

# What is formative assessment? Conceptualisation and level of knowledge of basic education teachers

## *¿Qué es la evaluación formativa? Conceptualización y grado de conocimiento del profesorado de educación básica*

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### Abstract:

For educational research and practice, it is vital to identify how much teachers believe they know about formative assessment, as well as their ideas of the concept. However, there has been little research in this area. Therefore, this research aims to: (1) analyse teachers' perceived level of knowledge of the concept *formative assessment*, establishing whether there are statistically significant differences according to the educational level at which they teach, the training in assessment they have received, the number of training activities on assessment they have completed, and their years of teaching experience; and (2) to analyse teachers' theoretical conception of formative assessment. A mixed design was used with 713 teachers from primary education (39.1%) and secondary education (60.9%). The #EvalFormEPESO questionnaire was used to collect information. Specifically, the item about the level of knowledge of the concept *formative assessment* and an open-ended question requesting its definition. The results show statistically significant differences in the level of knowledge of the concept *formative assessment* depending on the variables studied. Moreover, the definitions teachers provided show incomplete or erroneous conceptions.

**Keywords:** formative assessment, conceptualisation, definition, training, knowledge, teachers, basic education.

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**Resumen:**

Para la investigación y la práctica educativa, es fundamental saber el grado de conocimiento que el profesorado considera que tiene sobre la evaluación formativa, así como cuáles son sus ideas sobre dicho concepto. Sin embargo, la investigación en este ámbito es escasa. Por ello, esta investigación se plantea (1) analizar la percepción del profesorado sobre su grado de conocimiento del concepto *evaluación formativa* y valorar si existen diferencias estadísticamente significativas en función de la etapa educativa en la que ejercen docencia, de la formación en evaluación recibida, del número de actividades formativas sobre evaluación realizadas y de sus años de experiencia docente; y (2) analizar la concepción teórica que el profesorado tiene sobre la evaluación formativa. Para ello, se empleó un diseño mixto con 713 docentes de educación primaria (39.1%) y secundaria (60.9%). Para la recogida de información, se empleó el cuestionario #EvalFormEPESO. En concreto, el ítem sobre el grado de conocimiento del concepto *evaluación formativa* y una pregunta abierta que solicita su definición. Los resultados muestran que existen diferencias estadísticamente significativas en el grado de conocimiento del concepto *evaluación formativa* en función de las variables estudiadas. Además, las definiciones reportadas por el profesorado muestran que existen concepciones incompletas o erróneas.

**Palabras clave:** evaluación formativa, conceptualización, definición, formación, conocimiento, profesorado, educación básica.

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## 1. Introduction

Teachers' pedagogical conceptions have a significant impact on their classroom practice and are fundamental for understanding the results of the educational reforms that have been implemented in the education system (Martin et al., 2022). Over recent decades, educational reforms have increasingly focussed on the use of formative assessment processes (Casanova, 2021; DeLuca & Klinger, 2010; Van der Linden et al., 2023) given that there is sufficient evidence to show that their use contributes to improving learning and the outcomes of the teaching-learning process itself (Bennet, 2011; Pastore et al., 2019). Despite the benefits shown by research, the implementation of formative assessment is hindered by certain prior conditions such as teachers' motivation and predisposition, their training and skills in relation to its use, the presence of a favourable classroom environment, and the availability of the necessary tools and strategies for putting it into practice (Pastore & Andrade, 2019; Yan & Pastore, 2022). Accordingly, one of the principal obstacles to the correct application of formative assessment lies in defining it, in conceptualising it with precision, as much as in the characteristics that shape its implementation, an aspect that affects the practical scenario of the assessment (Hanefar et al., 2022; Martin et al., 2022). So, studies like that of DeLuca and Johnson (2017) find that factors such as a lack of assessment literacy and a lack of knowledge and skill for putting it into practice could be behind this situation. Considering the above, we should ask how familiar teachers are with the concept *formative assessment* and what notions they have of it. The present work seeks to provide evidence in this regard.

### 1.1. Formative assessment

Formative assessment is a practice fostered in the current education system for its pedagogical potential (Casanova, 2021; DeLuca & Johnson, 2017; Van der Linden et al., 2023). It is defined as the collection of activities and assignments integrated into the teaching-learning process that facilitate the systematic gathering of information about all of the elements at play in students' learning for the purpose of producing a fair and well-founded assessment and

providing feedback so that students can achieve greater academic success (Bennet, 2011; DeLuca & Johnson, 2017; Sanmartí, 2019; Yan & Pastore, 2022).

