

D2.2. Harmonized European Model of practical trainings guidance and support to schoolteachers

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Introduction

The purpose of this document is to present the basis of the reflective model of online guidance and accompaniment for students and education professionals who are in the first years of their professional practice in primary and secondary schools. It is based on an educational approach to respond to the needs of teachers who are beginning their training, taking full advantage of the potential of information and communication technologies.

It is a model that uses collaborative tools, agile and participatory methodologies in order to provide a learning environment where each teacher can reflect and research on his or her practice accompanied by a community of peers. The educational model is oriented towards participation and the collective construction of knowledge from an interdisciplinary and intercultural approach, open to formative, social, and work experience.

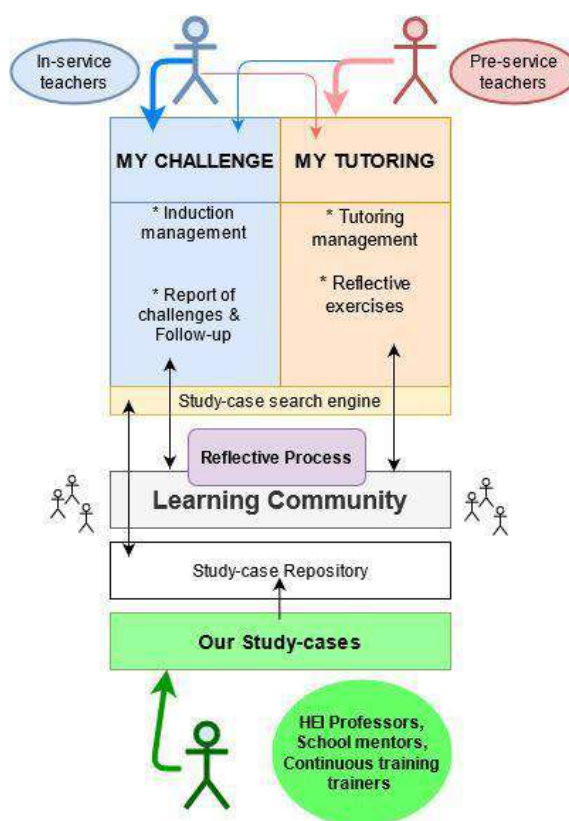


Figure 1. Digital platform approach

The evolution of teachers' training needs, as well as the development of technology itself, make the model open and flexible, capable of evolving and introducing changes and innovations that allow progress in the improvement of learning by expanding and improving the use of the network for training and reflective accompaniment. It is designed as a flexible platform that allows for the co-creation of knowledge, encouraging the teaching staff to reflect on their practice in real time. In this sense, the model proposes the **collaborative design of case studies, using methodologies such as problem-based learning (PBL) and the development of a reflective**

practice guided by a trainer/mentor and shared with a learning community.

The project's perspective considers learning as derived from a complex interaction with other individuals who feel connected by belonging to a community. For this reason, the initiative is committed to the development and validation of a European digital platform for the support and improvement of teaching practice developed and carried out by, with, and for teachers. To this end, it will develop a common virtual environment for teachers in transition (trainee or student teachers, newly qualified teachers, beginning or in-service teachers), school mentors, HEI teachers, and continuing education teachers. In this environment, each teacher and his or her reflective action will be at the center of a training activity that is committed to the constant improvement of his or her skills.

The initiative will contribute to the active participation of teachers, within the framework of a shared learning community among European institutions, promoting the exchange of knowledge, experiences, and meanings, making new forms of collaboration possible.

The document is of a transversal nature, describing the background of the proposal, its theoretical and technological foundations, as well as the components of the model and its implementation strategies. The document also aims to provide instructions for the technopedagogical design, specifying the roles through which the participants can move, as well as the interactive dynamics, spaces, and to favor communication.



I. Contextualizing the project: what is Digital TA?

This proposal is a response from European training institutions to support teachers' professional development and reduce teacher attrition (Spanorriga, Tsiotakis, Jimoyiannis, 2018) in the early years of professional practice.

The proposal aligns with the framework of the EU "Common Digital Action Plan" (2021-2027) and the "Conclusions on Effective Teacher Education" (EU, 2014): "Both initial teacher education and continuing professional development for teachers must be based on sound pedagogical research and apply adult learning methods based on communities of practice, online learning, and peer learning."

From the review of the studies that precede this initiative, we have detected that one of the problems that affect the teaching staff is located in the transition period from initial training to the first years of their professional practice in the classroom. A period in which this collective cease to be teachers in training, experiencing the transition from learning to teach to teaching to learn (Herrington, Herrington, Kervin, & Ferry, 2006).

This is an important step for most young and inexperienced teachers who report feeling alone in encountering the complexities of the practices. In many cases, they are overwhelmed by the lack of resources, space, time, and the need for support to reflect on their daily activities.

According to the general context of the project, the objective of this initiative is to propose a shared development process among European countries and to define a useful tool for teacher training, taking advantage of current technological capabilities and offering quality training for all, without barriers of accessibility or social distinction.

That is, to support students and newly qualified teachers to engage in collaborative critical reflection on teaching practices. In this way, we seek to avoid conformity to dominant school practices (De Roiste et al., 2012) and engage participants in an enriching socialization process, which promotes the improvement of their practices.

The proposal focuses on the generation of knowledge, emphasizing peer-to-peer, collaborative, and networked learning based on problem solving, participation in the development of projects, joint creation of resources and materials, discussion and inquiry.

The pedagogical approach of the model presented here is based on the consideration that learning derives from a complex interaction of individuals who feel linked to a specific community where identification among member peers will increase to the extent that the community shares particular experiences that, due to their degree of universality, will have echoes and points of encounter with the experiences of other teachers. Communication based on experiences in the classrooms and the daily life of the centers will favor recognition and identification, increasing the sense of belonging of the group of participants. Therefore, the project proposes the creation of a teaching/educational knowledge base, which can be continuously updated based on individual and group professional experience and emerging research, thanks to the participation of teachers in the social network of peers.

This collaborative network of reflections will consist of an organized collection of knowledge open to teachers through a digital platform. A common virtual environment with free access for teachers in transition (trainee or student teachers, newly qualified teachers, beginning or in-service teachers), school mentors, HEI teachers, and continuing education teachers, among many other professionals involved in classroom teaching.



The social network for reflective practice would include theoretical and practical knowledge, as well as spaces for collaborative case development, where all participants will have the opportunity to share and develop their knowledge, motivation, and professional practice, accompanied by in-service professionals, practice mentors and supported by a community of peers seeking solutions to everyday problems in their classrooms in a multicultural context. This is a cyclical meta-reflective or meta-cognitive process in which the communicating vessels between reflection and practice will be promoted.

To this end, the platform designed for the project will be supported by digital technologies and will deal with reflective practices of teachers associated with a social network of peers, mentors, and all the training institutions involved. This collaborative network is offered as a tool for meta-reflection: providing an environment for teachers in transition to analyze their experience and practice based on a specific case study or personal challenge.

The model we present is dynamic and flexible. It is designed to constantly adapt and evolve over time through co-design and collaboration with the participating community. This is a process of collaborative knowledge generation where new teachers will reflect in a network with their peers (national and European) on the issues that occupy them every day in their classrooms. This community will be accompanied by specialized teachers who will guide the group as mentors and whose main functions include guidance, orientation, support, and revitalization of the entire educational process.

This allows us to build a bridge between initial and in-service training and between EU countries in order to harmonize criteria for teaching practical skills to teachers in transition connected to a Learning Community in order to offer a comprehensive solution to reduce teacher attrition. In this way, it will be possible to face the daily practical challenges of teachers, share experiences with colleagues, discuss practical experiences in real school scenarios, together, promoting the virtual mobility of teachers.

In addition, active participation in a shared learning community among European institutions leads to the broadening of international experiences and meanings, enabling a new form of collaborative process and development, active knowledge, discussion, exchange, negotiation, and integration of ideas.

The consortium that carries out this initiative is made up of initial and continuing teacher training providers from the Czech Republic, Ireland, Poland, Spain, and Sweden. The initiative aims to consolidate a shared development process among European countries and to define a useful tool for teacher training, taking advantage of current technological capabilities and offering quality training for all, without barriers of accessibility or social capacity.

It is, therefore, proposed to lay the foundations for the design of a European approach to accompany the transition period of teacher training prior to their insertion in the educational system and to complement the continuous training of teachers during the first years of professional practice.

All this translates into a collective proposal that has as its ultimate goal the development of the following actions.

- Creation of a repository of shared European experiences on training processes for the initial and continuous practice of teachers.

- Development of a harmonized European model for accompanying practical training that provides guidance and support to school teachers during their first years of professional practice.
- Design of a social network for reflection, research, and support of teaching practices in the transition period between initial and continuous teacher training.
- Definition of roles of the agents involved in the reflective accompaniment model (trainee teachers, trainers, mentors) and institutions involved (schools, IES, continuous professional development) integrated in a collaborative European community for reflection and research on professional practices.
- Implementation of an international and cross-cultural learning community for the support and improvement of teaching practices based on the analysis of **case studies focused on the most relevant daily challenges of teachers** in their communities of practice.

II. Background supporting the pedagogical model

As the educational landscape evolves in the search for alternatives to provide students with a comprehensive, personalized education, adapted to the needs of their context, there is a growing need to think of new structures and flexible proposals that guarantee comprehensive lifelong learning **for teachers**.

In many countries, an educational problem diagnosed is the need to promote the professionalization of teaching and the revision of teacher training programs (Cochran-Smith & Lytle, 1999; De Kock, Slegers, & Voeten, 2004; Escalié & Chaliès, 2011) not only to develop their teaching skills but also to provide tools that will allow them to pass in a less traumatic way the period from the end of their training to the first two years of their professional practice.

