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Assessing Teaching Competencies in Pre-Service Teachers: Design and Validation of INDUCTEACHING Instrument

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Abstract

Induction is a priority action during initial teacher training. This period should include formative training and assessment that allows the student teacher to reflect on their progress and the acquisition of teaching skills. This article presents the design (following a descriptive-inferential method of quantitative approach) and validation of the self-assessment instrument for teaching competencies INDUCTEACHING, developed ad hoc, within the framework of an induction proposal, with the participation of 19 education professionals - nine teachers from five universities who teach teacher training courses for preschool, primary and secondary school teachers and 10 teachers from six public schools - and a pilot test of the tool (in pre and post phases) with the participation of nine teachers in training in the last year of the Primary Education Degree during their training practices. The results demonstrate the tool's content validity and internal consistency and indicate an improvement in perceived mastery of competency between the pre- and post-phases, particularly in the analysis and reflection dimensions. It is observed that induction processes improve professional teaching skills and that the INDUCTEACHING self-assessment tool is useful for teachers in training to reflect on their skill acquisition.

Introduction

The current context, increasingly complex and marked by high uncertainty, leads the teaching community—especially teachers who will practice their profession at the early childhood and primary education levels—to express doubts about how to carry out quality teaching tasks (Tarabini & Jacovkis, 2020) that allows us to respond to the major educational challenges facing the current teaching profession as a regulated profession: tutorial action as a framework for pedagogical and emotional support, attention to diversity and prevention of early school leaving (González-Benito, 2022), digital competence and its management and effects on artificial intelligence (Gairín & Mercader, 2021), discipline and motivation (Jáspez & Sánchez-Moreno, 2019), formative assessment and work with families (Marcelo & López Ferrerira, 2020), management of the educational environment (Martinsone et al., 2023), interpersonal and intrapersonal relationships in the educational center (Ficarra & Quinn, 2014), among others.

In this scenario, persistent issues—such as the limited quality of initial teacher education (Donaire, 2021), low motivation and professional commitment (García-Garnica, 2017), low teaching quality, and decontextualized professional development that fails to address emerging educational needs (Marent et al., 2020)—could have adverse effects on teachers' professional growth, especially if they are not properly supported during the first years of university teaching. In some cases, these challenges may even lead to professional attrition (Amitae & Van Houtte, 2022; Räsänen et al., 2020). This underscores the urgency of strengthening the early stages of teacher professionalization. Reinforcing the transition from initial training to professional practice is crucial for teacher development and for fulfilling the global commitment to quality education established in Sustainable Development Goal 4 (UNESCO, 2016).

In line with these international goals, the Programme for International Student Assessment (PISA) reflects the competency results of young people in three specific instructional areas—reading, mathematics, and science skills (Carrasco Gómez, 2024; Ministerio de Educación, 2010), underscoring the importance of strong teacher preparation. According to the OECD (2018), countries with high PISA results share three traits: robust initial teacher training, structured support for new teachers, and continuous assessment and feedback for teachers.

Teacher induction thus becomes a cornerstone of modern teacher education systems, viewed as a decisive element for ensuring highly qualified, motivated, and resilient professionals (Marcelo & López Ferreira, 2020; OECD, 2018). Conceptually, induction can be understood as a systematic and sustained process that facilitates teachers' transition from students to professionals, bridging the gap between academic preparation and classroom realities (Donaire, 2021; Marcelo, 2009).

Accordingly, this article aims to demonstrate the suitability of the intervention strategy based on self-assessment and reflection on the process of acquiring teaching skills by the trainee teacher as part of an induction model integrated into initial teacher training through: a) the design and prior validation of the INDUCTEACHING competency self-assessment tool, developed within the framework of the strategy under analysis; and b) the analysis of the preliminary results derived from the pilot implementation of said intervention strategy.

Theoretical Framework

Considering that the beginning of professional teaching activity shapes the professional development of teaching staff and their future professional practice (Lorente & Senent, 2023), it

is important to pay close attention to the main difficulties faced by new teachers—difficulties linked to the aforementioned major educational challenges.

The quality of teacher professionalization depends on the early integration of teachers in training into schools (García-Garnica, 2017); therefore, it is essential to focus on improving the quality of initial teacher training and ensuring their adequate preparation and suitability for entering the profession, taking into account the challenges that the teaching profession must face (Hinojosa-Torres et al., 2024).

Moreover, low teaching quality has become one of the major educational challenges within the framework of the UN 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs), which establish ensuring quality education for all as one of their key objectives (SDG 4) and increasing the supply of qualified teaching staff as one of their priority goals (UNESCO, 2016). In UNESCO's (2016) own words:

> This requires relevant teaching and learning methods and content that meet the needs of all learners, taught by well-qualified, trained, adequately remunerated and motivated teachers, using appropriate pedagogical approaches and supported by appropriate information and communication technology (ICT), as well as the creation of safe, healthy, gender-responsive, inclusive and adequately resourced environments that facilitate learning. (p. 30)

Within this framework of teaching quality, we find the Programme for International Student Assessment (PISA). As previously mentioned, PISA—rather than merely measuring education—helps identify specific or structural deficiencies in education, highlighting, among them, the preparation and quality of initial teacher training. In this sense, PISA serves as a tool for assessing teacher quality, as it allows teachers to accurately identify difficulties and shortcomings, offering clues about the requirements for initial teacher preparation and training. The Effective Teachers Policies report (OECD, 2018) noted that the common elements of teacher professional development policies in high-performing countries in PISA include initial training, induction and support, and ongoing assessment and feedback.

