

PARTICIPATORY EVALUATION IN HIGHER EDUCATION: TRENDS AND THEIR IMPACT ON TRAINING IN SPORTS SCIENCES

EVALUACIÓN PARTICIPATIVA EN EDUCACIÓN SUPERIOR: TENDENCIAS Y SU IMPACTO EN LA FORMACIÓN EN CIENCIAS DEL DEPORTE

Jaime Casterad Seral¹ 

Víctor Murillo Lorente¹ 

José Antonio Poblador Vallés¹ 

Luis Pueyo Romeo² 

Javier Álvarez Medina¹ 

¹ Faculty of Health and Sports Sciences, University of Zaragoza, Spain

² Department of Physical Medicine and Nursing, University of Zaragoza, Spain

Correspondence:

Jaime Casterad Seral
jcaster@unizar.es

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Abstract

This study investigates the impact of the Collaborative-Opposition Sports course on competency development within the Physical Activity and Sports Science degree in higher education. Utilizing a questionnaire based on a 1 to 5 Likert scale, student perceptions regarding competencies gained upon completing the course over three consecutive academic years: 2018-2019, 2019-2020, and 2020-2021 were assessed. The sample consisted of a total of 147 participants. Findings indicated significant variations in competency perceptions, with effect sizes ranging from moderate to very large. Teaching-learning strategies were implemented to enhance those competencies receiving less favourable evaluations. The results emphasize the importance of the learning process and the ability to learn effectively, particularly highlighting a positive impact on systemic competencies. It is concluded that the integration of methodologies combining teaching practice, reflection, collaboration, and experience is crucial for the development of skills and competencies in university students, thereby contributing to their preparedness to face the challenges of contemporary society.

Keywords: Peer assessment, university training center, competency-based education, active methodologies.

Resumen

El presente estudio examina la influencia de la asignatura de Deportes de colaboración-oposición en el desarrollo de competencias dentro del grado de Ciencias de la Actividad Física y el Deporte en la educación superior. A través de la aplicación de un cuestionario basado en una escala Likert de 1 a 5, se evaluaron las percepciones de los estudiantes respecto a las competencias adquiridas al concluir la asignatura durante tres años académicos consecutivos: 2018-2019, 2019-2020 y 2020-2021. La muestra estuvo compuesta por un total de 147 participantes. Los hallazgos revelaron variaciones significativas en la percepción de las competencias, registrando tamaños de efecto desde moderados a muy grandes. Se implementaron estrategias de enseñanza-aprendizaje dirigidas a fortalecer aquellas competencias con evaluaciones menos favorables. Los resultados subrayan la importancia del proceso de aprendizaje y la capacidad de aprender de manera efectiva, destacando un impacto positivo particularmente en las competencias sistémicas. Se concluye que la integración de metodologías que combinan la enseñanza-práctica, reflexión, colaboración y experiencia resulta fundamental para el desarrollo de habilidades y competencias en estudiantes universitarios, contribuyendo así a su preparación para afrontar los desafíos de la sociedad contemporánea.

Palabras clave: Evaluación por pares, centro universitario de formación, educación por competencias, metodologías activas.



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Introduction

Today's global society has brought about a paradigm shift in university education, which is reflected in the creation of the European Higher Education Area, which establishes that the new teaching framework must focus on developing students' skills and competences that allow them to face the challenges of contemporary life (Bologna Declaration, 1999). It is necessary to train autonomous, participative students with cognitive flexibility, complex thinking, critical and reflective judgment, who become responsible citizens, as well as good professionals, capable of adapting and acting effectively in today's knowledge society subject to rapid and profound changes (Rodríguez-Gómez et al., 2018).

Royal Decree 1393/2007 on the Regulation of University Education, amended by various regulations (RD 861/2010, RD 96/2014, RD 43/2015) and the European Qualifications Framework for Higher Education (Royal Decree 1027/2011), incorporate references to two types of competences in university education: specific competences related to a specific disciplinary area and transversal competences transferable to other contexts related to the personal-social development of the individual, which do not depend on a specific thematic area but can be developed in different academic or professional disciplines (Rodríguez-Gómez et al., 2018). These skills are understood as an incipient social and professional need, bureaucratically accepted to manage and react to change and employability since they are closely linked to the social and labor demands of the current market (Martínez-Otero et al., 2018; Medina & Jaruta, 2013).

Transversal competences related to participatory assessment are those that students put into practice when they assess their own performances and productions (self-assessment), those of their peers (peer assessment, peer evaluation, small group evaluation, reciprocal evaluation), between two people (student-teacher co-assessment; student-student) or those of the teaching staff (hetero-assessment) (Rodríguez-Gómez et al., 2018).

The participation of students in the teaching-learning process and in their own assessment enhances the development of competencies through a series of elements such as reflection, collaboration, involvement, motivation and improves the results of the same if, together with teachers, they become responsible partners in learning and progressively assume responsibility for the processes and develop the ability to judge the quality of their own work, as well as that of others, according to agreed standards (Boude & Associates, 2010; Ibarra-Saiz, Rodríguez-Gómez, & Gómez-Ruiz, 2012; Thomas, Martin, & Pleasants, 2011).

The current concern of university professors in Higher Education to receive feedback from students that implies the improvement of teaching processes is reflected in different research on the acquisition and transfer of skills (Jarauta & Medina, 2013; Martínez-Clares & González-Morga, 2018; Muñoz-San Roque, Martín-Alonso, Prieto-Navarro, & Urosa-Sanz, 2016; Pérez-Vázquez & Vila-Lladosa, 2013; Salmerón, 2013; Villardón-Gallego, Yániz, Achurra, Iraurgi, & Aguilar, 2013).

Nowadays, society demands that students acquire knowledge and skills related to certain disciplines, on the one hand, but also transversal skills that ensure, firstly, the ability to continue learning and updating themselves throughout life, in line with new advances and discoveries, according to the needs that arise. It is not just about accumulating knowledge, but rather about transforming information into knowledge on which to base professional performance and which also allows it to be judged, assessed and used to transform reality (ANECA, 2011).

Thus, competencies, understood as the ability to put knowledge and skills into action, are, on the one hand, something that the student has to learn and, on the other, they allow an application of knowledge that brings us closer to other forms of learning in that they serve to contrast a way of understanding things; this way may be wrong or right and, in reality, this would not matter too much from the point of view of learning, as long as the student takes advantage of the opportunity, with the help of the teacher, to reflect on the results of his activity and learn from this feedback (ANECA, 2011).