Although the final intention is clear and recognized in the legislation in force in the European context, when it comes to putting policies into practice, we find a large number of teachers who leave the training centers demanding tools that will enable them to face day-to-day problems in their classrooms.

These claims open the door to thinking about the multiple challenges that arise during their first years of practice in educational centers. Challenges that are not sufficiently addressed in teacher training programs. This disconnection between theoretical training and professional practice can open up an interesting range of questions, such as:

- How does one learn to teach while teaching?
- Do they feel prepared to teach when they start teaching?
- What kind of training programs do they participate in? And how does this ongoing training impact their practice?
- Do teachers spend more time on classroom conflict management and resolution than on actual teaching and learning?
- Do they have enough time and space to reflect on how to address the problems of their daily practice?
- What spaces of accompaniment, resources, or experiences of other professionals do they have available to consult?
- Are there other teachers in the same situation?
- What accompanying strategies can be developed to mitigate the feeling of loneliness in practice?

II.1 Transit the learning of the trade: from learning to teach to teaching to learn

Some of the above questions are still unresolved. Others have been addressed in some way in the Teaching and Learning International Survey (TALIS), OECD report (2022). From this report, which is based on the voice of teachers and school leaders, a series of considerations can be drawn that revolve around the questions posed above and a series of policy orientations to help strengthen the knowledge and skills of the teaching workforce.

These include the following:

- Several schools provide help to new teachers through introductory tutoring programs, but almost a third of new teachers report a great need for training in aspects of day-to-day classroom management. **One out of four novice teachers report a great need for training in aspects related to student discipline and behavioral problems.** Only one out of eight

teachers with more experience reveals having this same need.

- A large number of teachers begin to practice the profession but do not continue. Facilitating the professional development and success of new teachers requires an **understanding of their needs and how they can be helped to master their profession**. Providing them with this type of support can help keep new teachers in the teaching profession.
- According to the countries surveyed, novice teachers spend **less time on the teaching-learning process and more on classroom management**. On average, new teachers spend 9% of their time on administrative tasks, 18% on maintaining order in the classroom and classroom management, and 73% on the teaching-learning process itself. Little or no time is devoted to research and reflection on what we do.
- When new teachers were consulted about their perceptions of their own levels of self-efficacy, a large percentage of voices acknowledged and placed themselves at notably lower levels than their more experienced professional colleagues. Novice teachers **have less confidence in their ability to be effective teachers**.
- In countries where large numbers of novice teachers leave teaching, the dropout rate is often attributed to their being subjected to **harsher working conditions or being sent to schools that are more difficult to staff**.

Going deeper into the diagnosis and focusing on the classroom context, the review of several international studies has allowed us to confirm that in-service teachers, once in the classroom, have difficulties in dealing with the complexity of classroom interactions (Stokking, Leenders, de Jong and van Tartwijk, 2003). On several occasions, recent graduates have to face a tough transition: training in HEIs to training immersed in the classroom. A period in which this group ceases to be teachers in training, experiencing the transition from **learning to teach to teaching to learn** (Herrington, Herrington, Kervin, & Ferry, 2006) Ferry, 2006). This is an important step for most young and inexperienced teachers, who encounter realities that go beyond the theories acquired in their training, and which, in many cases, lead to situations of frustration and helplessness, causing them to leave the profession early on. These early years of teaching are particularly challenging, as **newly qualified teachers prioritize survival and control** (McGarr & McCormack, 2015) by trying to focus on their day-to-day lives so as not to succumb to situations for which no classroom has trained them. Several studies have focused on the issue (Fuller, 1969; Fuller & Brown, 1975; Conway & Clarke, 2003), identifying as a first response the "preoccupation with self" of student teachers and newly qualified teachers in which they view events/problems from their own perspective only and **rarely consider problems from the perspective of others**. In this initial solitude, the act of learning and the reflection on what to do are halted by **the vertigo of responding to problems that often overwhelm them due to lack of experience**.

As prospective and newly qualified teachers negotiate the transition from college to school, they often experience dissonance and conflict (Galman, 2009; Ward, Nolen, & Horn, 2011). When exposed to new school cultures and practices, teachers, particularly trainees and newly qualified teachers, conform to the dominant behaviors within that school context (Gleeson et al., 2014), leaving questions about the ethical and moral dimensions of teaching unanswered (Jay & Johnson, 2002). Such socialization of newly qualified teachers into the dominant norms and practices of the school limits the ability of new teachers to engage in "social critique and transformation" (Grundy & Hatton, 1995, p. 9).

Flores and Day (2006, p.230) identify that "the workplace played a key role in reshaping teachers' understanding of teaching by facilitating or hindering their learning and professional development and in the (re)construction of their professional identities," often with a negative and destabilizing effect. Certain contexts, therefore, can have a negative impact on learning, behaviors, beliefs, and



student/teacher NQ conceptions of a teacher's role. As a result, **learning from initial teacher education often "fades" during school practice** (Tabachnick and Zeichner, 1984, p. 29).

Consequently, there is a need for teacher training to promote actions in order to reduce the gap between theory and practice, helping future teachers to successfully link the pedagogical knowledge acquired during their training with practice situated in real classroom contexts (Borko, Liston, & Whitcomb, 2006; Cochran-Smith & Zeichner, 2005).

In schools, there is usually not enough time to find, share, understand, and apply research findings; nor time to stop and reflect on daily events and how and why we teach how we teach.

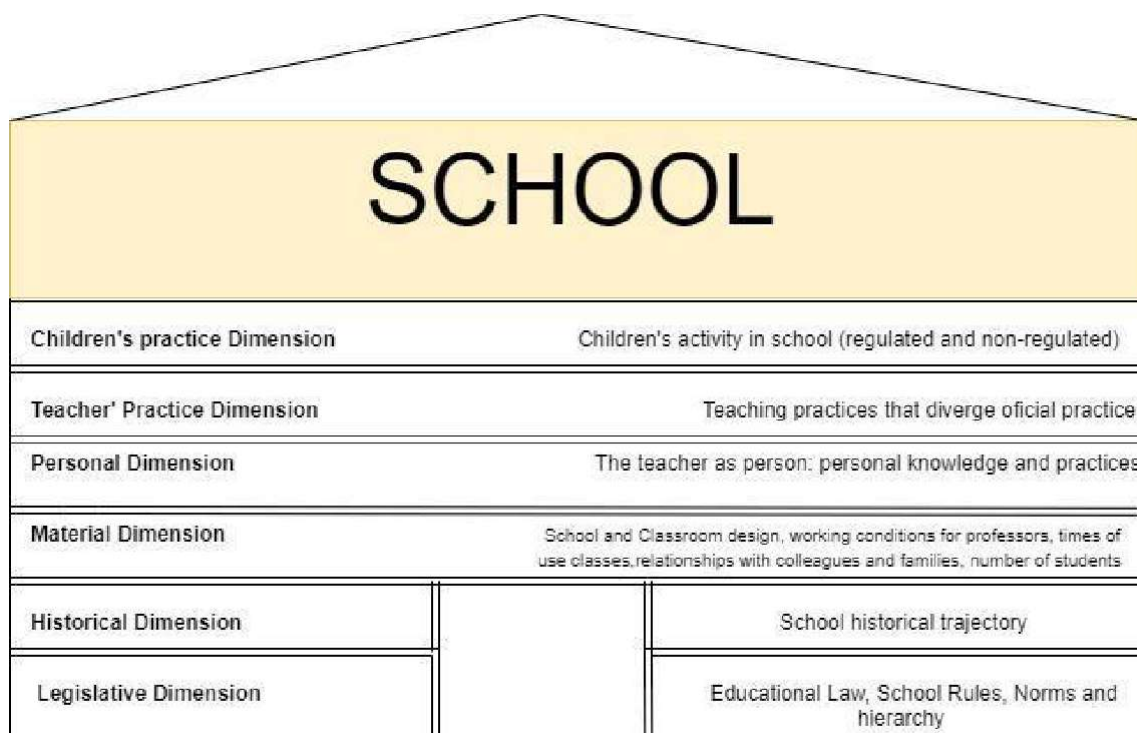
One of the prerequisites for a reflection on teaching practice is to know the different layers that constitute it: the dimensions of teaching practice at school.

II. 2 Teaching practice: Recovering the day-to-day institutional experience

Rockwell and Mercado (1988) initiate a reflection on the different dimensions that support teaching practice, with the purpose of including them in the learning process of teaching. They ask: "How can school reality be recovered within teacher training and updating projects?" (Rockwell and Mercado, 1988, p.65)

In this search, Rockwell and Mercado (1988) warn us that, in order to find answers, we must begin by clarifying the conception of the school institution beyond its regulations or the educational laws of the countries. To design a training program, we have to go back to the essentials, which are often invisible to the eye. This is the key that the authors give us: "to understand the teaching practice, it is unavoidable to look at the school" (p.66). In order to explore the institutional functioning of the school, it is necessary to take into account not only the normative/legislative part of the school but also its daily life. Since, just as rules, norms, and laws regulate the functioning of the school, everyday life is constitutive of the school institution.

In the same way, to approach teaching practice, we can explore its different dimensions in the space of the school: the teacher is a specialist in pedagogical theory, but also a professional with more or less experience (and, therefore, with a history of educational practices and knowledge that operate in everyday life), and also a cultural being inserted in an institutional experience. And it is precisely this experience of the school institution that is rarely associated with the construction of the teaching profession (Rockwell, Mercado, 1988). The experience of the school institution is constructed as a historical process that feeds the daily development of teachers' practices, and consequently, it should be taken as an essential subject of teacher training. As Rockwell and Mercado make clear: "teachers are trained in the schools in which they work" (1988, p.70). This leads us to think that a good part of their "professional way of doing things" is acquired from the dynamics (visible and invisible) that take place in the educational centers: habits, customs, and traditions; ways of being and doing in the classrooms, which are learned from the exchange with other professionals. Rockwell and Mercado identify these dimensions of everyday experience:



6 Dimension of the institutional experience in the school

Figure 2: Six dimensions of the institutional experience at school (Source: Based on Rockwell and Mercado, 1988)

The 6 dimensions of the institutional experience combine to construct the daily life of the school ("the institutional experience"), a significant element for the understanding of the processes of construction of teaching practice and identity.