At the international level, teacher induction has been established by educational systems and policies as a priority line of action to guarantee highly qualified teaching professionals, providing this opportunity from the beginning of professional development (Donaire, 2021; Maloch et al., 2022; Marcelo & López Ferrerira, 2020). We define induction as the set of processes that enable teachers to transition from students to teachers, improve the quality of their initial training and prepare them for their entry into the teaching profession (Marcelo, 2009). To understand that induction into the teaching profession is a process that begins during the internship period in initial teacher training and extends throughout the first years of professional practice. Therefore, it is necessary to understand teacher induction as part of a teacher career system integrated into initial training processes (Donaire, 2020; OECD, 2015, 2019).

Likewise, teacher induction contributes to identifying quality improvement indicators in both initial training and professional teacher development (Martínez & Marín, 2019). This must be developed in accordance with the culture, values and principles of the educational institution (Ransom & Vlachopoulos, 2021), regardless of whether it is presented as a training process or only as a process of framing in the educational institution (Prats, 2019), and within the framework of a process that must be planned and structured. Authors such as Jorde (2014), propose that teacher induction processes be structured in three phases throughout which actions focused on: 1) the establishment of links with the educational institution; 2) socialization into the culture of the centre and an understanding of all the implicit components of the teaching profession and role centre; and

3) the reinforcement of teacher professional development; all of this is accompanied by ongoing support and feedback processes that help new teachers reflect on their own teaching performance and establish the next steps to develop and improve their teaching skills.

The teacher induction period should be a period of training, formative assessment, and reflection that enables the improvement of teaching skills and abilities, helping new teachers develop self-regulation skills to monitor and improve their own practice (Timperley, 2008). Support from a more experienced mentor should enable reflection on one's professional performance through observation, evaluation, and self-assessment processes that contribute to the self-regulation of teachers-in-training's professional practice. Specifically, self-assessment processes contribute to generating information that, when analyzed, allows for changes to be incorporated into professional practice (Díaz-Vicario et al., 2020), encouraging teachers (Borg & Emet, 2019): a) to be the protagonist of your own learning process and improvement decisions; b) to reflect on your professional competencies; c) to reflect on the extent to which you are achieving your intended goals; d) to be involved in the evaluation process itself, when this is linked to teaching performance processes. Therefore, within the framework of any teacher induction program, self-assessment tools are essential for the learning and development of trainee and novice teachers.

These tools help improve learning and professional development by guiding teachers in monitoring their progress, analyzing their learning, and reflecting on their teaching practice and performance (Eiroa et al., 2025; Karaman, 2024). In short, these tools help teachers monitor their progress in teaching, learning, and development (Steffen & Ohl, 2024).

However, as previously mentioned, applying these tools must be accompanied by support and feedback from mentors—experienced teachers who guide the reflective processes of future teachers—as they can identify which professional teaching skills are likely to be addressed during initial training (Olmos Rueda, 2023), as these skills are essential for future teaching practice and professional development.

Various studies conclude that effective induction processes improve integration into school culture and the development of classroom management skills; they also decrease quitting and reduce the difficulties experienced by novice teachers in the first years of teaching (Donaire, 2021); however, coverage and systematization remain incipient. A systematic review carried out by Rodríguez et al. (2020) concluded that most higher education institutions lack induction processes and that novice teachers face difficulties in teaching, interpersonal relationships, research, and connecting with society. It is therefore necessary to develop strategies that ensure a smooth transition, integration, and initiation into professional teaching following initial teacher training.

Methods

Research method

This work employs a descriptive-inferential method, using a quantitative approach to collect and process data within the framework of a self-assessment and reflection strategy for acquiring teaching skills. The strategy analyzed in this paper seeks to ensure that trainee teachers are aware of their progress in achieving teaching competencies.

Context and participants, data collection, and analysis

This research is developed within the framework of an induction proposal that aims to contribute to the completion of the initial training of future teachers by developing teaching competencies (core and transversal) that are susceptible to development during the initial training stage, drawing on prior work identifying and prioritizing competency indicators. It is assumed that induction, while contributing to improved teaching quality, must be implemented within a teaching competency model that includes core and transversal competencies and is defined by all stakeholders involved in its implementation. In this context, the INDUCTEACHING model (Olmos-Rueda, 2023) has been developed as a proposal for induction into the teaching profession and, among other strategies, includes the INDUCTEACHING self-assessment tool for teaching competencies, which is the subject of this work.

The tool was developed ad hoc, with the participation of five of the nine universities that offer teacher training courses for preschool, primary, and secondary school teachers, and the participation of six public educational centers located in three of the four provinces of Catalonia (Spain)—specifically in Barcelona, Tarragona and Lleida. The study involved 19 education professionals (hereafter referred to as the research team): nine teachers of higher education linked to Faculties of Education/Educational Sciences (Teacher Training course for teachers in early childhood and primary education and/or pedagogy) and 10 teachers (six members of the management team) from six public centres that host students in early childhood and primary education practices.