The context of this work is carried out in the Degree of Physical Activity and Sports Sciences, a qualification in which one learns to be a competent professional in five profiles: teaching of physical activity and sports, sports training, physical activity and quality of life, sports management and recreation. The work developed is based on a teaching environment oriented to learning, central axis of the reform in which the Spanish university system is immersed, where a program must be judged in terms of its effectiveness to help teachers to maximize student learning, it must be a starting point for annual decision-making, thanks to the active participation and feedback obtained from the students' results, which help to improve the process (Gessa, 2011).

This work is the continuation of a process of continuous improvement within the subject of collaborative-opposition sports of the Degree in Physical Activity and Sports Sciences that has followed the following process:

1. Construction and validation of a questionnaire to evaluate the teaching process of sports techniques by peers in Higher Education (ETEPES) (Álvarez et al., 2019).
2. Student opinion on the peer-based sports technique teaching process in Higher Education (ETEPES) (Álvarez-Medina et al., 2022)

3. Inclusion of participatory assessment in higher education of team sports (Álvarez-Medina et al., 2020).

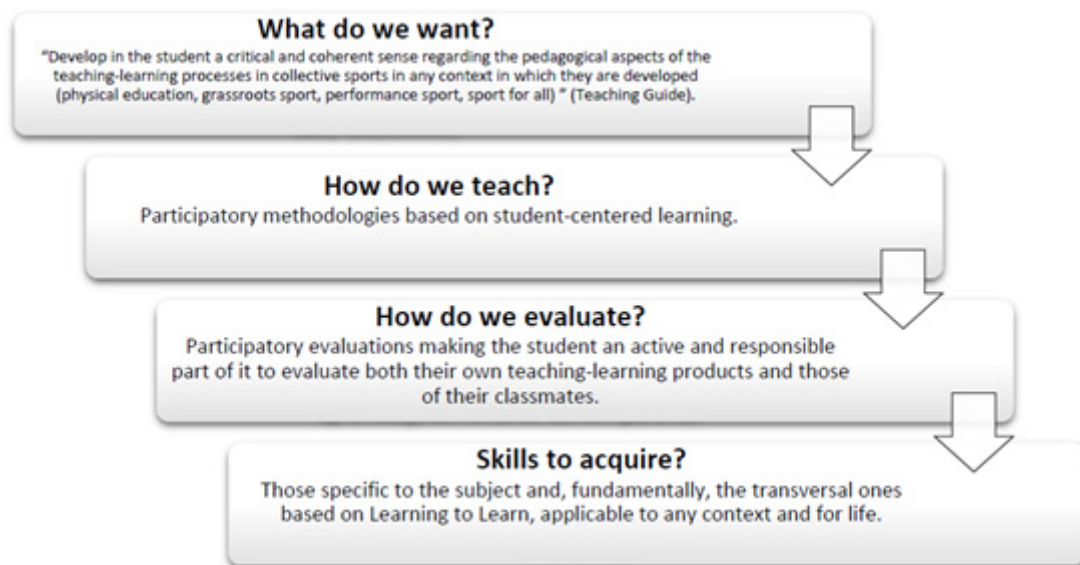
The results of previous publications on participatory assessments and methodologies show that students agree with the benefits they provide, confirming what other authors have established as one of the most effective ways to improve the development of interpersonal strategies, increase formative intentionality, encourage dialogue and the ability to make judgments with other classmates and even teachers to assess, improve the processes and products of learning specific subjects as well as the development of skills in general, producing an attitudinal change towards learning. All of this represents an undoubted formative value that helps to form more autonomous, responsible, critical students (Ibarra-Saiz, Rodríguez-Gómez, & Gómez-Ruiz, 2012; Moreno-Murcia, Aracil, & Reina, 2014; Prins, Sluijsmans, Kirschner, & Strijbos, 2005; Valdivieso et al., 2013), and as society demands, democratic citizens (Valdivieso et al., 2013), capable of entering the labor market and adapting to it throughout life.

Once, as suggested by Salmerón (2013), innovative proactive teaching methods with participatory assessments have been included to facilitate the development and attainment of the skills necessary to transfer knowledge and innovate in the workplace (Muñoz-San Roque et al., 2016), it is necessary to measure the degree of acquisition of the skills established in the Degree. Thus, this work shows a way of knowing the opinion of the students regarding the skills developed, and how within the subject under study work is done to improve those that are evaluated the worst.

The object of study of this research is to evaluate the students' assessment of the skills of the subject "Collaborative -opposition sports" and try to improve the acquisition of these skills, especially those in which the worst results are obtained.

The research hypothesis is that students participating in the subject of Collaborative -Opposition Sports perceive the evaluated competencies positively, although work on those that are less well evaluated can have a positive effect on their acquisition in later years.

Figure 1
Structure of the object of study



Material and Method

A selective longitudinal study was carried out on second-year students of the Degree in Physical Activity and Sports Sciences in the subject "Collaborative-opposition sports". The courses analysed were:

- 2018-2019, 47 participants.
- 2019-2020, 2nd semester, 54 participants.
- 2020-2021, 46 participants.

76.1 % of the students are male, while 23.8 % are female.

It should be noted that, starting in the second semester of the 2019-20 academic year, they were developed under the health restrictions caused by the COVID-19 pandemic.

Instrument

The general skills proposed for this subject are divided into:

- Instrumentals
- Personal and interpersonal relationships
- Systemic
- Others

In order to determine whether the competencies have been achieved, a questionnaire was prepared consisting of all those described in the teaching guide for the subject “Collaborative-opposition sports”:

Table 1
List of Instrumental, Personal and interpersonal, Systemic and other competencies