The teacher's identity is constructed as he/she experiences, discusses, constructs, resolves, learns, and unlearns while moving between the dimensions. Pérez Gracia, Serrano Rodríguez, and Pontes Pedrajas (2022) analyze the studies that focus on the process of teacher professional identity creation and show that the research of the last 30 years focuses on the personal aspects linked to teacher development, rather than on the institutional background: motivation, self- knowledge, confidence, or experience in education, rather than their daily presence in the institution. Individual aspects that seem to obviate the institutional aspects linked to learning to teach.

The process of building professional identity, that is, the formation of being and doing as a teacher is then related to the "social fabric of the school" (Rockwell and Mercado, 1988, p. 71). It is about the daily training actions of its actors (exchanges, reflections, decisions, but also continuous training courses), carried out in the school setting. This daily flow nourishes the teacher's experience and practice. In this sense, daily institutional experience constitutes a source of knowledge for training work (Rockwell and Mercado, 1988).

On the other hand, another dimension of the practice is associated with the processes of strengthening professional identity through mentoring.

II.3 The mediation of mentors for reflective learning

As presented in the OECD report (Guerriero, 2017), there is no broad consensus on what can be called good practice or good design, as **knowledge and learning depend on context**. Therefore, the theoretical learning of critical reflection requires the **mediation of mentors or facilitators**, who may come from universities or other teacher training centers. As we know that educational research is not cumulative (Rovai, Guerriero, 2017), every school needs a mentor and mediator to act as a communicating vessel between research and practice, facilitating **the transition from knowledge to action in the classroom**. Meeting this need will also have the added value of changing teachers' self-awareness and seeing themselves as practitioner-researchers.

Therefore, there is a need for active learning, to use the specificity of the social context to explain and understand what happens in the classroom/workplace. This need relates directly to the issue of **teacher knowledge dynamics** (e.g., Zbróg, 2019), which is described as "a complex system in which multiple actors interact to shape teachers' knowledge" (Guerriero, 2017).

We draw here on a concept that accepts the sociocultural understanding of knowledge and learning, which is derived from Philippa Cordingley's (2017, pp.37-67) research on the process of knowledge transformation influenced by research findings. **This complex mediation process involves mainly the knowledge of the teachers themselves** (researchers), **the mentors** (those involved in bringing new knowledge to the environment), **the knowledge of practicing teachers, their practical wisdom, and their beliefs and motivations**.

Similarly, and based on a sociocultural approach to training, we understand that a central skill for teacher learning is the **reflective process**. Reflection on adult learning practices is highly topical, and discussion should be developed and encouraged (Frison, Fedeli, Minnoni, 2017). Reflection is a "continuous" process that involves the interpretation and reinterpretation of experiences (Kerby, 1991) through a process of reflection, which activates cognitive and emotional resources. The process of teacher self-reflection on their own practices is considered very useful to increase competencies and promote the professional development necessary to face changes in professional contexts (Alsup, 2005).

Engaging in reflective practice with others provides opportunities for prospective and newly qualified teachers to consider other perspectives (Newell 1996). At this stage, reflective practice can be a challenging task, as newly qualified prospective teachers/educators may lack sufficient 'professional knowledge' (Redmond, 2006, p.1). Engaging with a More Knowledgeable Other (MKO) through a collaborative inquiry process can help these teachers deepen their thinking about their practice (McGarr et al., 2019). In this sense, as sustained in several studies, the interaction between experienced and novice teachers becomes strategic, allowing some activities such as listening, empowerment, realistic self-evaluation, development, and planning (Cerini & Spinosi, 2016). The rich and widely discussed research on the subject (Schon, 1984) shows that the cognitive characteristics of an expert are related to the definition of problems, the search for flexible

solutions, the integration of the context in the problem-solving system, and the dependence on specific knowledge. This process becomes part of a "know-how" that teachers develop over time, especially in situations of uncertainty, combining reflection and action. It is precisely this encounter between the practical knowledge of professionals with years of practice and young teachers, which allows a common reflection on their daily work, in an act of accompaniment and communication between peers, strengthening the ties between both groups. **It places reflection as the instrument for addressing the current demands of educational centers.**

In summary, it is true that a large part of the responsibility for preparing new teachers for their incorporation into the professional world falls on initial teacher training centers and teacher preparation programs. However, once a new teacher starts teaching, regardless of the situation in his or her center or classroom, **most centers do not have sufficient programs, infrastructure, or resources to provide further assistance.** Reducing teaching loads, mentoring through tutoring programs and offering professional development activities on classroom management seem to be easily accessible areas to improve the self-efficacy of new teachers and contribute to enhance their success, but they still remain isolated and insufficient actions.

The analysis of the diversity of the situations described above has led us to ask ourselves, **what can be done to help new teachers? And why should we invest in continuous teacher training?**

Hence, the need to think of support programs in which teachers are provided with spaces for research on (and at the same time immersed in) their practices; spaces for dialogue and reflection are provided to reduce the feeling of helplessness and loneliness; methodologies and training spaces are offered to promote a reflective practice among peers; or flexible digital environments are offered to socialize those transversal cases, so that individual knowledge opens debate and conversation within the **framework of a community of peers.**

On the other hand, some of the aspects most pointed out by studies on teacher identity since the 1990s indicate that **the mentoring process has a great influence on individual aspects linked to learning** (Pérez Gracia, Serrano Rodríguez and Pontes Pedrajas (2022).

The promotion of accompaniment systems, either through **mentoring processes**, or by promoting **spaces for reflection on teaching**, or **both at the same time**, can reduce dropout and promote educational processes that return knowledge to the classroom by reflecting on what happens in it on a daily basis, allowing teachers as a whole to create and share new knowledge, **the result of looking inside the classroom to recognize ways of being and doing as teachers located in living contexts.**

Let's call it mentoring, tutoring, or accompaniment space; essentially what it is about is to have spaces and times to better understand the nature of the learning difficulties they encounter in their classrooms, but also to better understand the teaching problems faced by education and teaching professionals. Beyond the particularities of each experience, the idea is to **promote spaces to share with others and rethink the ways of doing things in the classroom based on a real problem.**

II.4 Learning modeling

Processes of reflexivity can take place before, during, and after professional actions (Vloet, 2009). According to Korthagen and Vasalos (2005), but will always be richer if done with the support of an experienced educator, linked to a specific and focused activity to question the actions. In this way, it is possible to support the creation of "alternative scenarios," i.e., possible and simulated situations where they can be placed in focus to open reflection.

The advanced models for accompanying or mentoring experiences reviewed so far describe cyclical processes without a predetermined starting point, providing an unencumbered environment in which to reflect on internal ways of being. Therefore, we understand that the starting point, which triggers reflection, can be initiated at any time and from a diverse multiplicity of inputs.

Hence, the initiative we present is nourished by the idea that **learning is the result of a complex interaction with other individuals who feel linked to each other** based on the need to reflect on their daily actions in the classroom and to share ways of doing and being a teacher, thus forming a community:



Figure 3: Five directions for reflection (Source: Own creation)

We therefore propose the development and validation of a European digital platform for the support and improvement of teaching practice. The platform will be a common virtual environment for teachers in transition (trainee teachers or students, newly qualified teachers, beginning or in-service teachers), school mentors, HEI teachers, and continuing education trainers.

The proposal focuses on the generation of knowledge, emphasizing peer-to-peer, collaborative, and networked learning based on problem solving, participation in the development of projects, joint creation of resources and materials, discussion, and inquiry.

This collaborative network is conceived as a formative environment where teachers in

transition will be able to describe, present, and analyze the personal challenges arising from their practices as they take place. They will be accompanied by a group of experienced teachers or mentors who will facilitate reflection by providing theoretical, methodological, and emotional tools, so that the result of the reflective process can be shared and accompanied by a collaborative community. In this way, it will be possible to face the practical daily challenges of teachers, share and reflect on practical experiences in real school scenarios, promoting the virtual mobility of teachers.

The final repository of experiences is conceived as a dynamic space for the co-creation of learning in community. A space where new and old professionals will be able to connect theoretical knowledge and practical experiences through a process that invites reflection- research- collaboration-formative action.

We thus understand that active participation in a shared learning community among European institutions leads to the exchange of international experiences and meanings, making real new forms of collaboration and knowledge creation.

III. Model components and implementation strategies

The objective of this section is to present the principles that support the reflective accompaniment model, presenting the methodological conceptions that support the training proposal. They also define the roles to be assumed by the different groups to which the proposal is addressed and make a series of suggestions for the techno-pedagogical design of the digital environment. Finally, some possible interaction scenarios, tools, and educational actions that could be developed within the framework of the network are proposed.

III.1 Theoretical foundations of the reflective model for the accompaniment of teaching practice

The reflective model we propose today has its roots in constructivist approaches, which hold that knowledge is constructed through the interaction between the person and his or her environment (Dewey, 1933; Piaget, 1970). In addition, this model is based on Schön's (1983) theory of critical reflection, which states that reflection on practice is essential for learning and continuous improvement. Likewise, the reflexive constructionist model is supported by Mezirow's (1991) transformational learning theory, which holds that learning occurs when individuals question and transform their prior beliefs and values through critical reflection.

