



The Work Experience of Graduates as a Motivating Element in the Teaching-Learning Process

Experiencia laboral de graduados como elemento motivador en el proceso de enseñanza-aprendizaje

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ABSTRACT

The current labour market context requires Universities to continuously adapt to changes to train students who can respond to the market's needs. Based on their professional experience, university graduates can and must be an essential element for university education to be in line with the labour market. This article presents a proposal for integrating graduates in the teaching-learning process, playing an active role. The study has been developed in the context of a bachelor's degree (Bachelor's Degree in Computer Engineering) and a master's degree (Master's Degree in Secondary School Teaching). The satisfaction survey results show that the experience has been very positive for our students. At the same time, it helps reduce the students' insecurity concerning their professional future.

RESUMEN

El contexto del mercado laboral exige a las Universidades una adaptación continua para formar a estudiantes que puedan responder a las necesidades cambiantes del mercado. Los egresados y egresadas universitarios, a partir de su experiencia profesional, pueden y deben ser un elemento esencial para que la formación universitaria esté en consonancia con el mercado laboral. Este artículo presenta una propuesta para la integración de los egresados y egresadas en el proceso de enseñanza-aprendizaje, desempeñando un papel activo. El estudio se ha desarrollado en el contexto de una licenciatura (Grado en Ingeniería Informática) y un máster (Máster en Profesorado de Secundaria). Los resultados de la encuesta de satisfacción muestran que la experiencia ha sido muy positiva para nuestro alumnado. Al mismo tiempo que contribuye a reducir la inseguridad de los estudiantes con respecto a su futuro profesional.

1. Introduction

The fast-paced scientific and technical advancements that have taken place worldwide have required universities to adapt to the impact of such changes. Therefore, the challenge often presented to universities in this context is to provide the appropriate and updated training to its students, enabling them to meet the everchanging professional demands within society (Aguayo Téllez et al., 2015). The employability of university graduates is a constant concern for universities, which must correct the mismatch between the training received and the requirements of the jobs. For this reason, the promotion of employability is one of the priorities of universities within the framework of the European Higher Education Area (Michavila et al., 2018).

The increasing incorporation of information and communication technologies (ICT) in the workplace has led to the need for students to have the necessary digital skills (Alonso de Castro & García-Peñalvo, 2022). Also, close contact between universities and different professional areas is necessary in order for learning processes, based on a society's needs, to be adequately adapted and modernised. As a result, an interesting approach to analysing this subject is to maintain contact with university graduates (Ortega Ojeda et al., 2015). Reaching out to former students is a way for information to be gathered regarding how easy or difficult it can be to find employment (Ibarra Cruz, 2009) and for receiving feedback about the students' experiences during their time at university (Fresán Orozco, 2003). The information provided by the graduates can provide valuable insight into the current state of affairs and requirements of today's labour market (Contreras Gutiérrez & Urrutia Aguilar, 2016). In fact, some of the first studies conducted regarding this subject focused primarily on carrying out surveys as a means to research labour market integration.

Additionally, the information obtained from these surveys was considered essential for improving the relationship between academia and job markets. However, suitable assessment guides are needed for examining the labour market insertion process to ensure the information collected is actually useful for achieving the necessary change (Rodríguez Espinar & Prades Nebot, 2003). Consequently, these surveys have become part of what is known as the Graduate Follow-up Process, which was adopted as a mechanism for establishing contact with work-related and professional contexts (García Ancira, et al., 2019). Through these questionnaires, over recent decades, graduates have been given the opportunity to describe their integration into the work force, their opinions about the training they received, as well as any shortcomings they may have detected.