Competencies
Instrumentals
CI1.-Ability to analyze and synthesize applied to the management and organization of physical and sports activities
CI2.- Use of appropriate oral and written communication techniques. both in academic contexts (in their different manifestations) and in informative situations
CI3.-Understanding of scientific literature on physical activity and sport in languages with a significant presence in this field. as well as correct expression in the aforementioned languages.
CI4.-Application of information and communication technologies (ICT) to the field of Physical Activity and Sports Sciences
CI5.-Organization and planning of own work. establishing guidelines and strategies appropriate to each situation
CI6.-Development of habits of excellence and quality in professional practice
CI7.-Application of knowledge on gender differences in AFE and sports in any professional field of the GCCAFD
CI8.-Application of knowledge to professionally care for any group or individual with special needs
Personal and interpersonal
CPEI.1.-Know and act within the ethical principles necessary for the correct professional practice referring both to the relations with users and to the organization and management of physical activity properly speaking.
CPEI.2.-Recognition of diversity and multiculturalism in professional performance
CPEI.3.-Commitment to the educational and social values of sport and physical activity as part of a culture of peace and democracy
CPEI.4.-Critical reasoning in the analysis and assessment of alternatives in all occupations related to professional performance
CPEI.5.-Develop management leadership interpersonal relationship and teamwork skills
CPEI.6.-Ability to integrate into multidisciplinary teams
Systemic
CS1.-Ability to adapt to new situations and changes in the environment
CS2.-Initiative and coherence in problem solving
CS3.- Positive attitude and sufficient aptitude for autonomous learning
CS4.- Ability to undertake improvements and propose innovations
Others
CO1.- Ability to understand each other in an international context
CO2.-Application of theory to practice
CO3.-Research skills
CO4.-Knowledge of other cultures
CO5.-Ability to work independently
CO6.-Project design and management
CO7.- Achievement motivation
CO8.-Environmental sensitivity

Note: CI (Instrumentals Competency); CPEI (Personal and interpersonal relationships Competency); CS (Systemic Competence); CO (Others Competency).

Quantitatively indicates the student's perception regarding general competences, using the Likert scale 1-5 where 1 corresponds to "I have not acquired it" and 5 "I have fully acquired it" and also regarding sub-competences, in which case it is necessary to mark whether they are considered to exist. In addition, qualitatively at the end of the questionnaire, it is possible to give an opinion on the competences and sub-competences raised.

Procedure

The questionnaires were collected through Google Platform Forms. Each participant was asked at the end of the course in each academic year, and in the presence of the professor responsible, to complete it and ask questions about any type of doubt they had regarding the items.

The inclusion criterion is that all students enrolled in the subject in each academic year participate in the study, while the only exclusion criterion established was not opting for continuous assessment of the subject based on what is established in the teaching guide, such as non-attendance in class.

Throughout each academic year, students progressively assimilate the learning processes in the cognitive, emotional and behavioural aspects, facilitating the assessment of the learning products (Muñoz-San Roque et al., 2016). Although all the competences must be acquired at the end of the degree, the obtaining and learning of the competences framed in this subject together with the contributions of the students through the final assessment, provide valuable feedback to help understand and improve the established process, highlighting the importance of knowing the opinion of the students as they are the main protagonists (Santos-Rego et al., 2017; Tejada & Ruiz, 2016) and the main ones affected by their pedagogical action (Dugas, 2006; Martínez-Otero et al., 2018).

Throughout the study, the anonymity of the responses was guaranteed in compliance with the ethical research standards of the Code of Good Practices in Research of the University of Zaragoza (2018), administering and being accepted by the participants the corresponding informed consent to participate in the study.

Intervention

The feedback obtained in the 2018-2019 academic year was considered and taken into account for the improvement of the subject in the following courses, both in the score of each competence and in the comments provided by the students. Some of these comments were:

- "I think that many of the skills mentioned here would be very good to acquire if it is really an objective proposed in this subject. I think that the way this subject has been developed has been by giving a lot of priority to some topics. The topic of the environment, curricular adaptations, gender equality, interculturality... I think that they have not been addressed at all, ..."
- "Knowledge of other cultures? Environmental sensitivity? I haven't heard a word about this."

With the aim of continuing to improve in all those skills especially related to "Learning to Learn", in the 2019-2020 and 2020-2021 academic years a series of activities-tasks were established to try to specifically improve those skills that obtained the worst results in the previous year. These were:

- Competence related to: Gender attention
 - Intervention: Work "Current role of women in sport".
- Competence related to: Other cultures and languages
 - Intervention: Searches for bibliographies in another language.
- Competence related to: Environmental care
 - Intervention: Reference to it in each assignment and in each class activity.
- Competence related to: Adaptive sport
 - Intervention: Monograph on adapted team sport.

The special situation experienced in the 2019-2020 academic year due to COVID-19 affected the acquisition of skills as it prevented the completion of some of the specific tasks planned for this purpose for the last months of the course, where both in theoretical class and in practice the student's intervention was even greater.

Statistical Method

SPSS v.21 program licensed by the University of Zaragoza. The results are given in descriptive form: frequency, percentages, mean and standard deviation. Inferential for the comparison of variables and to establish significant differences chi-square ($p < .05$). *Cronbach's alpha coefficient to establish the relationship between samples and Cohen's d* statistic to estimate the effect size.

Results

Table 2 shows the relationship between the different types of competencies and their scores in the 2018-2019, 2019-2020, and 2020-2021 academic years. The "Difference" column shows the difference in scores between two consecutive years, while the "p" column shows the p - value (probability) associated with that difference. The "Cohen's d" column shows the effect size.

It can be seen that in the instrumental competencies, there was an increase in 2019-2020 (.27) but a decrease in 2020-2021 (.08) with a p-value (.067) and a moderate Cohen effect size (.12). In personal and interpersonal competencies, there was an increase in 2019-2020 (.13) and a decrease in 2020-2021 (.02) with a p-value (.451) and a Cohen effect size (.03) estimated as small. In systemic competencies there was an increase in 2019-2020 (.40) but a decrease in 2020-2021 (.34) with a p-value (.000) and a very large Cohen effect size (.85). In the 'Other' competencies, there was an increase in 2019-2020 (.21) but a decrease in 2020-2021 (.11) with a p-value (.000) and a Cohen effect size (.28) considered as moderate.

Table 2
Acquisition of type of competences

Types of competencies	2018-19	2019-20	Difference	p	Cohen's d	2020'21	Difference	p	Cohen's d	Diff. 2018-19 vs 2020-21		
Instrumentals	3.57±.53	3.84±.53	+27	.006	0.51	3.76±.08	-.08	.067	0.12	.19	.016	0.27
Personal and interpersonal	3.80±.63	3.93±.61	+13	.298	0.21	3.91±.08	-.02	.451	0.03	.11	.882	0.15
Systemic	3.77±.64	4.17±.56	+4	.001	0.67	3.83±.10	-.34	.000	0.85	.06	.000	0.13
Others	3.38±.70	3.59±.54	+21	.132	0.34	3.70±.09	-.11	.000	0.28	.32	.000	0.65
Total	3.63±.19	3.88±.24	+25			3.80±.09	-.08			.17		

Herein table 3 shows a slight improvement in skills for both genders in the period 2020-2021 compared to 2018-2019 ($p = .04$). However, assessing skill by skill, the differences between men and women in both periods are small and not statistically significant ($p > .05$), except for the 'Other' skill.