The design of the self-assessment tool was carried out in two phases (F): (1) construction of the INDUCTEACHING model and (2) definition of the INDUCTEACHING self-assessment tool.

F1. Construction of the INDUCTEACHING model based on competency dimensions and indicators. Four actions were carried out in this phase (A1, A2, A3 and A4):

A1. *Preparation of a list of competency indicators resulting from documentary analysis and initial classification based on mastery level*. To define the contents related to the competencies involved in the INDUCTEACHING model, reference theoretical documents and studies of interest were analyzed (*N*=17). Three types of documents were proposed: legislative documents, current practice documents used by participating universities, and prior studies on teacher induction. Based on the documentary review, a proposal for 52 competency indicators grouped into 4 dimensions was developed (see Table 1).

Table 1: Dimensions and competency indicators for professional teacher development.

DIMENSIONS	**COMPETENCE INDICATORS**
PERSONAL	Knowledge of the subject matter that needs to be worked on in the classroom
	Communication skills in the official languages of Catalonia
	Communication skills in a foreign language
	Technological skill
	Ability to search and manage information
	Ability to work independently
	Ability to learn to learn
	Positive attitude
	Attitude of tolerance and respect towards others

	Responsible attitude
	Ethical attitudinal aspects
	Ability to adapt to change
	Empathetic capacity
	Ability to participate and work in a team (collaborative work)
	Ability to argue and negotiate
	Ability to solve problems and make decisions
	Creative ability to generate new ideas
	Critical thinking
PROFESSIONAL	Knowledge of the curriculum
	Diagnosis of the situation
	Evaluation of educational interventions
	Design of interdisciplinary educational interventions
	Application of educational interventions
	Analysis and reflection on educational interventions for research, innovation and improvement
	Use of resources
	Teaching and evaluation strategies
	Attention to diversity
	Time management
	Organization of space
	Climate management and promoting coexistence
	Detection of difficulties and action
	Resolving disciplinary and disruptive behaviour
	Leadership skills
	Build trust
	Prevention of problematic and/or risk situations
	Detection and action in situations of learning and socio-family difficulties
	Tutorial action with families (interviews, regular information)
	Creating bonds with students
	Guidance and support in students' educational process
	Mediation and conflict resolution
SOCIAL	Relationship with families
	Relationship with students
	Relationship with colleagues
	Relationship with other educational agents
	Relationship with management
INSTITUTIONAL	Participation and involvement with the Educational Center and with the Center's Projects
	Knowledge of the Center's organization
	Knowledge of institutional documents and their application
	Carrying out coordination activities
	Carrying out assigned management activities
	Promotion, organization and participation in complementary activities

The proposal was presented to the educational centres in an initial meeting between them and the teaching staff of the participating universities to jointly analyze and review the competency indicators in terms of mastery level. The result was the classification of the indicators into three levels of domain: essential (those that should be acquired in initial training), desirable (appropriate to acquire in initial training), and expert (to be acquired and consolidated through experience).

A2. *Second round of indicator prioritization based on the domain level.* To select and prioritize the indicators considered key competencies of the INDUCTEACHING model, a second

round of prioritization was conducted collaboratively (university – educational centres). For the INDUCTEACHING model, only the essential and desirable mastery levels were proposed. Next, we inductively organized the indicators at the relevant mastery levels for each of the four dimensions. At the end of the process, 43 indicators were selected: 18 from the personal dimension, 16 from the professional dimension, 4 from the social dimension, and 5 from the institutional dimension (see Table 2).

Table 2: Classification of the levels of mastery of competency indicators for professional teacher development. Source: Olmos-Rueda (2023, pp. 13-16).

DIMENSIONS	**PROFESSIONAL DEVELOPMENT INDICATORS**	**Mastery level (N)**	
		Essential	**Desirable**
PERSONAL	Knowledge of the subject matter that needs to be worked on in the classroom		x
	Communication skills in the official languages of Catalonia	x	
	Communication skills in a foreign language		x
	Technological skill		x
	Ability to search and manage information	x	
	Ability to work independently	x	
	Ability to learn to learn	x	
	Positive attitude	x	
	Attitude of tolerance and respect towards others	x	
	Responsible attitude	x	
	Ethical attitudinal aspects	x	
	Ability to adapt to change		x
	Empathetic capacity	x	
	Ability to participate and work in a team (collaborative work)	x	
	Ability to argue and negotiate	x	
	Ability to solve problems and make decisions		x
	Creative ability to generate new ideas		x
	Critical thinking		x
PROFESSIONAL	Knowledge of the curriculum	x	
	Diagnosis of the situation		x
	Evaluation of educational interventions		x
	Design of interdisciplinary educational interventions	x	
	Application of educational interventions	x	
	Analysis and reflection on educational interventions for research, innovation and improvement		x
	Use of resources	x	
	Teaching and evaluation strategies	x	
	Attention to diversity	x	
	Time management		x
	Organization of space		x
	Climate management and promoting coexistence		x
	Detection of difficulties and action		x
	Build trust		x
	Tutorial action with families (interviews with families, periodic information to families)		x
	Guidance and support in students' educational process		x
SOCIAL	Relationship with families		x
	Relationship with students	x	