According to García Ancira et al. (2015), the Graduate Follow-up Process is comprised of two different dimensions: one that is informative and the other formative. The informative dimension provides relevant information about professional development, labour market insertion, the quality of the training received, and the general level of satisfaction of the graduate. The formative dimension, on the other hand, allows the training process of current students to be reinforced, and also includes the graduates themselves through the development of continuous training programmes (Jaramillo et al., 2006). This training dimension includes career guidance for students (García Ancira et al., 2017), where interesting experiences have been made possible through conferences, seminars and student workshops with graduates. These interactions therefore provided the students with information about the graduates' professional experiences, access to the labour market and employment conditions (Montero Parejo et al., 2014). However, despite the work that has been done, the information gathered from the Graduate Follow-up Process has been found to have little impact on students' careers (García Ancira et al., 2015).

Student-centred methodologies have deeply transformed university teaching over recent decades. To achieve meaningful learning, these methods require students to have a global and contextualized understanding of certain knowledge. For this reason, establishing interactions between university students and those graduates already employed is particularly interesting as graduates can share their own professional experiences. The new teaching methodologies have emerged in recent years, such as the flipped classroom, challenge-based learning, gamification, or game-based learning, all of them trying to seek the active participation of the student (Fidalgo-Blanco et al., 2021). Several studies and feed-back from institutions indicate that student-centred and participatory methodologies, where students are offered multiple contextualized, real and varied situations, are the most appropriate for their academic success (Paños, 2017). Active learning places the teacher as a mediator who must provide the student with the guidelines for learning to take place. In this context, the student is at the centre of the teaching-learning process (García-Holgado et al., 2021; García-Peñalvo et al., 2021).

Students in the final year of a bachelor's or master's degree are very close to entering the labour market. This proximity can generate insecurities either because they have doubts about the quality of their training programme or because they are unsure of how their own personality may face new situations (Martínez, 2020). Obtaining information about job prospects at the end of their training, as well as being and feeling prepared to respond to the demands of society (Martínez, 2020), can help students to overcome any insecurity about becoming a future professional (Cantón Mayo et al., 2015).

Employability is understood as not only the ability to obtain an initial job (after the educational period), but also the ability to maintain it and to obtain a new job if necessary (Michavila et al., 2018). In line with this idea, incorporating professionals in the classroom not only contextualises learning, but also generates extra motivation for students who are getting closer to searching for employment. The presence of graduates in the classroom can improve the way students view their own education and reduce their doubts and fears about the future. In these situations, specific and innovative content material is taught by an expert in the field. Thus, students receiving this type of exposure may have greater confidence by being encouraged to follow the advice given by the professionals. In addition, graduates can describe their process of integration into the world of work, which also began at the same university where the students are currently studying. Consequently, the students see the graduates as a reference that is quite relevant to them.

The work of this paper aims to further develop the Graduate Follow-up Process within the context of its formative dimension by including the collaboration of university graduates in the teaching-learning process through conferences and workshops. Graduates will be given the opportunity to return to the classroom as teachers, planning activities related to their work experience, which could have a direct impact on developing some competences.

2. Context and Objectives

In this study, the research approach was developed and carried out for four different course subjects: two taught during the last two years of a bachelor's degree (3rd and 4th year) in Computer Engineering in Information Systems (*Grado en Ingeniería Informática en Sistemas de Información [GIISI]*), and the other two during the speciality in Technology path of a master's degree in Teaching Secondary and Upper-Secondary Education, Vocational Training and Languages (*Máster en Profesor de Educación Secundaria Obligatoria y Bachillerato, Formación Profesional y Enseñanzas de Idiomas [MUPES]*). For each of the subjects, the participation of professionals was incorporated into the classes imparted. The study was designed not only to consider the contextualization of learning, but also to enhance the motivation of students on the point of graduating and about to face their integration into the labour market.

The general objective of this research, which forms part of an education innovation project, was to develop the competence of entrepreneurship from the point of view set out above.

The specific objectives were to generate student satisfaction with the educational process and to empower them. The fact of being able to understand new content presented in class by a professional working the field, receiving first-hand information about job opportunities and experiences, can help to minimise the insecurities felt by students at the prospect of facing this new stage in their lives.