Table 3
Acquisition of skills by year and gender

Types of competencies	2018-2019				2020-2021				Diff. 2018-19 vs 2020-21		
	Masc.	Fem.	Diff.	p	Masc.	Fem.	Diff.	p	Masc.	Fem.	p
Instrumentals	3.6 ± 0.56	3.48 ± 0.49	+0.12	.635	4.08 ± 0.77	4 ± 1.15	+0.08	.720	0.48	0.52	0.132
Personal and interpersonal	3.89 ± 0.62	3.57 ± 0.54	+0.32	.359	3.81 ± 0.81	3.9 ± 0.83	-0.09	0.511	-0.08	0.33	0.753
Systemic	3.73 ± 0.7	3.86 ± 0.49	-0.13	.219	3.83 ± 0.775	3.7 ± 1.33	+0.13	0.975	0.1	-0.16	0.521
Others	3.42 ± 0.75	3.29 ± 0.59	+0.13	.145				0.365			0.04
Total	3.66 ± 0.65	3.55 ± 0.53	+0.11		3.91 ± 0.785	3.87 ± 1.10	+0.78		0.25	0.32	0.04

Analyzing competency by competency (table 4) we can see those that have obtained significant differences between the courses. In particular, a significant increase is observed in competencies 1, 2, 3, 4, 5, 6 and 8, with statistically significant differences ($p < .05$) in competencies 1, 2, 4, 5 and 6. On the other hand, a significant decrease is observed in competency 7, ($p = .017$).

In competencies 9, 10 and 11 an increase is also observed, but it is not significant.

As reflected in table 5, a positive trend is shown in the assessment of instrumental and personal and interpersonal competencies. If we look at the instrumental competencies, it is observed that the scores for sub-competence 1.c Generation of activities and experiences have been relatively stable over the three years, with a slight decrease in the year 2020-2021. Sub-competence 3.d Identification of errors and proposal of alternatives has shown a significant increase in scores over the three years. Sub-competence 3.a Conducting scientific searches has also shown an increase in the score in the year 2020-2021 compared to the year 2018-2019, but a decrease in the year 2019-2020. Finally, subcompetence 6.d Assessment and review of performances showed an increase in the score in 2019-2020 but decreased in 2020-2021.

Table 4
Acquisition of skills

Competency	2018-2019	2019-2020	Dif	p	2020-2021	Dif	p
Instrumentals							
C.I.1	3.89±.79	3.89±.82	=	.885	4.24±.79	+.35	.027
C.I.2	3.34±.81	3.70±.80	+.36	.034	3.8±.74	+.1	.542
C.I.3	3.62±.92	3.85±.82	+.23	.159	4.11±.70	+.26	.101
C.I.4	3.85±.95	4.23±.82	+.38	.040	4.02±1.02	-.21	.402
C.I.5	3.66±.89	4.02±.70	+.36	.030	3.8±.77	-.22	.130
C.I.6	3.91±.77	4.06±.79	+.15	.334	3.52±1.11	-.54	.018
C.I.7	3.23±1.07	3.68±.98	+.45	.039	3.85±.86	+.17	.443
C.I.8	3.02±1.19	3.30±.93	+.28	.269	3.26±1.06	-.04	1
Personal and interpersonal							
CPEI.1	4.26±.82	4.23±.87	-.03	.943	4.07±.85	-.16	.122
CPEI.2	3.43±1.12	3.72±.95	+.29	.205	3.89±1.04	+.17	.087
CPEI.3	3.98±.70	4.08±.94	+.1	.318	4.2±.80	+.12	.010
CPEI.4	3.91±.93	4.15±.72	+.24	.263	4.04±.72	-.11	.570
CPEI.5	3.77±1.00	4.08±.78	+.31	.141	4.04±.84	-.04	.594
CPEI.6	3.43±.95	3.32±.99	-.11	.693	3.41±1.00	+.09	.001
Systemic							
C.S.1	3.49±.93	3.92±.76	+.43	.008	3.89±.82	-.03	.003
C.S.2	3.74±.99	4.04±.76	+.3	.162	3.83±.82	-.21	.474
C.S.3	4.06±.96	4.49±.75	+.43	.012	4.26±.88	-.23	.011
C.S.4	3.79±.88	4.21±.74	+.42	.010	3.87±1.00	+.34	.530
Others							
C.O.1	3.09±1.16	3.13±1.06	+.04	.852	3.17±1.06	+.04	.000
C.O.2	3.96±.83	4.13±.71	+.17	.331	4.07±.8	-.06	.354
C.O.3	3.43±.97	3.43±.89	=	.855	3.8±.91	+.37	.017
C.O.4	2.30±.93	2.57±.93	+.27	.157	2.98±1.14	+.41	.482
C.O.5	4.13±.80	4.28±.70	+.15	.357	4.39±.64	+.11	.064
C.O.6	3.57±1.02	3.83±.83	+.26	.170	3.85±.86	+.02	.017
C.O.7	3.74±1.13	4.17±.80	+.43	.067	4.07±.92	-.1	.000
C.O.8	2.81±1.34	3.19±1.18	+.38	.162	3.22±1.19	+.03	.000

Note: C.I. (Instrumentals Competency); C.P.E.I. (Personal and interpersonal relationships Competency); C.S. (Systemic Competence); C.O. (Others Competency).

Table 5
Summary of the evolution of the sub-competencies worked on throughout the 3 academic years analyzed 2018-19; 2019-20; 2020-21 expressed in percentage value

COMPETENCE	2018-19	2019-20	2020-21
Instrumental skills			
1.c Generation of activities and experiences	82.98%	84.91%	84.78%
3.d Identifying errors and proposing alternatives	78.72%	86.79%	89.13%
3.a Conducting scientific research	85.11%	83.02%	89.13%
6.d Assessment and review of actions	80.85%	92.45%	80.43%
Personal and interpersonal skills			
9.a Respect for the integrity of people. both from a physical. emotional and social point of view	82.98%	86.79%	82.61%
9.c Respect for rules and regulations in interaction situations	82.98%	86.79%	82.61%
11.a Understanding physical activity practice situations that can be treated from the culture of peace and fair play	82.98%	86.79%	86.96%

As for personal and interpersonal competencies, a similar trend is observed in sub-competencies 9.a and 11.a. Both scores have remained stable over the three years, with a small increase in the year 2020-2021. However, sub-competency 9.c Respect for rules and regulations in interaction situations has shown a significant increase in score between 2018-2019 and 2019-2020, but a decrease in the year 2020-2021.