	Relationship with colleagues	x	
	Relationship with management		x
INSTITUTIONAL	Participation and involvement with the Educational Center and with the Center's Projects		x
	Knowledge of the Center's organization	x	
	Knowledge of institutional documents and their application	x	
	Carrying out coordination activities		x
	Carrying out assigned management activities		x

A3. *Selection, prioritization and classification of competency indicators for the INDUCTEACHING model*. In the first round, the 10 competency indicators (derived from the second classification) considered key to the proposed INDUCTEACHING model were established. To do so, a specific weight was assigned to each dimension: personal (40%), professional (40%), social (10%) and institutional (10%). Next, and by consensus (Anguera, 1990; Arana et al., 2016), a proportional number of indicators were considered in each dimension: 4 in the personal dimension, 4 in the didactic-organizational dimension, 1 in the social dimension and 1 in the institutional dimension. Subsequently, the competency indicators were prioritized using the diamond technique (Reid et al., 1987) at three levels of importance (low, medium, and high)—as an instruction, an indicator could be accepted at only one level (see Figure 1).

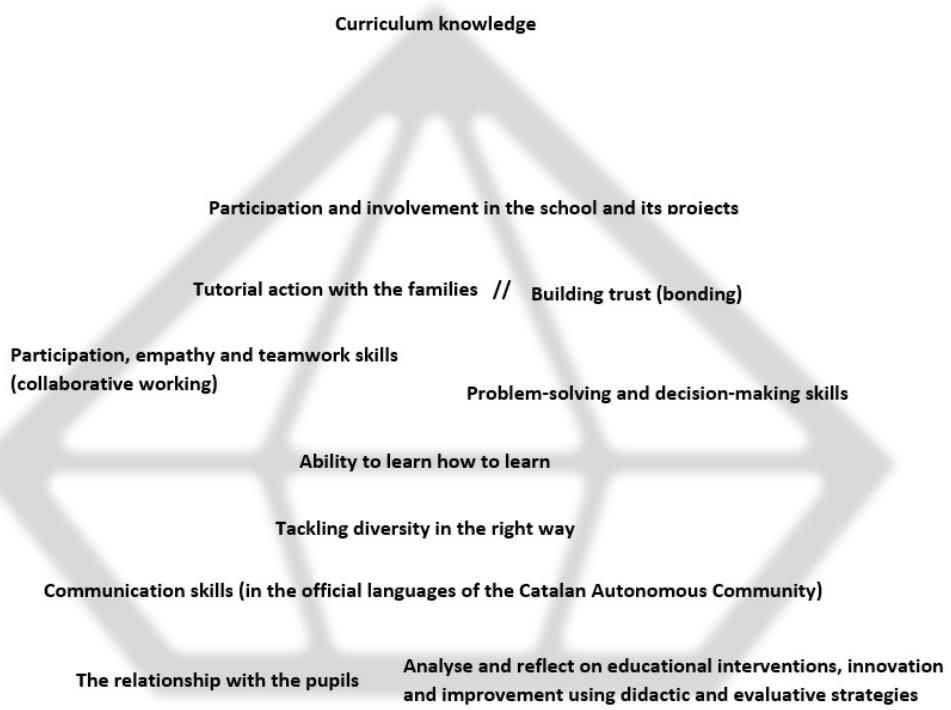

Figure 1: Prioritization of the 10 INDUCTEACHING competency indicators using the diamond technique. Source: Olmos-Rueda (2023, p. 22).

A4. *Selection of INDUCTEACHING core competencies*. To establish the INDUCTEACHING competency model, the 10 resulting indicators were classified by the members of the research group into two interrelated competency groups: core competencies—the

distinctive competencies of the four key dimensions of professional teacher development (personal, professional, social and institutional) that prepare and enable teachers for work involving transversals competencies—and transversal competencies—cross-cutting skills that can be transferred to many educational situations and that contribute to teachers' ongoing professional development.

A working group was formed by three of the five universities and three of the six educational centres comprising the project. After analyzing the 10 selected and prioritized competency indicators, it was determined that INDUCTEACHING should focus its action strategies on four core competencies, which, in turn, would allow the remaining INDUCTEACHING competencies to be addressed transversally (see Figure 2). The four dimensions or core competencies identified were: D1. Analysis and reflection on educational interventions, innovation, and improvement; D2. Relationship with students at the reference center; D3. Participation and involvement with the school and its projects, and D4. Tutorial action with families.

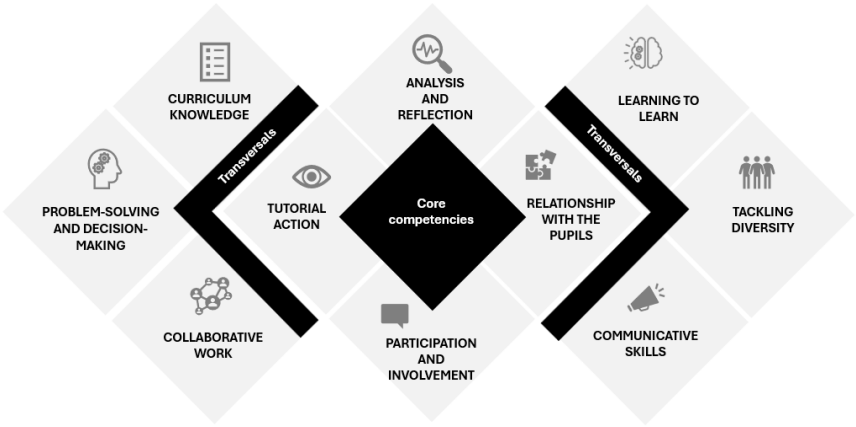

Figure 2. INDUCTEACHING competency model. Source: Olmos-Rueda (2023, pp. 24).