Over recent decades, numerous studies have shown the benefits of using formative assessment in students' learning (Bennet, 2011; DeLuca & Klinger, 2010; Gan et al., 2018; Yan & Pastore, 2022). Among these benefits, its use promotes the development of strategies that favour students' awareness of the place and time of the learning in which they find themselves and their reflection on their strengths and aspects to improve (Hanefar et al., 2022; Jawad, 2020 & Ziqi et al., 2023). Consequently, students develop cognitive and metacognitive skills that help them critically assess their own learning processes and those of their peers (Sanmartí, 2023). To achieve these benefits, William and Leahy (2015) suggest five key strategies for implementing true formative assessment: (1) clarifying, sharing, and comprehending the learning objectives and assessment criteria with students; (2) fostering effective debates, assignments, and activities that favour demonstrating learning; (3) providing feedback and feedforward that enable students to know how they are doing in comparison with learning objectives and how to achieve them to a greater extent; (4) engaging students in their own learning and assessment; and, (5) engaging students in their classmates' learning and assessment process.

## 1.2. Teachers' conception of assessment

The conception of assessment comprises the ideas, values, and attitudes teachers have of educational assessment (Brown & Gao, 2015; Jawad, 2020), including cognitive and affective aspects linked to the teachers' vision of the education system in general. On the one hand, the cognitive notion of assessment relates to the theoretical knowledge and epistemological beliefs that teachers possess (Pastore & Andrade, 2019). On the other hand, the affective dimension reflects teachers' emotional predisposition towards formative and practical experiences of assessment developed throughout their professional and academic career (Yan & Pastore, 2022). Accordingly, teachers' conception of assessment can be variable and changing (Van der Liden et al., 2023; Hanefar et al., 2022); this change will occur when they display a favourable attitude towards the implementation of new assessment policies. However, Pastore et al. (2019) note that teachers sometimes have ideas and systems that are relatively stable and rooted in the cultural tradition associated with assessment as a means of measurement and grading. This means that teachers are resistant to change and are not proactive in implementing and modifying their practice in a work setting (Martin et al., 2022).

## 1.3. Formative assessment literacy

Formative assessment literacy refers to the necessary body of knowledge and skills that teachers must acquire to implement assessment that is fair, equitable, and suited to the needs and demands of the education system (Yan & Pastore, 2022). It combines all of the teaching aptitudes necessary to design and implement appropriate and contextualised assessment processes and to make a fair and coherent value judgement about students' performance with the aim of promoting meaningful learning (Pastore & Andrade, 2019). Teachers' formative assessment literacy also requires the facilitation of appropriate experiences to encounter practices that favour self-regulation of students' learning such as self-assessment and co-assessment (Sanmartí, 2023; DeLuca & Klinger, 2010). Similarly, Ziqi et al. (2023) determine that it must be centred on the development of feedback processes, which are one of the decisive indicators of the efficacy of the teaching process.

Formative assessment literacy is currently understood to be a complex interaction with various elements in play. Xu and Brown (2016) lay the foundations for a conceptual framework and identify a hierarchical model comprising six components: (1) the teacher's knowledge base, (2) conceptions of assessment, (3) institutional and sociocultural contexts, (4) training in assessment in practice, (5) the teacher's learning, and (6) the teacher's identity as an assessor.

From a holistic perspective, and using this classification as a reference, Yan and Pastore (2022) suggest that literacy in assessment can be grouped into three major dimensions that make up teacher identity: (1) conceptual, (2) practical, and (3) socioemotional. The conceptual

dimension refers to the fundamental knowledge of formative assessment that teachers must have, including its goals and methods (Pastore & Andrade, 2019); The practical dimension combines the specific techniques and procedures that a teacher must use to develop quality formative assessment, and the socioemotional dimension refers to the teachers' perception and conception of the education system in general and how they understand assessment in particular (Yan & Pastore, 2022). Brown and Gao (2015) indicate that teacher literacy has principally been focussed on summative and centralised assessments. However, as formative assessment has grown in importance, new challenges have emerged for the literacy and training of the teachers, which confront the move towards the construction of a new assessment paradigm (Yan & Pastore, 2022). Therefore, it is vital for teachers' literacy and training to include comprehension of the theoretical principles behind the assessment practices and to provide practices, instruments, and procedures that fit these new proposals (DeLuca & Klinger, 2010). For this to occur, Ziqi et al. (2023) claim that the generalised conception rooted in the more evaluatory vision of assessment must be set aside.