Discussion

This study analyses the extent to which the competencies established in the Degree are being acquired. All the opinions obtained in the 2018-2019 academic year were considered and taken into account for the 2019-20 and 2020-21 academic years and a series of activities-tasks were established to try to specifically improve those competencies that obtained the worst results without ceasing to work on them in order to try to continue improving in all those competencies, especially those related to 'Learning to Learn'.

At first glance, it can be seen that scores have increased between 2018-19 and 2019-20 in all categories, except for the 'Other' category, which remains stable. However, between 2019-20 and 2020-21, a decrease in skills is observed in all categories, except for the 'Other' category, which increases. In addition, the effect size (Coh's d) is moderate or large in most comparisons, suggesting a significant impact.

Specifically, all types of competencies after the intervention have improved their scores in the 2019-2020 academic year compared to the previous one, being higher than 3.5, obtaining an improvement of .25 on average, going from $3,63 \pm .19$ to $.3,88 \pm .24$ and dropping minimally in the 2020-2021 academic year to $3.86 \pm .19$. The greatest increase (0.4) has occurred in the systemic ones, going from $3,77 \pm .64$ in the 2018-2019 academic year to $4,17 \pm .56$ in the 2019-2020 academic year, going from the second best rating to the first before the intervention. The personal ones obtain the smallest increase (.13) in the year 2019-2020, going from first place before the intervention to second after it, in the year 2020-2021 they increase slightly (.01). After the intervention, the instrumental ones continue to occupy the third best average and 'Others', despite suffering the second largest increase post-intervention (.21) in the 2019-2020 academic year, continues to obtain the worst average of all. Significant differences have been obtained in the instrumental (.006) and systemic (.001) in the 2019-2020 academic year.

If we look at the overall differences between the first and last year (2018-19 and 2020-21), there are significant differences in the values of the systemic competencies ($p = .016$), as well as in the Systemic ($p = .000$) and 'Other' ($p = .000$) competencies. It can be said that all of them are worked on within the subject for their full acquisition at the end of the degree.

It is worth noting that various investigations have shown that the combination of different types of educational experiences, including practical teaching and collaboration, are effective for the development of competencies in university students. In addition, it has also been shown that academic support and guidance are important to improve the development of personal and interpersonal competencies (Biggs, 2003; Popovic, 2013).

Evaluating the acquisition of skills by year and gender (table 3), a subtle increase in performance has been observed in both genders during the period between 2020 and 2021 compared to the period between 2018 and 2019. However, the variations between genders in both periods are insubstantial and do not reach statistical significance ($p > .05$). There are several studies that have examined the relationship between gender and skills at the university level in the degrees of physical activity and sports, and some of these studies have also concluded that there are no significant differences between the gender variable in terms of the acquisition of skills, considering the works of Gómez Ruiz et al. (2013), Rodríguez-Gómez et al. (2018), or in Bustamante-Ara et al. (2022).

Going deeper into the analysis of the acquisition of sub-competencies (table 4), we want to assess how in the instrumental competencies it is seen that the average scores between men and women are similar in the three years, with an average difference between genders of only .12 in the first year, .16 in the second year, and .0.8 in the third year. In the personal and interpersonal competencies, it is seen that the average scores are slightly higher in men than in women in the three years, with an average difference between genders of .32 in the first year, .0.2 in the second year, and -.0.9 in the third year. In the first and second year, the difference is significant ($p < .0.5$), but the value in the third year is not significant.

Regarding systemic competencies, it can be seen that the average scores are similar between men and women in the three years, with an average difference between genders of -.13 in the first year, .0.04 in the second year and .13 in the third year. The p values indicate that there is no significant difference between the average scores of men and women in systemic competencies.

Regarding the effectiveness of the specific measures implemented in the 2019-20 and 2020-21 academic years, all have improved, except for "Application of knowledge to professionally care for any group or individual with special needs" which decreased slightly in the 2020-21 academic year.

Breaking these down, we highlight the following considerations:

Attention to Gender:

Application of knowledge on gender differences in AFE and sports in any professional field of the GCCAFD $3.23 \pm 1.07/3.68 \pm .98 (+.45) / 3.85 \pm .86 (+.17)$. It is important to highlight the importance of developing this skill given that there are studies that highlight that there is still ongoing discrimination based on gender in our society but that students positively highlight the approach to these issues in university education. An aspect that we should overcome and address through this degree (Bas-Peña et al., 2017).

Other cultures and languages:

Understanding of scientific literature on physical activity and sport in languages with a significant presence in this field, as well as correct expression in the aforementioned languages $3.62 \pm .92/3.85 \pm .82 (+.23) / 4.11 \pm .70 (+.26)$

Ability to understand oneself in an international context $3.09 \pm 1.16/3.13 \pm 1.06 (+.04) / 3.17 \pm 1.06 (+.04)$

Knowledge of other cultures $2.30 \pm .93/2.57 \pm .93 (++)2.7) / 2.98 \pm 1.14 (+.41)$

One of the most characteristic features of the university in the 21st century is its great linguistic, cultural and academic diversity. This is why studies such as those by Dafouz (2015) and Oyarzún et al. (2012) suggest the need to develop, in the university environment, a multidimensional linguistic competence that contributes to students being able to understand the professional needs that they may encounter in current times. Hence the importance of the results of our study where these competences register a relevant consideration by the students.

Caring for the environment:

Environmental sensitivity $2.81 \pm 1.34/3.19 \pm 1.18 (+.38) / 3.22 \pm 1.19 (+.03)$

Adaptive sport:

Application of knowledge to professionally care for any group or individual with special needs $3.02 \pm 1.19/3.30 \pm .93 (+.28) / 3.26 \pm 1.06 (-.04)$

And with respect to the skills that will most promote 'Learning to Learn', we can highlight those that favor:

Ability to change, self-improvement, critical thinking:

Within the instrumentals (CI):

Application of information and communication technologies (ICT) to the field of Physical Activity Sciences $3.85 \pm .95/4.23 \pm .82 (+.38)$. As can be seen in table 4, in the 2019-20 academic year, the percentage of students who consider that work is being done increases compared to the 2018-19 academic year, although in the 2020-21 academic year the results decrease $4.02 \pm 1.02 (-.21)$.