F2. Definition of the INDUCTEACHING self-assessment instrument.

In this second phase, the INDUCTEACHING competency self-assessment tool was designed ad hoc, considering the voices of practicing and training teachers.

The tool was designed to be self-administered by the novice teacher (in training) in two phases: a) in the pre-phase, at the beginning of the training internship; and b) in the post-phase, at the end of the training internship. Its goal is for the teacher-in-training to reflect on their degree of mastery of professional teaching skills and to identify the skills (expressed as learning outcomes) they perceive they have not mastered and must develop, as well as those they perceive they must maintain or further improve.

The self-assessment instrument is presented as a grid that allows grading on a scale of 1 (low mastery) to 4 (high mastery and/or expert), with 22 learning outcomes grouped into the four INDUCTEACHING core competency dimensions (see Table 3). This tool was initially developed in Catalan. A back-translation into Spanish was conducted to enable administration in both

languages. For its English version, an official translation has been carried out (by a certified translation company).

Table 3: INDUCTEACHING self-assessment instrument.

Dimensions / Indicators	**Degree of mastery (Indicate from 1 to 4)**
D1. Analysis and reflection on educational interventions, innovation and improvement	
"I consider myself a capable/educated person because..."	
1.1. Designing teaching sequences consistent with curriculum guidelines and those indicated by the school.	
1.2. Designing contextualized and flexible teaching sequences, considering diverse situations and the participation of all students in the classroom.	
1.3. Using digital technologies, other resources and/or materials appropriate to the classroom situation and student characteristics.	
1.4. Regulating, on the one hand, the learning processes and outcomes of students and, on the other, those of professional competencies.	
1.5. Using different strategies and resources to manage classroom climate.	
1.6. Reflecting on classroom practices to innovate and improve teaching performance.	
1.7. Critically reflect on personal work and one's own actions to introduce improvements.	
D2. Relationship with the students of the reference center	
"I consider myself a capable/educated person because..."	
2.1. Establishing empathetic relationships with students.	
2.2. Regulating one's relationship with the group.	
2.3. Managing different coexistence situations in the classroom.	
D3. Participation and involvement with the educational center and its projects	
"I consider myself a capable/educated person because..."	
3.1. Integrating and getting involved in the sociocultural environment of the classroom and the educational community.	
3.2. Knowing and adapting to the center's educational project and classroom culture (adaptation to the methodology used in the classroom and/or proposal of realistic initiatives).	
3.3. Assuming a commitment to education as a professional, respecting the work philosophy of the classroom and the educational center.	
3.4. Making reasoned proposals for improving the educational situation of the center/classroom.	
3.5. Participating in the center's activities and events.	
3.6. Participating in meetings (faculty, coordination, etc.; whenever feasible).	
3.7. Working cooperatively with members of the educational community.	
3.8. Designing and/or collaborating on innovation projects carried out at the educational center.	
D4. Tutorial action with families	
"I consider myself capable/prepared for..."	
4.1. Establishing links with families to promote inclusion and learning.	
4.2. Accompanying and participating in tutoring sessions with families, performing the functions inherent to the teaching profession, providing information and suggestions.	

4.3. Accompanying and participating in meetings with families, performing the duties inherent to the teaching profession, providing information and suggestions.	

Source: Olmos-Rueda (2023, pp. 56-57)

The tool underwent a pilot test, as reported below. The outcome of this pilot is described in the results section of this article.

Assessment participants, recruitment process, and eligibility criteria

As stated at the beginning, the goal of this work is to demonstrate the suitability of the intervention strategy based on self-assessment and reflection on the process of acquiring teaching skills (INDUCTEACHING self-assessment instrument). For validation, the instrument was administered to a sample of nine teachers in training (8 female and 1 male) in the final year of the Primary Education Degree, during their four months of training practice in three of the educational centres that piloted the INDUCTEACHING model.

The selection of teachers in training for the pilot sample responded to the following criteria: a) teachers in training (in their final year); b) student interns at an INDUCTEACHING centre; and c) a mentor/tutor at one of the universities and one of the INDUCTEACHING schools.

Ethical aspects

INDUCTEACHING is developed within the framework of a program to improve and innovate the training of primary and secondary school teachers, promoted by the Department of Education of Catalonia. Ethical considerations of this study therefore align with the principles established in the Spanish Organic Law on the Protection of Personal Data (3/2018) and the fundamental ethical and intellectual property principles of the European Union and Catalan legislation. All participants from schools, trainee teachers selected for the pilot, and universities, after being shown the study, voluntarily signed the informed consent form in which they agreed 1) to participate in the activities established by the Program for the Improvement and Innovation in the Training of Primary and Secondary School Teachers and/or Faculty; and 2) to follow the principles established in the aforementioned Organic Law on Data Protection.