#### 1.4. Teachers' conception and literacy regarding formative assessment

Teachers' ideas of assessment will have a direct impact when implementing formative assessment processes. Accordingly, teachers' level of knowledge of assessment and their conception of it can hinder its successful implementation (Van der Liden et al., 2023). Similarly, teachers' conception and intention is, on the one hand, closely linked to their assessment literacy and, on the other, to their identity as assessors, that is to say, to their beliefs, feelings, and experiences (DeLuca & Klinger, 2010). In this regard, examining teachers' conceptions makes it possible to identify the underlying ideas that guide their assessment practice and also makes it possible to understand better how they design and implement assessment practices (Van der Liden et al., 2023).

In a study by Pastore et al. (2019), teachers relate formative assessment to the process of identifying students' strengths and weaknesses and giving feedback to improve them. However, the results show that the traditional vision of assessment still prevails, as teachers tend to believe that formative assessment is an instrument for supervising and checking students' learning (Casanova, 2021; Sanmartí, 2019). In this case, and concurring with Gan et al. (2018), it is notable that teachers associate formative assessment with the periodic use of various tests (exams, oral and written tests, etc.), above all to assess the cognitive dimension of students' learning.

These results are similar to those obtained by Hanefar et al. (2022) and Ma and Bui (2021), who find that teachers' discourses feature a strong correlation between assessment as improvement and as accountability, indicating that teachers believe that examining students contributes to the development of their learning. From this perspective, a degree of terminological confusion about what formative assessment is can be seen because teachers tend to confuse it with summative assessment when trying to carry it out systematically in everyday teaching practice (Gan et al., 2018; Van der Liden et al., 2023). This confusion could be influenced by contextual factors and by teachers' working environment (Ma & Bui, 2021). So, Pastore and Andrade (2019) determine that factors, such as cultural bias about assessment, the importance educational policies place on student performance, and the deep-rooted traditional conception of assessment, mean that teachers still have a rather limited view of assessment. In accordance with this idea, Hanefar et al. (2022) and Pastore et al. (2019) note that, a small change by teachers in their conception and perception of assessment can be perceived but that this change is linked to more theoretical and discursive aspects. In contrast, few teachers are able to represent and define formative assessment practically, and those who subsequently feel able to apply these processes in the classroom are even rarer. Accordingly, to try to answer this question, this study proposes two objectives: (1) to analyse teachers' perception of their degree of knowledge of the concept *formative assessment*, assessing whether there are statistically significant differences according to the educational stage in which they teach, the training in assessment received, the number of training activities on

assessment carried out, and their years of teaching experience; and (2) to analyse the teachers' theoretical conception of formative assessment.

## 2. Method

### 2.1. Study design

A mixed design (Creswell & Plano, 2017) was used to address the research objectives. A transversal quantitative study was performed in response to the first objective. After this, a qualitative and descriptive investigation was performed to contrast the alignment between teachers' level of knowledge of the concept *formative assessment* and their real knowledge of what it is.

### 2.2. Participants

A total of 713 Spanish teachers from primary education (PE) (39.1%) and Obligatory Secondary Education (ESO) (60.9%) participated. They were selected through random non-probability convenience sampling. The representativeness of the sample was calculated using the data provided by the Ministry of Education, Professional Training, and Sports (Ministerio de Educación, Formación Profesional y Deportes, 2024), which made it possible to establish that the sample was representative. The participants have a mean teaching experience of 11.32 ( $SD \pm 11.00$ ) years. Table 1 shows the details of the participants.

TABLE 1. Details of the study participants.