Several pedagogical theories have helped us to define what we understand as a learning space in order to build this model. Among the theories reviewed, the following theories are used since each one of them contains elements that we consider fundamental to think about a reflective accompaniment proposal developed in a virtual environment, namely:

- **Experiential learning theory:** this theory holds that learning occurs through experience and reflection. Reflection on the experience is an important step in converting the experience into meaningful learning. The model of reflection on practice in virtual spaces is based on this theory, as it involves reflection on practical experience to promote learning and improvement (John Dewey, David Kolb, Jean Piaget).
- **Collaborative learning theory:** this theory holds that learning occurs through social interaction and collaboration. Online collaborative learning can encourage reflection through dialogue and group discussion. Students can share their perspectives and opinions to build their understanding and learning, which aligns with the model of reflection on practice in virtual spaces (Lev Vygotsky; Elliot Aronson; David Johnson; Roger Johnson).
- **Self-efficacy theory:** this theory holds that one's perception of one's ability to perform a task influences one's performance. Reflection on practice in virtual spaces can improve self-efficacy by allowing students to reflect on their strengths and weaknesses and take steps to improve (Albert Bandura; Richard Lazarus; Susan Harter).
- **Constructivist theory:** this theory holds that learning occurs through the active construction of knowledge by the learner. Reflection on practice in virtual spaces is based on this theory since participants construct their knowledge through reflection on their experiences and actions (Jean Piaget; Lev Vygotsky; Jerome Bruner).

Meta reflection in learning

- The constructionist theoretical perspective holds that learning is an active process that involves the construction of new knowledge and the reorganization of previous knowledge based on experience (Bruner, 1983). From this perspective, it is understood that learning is not simply the transmission of information but a process that involves active participation where the student is the protagonist of his own learning process, also from meta reflection:
- Papert and Harel (1991) point out that this way of conceiving practice can be a valuable tool in teacher training, since it **focuses on learning as the construction of a mental object specific of each individual** and through which he or she can reflect on his or her **own mental construction**. This implies that learning is an active and constructive process, where each person **is the protagonist of his own learning process**, and from this place, he or she will be able to reflect on his or her conceptions and experiences in order to reconstruct his or her own knowledge in a movement that could be considered as **a metareflective cycle**.
- Therefore, as Argyris and Schön (1996) point out, this model is based on the idea that **critical reflection** is fundamental for the transformation of teaching practice, and that this reflection is built through the promotion of various interactions, including internal dialogue and collaboration with others.
- According to Bruner (1983), this internal dialogue must keep in mind that "effective learning necessarily involves a task of cognitive construction, not simply the passive acquisition of information" (p. 98). Therefore, teachers must develop skills and abilities in order to be able to **construct and reconstruct their own conceptions** about teaching and learning in a reflective and critical process.

Collaborative learning

On the other hand, the fact of favoring instances of **collaborative learning**, where the exchange of experiences and knowledge is valued (Papert & Harel, 1991), fosters the development of social and cognitive skills, such as communication, argumentation, and problem solving, and allows students to build more complex knowledge through interaction with others. Along the same lines, Lave and Wenger (1991) emphasize the importance of participation in communities of practice for effective learning, which implies the opportunity to interact with other teachers and share experiences and knowledge.

For its part, the **reflective approach** implies "going around the experience" to analyze it critically, question assumptions, and generate new forms of action (Schön, 1987). According to Schön (1987), reflection is a process through which teachers question their practice, analyze their experience, and develop new forms of action.

In this process of looking again at the very core of the experience as it happens, and according to Bruner (1983), we must be aware that effective learning implies a task of cognitive construction, where teachers must be able to construct and reconstruct their own ideas and conceptions about teaching and learning, moving towards a new level of metacognitive reflection.

Situated learning

The proposed process then implies recognizing and starting from **a situated learning**, that is, learning that occurs in a social and cultural context, where knowledge is constructed and transferred through interaction with other individuals and with the environment (Lave & Wenger,

1991) to promote second-level reflective exchanges by sharing these situated learnings within the framework of a community of peers. But at the same time, we must keep in mind that learning takes place in a social and cultural context, where knowledge is constructed and transferred through interaction with other individuals and with the environments through which they pass. Lave and Wenger (1991) emphasize the importance of **participation in communities of practice for effective learning**. According to these authors, "learning is not simply a process of acquiring knowledge but a process of participation in a community of practice" (p. 29). This means that teachers must have the opportunity to participate in communities of practice, where they can interact with other teachers and share experiences and knowledge.

Connected learning

Regarding the importance of the digital environment in teacher education, Siemens (2004) proposes the "**connectivism**" approach, which refers to the "learning theory for the digital age" (p. 3). According to this author, "effective learning in the digital age requires a combination of knowledge sources and a focus on building learning networks" (p. 4). In this way, the digital environment can be a favorable space for the construction of learning networks and the connection with other teachers who are going through similar processes.

Likewise, **reflexivity mediated by technological devices** can be a valuable tool for the development of reflection at different stages of the learning process. According to Kumpulainen and Mutanen (2011), technological media can support reflection at different stages of the learning process from planning to evaluation (p. 52) by enabling access to educational resources and tools, communication and collaboration between learners and trainers, and self-assessment.

In conclusion, the design of a pedagogical model for reflective training and the accompaniment of teacher training must be able to consider **the constructionist theoretical perspective and the digital environment as key elements for the construction of a collaborative ecosystem**, aimed at promoting reflection on educational practices and the construction of new knowledge through participation in communities of practice, the construction of learning networks, and the use of technological devices for the mediation of reflexivity.

III.2 Principles that support the reflective accompaniment model of practice

The model was created in response to the need to provide a space for reflection open to the educational community and to try to establish a methodology that goes beyond institutional compartments and collaborates in the generation of collective knowledge of teachers about their own practices. Due to its collaborative conception, it is presented as a **flexible, dynamic, and under construction** model since its richness lies in the fact that it is the result of network thinking, and its final form will be the result of the decisions made and the actions carried out by the communities that integrate it. Communities that will have a set of principles, tools, and support environments available for the network to collectively manage their training process.

Within the framework of the Reflective Accompaniment Model that we propose, the autonomous, accompanied, or collaborative learning of the participants is privileged over the teaching of contents, techniques, and dynamics. To this end, academic processes that encourage reflective learning and promote the development of skills, values, and attitudes to favor metacognition are made available.

The model's pedagogical principles are based on those elements that contribute to placing the individual at the center of the process and at the same time promote collaboration among peers, placing experienced teachers as guides and facilitators of the process. On the other hand, the model

prioritizes the observation and reflection of current educational practices, located in different contexts and scenarios in which different teaching modalities are experimented with (face-to-face, virtual, and hybrid), using a multiplicity of methodologies, which address a complexity of knowledge (theoretical and practical), transcending the watertight compartments of disciplines, and which are carried out to meet the needs of an increasingly heterogeneous community of learners.

The reflective accompaniment program that we propose is not reduced to the mere provision of content, but it is developed from a series of pedagogical actions aimed at promoting reflection and collaborative learning (among peers).

The set of principles set forth in this document, thereupon, is not derived from a single theoretical source nor is it intended to form a definitive representation of a reality. Each of them, however, is based on scientific knowledge or on conclusions generated from systematized institutional practices.

Hence the commitment to a dynamic environment from which it will be possible to chart different courses of action according to the needs of the moment or with the testing of new methodological and technological possibilities.

In other words, there are no complete models per se, nor complete bodies of knowledge, or pedagogical theories for this purpose. But there is enough knowledge and experience to define a structured set of principles and criteria that can guide practice, i.e., what is done to carry out reflective processes of training and collaborative accompaniment in a network.

Thus, the five basic principles on which the model has been built are as follows:

- **Encouragement of individual and collective reflection on the construction of professional identity during periods of transition.** From this we can derive the emerging concept of *extended community*, where each person is an author and a user at the same time.
- **Meeting in a learning community** fostering exchange and support among professionals from different backgrounds, cultures, professional backgrounds, gender, age... etc.
- **Defense of interculturality** based on a model capable of managing and increasing flexibility, personalization, interaction and cooperation: providing training solutions tailored to the needs of users, taking into account the constraints linked to the policies, cultures, times, and habits of each community.
- **Commitment for collaborative and agile methodologies**, such as problem-based learning and reflection based on the design and resolution of cases, experienced in real time.
- **Learning mediated by sustainable digital technologies** adapted to the needs of the community.

These principles should not be considered as static postulates but, on the contrary, dynamic and open to the transformations and new requirements that the participating communities manifest over time.

The principles include an approach that values individual experience and the reflective action of the teaching collective, understood as a cyclical process; an approach that focuses on the transformation and change of practices centered on real contexts; an approach that bets on critical reflection; an approach that provides tools to start from oneself to focus on dialogic reflection and provide an open and flexible process for the community.

The achievement of these principles is materialized in our proposal through the creation and implementation of the following actions:

- **Creation of a European platform for practical training and virtual mobility of teachers in transition connected to a learning community.** The platform will be supported by digital technologies and will deal with the reflective practices of teachers associated with a social network of peers and all the training institutions involved. The social network will enable a peer-to-peer mentoring process in an international European context. In this way, it will be possible to face the daily practical challenges of teachers, share experiences with colleagues, discuss practical experiences in real school scenarios, in tandem, promoting the virtual mobility of teachers.
- **Design of a common framework supported by a digital platform for institutional collaboration.** The platform allows us to build a bridge between initial and continuous training and between EU countries, in order to harmonize criteria for teaching practical skills. This project links pre-service and in-service training, offering a comprehensive solution to reduce teacher attrition. Our approach will establish a space for inter- institutional collaboration for comprehensive teacher training that develops the work of HEIs linked to society, better relations with schools, and new relations with continuing education institutions. The new system will improve training coordination and contribute to integrated teacher training. The project will develop a common digital framework for teacher education institutions for sustainable collaboration after the life of the project, with an impact on teacher education policies at European and national level. The educational administrations will be involved in the development of the project to achieve a better consensus.
- **Development and implementation of a methodological proposal to promote reflective teaching practice.** As a relevant approach, the project introduces the development of reflective teaching practices that, based on problem-based learning, enable reflection and learning on issues of concern to teachers at different levels of training. This methodology combines a process of self-reflection, expert mentoring, feedback, and/or peer tutoring with the support of the learning community.

