

TEACHERS AS KEY AGENTS IN EVOLVING EDUCATIONAL ECOSYSTEMS: IMPLICATIONS AND EVIDENCE FROM A PRE-SERVICE TRAINING PATH

GLI INSEGNANTI COME ATTORI CHIAVE NEGLI ECOSISTEMI EDUCATIVI IN EVOLUZIONE: IMPLICAZIONI ED EVIDENZE DA UN PERCORSO DI FORMAZIONE INIZIALE

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ABSTRACT

The paper deepens the results of a study conducted with 9986 future teachers, involved in a pre-service training pathway. The main objective was to identify their profiles, dispositions and competences in the field of instructional design, considered as crucial dimensions for a future effective professionalism in complex educational ecosystems. The study revealed a widespread interest in active and engaging methodologies. However, basic knowledge and skills were found to be weaker than expected.

Il paper presenta i risultati di uno studio condotto con 9986 futuri docenti coinvolti in un percorso di formazione iniziale. Il principale obiettivo è stato identificarne profili, disposizioni e competenze nel campo della progettazione didattica, dimensioni cruciali per una futura professionalità efficace in ecosistemi educativi complessi. Lo studio ha rivelato ampio interesse per un approccio metodologico attivo. Tuttavia, conoscenze e competenze di base sono risultate più deboli del previsto.

KEYWORDS

Educational ecosystem; Instructional design; Pre-service teacher training; Teacher professionalism.
Ecosistema educativo; Formazione iniziale degli insegnanti; Professionalità docente; Progettazione didattica.

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Introduction

In recent decades, the educational system has been under great stress due to the social, cultural, and technological changes that have occurred (Ardizzone & Rivoltella, 2008; Domenici, 2009; Limone, 2012; UNESCO, 2021). The sudden changes that the actors in the field have had to cope with have led policy makers to define and disseminate frameworks, guidelines and tools that are useful in making the processes underway more manageable. In this landscape, the scientific community has also wondered how to operationalize these theoretical references and integrate their principles sustainably into ordinary educational practice. One of the priority objectives has been to understand how to orient these practices in such a way as to renew their reference paradigms, so that they can be concretely useful in acquiring and enhancing the capacity to effectively manage increasingly complex and unpredictable processes (Darling-Hammond, 2006; Frabboni, 2008; González-Pérez & Ramírez-Montoya, 2022). These are capacities that should not only concern teachers and students in formal educational contexts, but should be interpreted in the broader perspective of global communities, in line with the goals articulated in the 2030 Agenda for Sustainable Development (ONU, 2015) and related frameworks, such as the UNESCO Education 2030 Framework for Action (2015) and the OECD Learning Framework 2030 (2018).

In working on such complex processes, the scientific community has, over time, contextualized its reflections within new constructs; one particularly controversial is that which considers educational contexts as ecosystems (Mueller & Toutain, 2015; Niemi, 2021; Falchi, 2025). The ecosystem construct applied to education brings into play the dynamic, interactive and interdependent dimension that should characterize educational and training processes, in which each actor active within it represents an indispensable part for the survival of the whole system, and each phenomenon occurring outside influences it and binds it to processes of continuous adaptation. As for the actors within the system, in their uniqueness they are all essential to the functioning of the ecosystem: it's the interaction between the parts and the process of co-construction of knowledge and experience that ensures that situations evolve within a broader framework and do not become exhausted by remaining an end in themselves. At the same time, what happens outside of formal educational contexts is also indispensable for the survival of the entire ecosystem, insofar as meaningful goals cannot be pursued if they are inconsistent with what everyone needs and experiences in daily life outside of the formal educational

contexts. Similar concepts have been explored by authors such as Senge (2006), who developed the idea of "learning organizations" as evolving dynamic systems, and Orr (2004), who spoke of schools as integrated ecosystems in which the environment and community play a critical role in learning and sustainability. These dimensions are consistent with the principles underlying other concepts already well established in the educational literature, such as those of lifelong, lifewide and lifedeeep learning, transformative learning, inclusive and adaptive approaches, and the need to orient teaching in ways that promote the development of key competences for active and aware citizenship.