Organization and planning of one's own work, establishing guidelines and strategies appropriate to each situation $3.66 \pm .89/4.02 \pm .70 (+.36)$. As can be seen in table 4, in the 2019-20 academic year, the percentage of students who consider that they work increases compared to the 2018-19 academic year, although in the 2020-21 academic year the results decrease $3.80 \pm .77 (-.22)$.

Within the personal ones (CP):

Critical reasoning in the analysis and assessment of alternatives in all those occupations specific to professional performance $3.91 \pm .93/4.15 \pm .72 (+.24)$. As can be seen in table 4, in the 2019-20 academic year the percentage of students who consider that they work increases compared to the 2018-19 academic year, although in the 2020-21 academic year the results decrease $4.04 \pm .72 (-.11)$.

Within the systemic ones (CS):

Ability to adapt to new situations and changes in the environment improves in the 2019-20 academic year compared to the previous one $3.49 \pm .93 / 3.92 \pm .76 (+.43)$ but worsens in the 2020-21 academic year $3.89 \pm .82 (-.03)$

Initiative and coherence in problem solving improved in the 2019-20 academic year compared to the previous one $3.74 \pm .99 / 4.04 \pm .76 (+.3)$ but worsened in the 2020-21 academic year $3.83 \pm .82 (-.21)$.

Positive attitude and sufficient aptitude for autonomous learning improves in the 2019-20 academic year compared to the previous one $4.06 \pm .96/4.49 \pm .75 (+.43)$ but worsens in the 2020-21 academic year $4.26 \pm .88 (-.23)$.

Capacity to undertake improvements and propose innovations improved in 2019-20 compared to the previous year $3.79 \pm .88 / 4.21 \pm .74 (+.42)$ but worsened in the 2020-21 academic year $3.87 \pm 1.0 (-.34)$.

Within 'Other' (CO):

Ability to work independently improved in both years, in 2019-20 $4.13 \pm .80$ / $4.28 \pm .70$ (+.15) and in 2020-21 $4.39 \pm .64$ (+.11).

Achievement motivation improves in the 2019-20 academic year compared to the previous one 3.74 ± 1.13 / $4.17 \pm .80$ (+.43) but worsens in the 2020-21 academic year $4.07 \pm .92$ (-.11)

These results coincide with the assessments of Ribas et al. (2022) or Douglas and Gammie (2019) both in that learning and the ability to learn are considered fundamental by the respondents, and a high assessment is also observed in terms of their performance in the Degree, which indicates that it is not only considered an important aspect, but that it is also being effectively developed through the participatory methodology applied in this study.

Likewise, in this table 5, several sub-competencies are highlighted that in the three courses analyzed the students consider that they are always worked on, which obtain percentages of approximately 80% of choice in all cases. Within the instrumental competence "Ability to analyze and synthesize applied to the management and organization of physical and sports activities", two sub-competencies stand out: "Generation of activities and experiences" and "Identification of errors and proposal of alternatives". Within the instrumental competence "Understanding of scientific literature referring to physical activity and sport in languages with a significant presence in this field, as well as correct expression in the aforementioned languages", the sub-competency "Conducting scientific searches" stands out. Within the instrumental competence "Development of habits of excellence and quality in professional practice", the sub-competency "Assessment and review of actions" stands out. Within the personal and interpersonal competence "Knowing and acting within the ethical principles necessary for the correct professional practice, referring both to relations with users and to the organization and management of physical activity itself", the sub-competency "Respect for the integrity of people, both from a physical, emotional and social point of view" and "Respect for the rules and regulations in interaction situations" stand out. Within the personal and interpersonal competence "Commitment to the educational and social values of sport and physical activity as part of a culture of peace and democracy", the sub-competency "Understanding situations of physical activity practice that can be treated from a culture of peace and fair play" stands out.

Due to the special situation experienced, COVID-19, it should be noted that although this subject and the methodologies and evaluations section were not excessively affected because it was annual and in the second semester there were less weekly teaching sessions, it did affect the acquisition of skills to a greater extent since it prevented some of the specific tasks planned for this purpose from being carried out for the last months of the course, where both in the theoretical and practical classes the student's intervention was even greater, so it may fundamentally affect the results obtained in the competitions and in the methodology applied in football because it is the last of all (González-Arévalo et al., 2022).

These values can be related to those obtained in the work of Amor-Almedina and Serrano-Rodríguez (2018), in which the levels of development of general skills in university studies were evaluated. The results show that there are significant differences between groups, but in general, the ability to work in a team is the best perceived by all participants, compared to the ability to communicate in a language and technological ability.

Cooperative peer assessment on a group of high school students. The results of the study suggest that this strategy can significantly improve students' academic performance. Furthermore, students who participated in cooperative peer assessment showed a higher level of confidence and a more positive attitude towards learning in general (González-Arévalo et al., 2022).

Cooperative pair assessment is carried out as follows: students are divided into pairs and assigned a specific topic to study. Each student then makes his or her own assessment of the topic, and then they meet with their partner to discuss their assessments and come to an agreement on their level of understanding of the topic. This technique allows students to improve their understanding of the material and also gives them the opportunity to teach their partners what they have learned.

In summary, cooperative peer assessment is an effective pedagogical strategy that can improve students' academic performance and increase their confidence and positive attitude toward learning.

It is important to note that these results must be interpreted with caution, as they depend on the methodology used to carry out the assessments and surveys, as well as the size and representativeness of the sample of students assessed. In addition, it is necessary to know the context in which these assessments were carried out in order to understand why certain improvements or decreases in the results have occurred.

Conclusions

The main conclusions regarding competences are:

- All skills are worked on throughout the subject, obtaining values greater than 3.5.

- The intervention has been effective, going from an average of $3.63 \pm .19$ to $3.80 \pm .009$, obtaining an improvement of .27.
- Highlighting the systemic ones, focused on 'Learning to Learn', going from $3,77 \pm .64$ to $3,83 \pm .10$ with an increase of .06.
- Despite the measures adopted, some skills are difficult to work on due to the characteristics of the subject.