III.3 Dimensions of the reflective accompaniment model

The design of this reflective ecosystem is composed of three dimensions: cognitive, affective, and social, which communicate and interrelate in order to promote a dynamic process of reflection and transformation of teaching practice. The **cognitive** dimension refers to the acquisition of knowledge and skills; the **affective** dimension focuses on the identification and regulation of emotions related to teaching practice; and the **social** dimension focuses on dialogue and collaboration among teachers to collectively construct knowledge (Loughran, 2002).

At the moment of making them operative, we must bear in mind that these dimensions cross and intertwine in the model as a whole, having more or less incidence, depending on the phase, stage, and professional situation of the teacher going through the process.

- **Cognitive dimension:** this dimension focuses on the development of teachers' critical and reflective thinking, and their ability to construct meaningful knowledge from experience and reflection on teaching practice (Dewey, 1933). According to Schön (1983), "learning to teach is based on reflection on practice and awareness of the implicit theory that guides action" (p. 72). Therefore, it is important that the reflective model contemplates strategies and techniques in order to foster the development of cognitive and critical thinking skills. As Brookfield (1995) points out, critical reflection involves questioning the implicit assumptions and beliefs that underlie teaching practice in order to develop a broader and more complex perspective on it. Therefore, teachers are expected to identify the problems they face in their practice and interpret them in the light of previous knowledge and existing theories (Mezirow, 1991). And at the same time, be able to reflect on the skills used for action (Schön,

1998) in order to build new knowledge.

- **Affective dimension:** this dimension refers to the development of emotional awareness and the management of emotions in the teacher training process. The affective dimension focuses on aspects such as the development of self-awareness and empathy as tools for collaborative work and the collective construction of knowledge. According to García and Fernández (2019), this dimension involves the identification and analysis of feelings and emotions that arise during the process of reflection and transformation of teaching practice. In the affective dimension, the aim is for the teacher to have an emotional self-knowledge that allows him/her to regulate his/her emotions and be more sensitive to the needs of others. To this end, the development of skills that allow the teacher to adequately manage conflictive situations and establish empathetic and constructive relationships with other educational actors is worked on (Goleman, 1995). In this sense, Argyris and Schön (1996) point out that the development of self-awareness and awareness of others favors interpersonal dynamics in the educational environment. According to Zeichner and Liston (1996), "the emotional dimension of professional development is fundamental since the teacher's identity is intrinsically related to his or her self-concept and self-esteem" (p. 58). Therefore, it is necessary that the reflective model contemplates the management of emotions and the construction of a positive teaching identity.
- **Social dimension:** the social dimension focuses on collaboration and dialogue as strategies for the collective construction of knowledge and the transformation of teaching practice (Vygotsky, 1978). According to Dewey (1933), learning is not an individual process but occurs in the context of social interactions and collaboration. For this reason, this dimension seeks to involve teachers in collaboration networks and to establish reciprocal relationships and solidarity with other professionals and educational communities. According to Fullan (1993), "collaboration among professionals is the key to improved educational practice and professional development" (p. 203). Hence, this dimension focuses on building collaborative and supportive relationships among faculty and developing strategies and techniques that foster collaboration and teamwork.

The dimensions underpinning the model are linked to the aforementioned principles of **innovation, collaboration, reflection, and flexibility**. Therefore, the model must be dynamic and ambitious in its objectives in order to allow its natural evolution, according to the changes taking place in the different educational scenarios and based on the technological transformations that can be integrated into the network's training environments.

In summary, taking into account the above principles and dimensions, the model:

- Is based on the teachers' situated experience.
- It upholds the relevance of peer-to-peer learning.
- It promotes the reflective formation of an autonomous and participative teaching staff.
- It is oriented to the intervention and close collaboration of the actors in the educational process.
- It commits to learning that is open to the community and adapted to changes in professional fields.
- It uses methods and tools to transmit knowledge, skills, or values, integrating the necessary technological developments to promote communication among its members.
- It favors intra- and inter-institutional mobility and comprehensive training, promoting a humanistic and interdisciplinary approach.
- It is nurtured by a complex and heterogeneous learning environment open to the demands of a constantly changing society.

The model will be implemented using the resources currently available in the media ecosystem,



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but keeping in mind that it is a living and growing ecosystem. Therefore, the platform is conceived as an expanding technological space that learns and transforms as interactions among participants increase. In this sense, like any system that learns from its parts, the resources available to it will be transformed and expanded as the community participates and as the technological developments of the moment favor it.

IV. Instructions for the design of the reflective learning ecosystem

IV.1 Starting conditions

Once the principles and dimensions of the model have been established, the next step is to think about how to put them into practice and how to build a model of reflective accompaniment with them

In order to answer these questions, we understand that the design of the model must enable the emergence of a rhizomatic, dynamic, flexible, and open reflexive ecosystem; and for this, we understand that it is necessary to favor the following conditions, namely:

- **Conceive it as a cyclical process:** the proposed reflective process is framed, among other things, around a cyclical process that encourages in-service teachers to draw on experience (what?), to consider what learning they can draw from other sources (peers, literature, etc.) (so what?), and to consider what action can emerge from the reflective process (so what now?). The process encourages users to recognize their learning from the cycle and to consider what other issues this raises through a constant cycle of inquiry. Once the cycle of the reflective process is complete, users can re-engage with it based on the (new) issues that have arisen as a result of the initial reflection. The analysis of the works of Borton (1970), Kolb (1984), Boyd and Fales (1983), Schon (1983), Driscoll (1994), Rolfe et al., (2001), Cowan and Stroud (2016), contributed in the definition of this postulate. This approach supports the development of a reflective vision that is continuous, sustained, and leads to further reflection. Users are also encouraged to engage in meta-reflection, reflecting on their reflections¹ to see what additional learning they can gain, with respect to their beliefs and values, from their reflection. The cyclical process helps in-service and pre-service teachers link theory and practice. Collin et al. (2013) identified the continuing challenge of the theory/practice gap. This process of reflective practice challenges this conceptualization and argues that practice is theory and theory is practice. By linking to the original trigger or experiential aspect, the user can be supported in developing their understanding from both a theoretical and practical perspective. Saric and Steh's (2017) conceptualization of reflection as needing to be "systematic and analytical" is important, as it acknowledges the busyness of the teacher's life and the many competing professional demands of the role. Central to this principle was the adoption of a cyclical model that is clear, practical, and easy for teachers in the community to follow. **The reflective practice process as we have devised here is mindful of the notion of the "Reflective Zombie"(De la Croix and Veen, 2018).** Therefore, the process encompasses a series of prompts/gateways where the user has flexibility in terms of engagement. We challenge this perspective as we build on and across a range of models, supporting flexibility, choice, and user agency.
- **Enhance transformative learning** with the goal of influencing practice. Several of the theoretical works reviewed on reflection propose placing the focus on transformation and transformative learning, often with beginning or novice teachers. g., Boyd and Fales (1983); Mezirow (1981); Gibbs (1988); and Jasper (2013). The proposed reflective process encourages and inspires teachers to consider how they can transform their practice, and how that transformation can be ongoing. It also supports research- informed decision-making.
- **Encourage critical reflection.** As the reflective process provides practicing and in-service

¹ In many cases, the reflections are completed, archived, and considered complete. This process is encouraging users to reflect on their reflections, which should unearth more issues for consideration.

teachers with the ability to raise and consider critical questions about issues of questioning power and preconceived ideas and assumptions, building on the work of Valli (1997), Brookfield (2005), Yost et al., (2000) and Zeichner and Liston (2004).

- **Placing the individual at the center of the process (starting from oneself).** The "I" is central to the reflection. The proposed model places the "self" as central to reflective practice, considering emotions, feelings, and preconceived ideas and assumptions, as identified by Atkins and Murphy (1995), Yost et al., (2000), Korthagen (2001), and Brookfield (2005). Reflections that demand honesty and openness often elicit hostile and strategic responses from students (Hobbs, 2007; in McGarr and Ó Gallchóir, 2020), as reflections are inherently constrained by their academic nature (Ross, 2014). The authors have attempted to plan for this by including scaffolds in the shared learning space that promote active listening; tolerance for error; suspension of judgment; as well as drawing on multiple perspectives in the trigger or experiential piece.
- **Encourage flexibility, choice, and options.** The model provides users with options, flexibility of use, and choice. Users will not be required to participate in the stages of the reflective process in a particular order; they will not be required to complete specific tasks. Rather, the reflective process provides users with choices and options in terms of the approaches they can use to reflect on their process, and also how they can capture these reflections. Users are given a justification for each task (why am I being asked to consider this?), as a way of encouraging them to see the benefits of completing and engaging with the tasks, rather than being forced to do so.
- **Encourage dialogic learning and shared experiences.** The reflective process supports practicing and in-service teachers to engage in shared learning and dialogue and share experiences. This enables international peer-to-peer interaction, the development of cross-cultural awareness, and helps users to integrate additional and alternative sources of "knowledge" beyond their own context and understanding (Vella, 1994). Developing trust and ensuring that participants respect and are respectful of others are critical to learning and effective dialogic interaction.

Thus, the model of reflective accompaniment is presented as a **living ecosystem**, which allows to move through different environments, scenarios, and modalities of reflection within a digital platform.

The starting scenario will be composed of **multiple digital environments hosted on a platform in which each participant will be able to find a series of resources, spaces for interaction and communication** that favor contact between members of the teaching community at the European level, favoring the analysis of situations that cross borders (disciplinary, generational, ideological, cultural, technological).

