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This is an **author produced version** of a paper published in:

European Journal of Teacher Education 46.3 (2023): 516 – 532

**DOI:** <https://doi.org/10.1080/02619768.2021.1950684>

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## **Contribution of formative assessment for developing teaching competences in teacher education**

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## **Contribution of formative assessment for developing teaching competences in teacher education**

The employment of formative assessment during teacher education not only contributes to the development of competencies of future educators but also promotes their assessment competence. Thus, the aim of this research is to explore graduates working as teachers and their impressions about the assessment practices during teacher education and how they contribute to competence development; it also aims to analyse university teachers' subjective beliefs about this process as a basis for recommendations regarding its use during this period. An instrumental case study was also conducted. This study examined four Spanish graduates teaching in primary and secondary schools and three university teachers. Information was collected through semi-structured interviews, non-participant observations, and documentary analysis. It was found that formative assessment during teacher education will contribute to the development of teaching competences if it is performed with clear criteria known to students and evidence is collected throughout the training period, giving proper feedback on the students' performance and promoting their participation in the assessment process.

Keywords: formative assessment; teacher education; teaching; competences

### **Introduction**

Traditionally, assessment has focused on making value judgements about students' performance (Dixson and Worrell, 2016). Greater value is given to the grades at the end of the learning process when ranking students, depending on the evaluation (Moss and Brookhart, 2019). However, for a few decades, there has been an increasing commitment to giving greater weight to the process of student learning (Dolin, Black, Harlen, and Tiberghien, 2018). From this perspective, certification assumptions are relegated to the background, focusing on providing information throughout the process of how students are performing and what they can do to improve their learning (Moss and Brookhart, 2019).

While this idea has been introduced gradually (Andrade, Bennet, and Cizek, 2019), the creation of the European Higher Education Area (EHEA; <http://www.ehea.info/>) made this transformation tangible. EHEA's structural and methodological changes led to transition from a teacher-centred perspective to a student-centred one (European Association for Quality Assurance in Higher Education, 2015).

According to this, assessment is truly formative when the information collected is used to adapt teaching to students' needs (Cañadas, 2018). Formative assessment can involve five key strategies: (a) clarifying, sharing, and understanding goals for learning and criteria for success with learners; (b) engineering effective classroom activities and tasks that elicit evidence of students' learning; (c) providing feedback that moves learning forward; (d) activating students as owners of their own learning; and (e) activating students as mutual learning resources (William and Leahy, 2015).

Although formative assessment is appropriate in all university studies, it is primarily relevant to programmes focused on teacher education. Thus, students will not only participate in a form of assessment that benefits their learning, but will also learn about the processes, which could serve as an example of the strategies they should use as teachers with primary and secondary students (López-Pastor, 2008).

### ***Formative assessment in teacher education***

Teacher education should provide students with the necessary competencies to develop and improve quality in their future practices. Professional teachers' competencies include a set of knowledge, skills, and attitudes fundamentally related to the content: how to teach, the use of technologies, organising students in class, participating in school management, briefing

families, addressing diverse issues, facing the ethical dilemmas of the profession, tackling the emotions involved in the teaching practice, and assessing students' learning, among others (Caena, 2011).

Thus, university teachers must use methodological and assessment strategies so that these learnings will be developed to the greatest extent possible (Hamodi, López-Pastor, and López-Pastor, 2017). One of the elements that has proven to be most useful during teacher education is the use of formative assessment (Cañadas, 2018).

Most studies of its use in teacher education have focused on how assessment influences the study strategies and their learning processes (López-Pastor and Sicilia, 2017). Others have examined the advantages and benefits of formative assessment, showing that its use improves students' learning, facilitates the development of autonomous learning competences functional and meaningful learning, and promotes metacognitive processes, especially through self and co-assessment (Cañadas, Santos-Pastor and Ruíz, 2021). It also increases the motivation and academic performance of the agents involved, achieves greater coherence between the elements of the programme and the assessment, and gives place to a renewal of the teaching practice (Heritage and Wylie, 2018; López-Pastor and Sicilia, 2017; Wanner and Palmer, 2018).