The main general conclusions of the study were:

- The entire teaching-learning process is coherent, with the methodologies and assessments used aligned with the acquisition of skills and the objective of the subject.
- Student feedback is effective in improving the process and should be a starting point for annual decision making.

The intervention had a positive impact on students' competencies, with a significant improvement in systemic competencies and a smaller but significant increase in instrumental competencies. However, the 'Other' category continued to have the worst average of all. Likewise, we consider that further research is needed in the application of this type of participatory methodology to identify possible solutions and improve the acquisition of students' competencies in these subjects. The combination of different types of educational experiences, including practical teaching, reflection, collaboration and experience, are effective for the development of competencies in university students.

Ethics Committee Statement

Not applicable due to the nature of the study, as it does not involve sensitive people or data that require approval from an Ethics Committee.

Conflict of Interest

The authors declare that this research has been carried out without any commercial or financial relationships that could be interpreted as a potential conflict of interest.

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Authors' Contribution

CRediT taxonomy, the individual contributions of the authors in this article are as follows: Interpretation of results: Javier Álvarez Medina, Jaime Casterad Seral, Víctor Murillo Lorente, Luis Pueyo Romeo; Methodology: Javier Álvarez Medina, Jaime Casterad Seral, Víctor Murillo Lorente, José Antonio Poblador Vallés; Data collection: Javier Álvarez Medina, Jaime Casterad Seral, Víctor Murillo Lorente, José Antonio Poblador Vallés; Literature review: Javier Álvarez Medina, Víctor Murillo Lorente, José Antonio Poblador Vallés, Luis Pueyo Romeo; Review and editing: Jaime Casterad Seral, Luis Pueyo Romeo. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

The data derived from this work are available upon request from the author (jcaster@unizar.es) without any undue restrictions.

References

- Álvarez, J., Casterad, J., Murillo, V., & Nuviola, A. (2019). Validación de la escala del proceso enseñanza de la técnica deportiva por pares en la educación superior (ETEPEs). *Retos: Nuevas Tendencias en Educación Física, Deporte y Recreación*, 37, 284-290. <https://doi.org/10.47197/retos.v37i37.73002>
- Álvarez-Medina, J., Murillo-Llorente, V., Casterad-Seral, J., & Nuviola-Nuviola, A. (2022). Valoración del aprendizaje técnico del voleibol mediante la metodología observacional por pares en estudiantes universitarios. *Cultura, Ciencia y Deporte*, 17(51), 31-39. <https://doi.org/10.12800/ccd.v17i51.1662>
- Álvarez-Medina, J., Usán, P., Estrada-Marcén, N., & Murillo, V. (2020). Inclusión de metodologías activas en el alumnado de enseñanza superior universitaria. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 15(2), 119-124. <https://dialnet.unirioja.es/servlet/articulo?codigo=7571290>
- Amor-Almedina, M.I., & Serrano-Rodríguez, R. (2018). Análisis y evaluación de las competencias genéricas en la formación inicial del profesorado. *Estudios Pedagógicos*, 44(2), 9-19. <https://dialnet.unirioja.es/servlet/articulo?codigo=6844676>

- ANECA (2011). *Guía de apoyo para la redacción, puesta en práctica y evaluación de los resultados del aprendizaje. Versión 1.0*. Agencia Nacional de Evaluación de la Calidad y Acreditación. <https://www.aneca.es/>
- Bas-Peña, E., Ferre Jaén, E., & Maurandi López, A. (2017). Educación superior, competencias transversales y género: Validación de un cuestionario. *Revista de Humanidades*, 31. <https://dialnet.unirioja.es/servlet/articulo?codigo=6004959>
- Biggs, J. (2003). *Teaching for quality learning at university*. SRHE and Open University Press.
- Boude, D., & Associates. (2010). *Assessment 2020: Seven propositions for assessment reform in higher education. Education and Training*, Australian Learning and Teaching Council. <https://doi.org/10.1200/JOP.2011.000236>
- Bustamante-Ara, N., Russell, J., Godoy-Cumillaf, A., Merellano-Navarro, E., & Uribe, N. (2022). Academic performance, physical activity, sleep and gender in university students during the pandemic-2020. *Cultura, Ciencia y Deporte*, 17(53), 109-120. <https://doi.org/10.12800/ccd.v17i53.1897>
- Dafouz, E. (2015). Más allá del inglés: la competencia lingüística multi-dimensional como estrategia para la enseñanza en la universidad internacional. *Educación y Futuro*, 32, 15-34. <https://dialnet.unirioja.es/servlet/articulo?codigo=5106623>
- Douglas, S., & Gammie, E. (2019). An investigation into the development of non-technical skills by undergraduate accounting programmes. *Accounting Education*, 28(3). <https://doi.org/10.1080/09639284.2019.1605532>
- Dugas, E. (2006). La evaluación de las conductas motrices en los juegos colectivos: Presentación de un instrumento científico aplicado a la educación física. *Apunts: Educación Física y Deportes*, 83(1), 61-69. <https://revista-apunts.com/la-evaluacion-de-las-conductas-motrices-en-los-juegos-colectivos-presentacion-de-un-instrumento-cientifico-aplicado-a-la-educacion-fisica/>
- Gessa, A. (2011). La coevaluación como metodología complementaria de la evaluación del aprendizaje. *Revista de Educación*, 354, 749-764. http://www.revistaeducacion.educacion.es/re354/re354_30.pdf
- Gómez Ruiz, M.A., Rodríguez Gómez, G., & Ibarra Saiz, M.S. (2013). Desarrollo de las competencias básicas de los estudiantes de Educación Superior mediante la e-Evaluación orientada al aprendizaje. *Relieve*, 19(1), 0-2. <https://doi.org/10.7203/relieve.19.1.2457>
- González-Arévalo, C., Monguillot, M., & Andrés, A. (2022). La evaluación por pares en el ámbito universitario: Una experiencia en el grado de ciencias de la actividad física y el deporte. *Ágora para la Educación Física y el Deporte*, 24, 140-160. <https://doi.org/10.24197/aefd.24.2022.140-160>
- Ibarra-Saiz, M.S., Rodríguez-Gómez, G., & Gómez-Ruiz, M.A. (2012). La evaluación entre iguales: Beneficios y estrategias para su práctica en la universidad. *Revista de Educación*, 359, 206-231. <https://doi.org/10.4438/1988-592X-RE-2010-359-092>
- Jarauta, B., & Medina, J.L. (2013). *Enseñanza y aprendizaje en la educación superior*. Editorial Síntesis.
- Martínez-Clares, P., & González-Morga, N. (2018). Las competencias transversales en la universidad: Propiedades psicométricas de un cuestionario. *Educación XX1*, 21(1). <https://doi.org/10.5944/educXX1.15662>
- Martínez-Otero, V., Pérez, V., & Gaeta, L. (2018). Estudio del discurso educativo en una muestra de docentes mexicanos. *Revista Iberoamericana de Educación*, 76(1), 169-186. <https://doi.org/10.35362/rie7602855>
- Moreno-Murcia, J.A., Aracil, A., & Reina, R. (2014). Assignment of responsibility in evaluation: A strategy adapted to the European higher education area. *Educación XX1*, 17(1), 183-200. <https://doi.org/10.5944/educxx1.17.1.10710>
- Muñoz-San Roque, I. M., Martín-Alonso, J. F., Prieto-Navarro, L., & Urosa-Sanz, B. (2016). Autopercepción del nivel de desarrollo de la competencia de Aprender a Aprender en el contexto universitario: Propuesta de un instrumento de evaluación. *Revista de Investigación Educativa*, 34(2), 369-383. <https://doi.org/10.6018/rie.34.2.235881>
- Oyarzún, G., Pino, E., & Oyarzún, M. (2012). Habilidades sociales y rendimiento académico: Una mirada desde el género. *Acta Colombiana de Psicología*, 15(2), 21-28. <https://actacolombianapsicologia.ucatolica.edu.co/article/view/263>
- Pérez-Vázquez, P.J., & Vila-Lladosa, L.E. (2013). La adquisición de competencias para la innovación productiva en la universidad española. *Revista de Educación*, 361, 429-455. <https://doi.org/10.4438/1988-592X-RE-2013-361-228>
- Popovic, C. (2013). Teaching for quality learning at university (2nd ed.). *Innovations in Education and Teaching International*, 50(4), 416-432. <https://doi.org/10.1080/14703297.2013.839332>
- Prins, F.J., Sluijsmans, D.M.A., Kirschner, P.A., & Strijbos, J.W. (2005). Formative peer assessment in a CSCL environment: A case study. *Assessment and Evaluation in Higher Education*, 30(4), 417-444. <https://doi.org/10.1080/02602930500099219>