The platform initially presents diverse virtual learning environments in which participants can find reflective dynamics, theoretical and methodological resources, as well as communication spaces that will facilitate the analysis of their practices at various levels (individual, personalized; accompanied by peers and/or in collaborative networks).

IV.2 Phases of participation in the platform

In order to illustrate the reflective process possible within the framework of the ecosystem, we have conceived four moments or phases of participation from which teachers can become part of the reflective community. Each of the phases **involves a set of strategies and activities** aimed at achieving the objectives of each dimension.

As with the dimensions, **the phases of the model should not be considered as a single, chronological sequence** since, in practice, the reflective process can begin in any of the phases and go through each of them indistinctly. The digital environment allows flexibility in time and space, which facilitates student participation in the training process.

In practice, the transitions between one phase and another must be conceived as **open, flexible, and malleable** since the combinations of paths that each teacher can follow must be intimately connected to the needs of his or her particular practice. Hence, the idea of a personalized, rhizomatic, and infinite accompaniment.

The following is a description **of the 4 phases with which the ecosystem is born**, with the proviso that they may be configured as required by the participants.

1. Phase of exploration and critical understanding of reality. Here teachers have to develop a critical perspective on the social, political, and cultural reality in which their practice takes place in order to understand the challenges and problems that arise and to identify opportunities and challenges for improvement in teaching practice (Schön, 1987). As Brookfield (1995) points out, "critical reflection involves analyzing the assumptions and frames of reference that underlie teaching practice in order to question and transform them" (p. 102). In this phase, **participants are invited to explore their practice based on previous experience and knowledge; analysis of the cases available in the repository; peer collaboration; consultation with mentor trainers; or participation in community discussion.** According to García and Fernández (2019), this phase allows "becoming aware of reality, denaturalizing practice, questioning normativity, and building knowledge from the perspective of action" (p. 57). The use of tools such as observation, recording, and systematization of the experience is suggested for the construction of knowledge based on reflection on practice. To this end, various strategies will be used, which may involve work at different levels: individual, accompanied by peers, or in community. **Likewise, at this stage, each participant will be able to count on different resources, spaces, and tools such as case analysis, observation of teaching practices, reflective journaling, and group work, peer coaching, among others.** These strategies are based on the idea that reflection on one's own practice is essential to improve the quality of teaching.

2. Dialogue phase, collaboration, and teamwork. Dialogue and collaboration among teachers are essential to collectively build knowledge, exchange perspectives, and develop new ideas. Therefore, in this phase, it is proposed that participants build new knowledge through interaction with others, teamwork for problem solving, and the generation of new ideas and knowledge in order to generate new forms of action (Brookfield, 1995). Thus conceived, the phase focuses on building support networks and identifying resources to address educational problems collectively. According to López (2018), this phase proposes an authentic and horizontal dialogue, where teachers sit in an environment of trust to share experiences, discuss cases, raise questions, and generate alternatives" (p. 29). According to Schön (1992), "reflective conversation among colleagues can be a valuable source of learning and professional growth" (p. 85). To facilitate this conversation (introspective; peer-to-peer or networked), various strategies will be used to encourage interactions among community members. In this sense, tools that favor communication (synchronous and asynchronous) will be made available, taking into account a wide variety of skills, media, and languages present in the community. In addition, a series of technical and methodological resources will be made available to encourage teamwork (agile methodologies); foster interaction (discussion forums, project collaboration); promote creative solutions (creation of multimedia digital materials; use of mixed reality); discussion spaces (Meeting, Zoom; incorporation of AI functions). These strategies are based on the idea that learning is a social and collaborative process, where participants can build more complex knowledge through interaction with other professionals and educational actors. According to Argyris and Schön (1996), dialogue and collaboration are fundamental for collective learning and

for building a community of practice.

3. Application phase, shared reflection, and transformation of teaching practice. In this phase, the aim is, on the one hand, for participants to apply the knowledge acquired during their reflective process in the classrooms, considered as living environments, and to evaluate their learning process, receiving feedback to improve their daily practice. To this end, various strategies will be used, such as the implementation of classroom projects, monitoring and evaluation of actions, informed feedback of evidence, or the provision of instruments to facilitate self-evaluation. These strategies are based on the idea that learning is a continuous process that develops over time, and that processes need to be implemented and evaluated in order to improve the quality of teaching.

On the other hand, shared reflection on teaching practice is promoted through collaboration and dialogue; the discussion of processes; and the contribution of other perspectives on classroom events. To this end, strategies and methodologies will be available so that participants can analyze and monitor the evolution of their peers and colleagues, identifying the strengths and weaknesses of their actions and proposing alternatives for improvement. This phase seeks to transform teaching practice through the collective construction of knowledge. The aim here is to encourage a conversation between perspectives from other contexts (disciplinary, ideological, cultural) that can contribute elements that can favor classroom actions. According to Zeichner and Liston (1996), "shared reflection can generate a real change in teaching practice since it allows for a critical review and reconstruction of educational conceptions and strategies" (p. 57).

All this to promote a transformation of teaching practice based on critical analysis and collaborative dialogue. As Schön (1983) points out, critical reflection involves identifying and questioning the assumptions underlying teaching practice in order to transform and improve it. This phase allows "the joint construction of new possibilities for action through reflection in action and reflection on action" (Schön, 1998, p. 67). The use of tools such as literature review, evaluation and joint educational action planning, and teamwork for the identification of innovative strategies is suggested.

4. Finally, and in coordination with the previous phases, we find the phase of Consolidation, transfer, and communication with the community. According to Zeichner and Liston (2013), this phase involves "consolidation of knowledge understanding, integration of new practices, and transfer to other teaching situations" (p. 25). Documentation and dissemination of the experiences and results obtained are promoted for their subsequent implementation in other educational contexts, and the aim is for teachers to become agents of change and promoters of critical reflection in their educational environment. According to Mezirow (1991), transformational learning involves the application of newly acquired knowledge and skills in everyday life to transform one's practice and continuously improve it. This phase proposes to increase synergies among participants as it seeks to consolidate and transfer learning to the context of practice (Fullan, 2001). At the same time, it implies the socialization of the knowledge acquired throughout the processes, and the construction of new inputs that feed back into the system by circulating through the communication channels provided for the exchange, the reflections, resources, cases, tools, methodologies, and solutions developed by the participants, so that the network of shared knowledge remains in constant growth. There are three elements to be prioritized in this phase, namely:

- On the one hand, fostering the development of metacognitive skills to critically reflect on their own thinking and learning process.
- On the other hand, the development of emotional skills to manage stress and emotions associated with teaching practice.
- Finally, the reflective model for the accompaniment of training must pay special attention to feedback processes, including dynamics, strategies, and tools that favor continuous and formative accompaniment, allowing participants to receive constructive feedback for

improvement.

IV.3 Implications of the model for continuing education

Thus conceived, we understand that the model will have important implications for continuing teacher education. In the first place, since it implies a change in the role of the trainer, who will have to act as a facilitator and guide in the knowledge construction process (Schön, 1987). Second, it implies the need to create communities of practice in which teachers can interact and collaborate to collectively construct knowledge (Wenger, 1998). Third, it implies the need to incorporate reflective strategies in teacher training, such as observation of one's own practice and critical reflection on it (Zeichner and Liston, 1996).

Participation in this ecosystem implies going through different levels of reflection in which participants will be able to develop and/or expand transversal skills and knowledge related to:

- **Critical understanding of reality:** teachers must develop a critical perspective on the social, political, and cultural reality in which their teaching practice takes place, in order to understand the challenges and opportunities that arise. Teachers are invited to make a critical analysis of their educational reality in order to identify the problems and challenges they face. It promotes reflection on one's own practice and the construction of knowledge based on experience.
- **Dialogue, collaboration, and teamwork:** dialogue and collaboration among teachers are essential to collectively build knowledge, exchange perspectives, and develop new ideas. Teamwork and the collective construction of knowledge is encouraged through the exchange of experiences and perspectives. Learning focuses on building support networks and identifying resources to address educational problems collectively.
- **Shared reflection and transformation of teaching practice:** shared reflection and transformation of teaching practice is promoted based on critical analysis and collaborative dialogue.
- **Development of metacognitive and emotional skills.** Teachers need to develop metacognitive skills to critically reflect on their own thinking and learning process, as well as emotional skills to manage stress and emotions associated with teaching practice.

V. Interactions in the designed ecosystem

V.1 The beehive model

The model we propose is of a nature that requires to be approached from a **systemic perspective**. This means that the different elements that compose it, to which we refer below, form and **relate to each other through a network/hive structure**. For this purpose, communication and interaction tools will be the basis of the network, as teachers must feel that they are members of a community that researches and experiments in order to improve their training.

This digital reflective cycle process supports agency and individual user input choice. In this sense, a teacher who enters the platform will have a series of environments and scenarios from which he/she can access spaces for reflection and experience different levels of interaction and commitment.

The model integrates five essential components that interact with each other.