In line with the systemic vision just mentioned, this paper focuses attention on what can be considered one of the main transformative agents active in an educational ecosystem, namely teachers. In particular, the paper will reflect on how the pre-service and initial training of teachers represents a crucial crossroads with regard to the challenges currently posed to the world of education and training: indeed, it is within these pathways that the foundations are laid for the construction of a solid professionalism capable of operating within a complex educational ecosystem, enabling all and aiming to promote in students skills useful for managing a social, environmental, and technological reality that is constantly changing.

1. Pre-service teachers training: vision and perspectives

In today's landscape, teacher training seems to be a priority shared by the educational systems of each national reality, in the awareness that only pre-service and initial training and continuous professional development can contribute to qualifying and innovating processes inside and outside formal educational contexts. Teacher training is therefore seen as a strategic investment, not only to improve the quality of teaching practice, but also to respond effectively to the challenges posed by increasing social and technological complexity (Atal & Deryakulu, 2021; Fiorucci & Zizioli, 2022; Iqbal & Ali, 2024).

Today, educational institutions and teachers are called upon to work on complex processes and objectives that integrate areas such as the promotion of global and sustainable citizenship, inclusivity, and the need to make conscious use of an increasingly pervasive digital sphere, in addition to traditional core outcomes.

Therefore, it's clear that their training cannot be limited to the simple transmission of disciplinary content, but must respond to the need to prepare professionals capable of operating in a system that is constantly evolving and adapting. In addition to being trained to teach competently and knowledgeably, teachers must also be able to manage diversity, promote active student engagement, and respond to the changes that characterize contemporary education (Niemi et al., 2018; Morganti, 2018).

In Italy, teacher training is "compulsory, permanent, and strategic" (Law n. 107, 2015) and - as reported on the institutional channels of the Ministry of Education and Merit - is considered as an "opportunity for professional development and growth, for a renewed social credibility of contribution to innovation and qualification of the educational system". From this perspective, the teacher should therefore be a reference figure for the community, able to understand the changes that are taking place and to mediate their implications, assuming the function of a transformative agent.

A qualified teacher should not only have a solid disciplinary background, but should also be able to master professional skills in the areas of pedagogy, psychology, general didactic, disciplinary didactic, evaluation, organizational-scholastic, and relational (Capperucci, 2022; La Marca & Marzano, 2022; Bruni Elsa, 2024). Therefore, a profile that is undoubtedly complex to build and to keep operational over time; but one that, if well oriented, can make a difference in the process of qualification and innovation of educational and didactical practices. Indeed, seems to be ambitious the perspective of transforming the student-centered approaches into an even more complex construct, in which teachers and students are co-constructors of knowledges and experiences, learning from each other in a process of continuous adaptation. Within this framework, pre-service and in-service training can be a resource for increasing the knowledge and awareness of those who are and/or will be active in educational contexts at all levels (Sibilio & Aiello, 2018; Baldacci et al., 2020; Arsena, 2024).

One of the most difficult challenges seems to be the operationalization and orientation of the construct of the educational ecosystem: the dynamic background within which all actors involved in educational processes should consciously interact. In order to proactively and adaptively manage the processes within it, it is crucial that teachers, as experts and directors of the pedagogical-didactic event,

know how to consciously perform their functions and flexibly use methods and strategies adapted to the needs of an increasingly complex audience in terms of profile and background (Rossi, 2011; Laudrillard, 2013).

With regard to the inclusive dimension, it is important that teachers are trained not only to recognize diversity, but also to value it as a resource for richer and more meaningful learning. To this end, initial training should include a focus on inclusive teaching practices and foster the acquisition of skills related to classroom management, personalizing learning, and adapting teaching strategies to individual diversity (Cajola & Ciraci, 2013; Gulisano, 2023). These skills are essential to ensure that all students have equal opportunities to learn, regardless of their starting conditions.

Another key aspect is the integration of digital technologies in the classroom. Although the digitization of education is now an established reality, pre-service teacher education should go beyond basic digital literacy by promoting a critical and reflective view of the use of technology in the classroom. Teachers should be able to choose and use digital tools strategically and flexibly to enrich teaching practices and facilitate the personalization of learning (Bonaiuti et al., 2017; OECD, 2024).

