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Self-regulated learning and formative assessment process on group work

Autorregulación del aprendizaje y procesos de evaluación formativa en los trabajos en grupo

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Abstract

This study aimed to design and implement a formative assessment context for a group assignment. This setting is based on self-regulated learning, the beneficial practices exposed in the literature and the challenges for the next decade. We carried out quantitative research using two questionnaires to measure self-regulated learning skills and the way of working as a group. The participants were 88 students getting a degree in Sports Sciences. Results showed that the reported way of working in groups has no impact on performance. Furthermore, higher self-regulation in their learning style and the use of assessment criteria led to higher performance. We did not find any differences regarding avoidance self-regulation style. We discuss theoretical and educational implications.

Keywords: University studies; Evaluation criterion; Group work; Self-assessment

Resumen

El objetivo de este estudio fue diseñar e implementar un contexto de evaluación formativa sobre un trabajo en grupo basado en la autorregulación del aprendizaje a través de las prácticas beneficiosas que expone la literatura y los retos que se plantean de cara a la próxima década. Se llevó a cabo una investigación cuantitativa a través de dos cuestionarios que midieron la capacidad de autorregulación y la forma de trabajar en grupo, con 88 estudiantes del Grado en Ciencias de la Actividad Física y del Deporte. Los resultados muestran que la forma de trabajar en equipo reportada por los estudiantes no tuvo un impacto en la calificación obtenida en su trabajo. Por otro lado, una mayor capacidad de autorregulación en su estilo de aprendizaje y un mayor empleo de los criterios de evaluación resultaron significativos, alcanzando una calificación superior. No se encontraron diferencias en relación con la dimensión de evitación de la autorregulación. Se discuten las implicaciones teóricas y educativas.

Palabras clave: Estudios universitarios; Criterio de evaluación; Trabajo en equipo; Autoevaluación

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Many studies point out that achieving success in university studies is a goal that is not always easy to achieve. Students encounter difficulties, especially in the transition to university during their first year, in which there is a high dropout rate compared to the following years (Gale & Parker, 2014). This difficulty comes from the multiple changes that students experience between the school and the university context (Oolbekkink-Marchand et al., 2006). Students perceive and classify these changes in two environments: those that are endogenous, or specific to the students; and those that are exogenous, or specific to the institution in which they are studying (Bowles et al., 2014). In relation to endogenous changes, difficulties arise when they reach an unfamiliar context, far from their usual circle of action (Krause & Coates, 2008). Normally, students tend to go to an educational centre that is close to their

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homes, and the change to the university leads to a longer journey time and the use of means of transport. Sometimes, they even have to change city, which also causes a change of home, with the consequent changes in family habits and friends (Hultberg et al., 2008). In the same vein, they will have new classmates and also the possibility of a new identity. On the other hand, the exogenous changes, specific to the university, involve a greater number of students in class (Christie et al., 2013), less supervision of the institution and the teachers (McPhail et al., 2009) and a great variety in terms of teaching styles and assessment systems (Coertjens et al., 2017).

University and assessment systems: Formative assessment

Research indicates that the key to overcoming all of the above changes and succeeding in university studies is primarily the capacity for autonomous learning and adaptation of students (Coertjens et al., 2017). This autonomy is related to students' ability to self-regulate their learning, defined as the ability to set their own goals and execute cognitive, affective and behavioral actions to progress on the path to achieving these goals (Zimmerman & Schunk, 2011). The capacity for self-regulation is a significant predictor of the achievement of academic success, as suggested by the meta-analysis carried out by Richardson et al. (2012). The reason for this, as pointed out by numerous studies and recent meta-analyses and reviews, is the strong relationship between self-regulation and the optimal use of learning strategies (Panadero et al., 2018). The university cannot assume that students arrive prepared with these skills to face their challenges as they demonstrate limited cognitive, metacognitive, motivational and emotional adaptability (Koivuniemi et al., 2017). Thus, the lack of development in these capacities, added to the endogenous and exogenous variables derived from the transition to the university and its own specific circumstances, cause a complex context to which students must adapt in order to succeed.