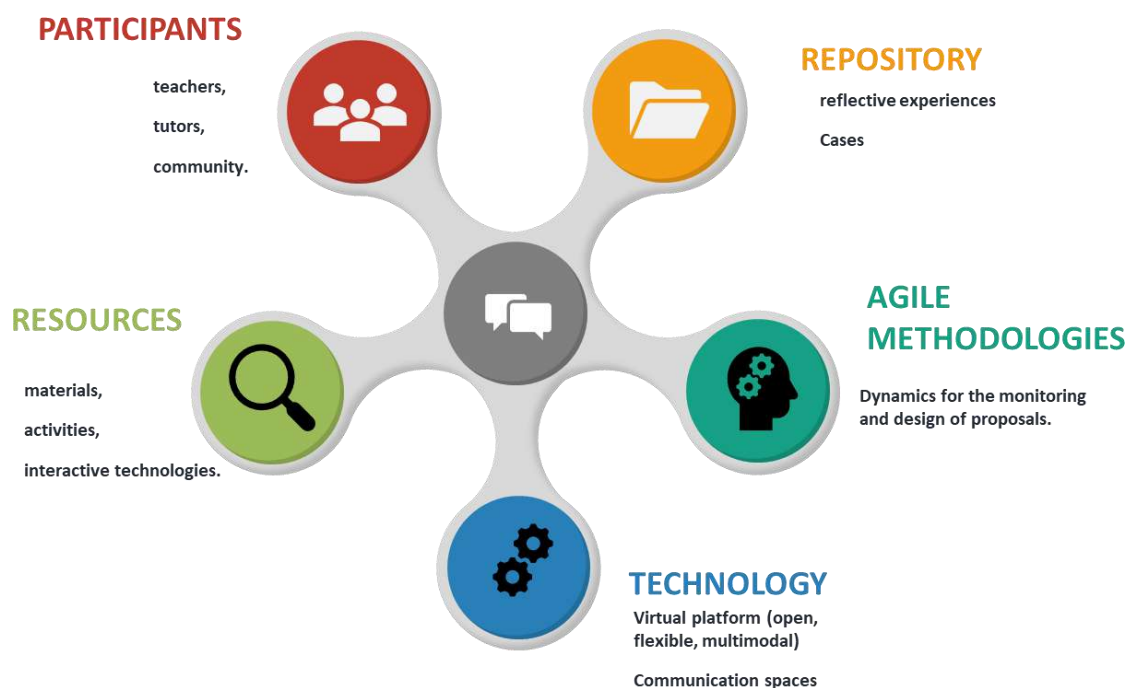


Figure 4: Interactions in the designed ecosystem (Source: Own creation)

According to this structure, the elements of the model interact with each other without following any pre-established order, given that the nature of the interrelationships will be constantly constructed in a dynamic and flexible manner as they are linked to the needs and demands presented by the practices.

The hive represents an **open and cyclical system** where new elements and new connections can be incorporated into the system at any time and affect more or less the previous forms of interrelationship. There is no hierarchy among these elements, since they all have a specific and essential function for the operation of the model.

Depending on the moment, the demand, the type of case, some elements become nodes with more connections than others since they intervene and are necessary for the development of a greater number of processes.

Starting from the life experience of each teacher, within a virtual environment, implies taking into account a series of specific elements that affect in a transversal way and, from different perspectives, the design of possible learning situations. Garrison (2005) identifies three necessary presences: the cognitive, the social, and the teaching in the design of learning processes in virtual environments, which in the framework of our proposal can be translated as follows.

- **Cognitive presence (personalized space)** refers to the design of the interaction between the teacher (student or recent graduate, professional) and the specific learning content on which he/she initiates his/her reflection, i.e., the challenge or case he/she brings to the community.
- **Teaching presence (accompaniment)** is developed from the figures of mentors and tutors, and the action of designing, facilitating, and guiding the cognitive and social processes with the objective of obtaining educational results that are significant for the members and enrich the meaning of the teaching accompaniment.
- **Social presence (network community)** is defined as the capacity of the network members to get involved in the work spaces with the rest of the participants (faculty and students) and to collaborate in the reflective processes proposed by their peers.

Another transversal element of the model is the commitment to the **development of agile and collaborative learning methodologies**. This again implies giving a fundamental role to the communicative processes of joint work among the members of the community (social presence), both in the reflection on the cases and in the reflective accompaniment of their peers or in the design of learning activities. The idea is to create learning situations that require the different groups to coordinate joint actions, manage information and resources, discuss and argue their own ideas, make critical judgments about the work of others, etc.

Collaborative learning involves **using teamwork in problem-solving situations, in the development of projects, in the co-creation of products, through communication and discussion with different, peer, and diverse others**.

Collaborative knowledge construction has to combine personal experience, group inquiry process, and knowledge management with the support of virtual environment tools. But the model must not only be based on group work. In fact, collaborative learning also **implies leaving spaces for autonomous work**, so individual use spaces must be provided where participants can have inputs that facilitate reflection on their own process. These spaces could have tools to

systematize their practices, research by doing (resources such as video blogs, virtual diaries, planning and follow-up systems, autoethnographic diaries, etc.).

In the model, the **experience and reflection on the particular experience of each teacher occupies a primordial place**. Therefore, the whole process revolves around the design of spaces, materials, and resources that favor and accompany their reflection-research-collaboration- learning processes.

Centralizing action on the teaching experience means **focusing on the design of spaces that favor encounter and dialogue** and, likewise, **provide tools, support, and spaces** for each teacher (individually or accompanied by the peer community) to have the necessary time to review those learning situations for which he/she has no answer in his/her daily work. In other words, it is not a question of offering **a recipe book of pre-designed answers based on the transmission of contents** but of promoting collaborative reflection and inquiry, to observe why we do what we do, and what type of interaction we establish with what we do.

This implies taking as the core of the work **the particular account of the cases that each teacher will raise as a problem or project of interest, from which he/she wishes to start his/her reflection and share it with other teachers**. From this perspective, the design of learning activities (cases) and the design of discussion, research, and collaboration activities around the resolution of cases are seen as two sides of the same coin.



Figure 5: The practical "case" at the center of the learning process (Source: Own creation)

V.2 Design of activities and resources

We observe how reflection on practice **based on the generation of cases** becomes the central learning activity, bringing together the three fundamental elements that constitute it: resources, collaboration, and accompaniment. Depending on the specific content and role of each of these elements, each teaching practice may generate a variation of this model, thus adjusting to the diversity of experiences and knowledge of the community.



Figure 6: The practical "case" in the case repository
(Source: Own creation)

An element considered transversal for the functioning of the network is the **construction of the case repository**.

This space, created jointly by the community, is a key element of the educational model, the nucleus around which reflection is organized, learning is given meaning, and the growth and continuity of the hive over time is guaranteed.

Cognitive presence may also arise from consulting the case repository since the space will grow as teachers contribute new experiences from their practical work.

This collaboratively built repository will also include a series of **learning materials and resources** developed by the participating community itself. Basing teaching action on the design of cases facilitates a revision of the meaning of teaching materials, which come to be considered more as resources for learning.

Learning resources comprise both **educational materials expressly designed to support and convey learning contents**, as well as other types of documents and tools, textual or multimedia, extracts from the web, created by the participants themselves. The project will have a **case study repository**, containing didactic case studies and a search engine. An online editor will enable teachers/trainers/mentors to create or edit new case studies, including scenario descriptions, videos, expert opinions, and reflection questions.



Figure 7: Learning resources around the case study (Source: Own creation)



Figure 8: The virtual environment of the Digital TA model (Source: own creation)

The **virtual environment** is the space that provides access to resources, content, and collaborative spaces, enabling a certain type of interaction with them; in this sense, it could be considered as another learning resource. The virtual environment of the network is the specific space in which the three presences referred to above converge and interrelate: the individual cases, the teachers (tutors and/or mentors), and the learning community.

Given the diversity of groups, themes, languages, and literacies that will converge in the

environment, it is necessary to provide a friendly tool where the different groups can interact and, at the same time, feel like a reference space for their formative reflection process. The sense of network training is oriented towards teamwork, and the student is asked to be able to manage and produce knowledge jointly. It is an approach to work that is more coherent with the philosophy of Web 2.0, based on participation and collective knowledge construction from an interdisciplinary approach and more transversal to the students' life experience (both formative and social and labor).

V.3 Interactions of the participants in the process

The model is based on the construction and strengthening of a community of peers, where accompaniment and reflection on the situated practice is presented as one of the elements that support the operation of the proposal.

In this sense, it is essential to have a broad collective that, based on their individual knowledge and experiences, can collaboratively build a repository of cases from which they can raise the problems, demands, and needs that arise on a daily basis in the educational scenarios where they develop their teaching practice in order to build a collective knowledge.

This community can be adequately described in terms of three interacting variables that run through the entire process:

- Students in training, teachers and professors, as main actors of the reflective process, enter the network from the approach of training needs and the elaboration of cases for collective discussion.
- Mentors and active teachers, as the driving force behind the accompaniment, participate in the network as facilitators of collaborative reflection.
- The knowledge and contents, as communicating links, feed the network from the generation of real cases on which the reflective process and the co-creation of actions in the acting community are initiated, generating new dynamics of collaboration that widen and feed the community.

As cross-cutting components, we highlight the evaluation and monitoring of both learning and its application, and the promotion of interaction and communication, which we understand must overcome the barriers of time and space with the use of various didactic and technological means.

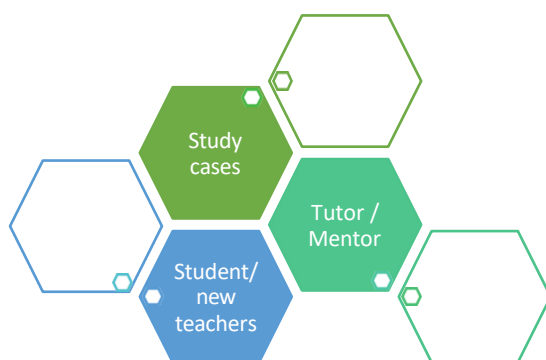


Figure 9: Model hive structure (Source: Own creation)

In short, the model must be able to evolve based on community sharing. It must grow as the cases bring new challenges to the teaching profession. It has innovated, creating dynamic models of third-generation reflective accompaniment. Creative models that, starting from individual experiences, bet on the construction of a flexible and participatory collective knowledge.