- Real Decreto 1027/2011, Gobierno de España. (2011). *Real Decreto 1027/2011 de 15 de julio, por el que se establece el Marco Español de Cualificaciones para la Educación Superior*. Boletín Oficial del Estado, 185, 87424-87428. <https://www.boe.es/buscar/doc.php?id=BOE-A-2011-13317>
- Real Decreto 43/2015: Gobierno de España. (2015). *Real Decreto 43/2015, de 2 de febrero, por el que se modifica el Real Decreto 1393/2007, de 29 de octubre, por el que se establece la ordenación de las enseñanzas universitarias oficiales*. Boletín Oficial del Estado, 26, 8479-8481. <https://www.boe.es/boe/dias/2015/02/03/pdfs/BOE-A-2015-1054.pdf>
- Real Decreto 861/2010: Gobierno de España. (2010). *Real Decreto 861/2010, de 2 de julio, por el que se modifica el Real Decreto 1393/2007, de 29 de octubre, por el que se establece la ordenación de las enseñanzas universitarias oficiales*. Boletín Oficial del Estado, 161, 58401-58403. <https://www.boe.es/boe/dias/2010/07/03/pdfs/BOE-A-2010-10542.pdf>
- Real Decreto 96/2014: Gobierno de España. (2014). *Real Decreto 96/2014, de 14 de febrero, por el que se modifica el Real Decreto 1393/2007, de 29 de octubre, por el que se establece la ordenación de las enseñanzas universitarias oficiales*. Boletín Oficial del Estado, 41, 15647-15649. <https://www.boe.es/boe/dias/2014/02/15/pdfs/BOE-A-2014-1562.pdf>
- Ribas, F., Dario, S.A., Girardelli, A.D., & Hidalgo, M.V. (2022). Valoración de competencias genéricas relevantes en contadores graduados de una universidad argentina. *CAPIC Review*, 20, 1-11. <https://doi.org/10.35928/cr.vol20.2022.127>
- Rodríguez-Gómez, G., Ibarra-Sáiz, M., & Cubero-Ibáñez, J. (2018). Competencias básicas relacionadas con la evaluación: Un estudio sobre la percepción de los estudiantes universitarios. *Educación XX1*, 21(1), 181-208. <https://doi.org/10.5944/educXX1.14457>
- Salmerón, L. (2013). Actividades que promueven la transferencia de los aprendizajes: Una revisión de la literatura. *Revista de Educación*, Extra(1), 34-53. <https://doi.org/10.4438/1988-592X-RE-2013-EXT-253>
- Santos-Rego, M.A., Jover-Olmeda, G., Naval-Durán, C., Alvarez-Castillo, J.L., Vázquez-Verdera, V., & Sotelino-Losada, A. (2017). Diseño y validación de un cuestionario sobre práctica docente y actitud del profesorado universitario hacia la innovación (CUPAIN). *Educación XX1*, 20(2), 39-71. <https://doi.org/10.5944/educXX1.17806>
- Tejada, J., & Ruiz, C. (2016). Evaluación de competencias profesionales en educación superior: Retos e implicaciones. *Educación XX1*, 19(1), 17-38. <https://doi.org/10.5944/educXX1.12175>
- Thomas, G., Martin, D., & Pleasants, K. (2011). Using self- and peer assessment to enhance students' future-learning in higher education. *Journal of University Teaching & Learning Practice*, 8(1), 201-222. <https://doi.org/10.53761/1.8.1.5>
- Valdivieso, J.A., Carbonero, M.A., & Martín-Antón, L.J. (2013). Elementary school teachers' self-perceived instructional competence: A new questionnaire. *Revista de Psicodidáctica*, 18(1), 47-78. <https://doi.org/10.1387/RevPsicodidact.5622>
- Villardón-Gallego, L., Yániz, C., Achurra, C., Iraurgi, I., & Aguilar, M.C. (2013). La competencia para aprender en la universidad: Desarrollo y validación de un instrumento de medida. *Revista Psicodidáctica*, 8(2), 357-374. <https://www.cicuyo.org/ojs/index.php/Psicoped/article/view/151>