Currently, initial teacher training in Italy, in accordance with European regulations, requires participation in a Qualifying university or academic pathway. These Pathways, regulated by the DPCM of 4 August 2023 ("Definition of the university and academic path of initial training for teachers of lower and upper secondary schools, for the purposes of complying with the objectives of the National Recovery and Resilience Plan"), aim to ensure the methodological and pedagogical skills necessary for teaching, including instructional design skills and the use of digital technologies. Annex A of the DPCM details the final profile, professional competencies and minimum professional standards expected of the Qualified Teacher, recalling the multiple dimensions already mentioned.

The recent legislation in the field of Qualifying Pathways has posed important challenges for Italian universities, which have had to prepare, in a short period of time, training pathways that meet the needs of a very diverse audience of future teachers. At the same time, this challenge has made it possible to meet many teachers and future teachers, to identify their initial profile and training needs, and to contribute to their training with the aim of adapting it to the needs of a changing

educational world that requires solid and motivated professionals. The work on these dimensions has thus enabled the scientific community to study phenomena relevant to understanding how to contribute to the qualification of what takes place within the so-called educational ecosystems.

2. Methods

The paper deepens the outcomes of an exploratory study conducted with 9986 future teachers, all enrolled in the first edition of the 30 CFU Qualifying Pathway (ex. art. 13, DPCM of 4 August 2023) activated by the eCampus Telematic University in March 2024. Given the requirements for admission to the training pathway, the unit of analysis - although defined as composed of "future teachers" - is composed of individuals who already hold a qualification in another disciplinary area or at another level of education, as well as the title of specialization in instructional support activities (as a special education teacher). The expression "future teachers" thus refers to the fact that, after obtaining the qualification, the subject will have the opportunity to teach in a new disciplinary area or in a different school order.

The unit of analysis was identified as part of one of the courses activated within the eCampus University pathway, namely *Competency-based Teaching* (CbT course); participation in the proposed data collection activities was voluntary.

The main objectives of the study were:

- To deepen incoming profile and dispositions of the group of trainees on the issues of teaching and instructional design;
- To identify the level of knowledge and skills on instructional design (and related areas, such as teaching and assessment);
- To reflect on the alignment between the identified overall framework, the expected profile of the Qualified Teacher and current challenges posed to the educational world;
- To verify the effectiveness of the proposed training activities on the group's knowledge and design skills.

To that end, the study has focused on the following research questions:

1. What are the initial profiles, dispositions, and levels of competence in instructional design among participants of the eCampus 30 CFU Qualifying Pathway?
2. How do these profiles align with the expected professional standards outlined in national and European frameworks?
3. What impact did the eCampus training activities (and more broadly, the activities of the Teaching and Learning academic Centers) have on participants' knowledge and skills in instructional design?

Prospectively, the study carried out has made it possible to identify the specificities and potentials of a large group of professionals who will be active in teaching-learning processes, and to reflect on how initial training paths can be an opportunity to strengthen the most motivated profiles and to redirect situations that could compromise the effectiveness of future professional practices.

The training activities aimed at the group included 30 hours of synchronous online classes (Zoom platform), during which thematic Tasks and a more complex Workshop activity were proposed. The latter asked to work on the design of a Learning Unit, drawing on the theoretical and methodological references presented during the lectures and discussed using the communication channels available to the trainer and the trainees (mainly Padlet, for the written part). The Padlet board of the CbT course was the main communication channel used (by enabling the "comments" feature), considering that the number of trainees connected to the lectures did not allow the possibility of activating their audio and video during the synchronous activities.

The data collection tools were: two questionnaires, proposed at the beginning and at the end of the course; several mixed-stimulus Tasks, whose answers were useful to deepen the trainees' knowledge and skills on the topics covered during the lectures; and an evaluation grid, which was used to evaluate and give formative feedback to the group on the Learning Units developed. It was also interesting for the study to analyze the comments that the trainees wrote on Padlet over time, both during the synchronous lectures, between lectures, and at the end of the course.

3. Main results

The unit of analysis

The group in training is mainly composed of people aged 41 to 50 years (43.7%) and 31 to 40 years (33.3%). 17.1% are between 51 and 60 years old, and 5.5% are between 25 and 30 years old. Are present some units with ages below or above the ranges mentioned. Both genders are represented, albeit with a predominance of female trainees. The geographical distribution is varied and covers almost the entire Italian country, that is all regions where eCampus University has activated the Qualifying Pathways.