By choosing proper assessment tasks and methods, teachers can guide students in developing meaningful learning (Biggs and Tang, 2011). However, despite the benefits shown, formative assessment is not used widely in teacher education (Lizandra, Valencia-Peris, Atienza-Gago, and Martos-García, 2017; Panadero, Fraile, Fernández-Ruiz, Castilla-Estevez, and Ruiz-Díaz, 2019). Some of the reasons indicated are related to the workload,

the large number of students, lack of knowledge of these procedures, or the consideration of this assessment as a lighter form of evaluation (Romero-Martín et al., 2015). Thus, it is necessary to determine how the different elements of the formative assessment process (instruments, student participation, feedback, and assessment moments) contribute to the development of teaching competences to avoid difficulties and focus on the relevant items.

***From formative assessment in teacher education to one in teaching practices in primary and secondary education***

The use of formative assessment systems during this stage influences not only the degree of development of student learning, but also the learning itself and knowledge of how to develop it in their professional career with their primary and secondary students. The assessment competence during teacher education must be a learning content (Koloi-Keaikitse, 2016), but at the same time, it must be developed from the experiences of formative assessment systems. This will also contribute to the development of metacognitive processes. Future teachers will develop strategies to plan learning, provide effective feedback to others, and value how they are doing their job regarding students' learning (Cornish and Jenkins, 2012). It will be necessary to make them aware of their learning process (what and how they learn) and to allow them to be part of this process.

For this purpose, during teacher education, university teachers must be consistent and use methodological and assessment strategies that can be reproduced in the classroom (Fullan, 1991; Ni Chróinín and O'Sullivan, 2014) and that do not perpetuate the traditional ways of approaching teaching. It has been shown that graduates do not apply the theories studied at the university, but rather reproduce the same methodology they received during

their teacher education (Fullan, 1991). Consequently, the implementation of formative assessment systems at this stage will not only help develop the necessary skills for their future professional practice but will also let them see the coherence between what theory says is required and what is actually done in the educational assessment (Hamodi et al., 2017).

The main research has focused on knowing how the use of formative assessment during teacher education has repercussions or is transferred to its use during teaching practice, on analysing graduates' perceptions of the assessments, and on whether they highlight the same systems experienced by them (Hamodi et al., 2017; Molina and López-Pastor, 2017). Hamodi et al. (2017) conducted three focus groups with students graduating between 2011 and 2015, and Molina and López-Pastor (2017) developed a case study with a mixed methodology. They found that teachers positively value the relationship that the influence formative assessment systems have during teacher education and how these methods are implemented in their practice. This is because their previous direct contact with these assessments and the realisation that they are viable forms make them less afraid, both emotionally and procedurally, to implement them with their students.

Thus, the aim of this research is to explore the impressions of the graduates about the type of assessment practices used during teacher education and how they contribute to competence development and to analyse university teachers' subjective beliefs about this process to establish recommendations.

## **Material and Methods**

### ***Design***

An instrumental case study was developed (Stake, 2006) and the *Quintain* was defined as ‘Could we establish some recommendations so that the formative assessment during teacher education has repercussions in the development of the graduates’ teaching competences?’ To answer this, we concreted two *issues* in the research. These are: a) What characteristics of formative assessment processes during teacher education are mentioned as the most useful ones to the development of graduates’ teaching competencies by those working as teachers including university ones? and b) How do graduates and university teachers perceive the implementation of formative assessment processes to contribute to the application of this assessment system during teaching work in primary or secondary education?

### ***Participants***

The participants in this research were four Spanish teachers in primary and secondary education and three university teachers. Graduates working as teachers were selected because they could provide their impressions with formative assessment processes during their entire teacher education stage, not only for a part as students would do. They could also tell us how formative assessment processes are implemented now in their classes or if their teacher education has been useful. University teachers’ participation assured contrasting former student teachers’ views about the use of formative assessment and the way it is done during the education phase and gives us information about the possibilities of implementing this kind of assessment during this stage. The graduates have, in common, the completion of university degrees (as conceived in the EHEA). Further, they are exclusive participants since there are not many graduates with these degrees who have the opportunity to work as teachers in Spain. Two of them had completed primary education



teaching degrees and worked as teachers in this educational stage, and the other two had completed the physical activity and sports sciences degree and worked as physical education teachers in secondary education. They had finished their university degree over the last five years, had between one and three years of teaching experience, and worked in private educational centres (educational centres subsidised with private funds).

The university teachers lecture in the degrees mentioned above and have been working between 5 and 20 years, employing formative assessment processes. All of them had research experience in educational assessment.