Results

This section presents the results of the validation and pilot study of the INDUCTEACHING self-assessment tool. The analysis of the results of the pilot application of the tool, using Jamovi (version 2.5.28), addresses two types of analysis: a) descriptive analysis (means and standard deviation) of the items and dimensions of the tool; and b) an inferential analysis (t test for paired samples) of the competency dimensions, after checking the prior assumption of normality (Shapiro-Wilk with a p value > .05), is interpreted as meaning that the variables analyzed are normally distributed and a parametric contrast (Student's T test) is applied, and the effect size is calculated (D_{Cohen}).

The paired samples T-test procedure allows us to compare the perception of the degree of mastery that the nine teacher trainees (members of the pilot sample) have of the 22 learning outcomes that, grouped into the four INDUCTEACHING competency areas, are analyzed in the pre-phase (month 1) and post-phase (month 4), allowing us to establish whether the tool

—previously validated— responds to its purpose. Consequently, the suitability of the intervention strategy based on self-assessment and reflection on the process of acquiring teaching skills is demonstrated.

Validation of the INDUCTEACHING self-assessment instrument

Validation of the instrument followed a double process: 1) content validation, estimating item agreement and univocality using Aiken's V coefficient; and 2) estimating the internal consistency reliability of the instrument's items (Cronbach's Alpha test) after administration to the pilot sample.

The use of Aiken's V coefficient allows estimating the content validity of the INDUCTEACHING self-assessment instrument of competencies with a sample of two groups of judges composed of 9 mentor figures and 10 students who evaluated, respectively, the level of agreement (polytomous variable rating scale 1-4) and univocity (dichotomous variable rating scale 0 *No* - 1 *Yes*) of each of the items constituting the instrument; consequently, of the competency dimensions in which they are grouped.

The results clearly show content validity of the tool, given that the specific V coefficients—both for the level of agreement and univocality (see Table 4 and Table 5, respectively)—were high for each of the items (> = .50) and the average coefficients for each dimension (> = .80).

Table 4: Aiken V coefficient INDUCTEACHING instrument. Degree of agreement.

Dimensions	V	Item	V
D1	.84	1.1.	.93
		1.2.	.96
		1.3.	.81
		1.4.	.70
		1.5.	.93
		1.6.	.70
		1.7.	.85
D2	.89	2.1.	.89
		2.2.	.89
		2.3.	.89
D3	.88	3.1.	.85
		3.2.	.93
		3.3.	.93
		3.4.	.85
		3.5.	.85
		3.6.	.93
		3.7.	.93
		3.8.	.81
D4	.81	4.1.	.81
		4.2.	.81
		4.3.	.81

Table 5 Aiken V coefficient INDUCTEACHING instrument. Degree of univocity.

Dimensions	V	Item	V
D1	.87	1.1.	1.00
		1.2.	1.00

		1.3.	.50
		1.4.	.60
		1.5.	1.00
		1.6.	1.00
		1.7.	1.00
D2	.93	2.1.	1.00
		2.2.	.80
		2.3.	1.00
D3	.90	3.1.	.80
		3.2.	.80
		3.3.	.80
		3.4.	.90
		3.5.	.90
		3.6.	1.00
		3.7.	1.00
		3.8.	1.00
D4	.87	4.1.	1.00
		4.2.	.70
		4.3.	.90

Once the content validity of the instrument was verified, the internal consistency reliability of the items was estimated by applying Cronbach's Alpha test to the competency dimensions into which they are grouped after their application in the pre-phase (month 1) and post-phase (month 4)—to a pilot sample of nine teaching figures.

Reliability statistics show the internal consistency of the tool, as presented in Table 6.

Table 6: Reliability statistics.

	Cronbach's alpha
Scale D1 – D4. Pre Phase	.741
Scale D1 – D4. Post Phase	.879

Pilot test of the INDUCTEACHING self-assessment instrument

The results derived from the descriptive analysis of the 22 items comprising the INDUCTEACHING instrument in the pre- and post-phases (Table 7), as well as the competency dimensions in both phases (Table 8), indicate that, in general, the nine teachers in training comprising the pilot sample start, at the beginning of their training practices, with a general positive perception of the degree of mastery of the teaching competencies analyzed and that this perception improves four months later, once the training practices have finished.

Table 7: Description of teaching skills.

Pre Phase (I)	Mean	SD	Post Phase (P)	Mean	SD
I1.1.	2.89	.33	P1.1.	3.44	.72
I1.2.	2.56	.52	P1.2.	3.44	.52
I1.3.	2.44	.88	P1.3.	3.11	.60
I1.4.	2.44	.72	P1.4.	2.67	.70
I1.5.	2.22	.66	P1.5.	3.44	.52
I1.6.	2.67	.86	P1.6.	3.33	.70
I1.7.	3.22	.44	P1.7.	3.67	.50

I2.1.	3.67	.50	P2.1.	3.78	.44
I2.2.	3.11	.60	P2.2.	3.56	.52
I2.3.	2.56	.88	P2.3.	3.00	.86
I3.1.	3.44	.52	P3.1.	3.89	.33
I3.2.	3.22	.66	P3.2.	3.67	.50
I3.3.	3.56	.52	P3.3.	4.00	.00
I3.4.	2.67	1.00	P3.4.	3.00	1.00
I3.5.	3.89	.33	P3.5.	4.00	.00
I3.6.	3.11	1.0	P3.6.	3.44	1.01
I3.7.	3.44	.52	P3.7.	3.56	.52
I3.8.	2.89	.92	P3.8.	3.00	.86
I4.1.	2.22	.97	P4.1.	3.00	.70
I4.2.	1.89	.60	P4.2.	2.56	.72
I4.3.	2.44	.72	P4.3.	2.67	.70

Table 8: Description of competency dimensions.