The diverse picture is also repeated with regard to the order of the schools in which the trainees report that they are active. 50.8% serve in high school, 27.6% in middle school, 15.7% in primary school, and 2.6% in kindergarten. 3.3% state that they have never been active in an educational institution.

Of those who were teaching at the time of the study, 43.8% were teaching instructional support, 18.9% were teaching math-science-technology, and 16.3% were teaching language-literacy. All other areas are represented by percentages of less than 5%, including artistic-expressive (4.3%), legal-economic (3.7%), and socio-psycho-educational (3.4%). Overall, 61.4% of the trainees are or have been active in educational support, and 23.9% have at least once held a middle management position in their school of service. In terms of length of service (including non-tenure years) at the school, the majority (40.5%) have less than 5 years of experience, followed by 32.5% with 5 to 10 years, 17.6% with more than 15 years, and 9.4% with 11 to 15 years.

The highly varied picture of background information from the unit of analysis immediately confronted the trainer with the need to review and redefine some of the details of the training, so that it could be a resource for both those who had extensive experience in the world of schooling and those who had less or no experience. However, the integrated analysis of the background data with what was found in the later stages of the study made it clear that a large part of the group - even the most senior by service - did indeed need more training on issues related to the macro area of instructional design.

Participation in training activities

The initial questionnaire, in addition to the descriptive data summarized in the previous section, allowed to focus on the expectations of the trainees with regard to the entire Qualification Pathway and with regard to the Competence-based Teaching course (within which the present study was developed). With regard to the former, the content of the responses seems to be polarized around two macro-issues: the need to acquire the qualification in order to change the school service order (an aspect present in about 43% of the responses) and the desire to enrich personal professional knowledge (present in about 65% of the responses). There are also some answers that indicate “any particular motivation” that led to the start of the training (24 responses).

With respect to *Competency-based Teaching* course, the main stated expectations are summarized in Figure 1.

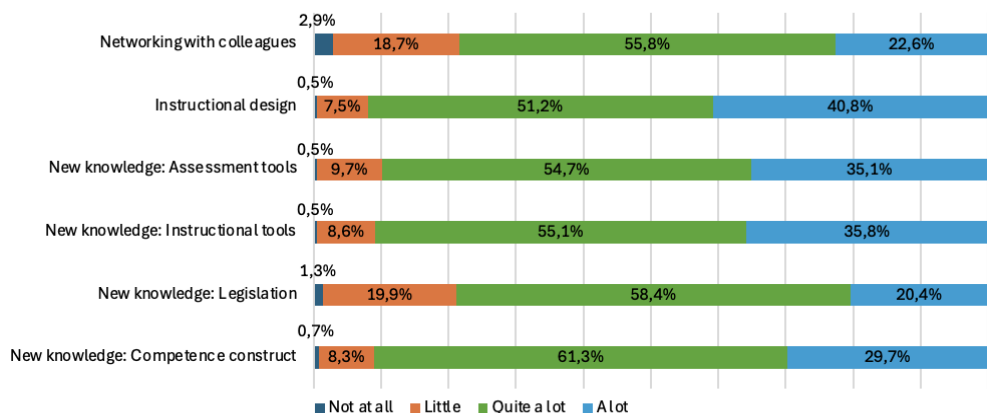


Figure 1. Expectations from *Competency-based Teaching* course

Overall, the group has high expectations (“A lot”) especially in relation to developing instructional design skills (40.8%) and increasing knowledge about the construct of competence (29.7%), and the dimensions useful for being able to promote its development in professional teaching practice (identified in Fig.1 with Instructional tools and Assessment tools). There seems to be less attention (but still present) to the aspects related to legislation and to the possibility of developing personal and/or professional relationships with potential future colleagues. The latter aspect was later discussed with the group, considering that the wide distribution of the unit of analysis throughout the country could have encouraged

the creation of interesting professional networks. Some of the participants then decided to collaborate with other trainees in the workshop activities proposed afterwards, hoping to stay in touch for future collaborations.