In this vein, on the part of the universities, the assessment policy is one of the most important institutional measures to favor the learning of the students and the completion of their studies (García-Jiménez, 2015). This aspect does not have to do with a lower demand to increase success, but with universities and teachers enriching the process and improving the acquisition of transversal skills related to self-regulation and the achievement of learning objectives.

In fact, one of pillars of the Bologna Process is the implementation of continuous assessment. Its aim is to abandon the assessment systems that had been carried out until then – based, for the most part, on a final exam with a summative orientation (Ibarra Sáiz & Rodríguez Gómez, 2010). This change in the practices and moments of assessment was aimed at abandoning the concept of assessment as a simple qualification/grade —summative assessment— to move to the concept of assessment at the service of learning, called formative assessment: "all processes of verification, assessment and decision making whose purpose is to optimize the teaching-learning process that takes place, from a humanizing perspective and not as a mere qualifying end" (Pérez Pueyo et al., 2009, p. 35).

Formative assessment: Guidelines and current challenges

Formative assessment must be conceived as a process of accompaniment. The concept is based on providing information to teachers and students about their progress and then providing feedback that facilitates the necessary adjustments and revisions for both the student in his or her task and the teacher in his or her teaching action (Black & Wiliam, 2009). Thus, students are helped to conceptualize what they are trying to learn, how they are doing so and how they can improve (Panadero et al., 2018). Various studies indicate that students who participate in formative assessment processes have improved involvement in the learning process (Hortigüela-Alcalá et al., 2015). The research, concept and practice of formative assessment has evolved over the past 30 years. Currently, a decade that was marked by a series of challenges such as those outlined in the

Assessment 2020 report is coming to an end (Boud & Associates, 2010). As that report and the research in the decade from 2010 to 2020 indicated, the current objectives and conceptions are related to the sustainability of assessment as learning and empowerment (Boud & Soler, 2016; Rodríguez-Gómez & Ibarra-Sáiz, 2015). Therefore, current challenges are associated with the design of quality tasks to foster student involvement, feedback loops, self-regulated learning and evaluative judgement (Ibarra-Sáiz & Rodríguez-Gómez, 2020).

Self-regulation, clarity of goals, assessment criteria and evaluative judgement

The implementation of formative assessment is based on providing clear and concrete assessment criteria to students; facilitating feedback; and allowing students to review and improve their work by giving them the opportunity to self-regulate their learning (Andrade & Brookhart, 2016). In fact, these processes —planning, monitoring and self-reflection — are the three phases described by Zimmerman (2011) in his cyclical model of self-regulation of learning supported by the cognitive, metacognitive, affective, motivational and behavioral dimensions of the student. In summary, to encourage student development, teachers must transmit the expectations and goals of each task in the form of assessment criteria and actively involve students in a process to understand and use criteria properly (Carless, 2015).

Along these lines, one of the challenges of formative assessment for the next decade is to go one step further, arguing that this formative process – based on assessment criteria – is not sufficient. Thus, scholars have argued for the development of the "evaluative judgement" of students, defined as the ability to make informed decisions about the quality of their own work or that of others (Tai et al., 2018). This step forward is based on the fact that students will not always have at their disposal assessment criteria that indicate the quality of the work required. In other words, the evaluative judgement does not focus exclusively on the educational field, but on the fact that it is fundamental to lifelong learning in any context. This premise is related to the sustainability function of assessment as learning in itself (Boud & Soler, 2016). That is, if students are unable to judge the quality of their own work or that of their peers, it is difficult for them to know how to learn effectively. For this reason, it is essential that students develop the ability to create criteria themselves and to be able to assess the quality of the work that they or others produce in any field. As an example, two educational benchmarking practices to promote evaluative judgement and the development of self-regulation of learning are the co-creation of rubrics with students (e.g. Fraile et al., 2017) and the analysis and critique of examples of varying quality (Carless et al., 2018).