Table 1. List of participants in the case study

Acronym	Professional Category	Gender	Years of teaching experience	Subjects taught
ST1	Secondary Education Teacher	Male	2	Physical education
PT1	Primary Education Teacher	Female	1	Generalist teacher
ST2	Secondary Education Teacher	Male	2	Physical education
PT2	Primary Education Teacher	Female	2	Generalist teacher
UT1	University Teacher	Female	18	Assessment in Physical education
UT2	University Teacher	Male	20	Teaching in physical education
UT3	University Teacher	Female	5	Research, Innovation and Assessment

### ***Instrument***

Data were collected with semi-structured interviews, unstructured observation, and documentary analysis:

- i. The semi-structured interviews with primary and secondary teachers included questions related to: (a) the development of teaching competences during teacher education, (b) the implementation of formative assessment processes during this stage, and (c) the usefulness of formative assessment and its different characteristics for the development of teaching competences, including assessment competence.

Meanwhile, interviews with university teachers related to how they developed assessment processes in their subjects if the purpose when using formative assessment transcends the improvement of the learning of the contents of the subject and also looking for a learning and a transfer of the assessment processes to the eventual teaching practice of the students. Contributions are collected in the text with the acronym of the participants (for example, secondary education teacher: ST1 or ST2)

- ii. Unstructured observations were made with primary and secondary teachers along a complete teaching unit. It was a period focused on teaching a particular theme, and its length could vary from 6 to 12 lessons. We decided to observe this period because it allows us to see the entire teaching and learning process. Its aim was to see how graduates implemented the assessment competence and to contrast what teachers were saying in the interview with what they really do in their classes; therefore, the observation was recorded openly, taking into account the implementation of formative assessment processes during the entire period. This information was collected using a log diary. The log diary was dated and recorded according to the person and course that was being observed. The information was gathered as events occurred in the classroom, which allowed us to record all

relevant facts related to our investigation. Contributions were collected with the following structure: Observed participant: Session Observed (for example, PT1: Session4)

- iii. In the documental analysis, we focused on what kind of assessment is used during teacher education by analysing the official documents of each degree. Official documents refer to teaching guides. These are specific for each degree subject at every university and collect the competencies that should be developed, the contents that should be worked, the assessment system that is going to be employed, and the hours of work (at class and autonomously) per student, among other aspects. We introduced this information to compare whether graduates' experiences related to assessment processes during their teacher education agreed with the assessment systems included in the design of the degrees. In this research, 68 teaching guides from the primary education degree and 35 from physical activity and sports sciences degree were analysed. These were retrieved from university websites where the graduates had studied.

The official documents and the interviews with graduates and university teachers were used to analyse the type of assessment used for each degree. Interviews and observations were employed to analyse the possible transfer of the use of formative assessment from teacher education to primary and secondary classes.

### ***Procedure***

We contacted the participants to invite them to participate in the study and then explained its purpose and the commitments by both parties. Once this phase of selection was completed, we provided the participants with a letter which offered a detailed explanation

of the study and asked for their signed informed consent to participate, guaranteeing the anonymity and confidentiality of the data.

First, we read the official documents for each degree to have a clearer idea of what competencies should be developed and what kind of assessment is proposed for the different subjects. This information helped us to establish the questions of the interviews and identify possible aspects on which to focus the observation. Subsequently, they were analysed to contrast the information obtained using the remaining techniques. Then, we monitored the primary and secondary teachers participating in this research. During this period, we arrived at the centre, stayed with the teacher, and accompanied them to the class. Once immersed in the development of the session, we stayed apart in an area of the class collecting the information that we considered relevant and that corresponded with the aims of the research. Finally, interviews were conducted. A script was developed with questions that were going to articulate the interviews. They lasted between 40 minutes and an hour. At the beginning, the interviewees were reminded of the purpose of the research so that their answers were focused on the topic to be discussed. They were also informed that the interview was going to be recorded, and that their answers would be anonymous. Primary and secondary teachers were given a sheet with the competencies that should have been developed in their degrees (generic, generic teaching, and specific teaching competencies) so that there were no terminological differences when conducting the interview. We asked the participants to follow the script that we had prepared, leaving them time to answer and, in some cases, redirected our questions when they did not answer. In the interviews with university teachers, the protocol followed was similar. They were not given a sheet with the competencies to develop in the degrees, since this was not the axis of the questions asked.

Once transcribed, they were sent to the participants, so they could provide more information if necessary. Finally, we analysed the collected data.

