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PEER EVALUATION AND CO-EVALUATION APPLIED TO PROFESSIONALIZING DEGREES

APPLICATION IN THE BUILDING ENGINEERING DEGREE

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KEYWORDS

Learning-oriented assessment
Skills
Peer evaluation
Building degree
Professional attributions
Co-evaluation
Valuations

ABSTRACT

The acquisition of the competences of a subject established in the study plan encourages the search for new methods that improve the teaching-learning process, especially in the qualifications that enable the exercise of a profession with legal attributions.
Through this text, the results of the application of the peer evaluation system and the co-evaluation of the subject Valuations of Real Estate and Expert reports of the Degree in Building Engineering are explained throughout 5 academic years, allowing to conclude the benefits on the acquisition of skills and improvement of success rates, as well as the implementation of professional powers.

PALABRAS CLAVE

Evaluación orientada al aprendizaje
Competencias
Evaluación por pares
Grado edificación
Atribuciones profesionales
Coevaluación
Valoraciones

RESUMEN

La adquisición de competencias de las asignaturas favorece la búsqueda de nuevos métodos que mejoren el sistema de enseñanza-aprendizaje, principalmente en las titulaciones que tienen asignadas competencias reguladas que habilitan para el desarrollo de las profesiones.
A través de este texto se explican los resultados obtenidos de la aplicación del sistema de evaluación denominado entre iguales y la coevaluación en la asignatura de Valoraciones, Tasaciones y Peritaciones durante 5 cursos académicos, permitiendo concluir que son destacados los beneficios obtenidos en relación con la adquisición de competencias y la mejora de las tasas de éxito, así como la implementación de las atribuciones profesionales.

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1. Introduction

Since the implementation of the European Higher Education Area (EHEA), the articulation of new teaching models that encompass teaching, learning and assessment has been promoted, with which it has been possible to favor the acquisition of skills, both specific and the basic ones as well as the general ones, in the different areas of knowledge of university degrees.

To guarantee the acquisition of skills by future graduates, it is essential to establish a new approach in learning procedures that guarantee the success of the acquisition in order to achieve future adaptation in the professional environment (Alcañiz et al. 2015), (Alcañiz et al. 2013), (Bridgstock, 2009).

Considering that the student is the receiver and therefore the main protagonist (Aneca 2004), the process for the search for new teaching methodologies is fundamentally focused on achieving their involvement (Alcañiz et al., 2015), (Sanmarti 2007).

It follows that it is a priority to increase the degree of student participation in all teaching processes (Delgado et al., 2016), (Hortiguela and Pérez, 2016), (Bretones, 2008), (Pinto, 2005), (Bordas et al., 2001), which leads to a change in the teaching structure that can be implemented in all areas of knowledge as well as in the different university degrees.

Starting from the fact that the progress and learning of the students is the ultimate goal, Brakke and Brown (2002) state that it is decisive, in order to achieve this, to design a specific evaluation process that allows the active participation of the students as well as its implementation in the different areas of knowledge of university degrees. The fact that most students base their main reason for their work on evaluation, that is, they learn and study for evaluation (Moreno, 2016), reinforces the design proposal. If we add to this that, as Bernabé and Blasco (2013) state, learning is reinforced and more motivated if the evaluation is related to jobs related to the real professional world, the result favors the acquisition of a wide variety of skills. And also, a really profitable activity in the future, due to its application to professional life (Sambell et al., 1997).

For technical degrees, learning requires putting into practice activities that they will necessarily have to face in their professional future, such as, for example, preparing reports, reports and documents of various kinds that must always be correctly argued for their valid foundation. . This type of learning supports the training of the student, who in this way absorbs the skills that are really going to be required in his professional life, motivating him to face the evaluation.