Furthermore, this approach can help students to acquire entrepreneurial competence, not only in the classic sense of creating new companies, but also in the broadest sense of the term. Bacigalupo et al. (2016) define entrepreneurship as "*a transversal competence, which applies to all spheres of life: from nurturing personal development, to actively participating in society, to (re)entering the job market as an employee or as a self-employed person, and also to starting up ventures (cultural, social, or commercial)*". Contextualized teaching requires an innovate attitude in the classroom from those of us who are involved.

3. Methodology

3.1. Research design

Lecturers participating in the project contacted graduates of the Higher Polytechnic School of Zamora (*Escuela Politécnica Superior de Zamora [EPSZ]*) to participate in the research. In the case of *GIISI*, two computer engineers collaborated by sharing their expertise in Web Development. For the two subjects taught during *MUPES*, two high school teachers. Therefore, two male and two female graduates, participated in the study.

The graduates were asked to collaborate in face-to-face or online teaching sessions through a workshop comprised of two parts. The first part of their lecture was to present their personal experiences about their trajectory of transitioning from university to the workplace. However, for the second part of their talk, they were asked to select a topic they considered to be cutting-edge and related to their work, either applied or relevant to the students, and to give a lecture. The workshops had a maximum duration of one and a half hours, with an additional 30 minutes allocated for discussion and questions. Two workshops for each degree programme were held. Table 1 shows the project group design.

Table 1. Group Design with Pre-test and Post-test Measures

Group	A1	A2	B1	B2
Subject	Web Application Development I	Web Application Development I	Assessment in the Speciality of Technology	Methodology in the Speciality of Technology
Course Year	3 ^o	4 ^o	1 ^o	1 ^o
Degree	GIISI	GIISI	MUPES 19/20	MUPES 19/20
Academic Year	2020-21	2020-21	2019-20	2020-21
Pre-test	January 2021		February 2020	February 2021
Application	January 2021		February 2020	February 2021
Post-test	January 2021		February 2020	February 2021

A pre-test and a post-test were applied to examine the usefulness of this teaching method. The pre-test included a questionnaire used to collect personal data from the students. In the post-test, another questionnaire was filled in to obtain information about the students' satisfaction with the experience.

3.2. Variables

The dependent variables are student learning/academic performance on the subject taught and overall satisfaction (Table 2).

Table 2. Variables

Type	Variable	Instruments
Dependent	Learning/Academic performance	Objective tests
	Student satisfaction with the methodology/experience	Questionnaire (Likert-type scale)
Control	Personal and academic data	Questionnaire

Academic learning/achievement is measured by means of an objective multiple-choice test. The test reflects, by comparison, the level of knowledge acquired. The sequence followed was:

1. An initial objective pre-test, prior to the experience, was carried out to ascertain the degree of prior knowledge.
2. Two workshops were held per degree. In the case of *MUPES*, the group of students who participated in both workshops was different. Due to the COVID-19 pandemic (Grande de Prado et al., 2021), the experience took place over two academic years. It was planned for the academic year 2019-20, but could not be completed for all subjects.
3. After the activity, an objective post-test was carried out in a similar way to the pre-test.

3.3. Instruments

The instruments used to assess each of the variables were:

1. *Questionnaire of previous personal and academic data.* This document aims to identify the student. It consists of five questions: one with an open answer (DNI) and the rest one-answer questions.
2. *Multiple-choice objective test, self-developed.* Consisting of seven items, this test seeks to measure conceptual knowledge. The graduates participating in the study helped to design the test. Given the small number of items, no error rate was taken into account to avoid the effect of chance. Three experts in the field validated each test.
3. *Satisfaction questionnaire.* The aim of this questionnaire is to find out how students feel about the experience, as well as their working methods. The questionnaire is based on the previous experiences

(López Fernández & Rodríguez-Conde, 2003; Romero, 2005; Olmos, 2008; Jiménez López et al., 2010; Jiménez López et al., 2011; González-Rogado, 2012) carried out within the research group Educational Evaluation and Guidance Group (GE20), of which the researcher responsible for this education innovation project is a member. It consists of 14 questions organised into 3 blocks (Table 3).