### ***Analysis of the information***

To analyse the collected information, we began with the transcripts of the interview recordings. Later, the information related to the observations (through the records carried out in the diary) and the teaching guides was included. Subsequently, an inductive coding process was followed. A list of codes was developed according to the topics of the research and the information obtained from the detailed reading of the seven interviews' transcription, observation, and documentary analysis. This step permitted a detailed view of the information collected, which was later analysed with the qualitative analysis NVivo v.12. software. This was developed on a qualitative basis of coding and categorising information. The sentences were taken as coding units. Immediately after that, the information was organised through an open coding system, setting the codes into categories and sub-themes (Vaismoradi, Turunen, and Bondas, 2013). Table 2 shows the final structure of the analysis after this process and the number of references in each one, depending on the degree studied. The first two codes refer to the types of assessment experienced during teacher education regarding its purpose and the moment of the process in which they are developed. Subsequently, the first issue of the research is addressed in this section, which is divided into three subtopics: (a) initial information and feedback: refers to information processes during formative assessment and their importance in improving learning; (b) student participation in assessment: collecting the way in which students' participation in the assessment was encouraged (or not); and (c) assessment instruments: related to the instruments used to collect information about students' learning.

The second issue presents no subcategories, so it was analysed as a whole. Finally, the data were interpreted considering the information within the reality in which it took place.

In this study, validity and reliability were ensured through three processes, following the criteria established by Noble and Smith (2015) and Lincoln and Guba (1985): a) during the interviews, checks were carried out on the answers given by the participants, summarising what they had answered and corroborating that we were correctly understanding what they were saying to us; (b) returning the interviews to the participants so that they could read the transcript and decide if they wanted some of the information given to not appear in the study; and (c) triangulation was used by employing different sources of data (interviews from two different sources to contrast information, observation and official documents). Furthermore, to ensure reliability, a detailed description of the procedures and the results found were made so that anyone can replicate the investigation (Noble and Smith, 2015).

Table 2. Codes of this study and number of references in each code

	Total	Primary Teacher Education Degree	Physical Activity and Sport Sciences Degree
Assessment practices used in teacher education i.e. formative assessment, summative assessment	68	28	40
Assessment moments i.e. initial, continuous, final	2	2	0
What characteristics of formative assessment processes during teacher education are the most useful to the development of graduates' teaching competences?			
<i>Initial information and feedback</i> i.e. share assessment criteria and objectives of the unit; follow-ups and information about the assessment tasks	8	6	2
<i>Students' participation in assessment</i> i.e. peer assessment; self-assessment; self-grading	39	18	21
<i>Assessment instruments</i> i.e. portfolios, rubrics, exams	398	244	154
How do formative assessment processes implemented during teacher education contribute to the application of this assessment system during their teaching work in Primary or Secondary Education?	14		

## Results

To provide coherence and fluidity to the information in this section, it will be presented in a single discourse following the order of the codes established in the methodological section. Before answering the two issues raised in this research, we will give an overview of how the assessment processes are set in the two degrees included in it. During the teacher education period, the university teachers used diverse assessment practices. The teaching guides analysed state that most of the subjects had a continuous assessment (with minimum assistance in class). However, most of these documents do not explain the purpose of this assessment (formative, summative, etc.).

In primary teacher education degree, less than 37% of the teaching guides stipulate that the assessment will be continuous and only 11% that it will be formative. The remaining participants did not specify this information. In physical activity and sport sciences degree, the situation is not very different: 42% of the teaching guides establish continuous assessment, 13% formative, and 45% do not specify. The university degrees included in this research propose to carry out many assessments over time, but not that these have to be formative. This was also perceived in the interviews by graduates working as teachers. In the primary teacher education degree, there seems to be a simplified vision of the assessment practices developed during their teacher education, emphasising that they have experienced formative assessment practices, but mainly in the last year of class and in the subjects of physical education speciality.

[..] yes, we had, mainly in physical education, during the last year. The assessment was much more formative, we could say that they would take more into account your progress, your participation in class... it was more continuous [...] (PT2).

In physical activity and sport sciences degree, there are more references to the use of different forms of assessment. At the same time, there is a greater presence of formative assessments. The graduates perceive three different forms of assessment: traditional, formative, and one in between. The latter represents people who 'believe' in applying formative assessment processes, but in reality, they only give students more work during the academic year without following up by giving proper feedback. This kind of assessment is not formative, but merely a way of conducting summative assessments.

Different types, from a completely summative assessment to formative, or even formative with no idea of what the term means... going through negotiated assessment, self-assessment (ST2).