In addition to expectations about the course as a whole and the specific CdT course attended, the group was asked to self-assess their level of knowledge about Competency-Based Teaching in one of the first Tasks. The responses collected did not seem to be entirely in line with expectations, which could (hypothetically) be linked to the background data, which saw a large part of the group as already active in the school world. On a 10-point scale, 28.2% of the trainees self-evaluated themselves with a score of 6, and the curve detected trending downward. At the extremes of this are 6.5% of the trainees who self-rated themselves with scores between 1 and 2, and 2.1% who placed themselves on scores 9 and 10. Delving further into pre-knowledge about Competency-based Teaching, the participants gave effectively very general answers, rarely far from assertions such as "Competency-based Teaching is important" and the like. Even when asked about instructional and assessment tools already known, the most common responses were "interactive whiteboards, learning units, assessment grids, tablets," with off-topic references and limited references to methodological dimensions solid in the literature. Were also present responses indicating that they did not know or could not recall at that time any instructional and/or assessment tool useful for a competency-based approach in didactics.

The results of the initial self-assessment led the trainer to redefine the themes of some planned intermediate tasks so that they could become a resource for strengthening the critical capacities of the trainees with regard to the themes that would form the basis of the subsequent instructional design workshop (in brief: didactics, assessment, inclusion, technologies). Among the topics addressed were the invitation to reflect on previous experiences in the school context, to identify and comment on strategies and tools they'd encountered as students and/or as teachers, and on the characteristics and purposes of so-called inclusive education, understood not only as support for students in situations of special need, but as a methodological approach aimed at qualifying everyone's educational experience. In connection with the focus of the latter task, the group was asked to reflect on the principles of Universal Design for Learning and on the topic of plus-dotation, which is seen as an opportunity (and a necessity) for personalization in education. One of the course lectures then focused on the topic of educational technologies

and exemplified useful strategies and tools for professional practice, both for personal organizational and design purposes and for the managing of classroom activities with students.

What the trainees produced in the thematic Tasks (answering closed-ended questions, writing short comments, answering surveys followed by discussion) allowed to highlight a lively interest in the topics covered and a willingness to delve deeper into their practical implications. These are elements that are encouraging when one considers the motivation with which the large group in training wanted to participate in the formative activities, even though in the overall picture the incoming profile detected was not particularly bright. The group seems to be aligned in terms of awareness that the teacher is a key figure in helping to qualify the processes within formal educational contexts, and that what happens inside the school should be in active dialogue and interaction with what happens outside it. Although the concept of the educational ecosystem had to be explained in detail during the lectures, the trainees showed that they understood its implications for professional practice; however, there was no lack of reflections on the concern to manage one's work effectively within such a complex horizon.

One of the most challenging and significant moments of the Competency-based Teaching course is the one that was dedicated to the instructional design workshop: the trainees were asked to develop a Learning Unit (LU). This activity made it possible to focus the knowledge acquired by the trainees on the topics covered in the lectures and to test the participants' skills in instructional design.

The workshop was divided into four working sessions (during 4 of the 6 lectures of the course), each of which was followed by formative feedback on the work in progress. The products gradually uploaded by the trainees were analyzed using an evaluation grid; the grid focused on the following dimensions and indicators:

- General framework (relevance of the topic to trainee's disciplinary area; connection to other disciplines and/or cross-curricular areas; appropriateness of target students and timeframe);
- Internal consistency of the design (between theme and macro-objectives of the LU; between macro-objectives of the LU and planned phases; between general and specific objectives of the LU; between specific objectives, planned classroom activities and assessment tools);

- Methodological-didactic choices (variety and relevance of planned instructional and assessment tools).

A qualitative assessment was made for each indicator, with the aim of discussing with the trainees the degree of relevance of the choices made, rather than assigning a formal rating to the documents. The feedback given back to the group after a sample analysis of the submitted documents always provided concrete examples of excerpts written by the trainees themselves, as well as drawing attention to the elements of the grid that were of interest in general. The idea was to share examples of effectively written LUs (or parts of them) and recurring critical elements, so that everyone could then go back to their own work to complete, enrich or correct it.

Table 1 summarizes three main stages of workshop activity management: Stage #1 is related to the feedback returned after the first working session; Stage #2 is about the status of the work updated to the second working session; Stage #3 is the result of the assessment of the work delivered by the trainees in the final version (fourth working session).