Table 3. Sections of the Student-satisfaction Questionnaire

Sections	Number of Questions	Description
Methodology	7	Likert-type scale, with five mutually exclusive alternatives: 1.- Strongly disagree 2.- Partially disagree 3.- Indifferent 4.- Partially agree 5.- Strongly agree
Activity	4	
Satisfaction	3	

The different questionnaires were made available via the web using the application Google Forms. The students were granted access through their *Studium* course (virtual campus) or by the creation a specific one (in the case of *GIISI*).

3.4. Sample

The sample comprised students taking the subjects Development of Web Applications I (DAWI) and Development of Web Applications II (DAWII) as part of the *GIISI* at *EPSZ* during the academic year 2020-21; and, students, specialising in the Technology path within the *MUPES*, taking subjects Assessment and Methodology in academic years 2019-20 and 2020-2021 respectively. Both degrees were being taken at the University of Salamanca (USAL).

The number of students enrolled in the subjects was 55, and 37 students completed the questionnaires (Table 4).

Table 4. Groups

Degree/Course	No. of Students Enrolled	No. of Students Participating	%
<i>GIISI</i> 3 rd Year	25	12	48.0%
<i>GIISI</i> 4 th Year	12	9	75.0%
<i>MUPES</i> 19/20	6	6	100.0%
<i>MUPES</i> 20/21	12	10	83.3%
Total	55	37	67.3%

4. Results

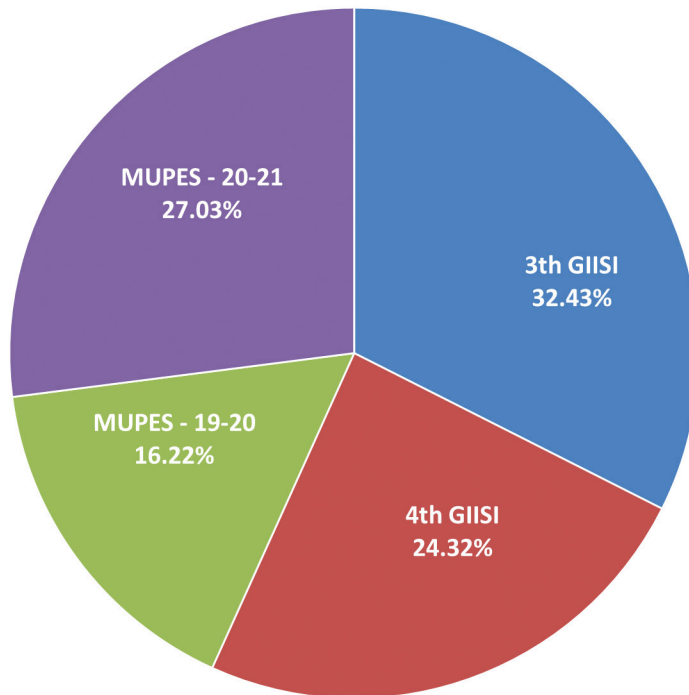
Once the experience was over and the questionnaires had been made available, all data gathered were analysed using the SPSS 26.0 package (USAL licence) to carry out the statistical analysis.

4.1. Sample characteristics

Of the 37 students participating in the study, 24.3% were female and 75.7% were male.

In relation to the specific degree course, 56.7% were enrolled in the *GIISI* and 43.2% in the *MUPES* (Figure 1). Also, 81.1% of the students indicated that they had attended between 90% and 100% of the classes.