Variable	<i>n</i>	%
Gender		
Male	226	31.7
Female	483	67.7
Others	4	0.6
School		
State	603	84.6
Private–state assisted	110	15.4
Educational level		
Primary Education	279	39.1
Obligatory Secondary Education	434	60.9
Academic year		
1 <sup>st</sup> cycle of PE	90	12.6
2 <sup>nd</sup> cycle of PE	76	10.7
3 <sup>rd</sup> cycle of PE	113	15.8
1 <sup>st</sup> and 2 <sup>nd</sup> year of ESO	181	25.4

3 <sup>rd</sup> year of ESO	111	15.6
4 <sup>th</sup> year of ESO	142	19.9
Employment status		
Public official	423	59.3
Temporary post	182	25.5
Permanent contract	108	15.1
Years of teaching experience		
1-5 years of experience	164	23.0
6-15 years of experience	162	22.7
16-25 years of experience	197	27.6
More than 25 years of experience	190	26.6
Highest academic qualification obtained		
Diploma or bachelor's degree (for PE)	178	25.0
Licentiate degree or equivalent and teaching qualification certificate (certificado de aptitud pedagógica) (for ESO)	259	36.3
Postgraduate title or equivalent (master's and/or doctorate)	276	38.7

Note: PE = primary education; ESO = Obligatory Secondary Education.

### 2.3. Instrument

An ad hoc questionnaire called “Formative assessment processes in basic education #EvalFormEPESO” was designed and used for data collection. This questionnaire consisted of 50 closed response items divided into 6 dimensions: (1) identifying data, (2) training in formative assessment, (3) purposes attributed to formative assessment, (4) participants and their roles in assessment and grading processes, (5) feedback, and (6) assessment tools. A 6-point Likert-type scale was used to answer the questions with answer levels ranging from 1 (never) to 6 (always). In addition, two open-ended questions were included where teachers were asked to define the concept of formative assessment in accordance with their perception and, whether they felt that anything essential for carrying out quality formative assessment had been omitted. The questionnaire was subjected to a process of content validation. This involved 6 experts (4 women and 2 men) from the field of formative assessment with between 10 and 30 years of experience as university teachers. The experts were asked to assess each item in the questionnaire, using the guide proposed by Escobar-Pérez and Cuervo-Martínez (2008), which has 4 categories of analysis (sufficiency, clarity, relevance, and coherence) assessed by means of a scale with 4 levels ranging from 1 (does not fulfil the criterion) to 4 (fulfils it totally). The questionnaire's reliability was then tested using Cronbach's alpha, which gave a level of internal consistency of  $\alpha = .873$  for the scale as a whole. To respond to the objectives set in this study, the items relating to teachers' knowledge of the concept *formative assessment* were used (Table 2). These included one closed and one open question.

TABLE 2. Items analysed for the research.

**Do you know the concept *formative assessment*?**

Yes, I know the concept well.

Yes, I know the concept, although I have doubts about its meaning.

I have heard it, but I am not sure what it means.

No, this is the first time I have heard it.

**Say what you consider formative assessment to be (give an example).**

## 2.4. Procedure

For the data collection, the email addresses of all of the primary and secondary education centres in Spain were compiled through the webpages of the autonomous communities. The ones that presented this information in a public and accessible form were selected. The questionnaire was uploaded to Google Forms and was sent by email to all of the schools, requesting the participation of the teachers from the educational institution. An information sheet and informed consent sheet were provided along with the questionnaire, in accordance with the principles of ethical research (American Psychological Association, 2010). This study was approved by the research ethics committee of the Universidad Autónoma de Madrid with code CEI-126-2604.

## 2.5. Data analysis

After collecting the data, the responses to the item “Do you know the concept *formative assessment*?” were coded into three groups for analysis: (1) I know the concept well; (2) I know the concept superficially; and (3) I don’t know the concept, I don’t know what it means. Subsequently, the descriptors were analysed and the chi-squared test was used to establish whether there were statistically significant differences in knowledge of the concept according to the different variables studied. This was done using the SPSS (version 26) statistics software program.

The teachers’ written responses to the open-ended question “Say what you consider *formative assessment to be* (give an example)” were also analysed. To do this, we used the Atlas.ti qualitative analysis software program. First, the terms used the most by teachers in the definitions given were extracted and counted. This was followed by a process of inductive coding with a bottom-up focus. Common elements in teachers’ discourses were identified and a list of emerging codes was prepared taking into account the topics of the research and the information from the fragments analysed. The phrases were taken as coding units and the information was organised through a system of open coding. So, 16 initial subcategories were established giving a detailed view of the information collected. After this, all of the citations selected for each subcategory were reviewed, grouping and organising them into 3 broader categories: (1) formative assessment as an aim or moment, (2) formative assessment as an assessment instrument, and (3) formative assessment as a participatory process (see Table 4 for more information about the specific categorisation).