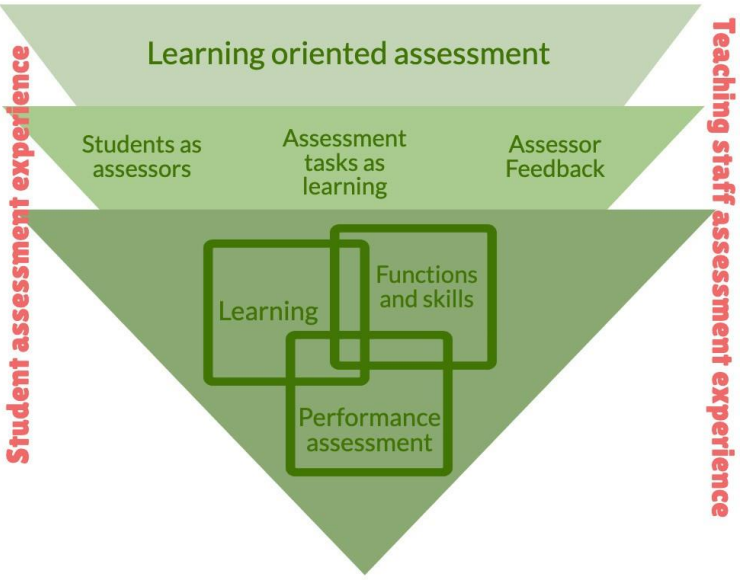
Therefore, a sustainable evaluation is proposed (Moreno, 2016), (Castelló et al., 2009), understanding it as an option that allows creating questions with solutions that achieve the increase and use of student participation (Jiménez, Fontana et al., 2015).

Based on what has been explained, the generation of a sustainable evaluation system was the main challenge for this work, through which the competencies will be evaluated to achieve a positive influence and a guarantee of their acquisition, for which it is proposed to develop practices that achieve reach the end of the EHEA (Bernabé and Blasco, 2013), (Ibarra and Rodríguez 2010).

In order to achieve a sustainable evaluation system, the different currently existing evaluation systems were reviewed (Díaz, and Barriga, 2002), (Covic and Jones, 2008), (Buttler and Winne, 1995), (Nicol and MacFarlane, 2006), as well as studies on learning-oriented assessment (Boud and Falchikov, 2006), (Carless, 2003), (Carless et al., 2006), (Keppell et al., 2006), (Gómez-Ruiz and Quesada-Serra, 2017), concluding that, among all of them, peer assessment and co-assessment were the most appropriate systems to ensure the continuous improvement of learning and the acquisition of skills as well as the one that promotes the application of professional skills in evaluation (Gessa, 2011), (Álvarez, 2008).

Currently, there are various peer assessment and co-assessment systems (Valverde, 2019), (Alcañiz et al., 2015) suitable for various areas of knowledge (Falchikov, 2005) and which are currently applied in other countries on a regular basis. To increase the learning of university students and focus it on their future profession (Keppell et al., 2006), this system of peer assessment and co-assessment is beginning to be used in Spain in some universities, despite the complexity of the process. Its implementation, given that, with this system, as has been stated, teamwork is favored and evaluation is facilitated, is guaranteeing the acquisition of competencies, and also determining the level of acquisition achieved. In addition, with the application of the peer evaluation and co-evaluation system, according to Fallows and Steven (2000), the training of students is enriched by improving both attitudes and aptitudes, with which a greater knowledge of future professional life is achieved, which also increases their autonomy and confidence in the development of their future professional life (Van der Schaaf et al., 2013). Learning-oriented assessment is schematically represented in Figure 1.

Figure 1. Assessment oriented to learning in competencies and attributions.



Source: Adapted from Ibarra et al., 2012.

As confirmed by Sambell et al.:

Assessment has a positive effect on student learning when it is related to authentic tasks, represents reasonable demands, encourages students to use knowledge in a realistic context, promotes the development of a wide variety of skills and perceived as beneficial in the long run. (Sambell et al., 1997)

Therefore, it is relevant to consider that the practical cases related to the future professional life will motivate the students.

The application of this evaluation system to the Degree in Technical Architecture (as well as to the rest of the denominations currently existing in Spain), a qualifying qualification for the practice of the profession of Technical Architect regulated by the Ley de Ordenación de la Edificación (1999), an eminently practical degree, is suitable above all for subjects that include skills related to professional attributions.