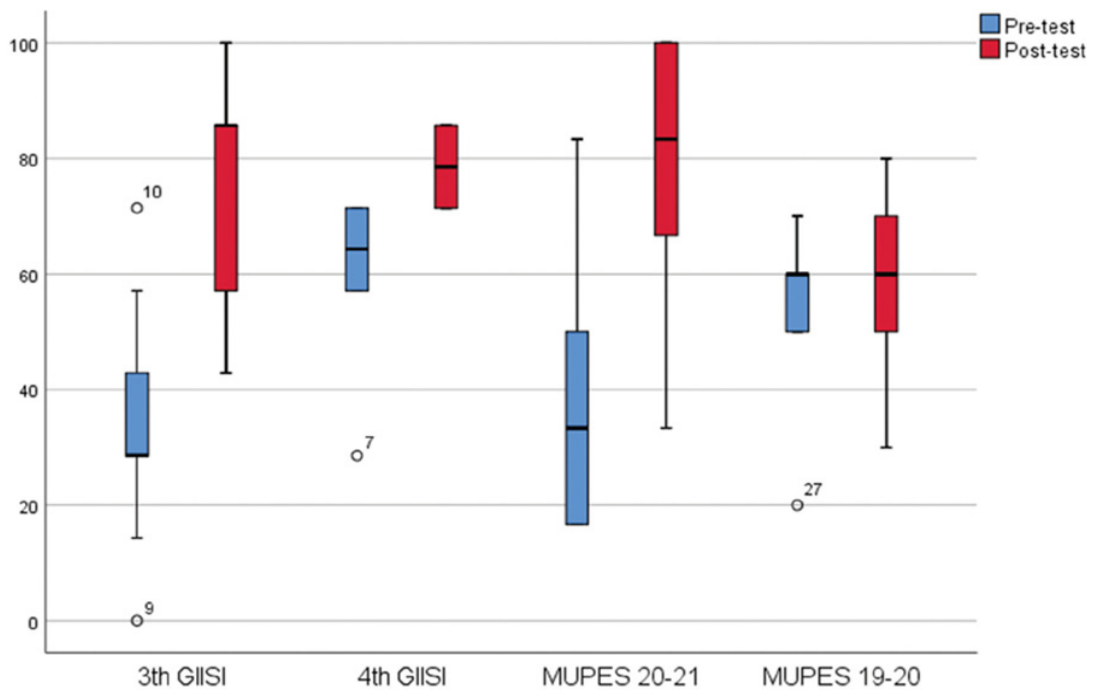
Figure 1. Students by Degree Course



4.2. Objective test

The objective test, pre-test and post-test consisted of 7 multiple-choice questions. For each item, 4 answer options were provided with only one correct option. For calculating the result, a no error rate was considered (Figure 2).

Figure 2. Results of the Objective Test



When analysing the results, we observed that participation in the sessions improved the students' knowledge of the contents taught. The average was found to increase according to the results of the post-test while the standard deviation (SD) decreased (Table 5).

Table 5. Percentage of Initial and Final Correct Answers

Variable	n	Min.	Max.	Average	SD
Pre-test	36	0.0	100.0	43.61	25.20
Post-test	32	30.0	100.0	73.81	18.31

We analysed the results according to the degree course and subject being taken. In the academic year 2019-20 for the *MUPES*, the percentage of correct answers for the average score and SD barely differed (Table 6). However, in the academic year 2020-21 for the same degree course, the average post-test score was the highest, although with a high standard deviation value. In the case of the *GIISI*, the difference in the average score between pre-test and post-test was smaller in the 4th year than in 3rd. In the 4th year of the *GIISI* the average scores for both the pre-test and post-test were above 50%. Additionally, it should be noted that in the post-test scores the SD decreases quite significantly (Table 6).

Table 6. Percentage of Pre-test/Post-test Correct Answers by Degree Course and Subject

	3 rd Year <i>GIISI</i> n=12		4 th Year <i>GIISI</i> n=9		<i>MPES</i> 19-20 n=6		<i>MPES</i> 20-21 n=10	
	Average	SD	Average	SD	Average	SD	Average	SD
Pre-test	38.96	24.8	52.38	31.9	53.33	17.51	35.00	21.44
Post-test	75.71	17.90	78.57	7.80	58.33	17.22	78.30	20.86