## 3. Results

Table 3 displays the results for the teachers’ reported level of knowledge of the concept *formative assessment* and the differences depending on the variables analysed. Of the teachers, 55.0% say that they know the concept *formative assessment* well, while only 15.3% say that they do not know it. There are statistically significant differences in knowledge of the

concept *formative assessment* according to the educational level at which the teachers teach ( $\chi^2(a) = 7.289, df = 2, p < 0.05$ ). Teachers from ESO are less familiar with the concept (18.0% compared with 11.0% from PE who say that they do not know the concept). Meanwhile, 59.9% of teachers from PE state they know the concept *formative assessment* well, compared with 51.8% from ESO.

There are also statistically significant differences in knowledge of the concept *formative assessment* by training received in assessment ( $\chi^2(a) = 272.237 df = 4, p < 0.05$ ). On the one hand, it stands out that 91.1% of teachers who perceive that they have received sufficient training in assessment report knowing the concept *formative assessment* well. On the other hand, 24.0% of teachers, even when reporting that they have received no training in assessment, say they know the concept well. Finally, among the participating teachers who report not having received training in assessment, 43.3% state that they are not familiar with it.

There are also statistically significant differences in teachers' perceived knowledge of the concept *formative assessment* by number of assessment training activities completed ( $\chi^2(a) = 135.429 df = 4, p < 0.05$ ). The ones who have done more than three training activities claim the best knowledge of the concept *formative assessment* (73.2%) while 35.3% of those who have not done any training activities say they are not familiar with it. Finally, statistically significant differences also appear in teachers' perception by years of teaching experience ( $\chi^2(a) = 15.617 df = 6, p < 0.05$ ). Although the most common response in all of the groups was "Yes, I know the term well", the respondents with the most teaching experience (more than 25 years) have the highest percentage of this answer (62.1%), while those with the least teaching experience (1-5 years) display the lowest percentage (48.2%). This same trend is maintained with those who say that they do not know the concept, with the ones with the least experience (from 1 to 5

TABLE 3. Knowledge of the concept *formative assessment*. Differences by educational level, years of experience, training in assessment, and training activities carried out.

		n	%			$\chi^2$	p
			I know the concept well	I know the concept superficially	I don't know the concept, I don't know what it means		
<b>Total</b>		713	55.0	29.7	15.3		
<b>Educational level</b>	Primary Education	279	59.9	29.0	11.1	7.289	<b>.026</b>
	Obligatory Secondary Education	434	51.8	30.2	18.0		
<b>Training received</b>	I have received sufficient training	203	91.1	18.0	0.0	272.237	<b>.000</b>
	I have received little training	314	51.0	41.1	7.6		
	I have received no training	196	34.0	32.7	43.4		



the word is taken as an independent unit and we focus on identifying the words used most frequently in the discourse, regardless of how they are used in it.

TABLE 4. Categorisation used for the analysis derived from the open question.

Category	Subcategory	Code	No. of references	Description
Formative assessment as aim or moment	Improving the teaching–learning process	A_ImpTL	103 citations	Assessment as a process that contributes to improving teaching and students' learning
	Guidance, giving feedback to students	A_Guide	171 citations	Process that helps guide students in their learning process
	Self-regulation of teaching and learning	A_Self_reg	112 citations	Monitoring, managing, or directing one's own learning
	Procedural and integrated into teaching–learning process	A_Inter	122 citations	Assessment as part of the process, not as an isolated activity
	Assessment of student performance	A_Performance	65 citations	Assessing how an assignment has been done in relation to the objectives set
	Competence assessment	A_Competence	10 citations	Assesses competence development
	Certifying	A_Cert	97 citations	Checking results and giving a grade
	Mid-course continuous assessment	A_MidC	73 citations	Mid-course tests or assignments done at specific moments
Formative assessment as an assessment instrument	A_Instr	60 citations	Specific data collection tools or methods	
Formative assessment as a participatory process	Hetero-assessment	A_Hetero	1 citation	Teachers assess students
	Self-assessment	A_Self	31 citations	Students assess their own work
	Co-assessment	A_Co_a	18 citations	Students assess the work of their classmates
	Shared assessment	A_Shared	18 citations	Assessment is shared between teacher and students
Don't know			23 citations	

After analysing the answers given by teachers, three major categories emerged, giving a total of 16 subcategories. These are shown in Table 4. Next, the results regarding the teachers' conceptions of what formative assessment is were presented based on the categories that emerged in the analysis.