Among the different forms of assessment experienced, graduates agreed that the formative one is the most useful to achieve competences. They believed that feedback was useful in improving their academic work and, therefore, their learning:

The formative one, because when I consider some learning... what works for me is that you tell me what I did right and wrong and what I can do to improve. Summative assessment does not include any type of reflection or immediate judgement, and formative assessment carries a reflection and dialogue (ST2).

***What characteristics of formative assessment processes during teacher education are mentioned as the most useful ones to the development of graduates' teaching competences by those working as teachers and university teachers?***

Among the different aspects of formative assessment implemented during teacher education, graduates show that knowing the learning objectives or indicators by which students will be assessed allows them to focus more easily on what they should learn in that subject. The participants in this study seemed to consider this a key element for learning.



Your grade is closely related to your work. You already knew what would be assessed from the beginning. I already know what they are going to ask, so then, what is this? Should I study it? And then you realise it's true, it's useful, because you already know what you have to learn. (ST1)

Related to this, they point out that working daily has helped them learn more, as long as it was accompanied by teachers' follow-up (feedback). Therefore, it seems that a fundamental aspect to ensure that assessment is at the service of learning is to provide feedback to students about the evolution of their workflow. This should focus on how they are doing and what they can do to improve their learning to achieve learning objectives. Graduates believe that it is fundamental for deeper and lasting learning. However, there are not many references from our sources regarding the use of feedback in teacher education.

In some of them, I can give you a total yes. Perhaps we had five tutorials before handing in the paper. They were giving feedback all the time, and they could send emails to those teachers. In some subjects you could, but in others, you just could not. There were not many and they were mainly in the physical education section. (PT2)

They also indicate that students' participation in assessment processes could be a very useful practice to achieve teaching competence development; however, it has not been a common practice during teacher education. Getting to know how this is experienced and valued by the graduates and the type of practices carried out will help us know if it is an aspect that they have been able to learn through their experiences in teacher education.

Regarding students' participation in assessment and grading, there are not many teaching guides that make provision for this possibility. A reference to student participation appears in less than 20% of the teaching guides. However, physical activity and sport

sciences graduates report that they have taken part in their own assessment and also in their peers' at different moments.

Yes, yes. Also, there were several subjects where we self-assessed our work and, then, we also co-assessed our classmates. Yeah, we used to do that fairly often. (ST1)

Based on their experience, graduates believe that the best way to carry out students' participation is with assessment criteria previously established and with teacher follow-up. When there is no teacher follow-up, they think peer assessment processes could lead to bad practices. As a consequence, the purpose of this type of practice could be distorted and lead students to give a good grade to a partner, even if their work lacks the required quality. In addition, students will not take these types of practices seriously, underestimating their usefulness and valuing them as *practices to avoid work by teachers*.

It's also true that, sometimes, there is this comradeship thought of 'how am I going to fail him?' When the truth is that that group you were talking to had not worked enough, they had not prepared quality work... and at that point I believe there's a lack of maturity on my side and also within the entire classroom. We need this to understand that if I fail your assignment, it's not because I do not like you or I hate you, it's because I want you to learn. And then you, as a mature person, say: 'well, it's okay, I am fine with it. They have failed me, but I am going to put more effort next time. I will understand the concept I have missed a lot sooner so I can pass the subject or get a greater grade'. (ST2)

One of the graduates suggests a solution to avoid these problems and, at the same time, grant some leadership to students: establish a grading dialogue between teachers and students. This dialogue would require students to justify in front of the teacher why they have assessed an assignment in a certain way (regardless of whether it is for their peers or for self-assessment). If the grade is not paired with the quality of the work according to some proposed indicators, it will not be maintained.

[..] What should be done is that teachers – working as moderators – and students would assess the assignment and, if there is a conflict, then a dialogue is established. Teachers and students have to engage in dialogue for a while until they reach an agreement. I need to provide evidence to justify that someone deserves a 7 when the teacher says he deserves a 5. At that moment, the comradeship does not work anymore. Comradeship is over [...]. (ST2)

Specifically, in the context of this research, it is necessary to find a solution to this type of practice. There should be a generalised regulation that indicates the way in which these procedures can be applied and also training for teachers so that they know how to apply them to be truly formative.