Its application implies the introduction of some changes in the teaching approach, so that the overcoming of the subject is subject to the correct application of the theory in the proposed practices, which should be cases like those faced in their professional future. With the use of this system, training feedback is automatically generated for the student, which in this way adds the benefits derived from peer assessment and co-assessment to their training. An additional motivation is provided when the system is applied, since the possibility of increasing the qualification, as confirmed by Hortiguela and Perez, (2016), Fink (2003) and Capó et al. (2013), represents an advance in learning.

With this system, a rapprochement is achieved between the professional and the educational (Blanco, 2009), since evaluation becomes part of learning, providing certain skills that are essential and transversal to all degrees (Bautista-Cerro and Murga, 2011).

The knowledge of previous studies (Revilla, 2021), (Sáez-Pérez et al., 2021a), (Sáez-Pérez et al., 2021b), (Fitipaldi, 2020), (Hopster et al., 2019), (Yan et al., 2018), (Sáez-Pérez et al., 2015), helped to improve and progress with the methodological proposal in these types of degrees studies.

Based on peer evaluation and co-evaluation, the process of peer evaluation and co-evaluation has been carried out during Valuations of Real Estate and Expert reports of the Degree in Building Engineering at the University of Granada, with the intervention of students and teachers. The results show the achievement of the competences established in the study plan, as well as the application of the professional reality to the student's training process by carrying out practical cases, all achieved through the innovative evaluation system.

2. Objectives

With the completion of this study, the aim is, first, to apply the strategy of evaluation among equals and co-evaluation to describe the experience in teaching with professional attributions. The perception of the participants will be extracted from it, to analyze it and check what the pros and cons are, as well as the usefulness derived from its application.

With all the above, the advantages and disadvantages of the peer assessment and co-assessment system will be deduced, showing whether or not the desired improvements in the teaching-learning process are achieved. Finally, it will be possible to conclude what the benefits of this system are compared to traditional evaluation, especially applied to matters directly related to professional attributions.

3. Methodology

To carry out the research, the peer evaluation and co-evaluation system was applied in the subject with professional attributions of Valuations of Real Estate and Expert reports of the Degree in Building Engineering of the University of Granada during 5 academic years have been considered for the present study. The total participation has been 300 students.

The action, designed by the authors of the research, was based on the different existing bibliographic sources on the subject, applying control and evaluation tools that are easy to apply and understand for students and that at the same time guarantee the achievement of the proposed objectives.

The system was used in the continuous evaluation of the practical part of the subject, which is the one dedicated to the writing of technical documents that are part of the subject program and that are of direct application in the professional life of the graduates by the professional attributions recognized by corresponding law (Decreto 265/1971), (Ley 12/1986), (García, 2017), (Ruiz, 2005).

The exercises of the practical part, as has been mentioned, coincide with real cases such as those that the students will find in professional life, working on their own or for someone else or as technicians of the Administration. To solve these practical cases, they must follow the same steps as a professional: information search, field data collection, application of legislative provisions, analysis, and organization of all the information collected and final drafting of the requested document.3.