### 3.1. Formative assessment as aim or moment

In a total of 103 citations analysed, teachers understand formative assessment to be an element that helps improve the teaching-learning process. Despite this, on a small number of occasions teachers report precise information about specific aspects that detail how formative assessment helps produce this improvement, without deeper consideration of more practical and pedagogical aspects.

"Improving teaching processes"; "directed at continuous improvement of the teaching-learning process"; "it serves to improve the teaching-learning process"; "the type that helps improve the learning process"; "it pursues improvement of the teaching-learning process"; "continuous improvement"; "constant improvement of the learning process" (A\_ImpTL).

"Constantly improving the teaching-learning process. With it we can see what, how, when, and how much the students are learning. Based on this, we can regulate class activities, resources, and strategies" (A\_ImpTL).

A total of 283 citations defines formative assessment as a practice that contributes to self-regulation, both of the teaching process by teachers and of learning by students. In this sense, teachers determine that formative assessment should help detect errors and difficulties in the teaching-learning process to guide teaching practice and provide feedback to students that helps them improve their performance.

"Identifying the difficulties and the errors, seeing that the possible causes, and taking decisions to be able to overcome them. It is a matter of self-regulating learning" (A\_Guide; A\_Self\_reg).

"Feedback on performance in an assignment to guide the student's learning" (Eval\_Guide).

"Procedural assessment in which the milestones assessed are the starting point for the didactic activities. It is based on obtaining feedback to know exactly where students are with regards to their learning process to plan the actions relating to teaching through the results" (A\_Self\_reg).

On this line, 122 citations claim that formative assessment has a procedural character, defining it as an element that forms part of the teaching-learning process and emphasising its integrated nature. From this perspective, it is understood to be a continuous process that is done throughout the whole of the process, and not as something that brings it to an end.

"We do it daily in every observation of work in class. It is almost a methodology, a way of working. It is a way of proceeding in class that obliges you to be constantly changing. When you start a teaching unit, you ask yourself what the class will be like and you even plan for it, but depending on the group, its interests, its starting point, and its diversity... based on the formative assessment, the teaching unit becomes something flexible, just an objective, a target" (A\_Inter).

"Assessment of the whole process, not just the end result"; "continuous assessment, not leaving the assessment to the end, but seeing how the process is going" (Eval\_Inter).

There are 65 citations from teachers who state that the function of formative assessment is to assess students' performance over a formative period and to identify the level of development of their learning. In this case, only 10 of them allude to the competence-related character of assessment, and the predominant discourse is from teachers who argue that assessment serves to assess students' acquisition of knowledge.

“Assessment done throughout the teaching–learning process that makes it possible to check whether the students are acquiring competences, basic knowledge...” (A\_Performance).

“To see how well the competences have been acquired”; “to know during the learning process how the students’ command of the content and competences is developing”; “reflection by students on the learning process and their level of acquisition of competences”; “seeing each child’s learning process, not just at the level of content, but also competences” (A\_Performance; A\_Competence).

However, a traditional vision of the concept of assessment is still found in teachers’ discourses, with 97 citations stating that formative assessment is a means of grading students, even if it is in different tests and moments in the teaching–learning process.

“Exams at the end of each block”; “check the knowledge acquired by the students. e.g: a written exam”; “the teacher assesses academic performance to make the students and their families aware of the academic level acquired”; “at the end of the year or term grading this evolution quantitatively or qualitatively”; “constantly knowing ‘how much’ the students are learning”; “grading the practice” (A\_Cert).

“For example, exam mark plus activities mark” “marks given more or less continuously based on work and assignments done” (A\_Cert; A\_MidC).