Finally, another aspect that stands out as relevant for the development of teaching competencies during this stage is the assessment instruments used. Many subjects analysed in this study used the exam as the main assessment instrument. In primary teacher education, 85.3% of the teaching guides proposed the use of exams, while in physical activity and sports science degree, it appears in 89.5% of the teaching guides. However, in physical activity and sports science degree, graduates also report the frequent use of different assessment instruments, such as portfolios, observation sheets, reading reviews, rubrics, and learning contracts, which helped them develop a wide variety of competences.

They tend to abuse written work and exams. [...] But there's already been a change, because I remember portfolios, doing different things, reading reviews, proposing questions through these readings, questionnaires on the computer... [...] Or a rubric, or I have to create an observation sheet... We do it and then we also assess it... so, yes, there's been a bigger range more useful for the development of competences. (ST1)

It will also open up the possibility of assessing the same learning in different ways depending on the capacities that they want to put into play. Knowledge needs different

instruments to be valued, just as formative assessment does to work fully. In addition, the possibility of adapting the assessment instruments could be considered so that students can demonstrate their knowledge by using different elements and not always the same ones. In the context of this research, the use of assessment instruments has hardly changed.

***How do graduates and university teachers perceive the implementation of formative assessment processes to contribute to the application of this assessment system during teaching work in primary or secondary education?***

This last section focuses on analysing the possible transfer of assessment practices used by university teachers during teacher education to their students, evaluating whether the latter apply these strategies when they become teachers of primary and secondary schools.

University teachers consider that the use of formative assessment processes during teacher education contributes to something more than simply learning the contents of the subject, helping students develop strategies related to the different assessment elements that they employ within the subject.

[...] it's true that formative assessment seeks to improve the learning processes. You not only teach them several matters related to the subject, but they also assume the assessment as another part that adds to their general process of learning about assessment. (UT2)

University teachers are aware of the importance of using formative assessment processes, not only because of the usefulness of improving student learning about the subject, but also because they contribute to generating ideas about how to develop such processes with students in primary and secondary classes in the future. They consider that it is important to practice what you preach: if you regard one type of assessment more

beneficial than others, then you must apply it so your students can get ideas that can be applied in their own teaching practices.

Yes, sure, because they look at us as ‘role models’, even though we may not be aware of it. For me, I have to practice what I preach: if it’s my way of thinking, then I have to reflect it in the way I teach, in the way I assess... In fact, I have students working at schools who come and say: ‘Hey, that thing we did once in class? I got it adapted for my kids and I am putting it into practice’. (UT3)

This was supported by the primary and secondary teachers interviewed in this study. In the primary teacher education degree course, it seems that formative assessment is applied less, but graduates consider that experiencing it has made them put it into practice to the extent possible.

Indeed, this has helped me. I have seen you can assess in different ways and you can find different instruments to collect the necessary information for a proper assessment. So, yes, that’s what I aspire. (PT2)

One of the primary education teachers (PT1) said that ‘if they had only assessed me with exams and in a more traditional way, I would have evaluated’ by valuing the importance of knowing how other people assess. In physical activity and sport science degree courses, the perception is the same, and one of the graduates (ST1) highlights the importance of these practices. Nonetheless, the context is different because they have seen how formative assessment is applied, so they can easily adapt it to their own experience. As he said, ‘Eventually, you end up perceiving what things are more coherent, what make more sense or what you can use in your teaching [...]. You saw different possibilities and then you keep the best’ (ST1).

The other participant (ST2) also pointed out that experiencing formative assessment

systems gave him more resources than simply learning it from a book. In addition, this experience helped in applying these instruments later in their own classes. For him, it is not enough that teachers mention the existence of these alternative forms of assessment, but rather experience them for himself and thereby learn how to apply them.

When you find yourself with teachers who know about formative assessment, you know how to apply it because you are reproducing something you have already learned. This is much easier than being given a book and applying it on your own. The fact that teachers integrate these proposals during their classes in a constant way from beginning to end [...] works as an incentive to use more innovative and formative assessment methods rather than just summative ones. This truly helps. (ST2)

Graduates positively value how the different instruments and procedures related to the formative assessment processes experienced during teacher education are useful for their professional work as teachers, using them in their classroom, and this is reflected in their practices: 'He tells them that in groups they will prepare the assessment items for the observation sheets. Each group will write some and then he will photocopy them, and each group with their assessment sheet will assess another one' (ST1: Session6).

However, university teachers emphasise that at the beginning, students do not see that in physical education classes they cannot use assessment processes as they have done in a university subject, and what they present or try to do about the paper would not be viable in practice.