Self-assessment and peer assessment

For students to develop their capacity to self-regulate their learning and evaluative judgement, they must be exposed to continuous opportunities to practice these skills, for example, through self-assessment and peer assessment (Panadero & Broadbent, 2018; Tai et al., 2018). These practices lead to a transformation in the role of learners to become active agents in the process of formative assessment. This requires more in-depth reflection, as well as creating and providing feedback on their own work and that of their peers, leading to increased learning.

Self-assessment is the process in which the student judges his/her own work to improve quality by identifying discrepancies between the current state and the desired quality state (McMillan & Hearn, 2008). That is, for this process to occur, students must take into account the assessment criteria that expose the quality of the task and, consequently, be able to self-regulate their learning. Therefore, self-assessment contributes to student learning by facilitating the understanding and clarity of learning goals, student involvement in assessing their instructional process and facilitating reflection on the outcome achieved (G. T. L. Brown & Harris, 2013). In addition, the ability to self-assess is also strengthened

through the involvement of peers in the learning process (To & Panadero, 2019).

Peer assessment is an activity in which students judge the work performed by their peers. This practice has great educational and inter- and intra-personal benefits (Alqassab & Panadero, 2020). In fact, Nicol (2014) argues that it has the greatest potential for the development of evaluative judgement because it also requires the use of self-regulatory learning and co-regulatory skills. The benefits of evaluating the performance of other students are associated with seeing examples of different quality and being able to contrast them with one's own performance, and reflecting — applying evaluative judgement — to provide feedback to one's peers (Panadero & Broadbent, 2018). In addition, within the context of formative assessment, peer assessment practices produce benefits at the interpersonal, motivational and emotional levels (Panadero et al., 2016).

Group work as practice in formative assessment

In the transformation of the university with the Bologna Process and its transition toward continuous and formative assessment — abandoning final exams as the only evidence in the assessment system — group work is one of the practices that has acquired considerable presence. Recent research on assessment practices in the Spanish university context based on syllabi shows that group work is present in 25.9% of subjects and is used more in the fourth year than in the first (Panadero et al., 2019).

There are two main reasons for asking students to do group work. First, it provides an environment that maximizes their learning by collaborating with other students and considering other points of view (Ko, 2014). In other words, it is an individual learning strategy in and of itself. Second, it prepares students for a work-like environment, enhancing their employability and developing the skills required for teamwork (Sridharan et al., 2019). Some examples of such skills include the development of interpersonal competencies and individual responsibility (Zerihun et al., 2012), as well as the improvement of transversal abilities related to communication, presentation, problem-solving, leadership and organization (e.g. Harvey & Green, 1994).

In group work, the co-regulation of learning among its members takes place. This process refers to the collaboration, guidance and support of the components among themselves (Häkkinen et al., 2017). In other words, it starts with the self-regulation of each student's learning and their relationship with their peers in the search for a common goal in terms of the performance of their group work. The difference with peer assessment is that it refers to the judgements of other students' work (Nicol & Macfarlane-Dick, 2006), while co-regulation occurs within the framework of joint evidence. Obviously, all these practices can be implemented by the teacher in his or her classes since it has been observed that peer assessment and self-assessment have a significant impact on the co-regulation of a group (Meusen-Beekman et al., 2016). Thus, for example, what is learned in peer assessment activities by looking at examples from others and providing feedback can lead to a benefit in one's own work through a subsequent process of co-regulation among team members.