### 3.2. Formative assessment as an assessment instrument

Something else teachers often do when attempting to define the concept *formative assessment* is equating formative assessment to assessment instruments and procedures. Of the citations analysed, 60 mention the name of some type of assessment instrument. In these cases, teachers only mention the instruments or procedures used, without going into depth in *how* or *to what end* they use them.

“Exam”; “a written exam”; “written test”; “various exercise options in a written test”; “test, multiple-response, essay questions, short response, linking, identifying images”; “A rubric for a project”; “continuous observation”; “rubrics”; “portfolios, learning portfolio, rubric and assessment targets”; “questionnaires, games, class dynamic” (A\_Instr).

### 3.3. Formative assessment as a participatory process

Some participants define formative assessment by likening it to a participatory process in the assessment by students. From this perspective, 31 citations use self-assessment as equivalent of “formative assessment” and 18 use the term co-assessment as a synonym of it. Therefore, it can be seen that the terms self-assessment and co-assessment are used as substitutes for the concept *formative assessment*, treating formative assessment as synonymous with these practices.

“Self-assessment and co-assessment of students”; “assessing yourself”; “self-assessment of students”; “self-assessment, co-assessment”; “self-assessment and co-assessment” (A\_Self; A\_Co\_A).

On the other hand, some participants also indicate that these processes are integrated in this practice, and they underline the importance of empowering students so that they have a voice in the assessment process. However, only 18 citations define formative assessment as a collaborative process shared with students where they participate in the assessment of their own practice and in that of their classmates.

“Students participate in their learning process and are aware of what aspects the subject teacher proposes that are associated with cooperative learning, among other methodologies, as well as self-assessments, co-assessments, and hetero-assessments” (A\_shared; A\_Self; A\_Co\_A).

## 4. Discussion

On the one hand, this study has analysed teachers' self-reported perceptions of their level of knowledge of the concept *formative assessment* and whether there are differences in this according to different variables. On the other hand, it has analysed teachers' theoretical conception of formative assessment.

With regards to the first objective, teachers in primary education report knowing the concept *formative assessment* well more often than teachers in secondary education. In this aspect, Cañadas et al. (2018) note that while the initial training on educational aspects for teachers in primary education lasts for four academic years (didactics, school curriculum, pedagogy, etc.) secondary teachers are trained in these aspects in the teacher training master's, which lasts for only one academic year. Therefore, the didactic-pedagogic training received in initial training could be a factor that results in better literacy among teachers about what formative assessment is.

With regards to the training teachers have received in assessment, the ones who consider they have received the most training and report having done more training activities assert that they know the term well, reporting higher values in all of the items analysed. These results are on the same lines as the studies by Yan and Pastore (2022), Pastore and Andrade (2019), and Ziqi et al. (2023), which underline that assessment literacy is essential for clear knowledge of what formative assessment is and for implementing it in the classroom. Therefore, providing specific training that focusses on formative assessment and its application in the classroom appears to be crucial in both initial training degrees and postgraduate courses and in continuous training for in-service teachers. On this line, it would seem logical to think that recently qualified teachers should have received more specific, exhaustive, and up-to-date initial training. However, the teachers who claim to know the concept best are the ones with more than 25 years of experience. This could indicate that continuous training currently focusses on increasing training in formative assessment and that initial training still does not meet the training needs of future teachers.

With regards to the second objective, the teachers' definitions of what they understand formative assessment to be are analysed. Although the four most frequently occurring words are *process*, *learning*, *students*, and *improvement*, the word cloud reflects the frequency of each word in the whole of the text analysed, without interpreting its contextual significance. This requires a more exhaustive analysis of the qualitative responses to analyse the depth with which teachers define formative assessment and to reach a conclusion on the basis of their generalised ideas of the concept. In this sense, a multitude of conceptions can be seen in teachers' discourses, which display a lack of agreement on what they consider formative assessment to be (Martin et al., 2022). Only a third of the teachers define it as a process that contributes to improving the teaching-learning process. These results are in line with those obtained by Ma and Bui (2021) and Pastore et al. (2019) where teachers also emphasise that for this improvement to occur, students' needs must be identified and the necessary tools and strategies be provided to enable them to progress and advance, an aspect that is not reflected in the definitions given in our study. This is reflected in another of the elements that must form part of the definition of formative assessment and which is only partially recognised by this study's participants: the guiding and regulating function of formative assessment. Less than half of the citations note the value of feedback, with a superficial conception of its purpose and application being apparent (DeLuca & Klinger, 2010; DeLuca & Johnson, 2017; Gan et al., 2018.). This leads us to consider that teachers have a general idea of what formative assessment sets out to be but do not know how to express this accurately, something that previous studies also noted (Hanerfar et al., 2022; Ma & Bui, 2021; Martin et al., 2022).