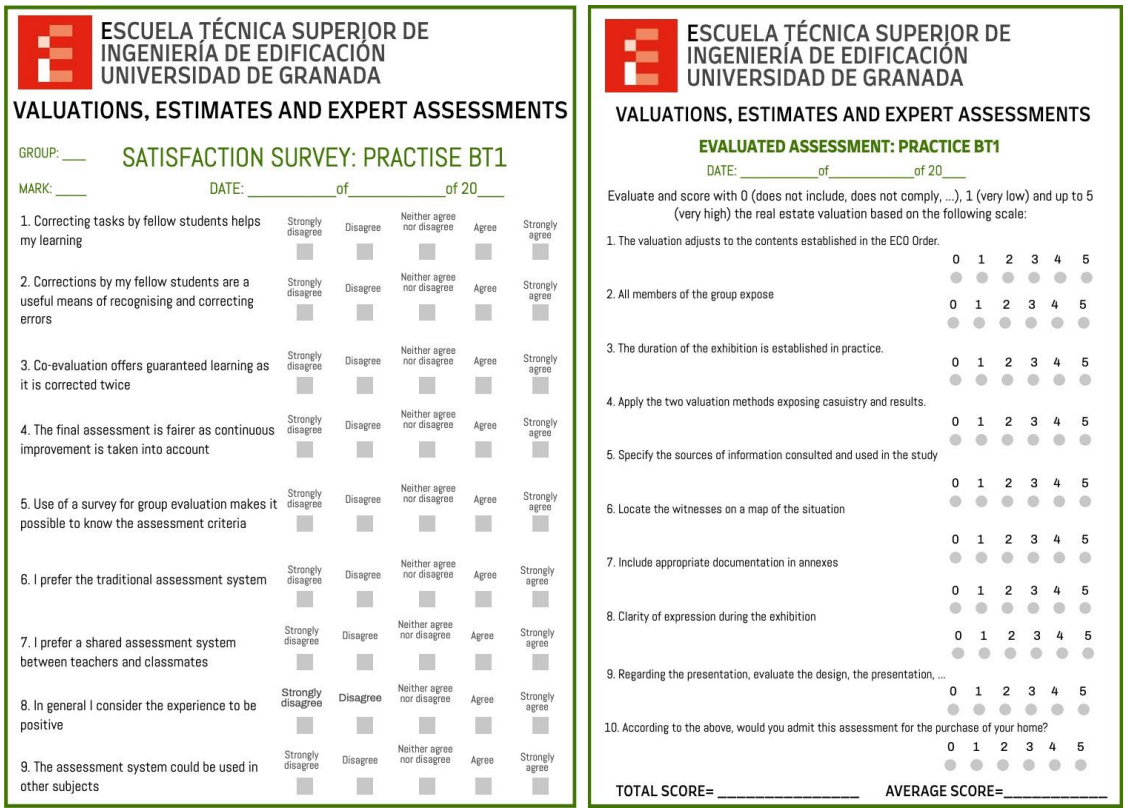
The practical cases of the subject are carried out during the practical teaching in presence, in work groups made up of a maximum of 4 students, and each proposed case is assigned the necessary time for its complete resolution working autonomously. In the previous explanation of each case, the academically assigned competences are set out, as well as those related to the professional work that they will develop in the future, including issues related to the various responsibilities that they will assume (Deontological/Professional/Ethical, Civil, Criminal, Disciplinary, Administrative and Social). Finally, the evaluation criteria and how it will be developed both by the students and by the teachers are exposed.

When the moment of evaluation arrived, once the documents had been delivered and the presentation and defense phase of the work of all the groups had been completed, peer evaluation was first applied. To carry it out, the students were given the procedure, which describes issues to be evaluated such as content, delivery times, application techniques and methods, formats, design, etc. As a complement to the procedure, they were provided with the rubric (fig. 2 left) to use in evaluating the work of the other groups. The use of the rubric in different practical cases promotes knowledge of other ways of approaching the work, other formats, points of view, etc., and the more groups it is applied to, the greater the benefits obtained. Next, the documents made by the groups are distributed to be evaluated by groups that have not been the authors. The use of the rubric favors both the resolution of the practical cases and their evaluation, since the students know the evaluable criteria beforehand and use it as a guide to adequately solve the case, which means that its use is positively valued by students (López-Pastor et al., 2016).

Secondly, it is the teachers who use the rubric again, but including criteria related to the skills learnt by the students and the information of the professional attributions from the technical point of view.

After the evaluation, all the participants filled out a short anonymous questionnaire (fig. 2 right) with questions related to the process to find out their opinion and their satisfaction with the acquisition of the skills, generating feedback from the evaluation system that allows to verify the successes and repair the errors in the next installments.

Figure 2. Rubric and survey model used during peer review and co-evaluation.



ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA DE EDIFICACIÓN UNIVERSIDAD DE GRANADA

VALUATIONS, ESTIMATES AND EXPERT ASSESSMENTS

GROUP: ___ SATISFACTION SURVEY: PRACTISE BT1

MARK: ____ DATE: _____of_____of 20___

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. Correcting tasks by fellow students helps my learning	☐	☐	☐	☐	☐
2. Corrections by my fellow students are a useful means of recognising and correcting errors	☐	☐	☐	☐	☐
3. Co-evaluation offers guaranteed learning as it is corrected twice	☐	☐	☐	☐	☐
4. The final assessment is fairer as continuous improvement is taken into account	☐	☐	☐	☐	☐
5. Use of a survey for group evaluation makes it possible to know the assessment criteria	☐	☐	☐	☐	☐
6. I prefer the traditional assessment system	☐	☐	☐	☐	☐
7. I prefer a shared assessment system between teachers and classmates	☐	☐	☐	☐	☐
8. In general I consider the experience to be positive	☐	☐	☐	☐	☐
9. The assessment system could be used in other subjects	☐	☐	☐	☐	☐

ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA DE EDIFICACIÓN UNIVERSIDAD DE GRANADA

VALUATIONS, ESTIMATES AND EXPERT ASSESSMENTS

EVALUATED ASSESSMENT: PRACTICE BT1

DATE: _____of_____of 20___

Evaluate and score with 0 (does not include, does not comply, ...), 1 (very low) and up to 5 (very high) the real estate valuation based on the following scale:

1. The valuation adjusts to the contents established in the ECO Order. 0 1 2 3 4 5
2. All members of the group expose 0 1 2 3 4 5
3. The duration of the exhibition is established in practice. 0 1 2 3 4 5
4. Apply the two valuation methods exposing casuistry and results. 0 1 2 3 4 5
5. Specify the sources of information consulted and used in the study 0 1 2 3 4 5
6. Locate the witnesses on a map of the situation 0 1 2 3 4 5
7. Include appropriate documentation in annexes 0 1 2 3 4 5
8. Clarity of expression during the exhibition 0 1 2 3 4 5
9. Regarding the presentation, evaluate the design, the presentation, ... 0 1 2 3 4 5
10. According to the above, would you admit this assessment for the purchase of your home? 0 1 2 3 4 5

TOTAL SCORE= _____ AVERAGE SCORE=_____

Source: Authors' material.

To ensure the procedure, tests were carried out in the subject, in different activities, to make students mindful of the improvements derived from the use of the peer evaluation and co-evaluation system. In these tests, it was found that the students agreed with its use and did not oppose it, even knowing that the evaluation among equals could not be correct since it was carried out by classmates, which could penalize their grades.

4. Analysis and results

The different phases of application of the system in the different practical cases carried out in the subject allow obtaining results on the acquisition of competences and knowledge of professional attributions, since, as has been explained, the system improves learning and provides competences to students.

The data collected is derived from 5 consecutive courses, so the results obtained represent many participants between teachers and students.

The improvement of learning can be deduced since an increase of the students presented has been noticed, greater than 90%, obtaining success rates above 75% and performance rates of 65%. From the surveys it can be deduced, by the students themselves, that the evaluation system used by peers favors the acquisition of the competences established in the study plan for the subject, in addition to the knowledge of the real professional attributions. As the evaluation is undertaken by the students themselves, they become more involved due to the knowledge of the correction criteria, so that they analyze with greater interest the practical cases to be solved. To all this, we must add that sometimes some groups, during the evaluation process, show difficulties in identifying the items of the rubric to use, so they ask during the process how to do it and they are, most of the time, the own classmates from other groups who clarify how to do it, feeding back learning among themselves and thus increasing their confidence.

Regarding the improvement derived from the application of the evaluation system, from the way of seeing of the teachers, the following should be highlighted:

The methodology is very participatory and theoretical aspects of direct application in practical cases are shared, so that these practices carried out in the interactive sessions complement the expository content sessions.

The fact of carrying out the evaluation between equals and the co-evaluation, favors the organization of the subject and allows to optimize the times and to hurry the available resources.

Another result is the statement about the sustainability of the evaluation, which confirms that the real work is reduced in the long term, without diminishing the knowledge acquired, in line with what Alcañiz et al. (2015).

As a result of the active participation of the students, the teaching staff must address issues with greater depth and, above all, use real examples of application in future professional life.

Analyzing the disadvantages, it is observed that there are some groups that reproduce the results of the rubrics of other groups, especially during the first years of putting the system into practice. To avoid this, the crossing was established in the different evaluations and different delivery dates of the documents.

According to the results, the students were reluctant at first about the application of the system, since they did not trust that the evaluation was carried out by their own peers, since this could harm them in the global qualifications. Subsequently, the system gained the trust of the students since, as Delgado et al. (2016), the anonymity of the documents evaluated was fundamental, as well as the performance of more than one evaluation, at least three, by different groups.