In order to maximize the benefits of group work, interpersonal variables must be taken into account. An optimal work climate and personal relationships among the components of the group emphasize their social connection and lead to an improvement in the team's academic performance (Peñalver et al., 2019). In fact, students report that this interaction in group work increases their motivation (Gaudet et al., 2010) and satisfaction (Lizzio & Wilson, 2006). In this vein, one of the problems of group work is the disconnection of one of its members — avoiding the tasks assigned to him or her and not demonstrating any involvement. Once again, the practices of formative assessment throughout the process of production of the group work facilitate the involvement of all the components in its accomplishment (Brooks & Ammons, 2003).

Aim, research questions and hypotheses

The main aim of this research is to explore which variables determine — and the extent to which they determine — the grade obtained in group work as a variable to measure student success and to assess, in turn, the teaching process implemented for the optimization of student learning.

The research questions (RQ) are as follows:

RQ1: What impact does the way students work together have on the grade of group work? It is expected that better collaboration and work among group members will be related to obtaining a higher grade on the work (Hypothesis 1).

RQ2: How do students' self-regulated skills influence the grade of their group work? It is expected that the higher the self-regulatory capacity, the higher the grade of the work (Hypothesis 2).

Method

Participants

The sample was composed of 88 volunteer students (17.4% women), aged 20-52 (M = 23.11; SD = 4.08), enrolled in five different groups of a course on creativity and physical activity in the third year of a degree in Physical Activity and Sport Sciences in a Spanish university.

Instruments and variables

a) *Group Work Grade.* This was the numerical grade (from 0 to 10) awarded to the dossier that each group presented to the teacher.

b) *Group Dynamics Questionnaire* (Fraile et al., 2018). This *ad hoc* questionnaire asks about seven different aspects related to group dynamics and working methods selected from the research (e.g. Häkkinen et al., 2017); and three strategies of self-regulation during the production of the dossier. It consists of seven four-point Likert scales for dynamics and methods: team work climate; group cohesion; motivation for work; utility of creative dynamics (1 "Not adequate" to 4 "Very adequate"); clear objective from the beginning; clear format of the work (1 "Very unclear" to 4 "Very clear"); and work distributed equally (1 "Strongly disagree" to 4 "Strongly agree"). In addition, there are three other four-point Likert scales for the self-regulation strategies: the initial provision of the assessment criteria is positive; the assessment criteria for the dossier have been considered; and a final check of the work with the criteria (1 "Strongly disagree" to 4 "Strongly agree").

c) *Self-regulation through the use of evaluation criteria.* The last three items of the *ad hoc* questionnaire, corresponding to the three phases of self-regulation described by Zimmerman (2011) — planning, monitoring and self-reflection — were grouped into a single quantitative indicator. These three items were concentrated to obtain an overall score on that particular dimension of student self-regulation, that is, in relation to the reported use of the guidelines and assessment criteria for task development.

An exploratory factor analysis, with a method of unweighted least squares extraction and Promax rotation (although this was not necessary), also suggested the existence of a single factor that explained 26.44% of the variance of the scores. The reliability, understood as internal consistency, was α = .445, typical of an instrument with few items. The scores of this self-regulation indicator ranged from 3 to 12. A higher score on this indicator points to greater self-regulation in the use of the assessment criteria for the production of the dossier.

d) *Emotion and Motivation Self-regulation Questionnaire (EMSR-Q)* (Alonso-Tapia et al., 2014). This questionnaire consists of 20 items (each a five-point Likert scale, from "strongly disagree" to "strongly agree"). This instrument is structured on the basis of five first-order scales. It also has two second-order factors: (1) learning self-regulation style, with 12 items and a reliability index (Cronbach's α) of .78; and (2) avoidance self-regulation style, with 12 items and a reliability of α = .86. The first scale includes self-messages or mental

verbalizations that affect students' motivation, goals and learning. The higher the value on this scale, the greater the positive effect of emotional and motivational strategies on student learning. The second scale includes self-messages and actions that show a lack of regulation or are geared toward task avoidance. The greater the value on this scale, the greater the negative effect on learning of the emotional strategies and motivations implemented by the student.