4.3. Student-satisfaction Questionnaire

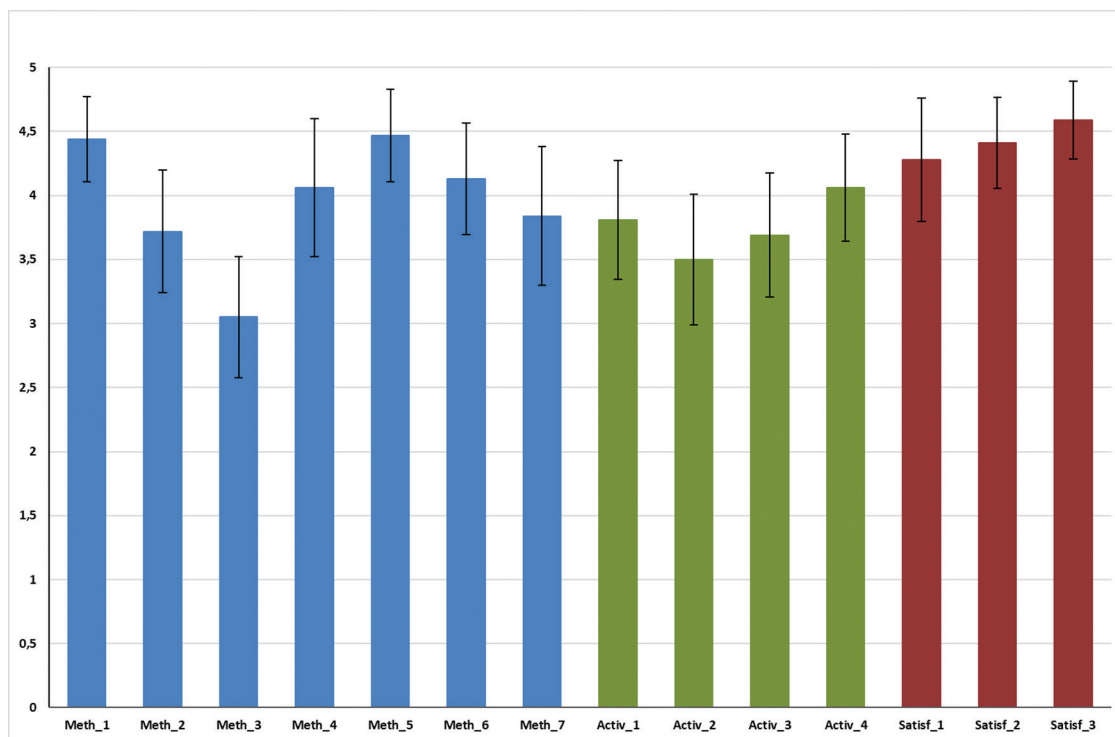
The satisfaction questionnaire was made up of 14 questions distributed in 3 sections (Table 7). Answers were valued on a five-point Likert scale. The value of 1 was considered “strongly disagree” and 5 “strongly agree”, with the rest being intermediate values. The first section was related to the methodology used in teaching the subject (7 items) and the second (4 items) was related to the activity ‘Graduates in the classroom’. The third section (3 items) asked the students to rate their level of satisfaction with regard to both the activity and the subject.

Table 7. Satisfaction Questionnaire items

	Item	n
Meth_1	I have understood the objectives of the subject.	32
Meth_2	I have consulted the notes and supplementary material in depth.	32
Meth_3	The content of this subject is difficult.	22
Meth_4	The attendance to the classes helps to understand the contents.	32
Meth_5	The proposed individual assignments and tasks help to understand the contents.	32
Meth_6	The proposed group work and assignments help to understand the content.	32
Meth_7	I think I have learned more than if I had only studied these contents on my own.	32
Activ_1	The activity helps the subject as a whole.	32
Activ_2	The activity should deal more with the professional experience of the guest than with subject content.	32
Activ_3	The activity should deal more with cutting-edge or applied subject content than with the graduate's professional experience.	26
Activ_4	I consider the activity to be well thought out.	32
Satis_1	I feel satisfied participating in the ‘Graduates in the Classroom activity’.	32
Satis_2	I have felt satisfied taking this subject.	32
Satis_3	I consider the content of this subject to be useful as a future professional.	32

The results indicated that the students considered they had understood the objectives of the subjects ($n=32$; average=4.44; SD=0.67) and that the work proposed, both individually and in groups, helped them to understand the contents of the subjects (individual: $n=32$; average=4.47; SD=0.72; group: average=4.43; SD=0.87) (Figure 3).

