
- Mendo, S., León, B., Felipe, E., Polo, M.I. e Iglesias, D. (2018). Cooperative team learning and the development of social skills in Higher Education: the variables involved. *Frontiers in Psychology*, 9, 1-11.
- Morales Vallejo, P. (2008). Estrategias para evaluar y calificar el producto del equipo: cómo diferenciar las calificaciones individuales. En L. Prieto Navarro (Coord.). *La enseñanza centrada en el aprendizaje: estrategias útiles para el profesorado* (pp. 151-169). Barcelona: Octaedro.
- Oakley, B., Felder, R.M., Brent, R., & Elhaji, I. (2004). Turning student groups into effective teams. *Journal of Student Centered Learning*, 2(1), 9-34.
- Ohland, M.W., Loughry, M.L., Woehr, D.J., Finelli, C.J., Bullard, L.G., Felder, R.M., & Schmucker, D.G. (2012). The comprehensive assessment of team member effectiveness: Development of a behaviorally anchored rating scale for self and peer evaluation. *Academy of Management Learning & Education*, 11(4), 609-630.
- Persons, O.S. (1998). Factors influencing students' peer evaluation in cooperative learning. *Journal of Education for Business*, 73(4), 225-229.
- Putpuek, A., & Kiattikomol, P. (2017). Development of a blended online and offline learning model with think-pair-share collaborative learning and student team's achievement division competition. *International Journal of Innovation and Learning*, 22(2), 254-269.
- Puzio, K., & Colby, G. T. (2013). Cooperative learning and literacy. *Journal of Research on Educational Effectiveness*, 6(4), 339-360.
- Rodríguez, A., & Hernández, A. (2012). Desmitificando algunos sesgos de la autoevaluación y coevaluación en los aprendizajes del alumnado. *REXE: Revista de estudios y experiencias en educación*, 13(25), 13-31.
- Sadler, D.R. (2010). Beyond feedback: Developing student capability in complex appraisal. *Assessment and Evaluation in Higher Education*, 35(5), 535-550.
- Sambell, K., & McDowell, L. (1998). The value of self and peer assessment to the developing lifelong learner. En C. Rust (Ed.), *Improving Student Learning, Improving Students as Learners* (pp. 56-66). Oxford: Oxford Centre for Staff & Learning Development.
- Seric, M., & Pranicovic, D.G. (2018). Managing group work in the classroom: an international study on perceived benefits and risks based on students' cultural background and gender. *Journal of Contemporary Management Issues*, 23(1), 139-156.
- Sridharan, B., Muttakin M.B., & Mihret D.G. (2018). Students' perceptions of peer assessment effectiveness: an explorative study. *Accounting Education*, 1-27.
- Sridharan, B., Tai, J., & Boud, D. (2018). Does the use of summative peer assessment in collaborative group work inhibit good judgement? *Higher Education*, 1-18.
- Tai, J., Ajjawi, R., Boud, D., Dawson, P., & Panadero, E. (2017). Developing evaluative judgment:

Toledo et al., The Mutual Assessment System in Teamwork

enabling students to make decisions about the quality of work. *Higher Education*, 13, 1-15.

Tsay, M., & Brady, J.A. (2010). Case study of cooperative learning and communication pedagogy: Does working in teams make a difference? *Journal of the Scholarship of Teaching and Learning*, 10(2), 78-89.

Wanzek, J., Vaughn, S., Kent, S.C., Swanson, E.A., Roberts, G., Haynes, M., ... Solis, M. (2014). The effects of team-based learning on social studies knowledge acquisition in high school. *Journal of Research on Educational Effectiveness*, 7, 183-204.

Yuan, J., & Kim, C. (2017). The effects of autonomy support on student engagement in peer assessment. *Educational Technology Research and Development*, 66(1), 25-52.

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Appendix A

Table A-1. Rubric for self-assessment and peer-assessment

Rubric for evaluating teamwork		Peer-assessment and self-assessment				
Name of the team:						
CRITERIA	9-10	7-8	5-6	3-4	2-1	0
Commitment (20%)	Attends all meetings punctually. Arrives prepared with assigned tasks.	Attends all meetings but a few minutes late. Arrives prepared with assigned tasks.	Misses one of the meetings. Sends prior notice of their absence. Sends part of the assignment or material by email.	Is late on more than one occasion. Attends without preparing materials or previous work.	Misses a meeting without due justification and does not send any of the assigned material or work.	Misses more than one meeting, with or without justification. Does not send the task or sends only a partially completed version.
Responsibility (20%)	Does their share of work diligently during work sessions.	A distraction during work sessions before settling down to do the assignment.	Jokes too much and distracts the group. The tasks were accomplished satisfactorily.	Does the bare minimum amount of work and waits for other members to remind them of their role.	Attends the face-to-face work session, but does only part of the work.	Goes to the sessions to "hang out". Does nothing or very little.
Contribution (20%)	Provides valuable information for carrying out the tasks, even exceeding what was assigned.	Carries out the assigned task.	"Does their part" of the research, but processes and reflects very little on the information obtained.	Just copies and pastes information from required sources.	Copies and pastes information from less relevant sources.	Does not do the part of the task that corresponds to them or does very little.
Collaboration (20%)	Shares and accepts different points of view, ideas and suggestions.	Does not share important information. Certain difficulties in listening to others. Finally accepts the suggestions.	Does not contribute any ideas and just accepts the points of view of others.	"Imposes their will". Accepts the suggestions after some discussion.	Finally does their part of the assignment but argues with another team member.	Decides to do the homework part alone.
Respect (20%)	Treats others in a kind and caring way.	Behaves with respect while completing tasks, although slightly removed from interactions with others.	Difficulty listening. Constantly arguing.	Criticizes the work of others, albeit cautiously.	Is late and makes mistakes without apologizing.	Openly devalues another member's work.
Total (sum of all divided by 5):						