Design and procedure

This research concerns the implementation of group work carried out by 3 or 4 students. Participation in this study was voluntary in terms of the completion of the questionnaires. All students experienced the same process as they were part of the pedagogical design and the assessment of the course. The participants completed the EMSR-Q questionnaire weeks prior to the beginning of the course in relation to other research.

During the course, throughout several sessions, a context of formative assessment was implemented in which the students were accompanied by teachers in the execution of this group work. This task was designed with the aim of creating truly collaborative and interdependent work (Channon, Davis, Goode, & May, 2017). Likewise, following the guidelines and challenges of the formative assessment, the students had to carry out their work — creative dynamics — with people outside the group and the course: that is, a context of authentic assessment (Brown, 2015).

First, after presenting the work and its objective, the teachers carried out dynamics to create the criteria for assessing the work together with the students and, furthermore, to develop their evaluative judgement. A rating scale with 21 criteria was then provided to guide and subsequently grade the work. With this instrument, activities were carried out for the students to develop the work in the sessions, guiding them and carrying out self-assessment, peer assessment and co-regulation activities. The aim was to provide guidance especially during the planning phase — the first phase in the self-regulation of learning — facilitating the students' understanding and involvement.

Finally, after handing over the dossier and before providing the grade, the students' opinions were obtained by means of the *ad hoc* questionnaire used in this study.

Data analysis

One of the main variables of analysis is the grade obtained in the dossier produced by the group work, the central experience of learning and assessment of this research. As explained previously, the sample is made up of the students of three teachers who carried out the same dynamics, described above. Despite the fact that the same instrument was used to grade the work, in order to obtain greater validity and reliability, the first author graded all the work twice, including those graded by the other teachers. In the case of differences, it was revised to consider a single criterion.

Descriptive statistics were calculated for the explanatory variables. The group work grade was related to the groups formed by the variables team work climate, group cohesion, motivation for the work, work distributed equally, clear objective from the beginning, clear format of the work and utility of creative dynamics, by means of a one-way analysis of variance (ANOVA). In addition, since some categories were chosen by very few individuals (specifically those who indicated little adequateness, agreement or clarity), the analysis was repeated using planned comparisons (Pardo & San Martín, 2010, p. 217), comparing the category that indicated the most agreement with all others taken together.

Using the data collected from 52 participants, the variables of the EMSR-Q, the two second-order scales — learning and avoidance self-regulation style — together with self-regulation through assessment criteria, were introduced into a hierarchical linear regression model to predict the group work grade. SPSS 25 was used for all analyses.

Results

The group work grade ranged from 2.90 to 10.00 (N = 88; M = 6.87; SD = 1.91), with a roughly normal distribution, $z_{K\text{-}S}$ = 0.67; p = .760.

RQ1: What impact does the way students work together have on the grade of the group work?

Table 1 shows the descriptive statistics of the grades, according to the different variables measured in the *ad hoc* questionnaire. No relationship was found between these variables.

RQ2: How do students' self-regulated skills influence the grade of their group work?

Of the total sample, data were collected on the two factors of EMSR-Q (learning and avoidance) for 52 students. For these participants, the total of self-regulation in the assessment criteria for group work was also calculated. All three variables were approximately normal (see Table 2).