Figure 3. Results of the Satisfaction Questionnaire



The students considered the activity was well planned ($n=32$; average=4.06; SD=0.84). Also, they preferred, although minimally, that the activity dealt more with content from the subject area than with the lecturer's professional experience (content: $n=32$; average=3.69; SD=0.97; experience: average=3.50; SD=1.02) (Figure 3).

As can be seen in Figure 3, the students were satisfied with both the activity and the subjects. The average values were all above 4 on a scale of 1 to 5. Finally, the students indicated that the subjects were useful for their future professional activity ($n=32$; average=4.59; SD=0.61). This item was rated the highest and was found to have the lowest standard deviation.

5. Conclusions

In order to validate the method employed, the experiment was carried out for two different degree programmes at the same time, involving students from the same field of knowledge. The number of students that took part in the project was reduced in the case of both degrees, which limits the validity of our results.

In relation to the instruments, it should be noted that the only objective test used to assess the experience did not allow the students' learning and performance to be reliably measured. A competence-based learning process, as followed in these subjects, makes learning a complex variable. Despite this, this test manages to assess the attention that students had devoted to the proposed activity and whether it was useful to them, considering that the content was not academically assessable. In this context, the objective test makes it possible to check the depth with which content had been assimilated and offers greater objectivity (Pomés & Arguelles, 1991).

When analysing the sample from a gender point of view, it can be seen that there are fewer women than men: 24.3% of women compared to 75.7% of men ($n=37$), far from an ideal proportion with values close to 50% for individuals of both genders. Although 38% of the student body at USAL is made up of men and 62% of women (Universidad de Salamanca [USAL], 2020), at the EPSZ, where the study was carried out, women represent 23% of the student body (USAL, 2020). This average value ranges from 15% in the degree course in

Mechanical Engineering and 39% in the degree course in Technical Architecture. Therefore, the project sample is congruent with what is happening in Engineering and Architecture degrees today.

This activity was initially planned for the 2019-20 academic year, but it only could be carried out for one of the subjects due to the Covid-19 pandemic. This initial problem helped us to improve the proposal, as we learned from the 2019-20 session, and we had time to organise and plan the sessions for the 2020-21 academic year. This can be seen in the results of the pre-test and post-test. The 2019-20 results made us adjust the type and content of the 2020-21 sessions.

As shown in the results section, students value the experience positively. The indecision that students show with respect to whether graduates should focus more on telling about their professional experience or on teaching advanced applied contents, shown in Figure 3 (Activ_2-Activ_3), can be due to the approach of the project, which seeks a balance between both aspects. Even more so considering the very positive assessment they made of the approach of the activity.

Incorporating graduates into the classroom has been a rewarding experience for the graduates, who expressed this after participating in the project, for our students and for the teaching team. In the case of the *GIISI*, the questions the students asked the graduates were related to the insecurity they felt because they lacked the knowledge about what the world of work would require of them. In the case of the *MUPES*, the students' questions were related to the competitive examination process for access to the teaching profession and the integration into lists of interim teachers.

The graduates reinforced the students' confidence with regard to their training, since on one hand they were able to follow their class, despite not knowing the environment that was presented and, on the other hand, they became aware that the most important thing is not to know everything but to have the initiative and the necessary preparation to learn the material, which they had.

With this research a path has been laid that should be further investigated, as it will help to strengthen the relationship between students and graduates and to provide students with a smoother transition into the world of work.

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<https://bit.ly/3OzDKtN>Table 7. Satisfaction Questionnaire items (*continued*)