When asked about the suitability of the system, 100% found that peer assessment enhances learning. However, when asking about the usefulness of the system to detect and correct their own errors, there is 12% who think that this system does not facilitate it, compared to 88% who think the opposite.

Regarding the consideration of the co-assessment, 66% strongly agree with its implementation and 30% agree, which reinforces its application as positive, since they can check the rating made by the teacher.

Once the evaluation has been carried out, 100% consider that the final evaluation is fairer since it is carried out providing continuous improvement, which motivates the students to make a greater effort in solving the practical cases, and, therefore, to increase your grades. Regarding the use of the rubric, 94% consider that the fact of knowing in advance the evaluation criteria that will be applied benefits the students, since it allows them to improve the resolution of the practical cases and at the same time has allowed them to know the development of the work of others, thus being able to self-evaluate.

Compared to the traditional evaluation system, the vast majority (92%) prefer this evaluation system once they are familiar with it, and they also agree to carry out the first evaluation between peers and the second one carried out by the teacher (87%). Conciseness, 97% strongly agree with the application of this assessment system, which confirms its acceptance by the students. In addition, 86% advocate the application of this system in other subjects of the degree, especially those in which knowledge of direct application to the exercise of the profession is acquired.

Figure 3 shows the results obtained in the surveys carried out on students during the last 5 years.

Figure 3. Results of the satisfaction survey carried out (total values).

Source: Authors' material.

With the results obtained, it can be affirmed that this type of evaluation is widely accepted by the students, with more than 85% agreeing or strongly agreeing on the different items. It is important to adapt the rubric and the surveys to obtain results that feedback the process to achieve continuous improvement.

Lastly, it is revealing to verify that in 70% of the cases, the resulting qualification by the different groups coincided with that made by the teaching staff.

5. Conclusions

It can be stated that, after the application of the peer assessment and co-assessment system for several courses, it is a sustainable proposal, since the system provides a balance between the time spent and the knowledge acquired, since their participation and involvement in the assessment promotes the improvement of learning, the acquisition of skills and the implementation of professional powers.

The combination of peer assessment with the co-assessment of teachers results in the acquisition of applicable skills in professional life since the practical cases are applicable in the real world of work and recognized by law. Among others, with this system, transversal skills are acquired that are so important in professional life such as teamwork, critical capacity, leadership, problem-solving tools, negotiation tools, work organization and innovation capacity, all of which are fundamental to develop your profession in the future.

To all this is added the implementation of real professional powers related to the subject, such as appraisals, appraisals, expert reports, studies, reports, or opinions related to the field of construction and real estate.

Compared to the traditional summative evaluation system, this evaluation system proposed according to the proposed methodology supposes both advantages and disadvantages for all those involved in the process, one of the main advantages being the immediate feedback thanks to the continuous evaluation, and the achievement of the increase of the rate of success and performance in the subject.

The use of this evaluation methodology promotes a more precise and objective evaluation, as well as the optimization of the time used in comparison with the level of effort made by the students, for whom peer evaluation does not imply an additional burden. In addition, the fact of carrying out the entire process in person and with the teacher's moderation, provides students with security and guides them before these new methods, something that is important (Bernabé and Blasco, 2013) since nowadays the load of work that is imposed on students is not balanced with the credits that the subjects represent.

The positive evaluation of the students when carrying out their own evaluation reinforces the improvement of the learning process, providing a significant increase in the performance of their abilities and in the security of their own performance. Carrying out the evaluation of the work of other groups translates into the acquisition of skills such as empathy, which is especially useful in the development of the profession.

Finally, it can be concluded that the peer evaluation and co-evaluation system improves the value worth of the work and the performance of the students and guarantees the acquisition of the competences attributed to the subject in the corresponding study plan, with which It can be affirmed that a truly formative evaluation is achieved that results in the learning system.

Teaching, this methodology allows evaluating the level of acquisition of the skills of the subject, and allows its application in different activities, especially in those of a professional nature, which has a very progressive influence on the training of students since it is possible to manage in the university environment the skills and tools that will be applied in their professional life.

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