Moreover, many of the citations show erroneous conceptions that equate formative assessment with the different moments at which assessment can be carried out (initial, continuous, or final). So, some participants liken the concept to carrying out continuous testing throughout the process to establish a final grade. These results, in line with those of Gebril

(2017) and Looney et al. (2018), show a tendency to equate formative assessment with simply compiling marks without a substantial change in the traditional assessment focus.

On the other hand, there is a tendency to use the terms self-assessment and co-assessment or the names of different assessment instruments (rubric, portfolio, observation, etc.) as synonyms for formative assessment. While these tools and strategies can be integral elements in the process (William & Leahy, 2015), their use does not in itself comprise formative assessment. This confusion shows that teachers are unable to argue for how using these instruments or students' involvement in the assessment process is relevant. As a consequence, and in agreement with Martin et al. (2022), Pastore et al. (2019), and Ziqi et al. (2023), it can be seen that teachers' conceptions are still influenced by a superficial view of assessment understood as a measurement instrument or tool and not as a collection of interrelated practices. This could result in lack of knowledge of what formative assessment is, resulting in it not being implemented effectively and no real change in pedagogical practices occurring (DeLuca & Klinger, 2010; Gan et al., 2018). Because of this, and in agreement with Ma and Bui (2021), it is vital to address and work on teachers' ideas and conceptions about formative assessment and foster a critical and reflective conception of it, as without conceptual change, effective implementation of these strategies in the classroom will be extremely challenging.

## 5. Conclusions

This research has found that although teachers report being familiar with the concept *formative assessment*, they are unable to define it precisely. Accordingly, it is apparent that teachers do not thoroughly define formative assessment and that in some cases they confuse it with specific assessment methods, strategies, and instruments.

Changes must be made to teachers' initial and continuous training, to devote more hours to training in formative assessment processes and their application and to promote a renewed student-centred focus. It is essential to work and reflect with teachers on the reason for and purpose of each assessment practice as this will enable them to reconsider their conceptions and align their methods with educational objectives and promote significant changes in this field. Furthermore, it is essential that training settings offer practices, strategies, and tools (specific guidelines, handbooks, appropriate instruments, etc.) that make it possible to systematically develop effective formative assessment in the classroom.

This study has various strengths, including the fact that it covers a topic that has hitherto received little attention, its large number sample, and the use of a mixed design that has provided an overview of the situation regarding teachers' perceived knowledge of the concept *formative assessment*. It has also made it possible to consider in depth what formative assessment is for teachers, offering a view of the aspects that still need further work and the aspects that efforts to increase assessment literacy should concentrate on more. However, it also has some limitations. Firstly, as the sample of participants comprises teachers from primary education and secondary education in the context of Spain, the conclusions can only be extrapolated to similar contexts. Furthermore, teachers report opinions based on their perceptions of a specific term. This does not offer an objective vision of what they really believe, and bias could be introduced by a wish to give socially desirable responses. Similarly, the use of a single open question in the questionnaire offers an initial overview of teachers' conceptions of formative assessment, but it limits the depth of their analysis. Future research should examine the topic in more depth through interviews or discussion groups to provide a more detailed understanding and consider in more depth how teachers' ideas of assessment can influence their teaching practice and their responses to institutional reforms. This could be complemented by analysing how sociodemographic variables, such as gender, place of work, age, or the educational level respondents teach at, influence their perceptions of formative assessment. It would also be essential to observe the real classroom context and the different options teachers have for implementing this type of process in their everyday practice.

## Authors' contributions

**Maite Zubillaga-Olague:** Conceptualisation; Data curation; Writing (original draft).

**Laura Cañadas:** Writing (review and editing).

**Jesús Manso:** Visualisation; Writing (review and editing).

## Artificial Intelligence (AI) Policy

The authors do not claim to have made use of Artificial Intelligence (AI) in the preparation of their articles.

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