The problem is not that they are not capable of design, but rather that they are not in the practical field, they are not aware of what it means to put a rubric on paper and then transfer it to a secondary school practical field. (UT2)

This is an important aspect to consider. When these events occur, the students try to apply as formative assessment systems what they have experienced and must adapt it to the reality in which they want to apply it. If they do not do so, this can lead to disproportionate assessment systems, loading the primary and secondary students with excessive work and generating rejection of these forms of assessment.

Finally, after the analysis of the two issues of this research, two questions arise: ‘What characteristics of formative assessment processes during teacher education are mentioned as the most useful to the development of graduates’ teaching competencies by teachers and university teachers?’, and ‘How do graduates and university teachers perceive the implementation of formative assessment processes to contribute to the application of this assessment system during teaching work in primary or secondary education?’ We are going to integrate this to give an answer to the *Quintain* of the study: *‘Could we establish some recommendations so that the formative assessment of teacher education has repercussions in the development of the teaching competences of the graduates?’* Figure 1 offers a scheme for answering this question. The upper part includes the dimensions of the assessment that may affect the development of teaching competencies. These dimensions came from the codes that emerged from the analysis: (a) it should have assessment criteria previously established; (b) assessment should be at different moments through the process; (c) there should be feedback along the process; (d) it should include students’ participation; and (e) different assessment instruments should be used. Below this row, there are guidelines to put these dimensions into practice to achieve the expected objective, and the last row explains the way in which each dimension contributes to the development of teaching competencies. This evidence emerges from the information provided by the

participants about how the assessment was developed and how this helped them develop teacher competences. Among the different aspects collected, we found the following: assessment criteria should be shared with students at the start of the unit to help make them aware of what they should learn in the unit; feedback should be used to allow students to know how they are doing and what they should do to develop competences to a greater degree; and students' participation should be encouraged with quality criteria on what they should assess, a progression in the responsibility assigned to them in the assessment, and the use of a wide variety of assessment instruments to assess competencies in all areas.

Finally, at the bottom, there is a section that refers to how the use of these dimensions of formative assessment adds to the development of assessment competence, according to the proposed guidelines. Therefore, the use of formative assessment during teacher education will contribute to the development of assessment competence, giving students ideas on how to develop assessment processes and adapt them to their context and their students.



	ASSESSMENT AT DIFFERENT MOMENTS THROUGHOUT THE PROCESS	ASSESSMENT CRITERIA	FEEDBACK	STUDENTS' PARTICIPATION	ASSESSMENT INSTRUMENTS
GUIDELINES FOR EMPLOYMENT	<p>Not only an assessment test at the end of the teaching and learning process</p> <p>Assessment at different times to be able to establish improvements and make adaptations according to the needs of the students</p> <p>Different deliveries throughout the process</p>	<p>Shared with the students at the beginning of the teaching and learning process</p> <p>Influence them throughout the teaching and learning process</p>	<p>That allows students to know how they are doing</p> <p>Let them know what they must do to improve</p>	<p>Provide students with quality criteria on what they should assess</p> <p>Accompanied by a follow-up by university teachers</p>	<p>Related with the assessment of the competences established</p> <p>Use of a greater variety of instruments during the process</p>
BENEFITS OF THE DEVELOPMENT OF COMPETENCES	<p>It allows students (and teachers) to assess how learning is been acquired so that adaptations can be anticipated and at the end of the process the competences will be acquired to the greatest possible degree</p>	<p>It helps students to be aware of what they are expected to learn in the subject and to put the focus on the relevant aspects and not on other secondary aspects.</p>	<p>It allows students to know what aspects they need to improve and what they must do to do it, so that they can introduce changes and improvements in what they are doing and develop competences to a greater degree at the end of the process</p>	<p>It helps students to be aware of what is being asked of them and to know if they are achieving the competences. It favors the learning of assessment competences.</p>	<p>The use of various assessment instruments will allow the assessment of the competences in all areas</p>
<b>ASSESSMENT COMPETENCE:</b> Contributes to the students to become aware of how to develop formative assessment processes and take ideas, that adapting them to their context, can be use in their primary and secondary classes					

Figure 1. Recommendations for the implementation of formative assessment in teacher education.