Table 1. Group work grade based on group dynamics

Variable	Observed categories	*n*	*M*	*SD*	*F*	gl_1, gl_2	*p*	*t**	*gl*	*p*
Team work climate	Hardly adequate	3	6.57	3.31	0.82	2, 84	.442	-.83	84	.411
	Adequate	41	6.58	1.82						
	Very adequate	43	7.10	1.87						
Group cohesion	Hardly adequate	2	6.98	0.04	0.43	2, 84	.654	-.27	84	.787
	Adequate	35	6.61	1.94						
	Very adequate	50	6.99	1.90						
Motivation for work	Hardly adequate	6	6.99	0.75	0.03	2, 84	.971	.24	84	.810
	Adequate	35	6.86	1.91						
	Very adequate	46	6.80	2.00						
Work distributed equally	Strongly disagree	7	6.57	1.90	0.95	3, 83	.421	1.18	83	.242
	Disagree	27	7.13	2.08						
	Agree	25	7.10	1.86						
	Strongly agree	28	6.39	1.72						
Clear objective from the beginning	Unclear	19	7.13	1.78	0.23	2, 84	.794	.33	84	.743
	Clear	47	6.78	2.02						
	Very clear	21	6.79	1.85						
Clear format of the work	Unclear	15	6.56	1.67	0.39	2, 84	.678	-.83	84	.411
	Clear	57	6.86	1.99						
	Very clear	15	7.18	1.93						
Utility of creative dynamics	Hardly adequate	1	6.95	0.00	0.04	2, 84	.964	-.04	84	.965
	Adequate	51	6.81	1.88						
	Very adequate	35	6.93	2.02						

Note: *t** = *Contrast statistics for the planned comparison.*

Table 2. EMSR-Q Descriptive Self-Regulation Statistics and Assessment Criteria

	Min.	*Max.*	*M*	*SD*	$z_{K\text{-}S}$	*p*
Self-regulation strategy (EMSR-Q)						
Avoidance self-regulation style	12	53	36.12	8.69	0.71	.697
Learning self-regulation style	32	57	44.31	5.96	1.10	.178
Self-regulation through assessment criteria	8	12	10.40	1.22	1.35	.053

Note: n = 52.

The regression model was statistically significant, $F(1, 47) = 5.94$; $p = .005$; $R_2 = 0.168$ (the significant variables of the regression model explain 16.8% of the variance of the rating). Of the self-regulation variables introduced in the model, the learning

self-regulation style factor, β = 0.303; $t = 2.29$; $p = .026$, and self-regulation through the assessment criteria, β = 0.285; $t = 2.16$; $p = .036$, were statistically significant.

Discussion

The general aim of this study was to explore the extent to which the grade obtained in a group work exercise determines the way students collaborate with each other and the influence of their skills to self-regulate their learning. In addition, the study intended to assess, in turn, the teaching process implemented for the optimization of student learning following the ideal guidelines established in the literature and addressing the current challenges of formative assessment processes. In order to discuss the results, the order of the research questions is followed, and then limitations, future lines of research, conclusions and implications are presented.

Teamwork

The first research question explored the relationship between the grade earned in the group work and the way students reported working together. The hypothesis is rejected, as no relationships were found between these variables. However, this is an interesting result. In order to explanation such a result, the students' answers in the different variables that explored the way in which they worked together should be explored. In relation to the team work climate, the group cohesion, the motivation for the work and the utility of the creative dynamics, 93.1 % — at least — of the students (Table 1) responded "adequate" or "very adequate," that is, the positive responses of these variables. This fact is in line with the finding of other studies (e.g. Livingstone & Lynch, 2002; Peñalver et al., 2019) that suggest that optimal functioning of the working group has a positive impact on academic performance. Therefore, if almost all students stated that their team dynamics were positive, it is understandable that this aspect did not have an impact on the grade. Likewise, a formative assessment process such as the one implemented in this research points toward a better classroom climate (Alonso Martín, 2007). On the other hand, in spite of finding greater variability in the responses on the equity in the workload performed by each student, it seems that this did not produce an effect on the previously commented variables, nor on the work grade. At first, an unequal workload could disturb the cohesion of the group and affect the grade, an aspect previously explored in the literature (Bendersky & Hays, 2012). Therefore, the good dynamics reported by the members of all the teams could have maximized these positive effects (Channon et al., 2017). This result is associated with the appropriate context of formative assessment implemented by teachers in this research. Along the same lines, clear goals and a formative context produce a positive impact on motivation (Sockalingam, 2010), since they contribute to the greater awareness of their strengths, make them feel worthwhile and motivate them to contribute positively (Livingstone & Lynch, 2002).