	Stage #1	Stage #2	Stage #3
General framework	- Poorly centered target, compared to topic and objectives. - Duration too long or too short. - Little balance between disciplinary and cross-disciplinary dimensions.	- Improved definition of target student. - Still problems with duration. - Good multidisciplinary. - Still difficulties with transversal dimensions.	- Improved average duration (about 18 hours, divided into 3 phases). - Overall improvement for the transversal dimension (e.g., digital component).
Internal consistency	- Very long lists of macro-objectives. - Confusion between macro-objectives of the LU and specific objectives of each phase. - Poorly detailed phases' content.	- Many LUs still have long lists of macro-objectives (copied from ministerial sources). - Improved description of phases. - Specific objectives not always consistent with planned activities. - Weak assessment dimension.	- Improved focus on macro-objectives (with personal revision). - Some LUs remain with long and unimportant lists. - Improved details of classroom activities, including concrete examples of assignments. - Assessment tools often referred to in general terms.
Methodological-didactic choices	- Lists of strategies without assignments details. - Lack of details on assessment dimension.	- Improved detail of the instructional part. - Still critical issues for assessment tools.	- Choosing a wide variety of instructional tools. - Consistency between objectives and planned activities very frequent. - Assessment mostly with vague references to grids and Reality tasks.

Table 1. Monitoring of workshop activities

As summarized in Table 1, in the initial phase of the workshop (Stage #1), the LUs produced had critical elements regarding the basic elements of instructional design (e.g., main objectives, coherence between objectives and planned activities,

relevance and quality of hypothesized teaching and assessment activities). Given the initial critical products on these aspects, the performance of the workshop participants seemed to improve over time, so that by the end of the course they had a repertoire of Learning Units of good quality. Although in some cases there were still critical elements to work on, the overall trend of the group (about 200 products were analyzed for each Stage) was positive. Even considering the comments shared by the trainees on Padlet, the use of formative feedback and its anchoring in the strengths and critical issues identified in trainees' own documents, as well as the moments of systematic discussion and collaborative revision, that were considered as important as the theoretical teaching part of the course, seem to have had a very positive impact on this outcome.

A particularly useful moment, according to the trainees, was also the last lesson of the course, dedicated to the collective discussion of some products selected by the teacher: on the Padlet of the course, the texts of the LUs were made available and, next to each one, a box for questions (in which the "reading" students could write) and one for answers (by the authors of the selected LUs) were also made available.

The activity was a great success and proved to be an opportunity to strengthen the sense of the group in training, which, despite technical difficulties, was able to face each other synchronously and to return to theoretical elements whose application still seemed critical.

With reference to the research questions outlined in paragraph 2, the data collected provide the following answers.

Regarding the first question, data from the initial questionnaires and tasks highlighted a highly diverse yet generally fragile profile in relation to instructional design competencies. This weakness appeared independently of prior teaching experience and was especially evident in the low self-assessment scores and the quality of initial workshop outputs.

As for the second question, the comparison between the observed trainees' profiles and the professional standards set out in recent policies (e.g., DPCM 4 August 2023) revealed a clear misalignment. Most participants were unfamiliar with the theoretical and methodological foundations required for a competence-based and inclusive educational approach. To address this critical issue - even considering what has been mentioned about the educational ecosystem construct

and the significance of school-university synergy - the university's role emerged as essential. Training activities managed by Teaching and Learning Centers can act as key resources in the education of both pre-service and in-service teachers

Finally, anchoring this consideration also to the third research question, the workshop progression, qualitative feedback, and final assessments show a significant improvement in both awareness and practical instructional design ability. Trainees' engagement with feedback loops, peer discussion, and iterative revision processes contributed to a positive transformation in their instructional design capacity. This is further supported by the qualitative feedback collected through Padlet interactions and final questionnaires, which emphasized the value of practical activities, peer exchanges, and iterative revision processes in enhancing trainees' design competencies.

Final balance

The comments that the trainees shared on Padlet during the synchronous lectures, between lectures, and at the end of the course, as well as the responses collected with the final questionnaire, provide entirely positive feedback to the Competency-based Teaching course and its internal articulation. The impression is that such a course can lay a useful foundation for «acquiring the basic knowledge and skills to be a good teacher» (L.M., future secondary school teacher) and that the inclusion of activation and workshop moments was strategic «to get out of just theory and have concrete guidance on how to deal with things encountered in professional practice» (M.D.S., future secondary school teacher). Dimensions that are strategic from the perspective of helping to qualify the practices of professionals who will act in the so-called educational ecosystem.