## **Discussion and conclusions**

The aim of this research was to explore the recollections and impressions of the graduates working as teachers about the type of assessment practices used during teacher education and how they contribute to competence development, and to analyse university teachers' subjective beliefs about this process to establish some recommendations for its use during this period. The main contribution of this research is a model with formative assessment elements that are well implemented and will contribute to a greater development of teaching competences. In addition, this study indicates that s formative assessment during teacher education will help future teachers to take ideas and use these processes with their primary and secondary students.

Despite the time that has elapsed since the establishment of the EHEA, it seems that in the context studied in this research, there is still room for improvement in the application of formative assessment in teacher education. It seems that even though it is considered useful and well-valued by students for their learning, it is not applied in many subjects in the degrees involved in this research. This is supported by Lizandra et al. (2017), who showed that only 18.6% of higher education teachers use formative assessment as the only way to assess students in their subjects, proving that there is still a great predominance of traditional assessment systems. We have also seen that for an assessment to be truly formative and to contribute to the acquisition of competencies, it must meet a series of requirements. For example, teachers should establish previous assessment criteria and share them with students, so they know which elements are going to be assessed. This conclusion has already been highlighted in previous studies showing that learning is better when students know what is going to be assessed (Silva and López-Pastor, 2015). Another

important element here is that assessment should be systematic, with teacher follow-ups providing information on how the work is being developed, so that it has a positive effect on the process of learning. Our research has shown that having more assessment tasks is not in itself more formative if these are not accompanied by university teachers' follow-up and feedback. Previous studies have also shown the importance of feedback in improving learning (Boud and Molloy, 2013; Nutbrown, Higgins, and Beesley, 2016). In the same way, even though in formative assessment processes, the use of different assessment instruments is expected, this study shows a fairly large prevalence of exams, similar to the results of previous research (Cañadas, Santos-Pastor and Castejón, 2018; Panadero et al., 2019).

The same problem appears with student participation in the assessment process. Although this is valued positively, either self-assessment or peer assessment, it is hardly used, corroborating previous studies (Cañadas, Castejón, and Santos-Pastor, 2018; Cañadas et al., 2018). Furthermore, when it is used, it is often not performed correctly. It should be preceded by criteria for its development and teacher follow-up and control; otherwise, it loses its formative power, relegated to a mere instrument, whereby students assume the authority to assess themselves without improving their learning. This is valued as an unfair way to assess and grade students' learning (Carvalho, 2013; Van Schenkhoof, Houseworth, McCordf, and Lannin, 2018).

As a final thought, having experienced formative assessment processes in teacher education provides future teachers with ideas on how to develop these processes. They can use them with their primary and secondary students, adapting them to their context and their classes. The information provided by our participants is in agreement with the

conclusions reached in previous research (Hamodi et al., 2017; Molina and López-Pastor, 2017).

This research has highlighted that not all assessment proposals that differ from a final exam are truly formative assessment approaches that promote learning. Therefore, it is important to know the characteristics of assessment that contribute to learning in higher education and how it should be implemented. This is what this research has shown. First, the employment of formative assessment during teacher education will contribute to the development of teaching competences. However, it must be done with clear criteria known to the students, while collecting evidence throughout the training period. It is important to provide proper feedback on students' performance and what they must do to improve it. The participation of students in the assessment process, with some reference criteria and the use of assessment instruments, will also contribute to the development of teaching competences. The assessment used in this way will work as a tool for the development of assessment competence, so that students become aware of how to carry out formative assessment processes in the future as teachers. These principles will help university teachers implement truly formative assessment processes during education that will help students develop competences in a better way. It will also help former student teachers develop assessment strategies to implement them in their primary and secondary classes.

This study had two main limitations. First, the small number of participants, which did not allow generalisation of the results. In addition, the fact that the research is limited to two specific university degrees as well as to specific subjects in the curriculum, which makes it difficult to extrapolate the results. Nonetheless, this study also has numerous strengths. The inclusion of graduates from the EHEA can lead to an assessment of the

adequacy of current training to the needs of teachers. In addition to deepening all the elements necessary to achieve truly formative assessment processes, this research can contribute to the development of a model to determine the specific way the formative assessment should be used to achieve certain benefits. In addition, the combined perspective of primary and secondary teachers and university teachers allows for a holistic vision of the assessment processes in this context. Future research should be extended, especially in secondary education, to other degrees and subjects of the curriculum to determine whether training in other specialties also uses formative assessment processes. In addition, this can provide insight on whether practicing teachers use it and where assessment training is needed. A large-scale study would allow a more general analysis of the degree of compliance with the elements studied in teacher education.

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