Self-regulatory capacity

The second research question examined the relationship between group work grades and students' self-regulatory skills through three different measures: the two second-order scales of the EMSR-Q questionnaire and the use of assessment criteria throughout the three stages of the student-reported self-regulation process.

In relation to the results of the EMSR-Q, this study shows that students with a learning self-regulation style achieved a higher grade. The factor related to the avoidance self-regulation style was not significant. First, this result is fully aligned with other studies showing that greater self-regulation toward learning is related to higher academic performance (e.g. Richardson et al., 2012). This measure of EMSR-Q is related to another variable in this study, composed of the three items that explored the use of assessment criteria in the three phases. Students who reported using them to their fullest extent in the production of their work scored significantly higher. This result is totally in line with previous studies in

which the use of the assessment criteria contributed to higher self-regulation and, concomitantly, higher academic performance (Andrade & Brookhart, 2016).

The other second-order scale of the EMSR-Q, on the avoidance self-regulation style, did not show significant results. It is important to note that this style, in avoidance, alludes to the lack of regulation associated with concentration on the task. This second-order scale is created from three first-order scales related to self-message and actions concerning, for example, the regulation of stress, with items such as "This is so difficult... I am not going to be able to make it right" (#8). It is also related to the avoidance scale and messages such as "Such long instructions! They only make me confused" (#11). The formative assessment process implemented in this group work means that it was probably not necessary for students to activate self-regulatory actions aimed at avoidance (Boekaerts, 2011). In the educational context of this research, assessment criteria were created with students (development of evaluative judgement), followed by peer assessment activities, self-assessment and the provision of teacher feedback. Panadero et al. (2014) stated that the students who received feedback reported having implemented more actions related to avoidance. In the case of this research, by receiving feedback from the teacher, teammates and other teams, no significant differences associated with avoidance were identified. Thus, the optimal teaching actions implemented may mean that students have not needed to make an effort to avoid these negative self-messages that make them decline to perform and fail to put effort into the task. Additionally, as other research argues, the provision of criteria and participation in a formative assessment context reduce stress (e.g. Andrade & Du, 2005) and increase self-efficacy (Panadero et al., 2017). Likewise, a transparent process in relation to the grades awarded — as in this research — is related to attitudes of security and optimism toward teamwork (Livingstone & Lynch, 2002). Therefore, these variables would be related to a lessened need for self-regulatory avoidance actions.

In relation to the use of the assessment criteria, students who reported higher employment of these throughout the three phases of the self-regulatory process scored higher in their group work grade. These three phases were accompanied by various formative assessment activities throughout the sessions of the course. These results are in line with previous studies (Panadero et al., 2018).

This investigation has several limitations that need to be considered: first, the sample size and the use of a convenience sample; and second, the data collection has been done only through self-reported questionnaires. As Pekrun (2020) points out, studies based on self-reporting are valid and useful. However, within these, he recommends a variety of instruments for collection that provide different points of view and a wealth of information. Furthermore, this research used a general measure of self-regulation, so it would be useful in future research to also collect situational data (Boekaerts & Corno, 2005). A third limitation concerns the use of a questionnaire created for this research and administered on an *ad hoc* basis. In future studies, it would be valuable to use other validated questionnaires, in addition to monitoring and collecting information throughout the process.

Conclusions

This study provides theoretical and practical implications for teachers and researchers in relation to formative assessment, its practices and challenges. As we have discussed and set out the results, self-regulatory skills are the key competences for success in higher education. This research provides a framework for the implementation of group work, which is widely used by university teachers. It is important that teachers implement formative assessment practices based on the development of such self-regulatory capacity in student learning. Its basis is associated with the creation and provision of assessment criteria,

self-assessment practices, peer assessment and co-regulation, which allow students to have opportunities to engage, use and understand learning goals.

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