Based on the data collected at the end of the course, the general expectations of the participants were largely met: 59.1% of the participants answered "quite a lot" and 35.1% "very much". A closer look at some of the dimensions of interest: 44.8% of trainees were "very" (and 49.5% "quite") satisfied with having learned how to manage instructional design in professional practice (either a Learning Unit or a single teaching activity); 92.4% were "very" and "quite" satisfied with the need to learn more about the construct of competence. The feedback is also positive with respect to increased knowledge of instructional tools, assessment tools, and school legislation, reaching respectively percentages of 83.2%, 79.9%, and 75.2% (summing the "very" and "fairly" response options).

In the course, trainees particularly liked (response “very”) the approach of the instructor (49%), the opportunity to receive systematic feedback (48.1%), the use of Padlet as a communication tool (44.7%), and the overall organization of the class (41.8%). The alternation between theoretical lectures and workshop activities was also much appreciated, as it allowed for a recursive work between theory and practice.

The most common keywords used to identify the strengths of the course were “clarity, helpfulness, competence”, appearing in over 82% of the total responses. On the other hand, those associated with weaknesses were “little interaction” (related to the technical inability to activate audio and video, but mitigated by the use of Padlet) and “little time available”, appearing in about 15% of cases.

95.7% of participants believe that the course has helped them grow as education and training professionals and that they will use the knowledge and skills learned “quite a lot” (55.4%) and “a lot” (38.8%) in their current and/or future professional practice. Specifically, in the perspective of quality teaching and aimed at promoting the development of skills, teachers say they will use the following strategies (sum of “quite a lot” and “a lot” response options): cooperative activities (97.4%); semi-structured tests based on “Reality Tasks” (94.5%); peer assessment activities (88.3%); simulation and role playing (83.8%). References to methods related to gamification, peer tutoring, problem-based learning, and peer and teacher discussion (e.g., circle time, brainstorming) also appear in significant percentages.

The trainees' final remarks seem to confirm that their training experience was significant for their teacher-profile qualification. Taken together, the answers to the research questions confirm the overall effectiveness of the training model adopted in the Competency-based Teaching course. The course structure, the use of formative feedback, and the integration of theory and practice proved to be strategic in fostering both professional awareness and practical design skills.

Conclusions

The study has offered an opportunity to reflect on a key issue for the scientific and educational community: how to support the development of a teacher's professional profile so that it becomes a transformative resource within the complex and dynamic ecosystem of education.

Today's teachers are expected to develop a professional profile that is multidimensional, complex, and capable of coping with the stresses that come to school from a constantly changing social and cultural reality. However, those entering the profession do not always start from the same baseline of knowledge, attitudes, and skills. The study revealed a strong interest among participants in active, engaging, and student-centered methodologies, an encouraging sign of their potential for growth. At the same time, it highlighted a significant gap between this interest and their actual foundational knowledge and instructional design skills, even among experienced teachers.

This critical finding provided an opportunity to reflect on how to address emerging training needs, building on pre-service and initial training pathways offered to many participants. In this context, universities and Teaching and Learning Centers can play a strategic role. Teacher training, when carried out through a supportive approach that emphasizes modeling and feedback, appears to be crucial in working with teachers and future teachers to develop and/or improve the wide range of competencies required in today's schools.

These conclusions align with the theoretical framework presented in the opening sections of this paper, particularly the view of education as an interconnected ecosystem and the role of teachers as key agents of transformation. The training experience revealed discontinuities between the ideal professional standards and the participants' real starting points, but it also confirmed their willingness to engage, reflect, and improve when provided with structured, purposeful support.

To contribute to a true qualification of teaching-learning processes, orienting them towards a flexible and inclusive approach capable of responding to the needs of each student, it's essential to continue developing training paths that significantly equip teachers and future teachers, as they are key figures in the process of shaping the education systems of tomorrow. In this sense, initial teacher training should be rethought as a strategic space not only for the acquisition of technical skills, but also for the construction of a professional identity capable of sustaining innovation, fostering collaboration, and embracing the ethical responsibilities inherent in educational work. The experience conducted within the Competency-based Teaching course made it possible to identify concrete strategies and tools that proved to be effective, as confirmed both by the trainees' feedback and by the results that emerged from the monitoring of training activities.

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