Pre Phase (I)	Mean	SD	Post Phase (P)	Mean	SD
ID1	2.63	.30	PD1	3.30	.48
ID2	3.11	.47	PD2	3.44	.52
ID3	3.28	.51	PD3	3.57	.40
ID4	2.19	.53	PD4	2.74	.64

As can be seen in the tables above, competency dimensions 2 (relationship with students) and 3 (participation and involvement with the school and its projects), and in general the set of competencies that comprise them, are those that start from a higher perception of the level of mastery ($M > 3.00$) by the teachers in training. However, the competencies linked to the management of classroom coexistence situations (item 2.3; $M=2.56$) and the reasoned proposals for improvement in educational situations at the centre/classroom (item 3.4; $M=2.67$) are the teaching competencies that, from the outset, are perceived to have the lowest level of mastery compared to the rest of the competencies comprising these dimensions; consequently, they are the ones that are least mastered and require further improvement.

On the other hand, dimensions 1 (analysis and reflection on educational interventions, innovation and improvement) and 4 (tutorial action with families), as well as the competencies that comprise them, are those that identify a perception of the lowest starting level of mastery (in general, an $M <= 2.6$), especially dimension 4 (with an $M = 2.19$ in the pre-phase and not reaching an $M >= 3$ in the post-phase). According to these results, in general, teachers in training perceive the skills linked to the design of teaching sequences, learning situations, use of teaching strategies and resources adapted to the needs of students, critical reflection of personal work and, especially, everything equivalent to the relationship with families as those teaching skills they perceive as those they master the least and, consequently, must develop.

Although the results analyzed so far indicate that the perception in relation to the level of mastery of teaching competencies advances between the pre- and post-phases, the inferential analysis derived from the application of the t-test for paired samples (Table 9), of the items grouped into the four competency dimensions in the pre- and post-phases, allows us to establish that the perceptual difference is highly significant only in dimension 1, the only one that identifies truly significant differences ($p < .05$) and with a very high effect size ($d > .80$) between both phases.

Table 9. Paired samples t-test.

		p	d
ID1	PD1	< .001	-1.749
ID2	PD2	0.067	-0.707
ID3	PD3	0.163	-0.512
ID4	PD4	0.086	-0.654

Discussion

Recent studies establish that teacher quality is key to ensuring high-quality educational systems (Churchward & Willis, 2023; Cochran-Smith, 2021; Vázquez et al., 2024). This involves ensuring both initial training and quality teacher professionalization, which depends on the early connection of teachers in training with the educational centre (García-Garnica, 2017). These lead us to conclude that improving the quality of initial teacher training, as well as the preparation and suitability of trainees for incorporation into professional practice, requires integrating induction processes into initial teacher training (Donaire, 2020). Official bodies, such as the OECD in various reports (OECD, 2015, 2019), also emphasize the necessary incorporation of induction processes as part of a professional teaching career system that begins with initial training.

INDUCTEACHING falls within this framework: a teaching induction model integrated into the initial training of future teachers that helps build bridges between initial training and the transition to professional teaching practice. The model has been defined in collaboration between universities and educational centres, based on a teaching competency framework articulated around a set of core and transversal competencies that must be acquired during initial training and consolidated in professional practice through an induction process.

This study aimed to demonstrate the suitability of an intervention strategy based on self-assessment and reflection on the process of acquiring teaching skills for the teacher-in-training. It focused specifically on the core competencies of the INDUCTEACHING model, namely: analysis and reflection on educational interventions, innovation, and improvement; relationships with students; participation and involvement in the school and its projects; and mentoring activities with families. The self-assessment and reflection that a centre teacher-in-training makes of these competency components, in terms of perceived mastery level, are key to their initial training, their preparation for entry to the educational centre, and their professional teaching. However, they must be mediated by an expert mentor teacher (Karaman, 2024), as this self-assessment process can only occur within a professional context and as a theoretical-practical dialogue (Vázquez et al., 2024). The results show, in a first analysis, how this dialectical process of theory and practice identifies central competencies linked to it with key and critical components that every process of initial training and teacher induction identify; in other words, guidance and accompaniment of a mentor figure (Tummons et al., 2024), socialization (Marent et al., 2020), inclusion in the centre's culture, discipline, planning, teaching methodology, tutorial action, evaluation, self-evaluation, reflection, feedback (Marcelo et al., 2021; Vázquez et al., 2024), among others.

Therefore, the INDUCTEACHING model offers a self-assessment tool within its development framework. Guided and mediated by expert teachers, this tool prioritizes and focuses future teachers' reflection on the performance of skills likely to be addressed during initial training. These skills are essential for future teaching practice and professional development. In short, it is a teaching tool that enables teachers to monitor their progress in learning and teaching development (Steffen & Ohl, 2024).

In the process of designing the INDUCTEACHING model, the results show the widespread presence of these components in the central dimensions of analysis and identify, in general and in the phase prior to their development, the tendency on the part of teachers in their final year of training to have a good initial perception regarding their level of mastery, the exception being the level of perceived mastery of certain components linked to socialization and the analysis and reflection of educational intervention and improvement.

In relation to socialization—latent in all self-assessed INDUCTEACHING dimensions — the results indicate the relationship with families and the management of coexistence situations in the classroom as the components that are initially perceived with a lower level of mastery, pointing out that after four months of practical experience in the educational centre and a mentored self-assessment and reflection process, the perception of the level of mastery improves.

Classroom management and, especially, the handling of discipline in this teaching-learning space are identified as one of the problems that new teachers must face the most and for which they feel least prepared—a fact that coincides with the results obtained by Ficarra and Quinn (2014) and Jáspez and Sánchez-Moreno (2019). The same is observed with the relationship with families (Gomariz Vicente, et al., 2017), identified as another of the main challenges that teachers must face, and which is identified as another of the latent needs of initial teacher training (Cabral et al., 2024; Evans, 2013). Consequently, both classroom management and relationships with families are essential aspects of teaching practice, requiring quality preparation that must be guaranteed during initial teacher training and consolidated during the first years of teaching. However, its approach in the initial teacher training plans is still not adequate and, therefore, there is a need to focus on the improvement of this initial teacher training, paying special attention to teaching practice because, as confirmed by Arias and Hernández (2025), their contributions to initial training are especially linked to the acquisition, development and strengthening of these essential skills.

Likewise, the necessary incorporation of induction processes is established that allow teachers to face experiences that lead them to prepare, confront, apply and improve both their classroom management skills (Ficarra & Quinn, 2014; Marent et al., 2020), self-assessment tools, such as those offered by INDUCTEACHING, along with a guided mentoring process, should allow for reflection on their acquisition and development and eventual identification of areas for improvement.

In this context, the socialization process of teachers is fundamental for the development of their sense of professional belonging, and the recognition of oneself as a teacher (Marent et al., 2020) can only arise from the interactions that the teacher in training establishes with others—fellow teachers, management team, students, families, etc.—in the educational centre.

Beyond these issues, it is worth noting that the study's findings underscore the importance of analysis and reflection on educational intervention itself and its improvement. These skills are linked to the design of teaching sequences and learning situations, the use of teaching strategies and resources adapted to students' needs, critical reflection on one's own work, and self-regulation of one's teaching practice. These skills are presented as another critical component for teachers in their final year of training. However, while in this experience, they perceive themselves as having the lowest level of mastery at the beginning of the INDUCTEACHING model, they are also the ones who identify truly significant progress after four months of training practices and a process of self-assessment and reflection guided by a mentor teacher at the educational center.

The INDUCTEACHING self-assessment tool, designed within the framework of a teacher induction model integrated into initial teacher training, is an effective induction tool that results in a high-quality training experience. More specifically, the INDUCTEACHING model identifies

multiple key elements in any induction process, in line with what other studies have established: contributes to the identification of elements for improving teaching intervention (Martínez & Marín, 2019), offers a framework for guidance and support for teachers in training by an expert mentor, supporting the process of professional improvement in quality teaching (Jáspez & Sánchez-Moreno, 2019; Marcelo et al., 2021; Sánchez-Tarazaga et al., 2022), and offers instruments that allow us to rethink evaluative practices and link them with induction, providing spaces for self-assessment, reflection and self-regulation, since as stated by Donaire (2020), feedback focused on improving the level of mastery of teaching skills allows us to demonstrate that these have been acquired according to an initial training level.

The work presented here highlights that the limited sample size (N=9) in the pilot study restricts the generalizability of the findings. However, despite being a pilot and validation study of the self-assessment instrument integrated into the INDUCTEACHING teacher induction model, the work is of potential interest to both higher education institutions and educational centres. On the one hand, it is an example of an induction model integrated into initial teacher training and the organizational culture of educational centres, and, on the other, of how self-assessment instruments on professional competencies contribute to reflection processes and generate information that allows for the analysis and incorporation of changes in professional practice itself.

This work paves the way for the INDUCTEACHING model to be implemented on a larger scale. This will demonstrate its impact on the development of the four key dimensions of professional teacher development and its potential for adoption by teacher education programs in other regions or countries. Teacher induction begins before entering the profession, during the practical training period of initial teacher training. It goes beyond the support provided by the educational institution, welcoming the trainee teacher. INDUCTEACHING is based on work prioritizing basic skills. This requires defining a set of strategies that provide resources, guidance and guidelines for developing these skills, as well as integrated, collaborative work by mentors in different contexts. INDUCTEACHING thus provides an opportunity for future teachers to meet mentors who support them in reflecting on their practice, offer continuous support and feedback, and provide guidelines for developing their skills.

This is especially relevant because, as Rodríguez et al. (2020) argue, teacher induction will contribute to the success of new teachers and, consequently, to improving the quality of the teaching staff and, ultimately, to ensuring quality education systems.

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