These transformations must make it possible to maintain the principles on which the model is based but from a new perspective:

- Flexibility must make it possible to implement multiple and diverse applications of the model, depending on the type of case to be considered;
- Personalization should allow each teacher to design and self-manage his or her own reflective process in the best possible conditions and with the necessary support from the peer community;
- The possibilities of interactivity must be provided by methodological and technological openness, based on the premise of interoperability between tools and the multimedia nature of the available resources;
- Cooperation must lead the collective to the collaborative construction of knowledge within a network of learning communities.

A fundamental element **of the model is accompaniment**. If we accept that the student in practice or the recently graduated teacher is the center of the process, then the members of the community who act as tutors and/or mentors must adopt a guiding role, support and energize the reflective action throughout the learning process, and help the student or young teacher to direct it towards the achievement of the established objectives. The idea of accompaniment is also reflected in the facilitation of the organization of resources and the design of the most appropriate forms of interaction and collaboration to achieve the learning objectives in each case, favoring maximum personalization. Constant follow-up and support are a value that must continue to be promoted and improved. To achieve this objective, the incorporation of tutors and mentors specialized in teaching innovation and research must be encouraged and reinforced.

VI. Proposed Didactic Design: scenarios, tools, and activities.

VI.1 Didactic sequence: define, share, reflect, resolve, consolidate

The process of reflective accompaniment must be synergetic, cooperative, and interactive, encouraging: personalized reflection, conversation among participants, the use of technological environments and the guidance of the facilitator.

- Facilitates, through instructional design, autonomous learning and independent student work in interaction with facilitators.
- The tutor or facilitator acts as a guide or companion along the path, providing methodologies and tools that favor individual reflective processes.
- It places the community members at the center of the process, as builders of their own knowledge and learning.
- Personalizes the reflective process by adjusting the proposals, challenges, and scenarios to the learning pace, time, and space of each person.
- It considers the different learning styles to diversify didactic strategies (individual and collaborative).
- Uses technological tools as a means to improve the teaching and learning process, promoting the use of digital educational resources.
- It favors interaction, incorporating synchronous and asynchronous moments.

In order for the community to build and define the main axes from which the network will start to be nurtured, an accompanying device is proposed that starts from the reflection on the individual practice of the participants to promote the situated reflection and the collective construction of knowledge.

In this way, another possible entry scenario to the network could be to enter through a door where the new user **starts his journey from a first challenge** in which he/she will have to **define his/her problem or need, building his/her own reflective challenge**. For this activity, teachers will be accompanied by a tutor or mentor who will guide their reflection by providing theoretical, didactic, and methodological elements so that each teacher can **inquire about his or her practice**.

In the next phase, the **user will share his challenge with other members of the community** in order to initiate **a collective, reflective action**. This action will be supported by accompanying methodologies such as **problem-based learning**. At this stage, the aim is for the community to contribute reflections based on their particular knowledge and experiences in order to collectively build alternatives to respond to the problems posed.

Afterwards, based on collaborative research, the community will participate in the **resolution of the cases** with a series of **resources, tools, and spaces**, where the participants will be able to carry out a process of reflection assisted and accompanied by active professionals.

This process of reflection and action research will end with the **construction of new cases, environments, and materials**, which will feed **the repository of experiences** that will remain open to the entire participating community as a space for consultation and creation of knowledge.

The cyclical nature of the process is the basis for the community to grow by fostering dialogue and interaction among participants. Thus, active participation in a shared learning community among European institutions will, we understand, foster the exchange of international experiences and meanings, making new forms of collaboration a reality. The following diagram outlines the proposed model.

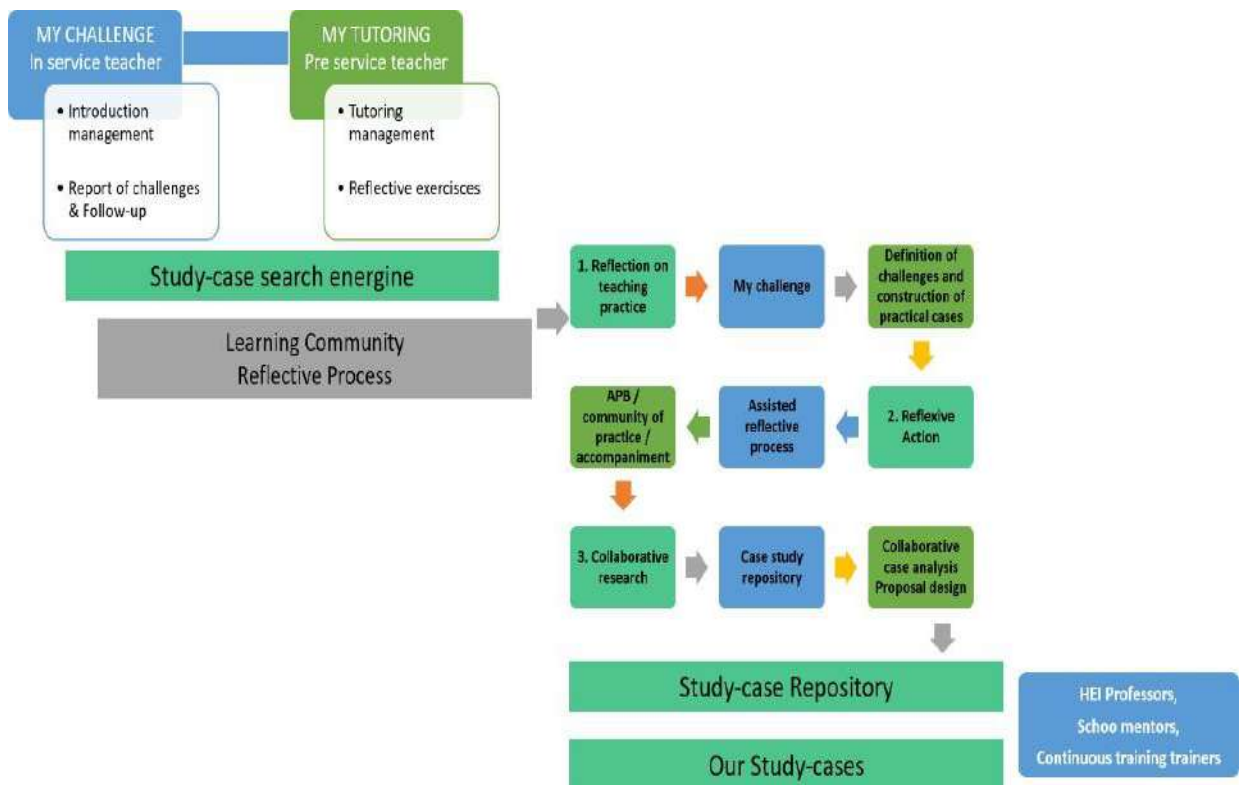


Figure 10: The two modules integrated in the model (Source: Own creation)

Each environment or "door" reflects and includes a series of common experiences:

- Environment Diagnosis or problem: part of a critical piece (case or challenge)
- Debate/Dialogue Environment: Professional Learning Community, PLN; Learn/Share.
- Metacognitive environment: explain the process and why they are asked these questions.
- Experience environment: link to 'Cases,' materials, and repositories.

Each environment includes prompts/questions to consider on an individual and/or shared level. It also includes a number of suggestions for process/pedagogical approaches to support engagement with the prompts (as evidenced by the literature review).

Thus, once the participant enters a new environment, he/she will find spaces configured to promote reflection according to the characteristics of the environment he/she wishes to move through. For example, you may decide to enter a personalized environment, where reflection

takes place on an individual level, where you will find resources to facilitate self-training. Another example may be the case of a teacher who decides to move through an environment accompanied or mentored by a peer. In this scenario, the participant will then find tools that allow him/her to communicate with his/her mentor, as well as resources for the guided planning of the reflective accompaniment or other materials that will facilitate the conversation with the community.

Following this line and as possible initial environments, we propose the creation of the following:

- **Personal reflection** (self-directed and/or accompanied by mentors and tutors), users will be able to go through the environment, passing through **a space dedicated to the development of a personal challenge** (which can also be worked on self-directed, accompanied, or at community level);
- **A meeting space for reflective practices** (open to the entire community) organized around a series of discussion topics, which will vary as the community resolves and proposes new topics for debate;
- **A space with a repository of experiences** (cases) and theoretical materials and digital tools of free access. A space that will function as a synthesis of experiences and a space for the collective creation of knowledge.

Learning to learn.

Cases can be the entry point for those who identify **a particular trigger/experiential piece**. However, the reflective practice process has been **developed and designed to also support a process-oriented reflective approach where the user is supported to explore and gain a deeper understanding of the problem or challenge**. Case studies do not always have to be the first engagement with the platform; rather, they can be introduced as part of or as a scaffolding for the pedagogical processes as identified and required by the user.

In this way, each user will be able to enter the community based on their specific situation, and from there, guided by their tutor/mentor, they will be able to move through the rest of the environment as their reflective process requires the use or combination of the tools, communities, and competencies offered in each of the doors of the environment.

The reflective process that accompanies this journey incorporates **metacognitive approaches** to teaching and learning about how reflection is promoted while participating in the process. In this way, it is proposed that users develop greater understanding and positive views towards reflection through participation in this metacognitive model, as each of the spaces will present them with a new way of reflecting on what they are doing and why (not only focused on their own experience but also on how the reflective process itself is constructed).

VI. 2 Considerations for platform development

The model contemplates the integration of information, communication, knowledge, and digital learning technologies (TICCAD), through technological tools and digital educational resources in the training programs and/or learning units in the different modalities and levels

of study.

Technological tools have the function of providing support as a means of online communication, interaction, and collaboration for the construction of knowledge and learning, as well as the management of teaching processes in virtual environments. Digital educational resources focus on informing, supporting the understanding and acquisition of knowledge, facilitating the acquisition of skills, and assessing the development of competencies.

To achieve this objective, it is important that the model allows flexibility and participation of the groups involved in the co-design and constant improvement of the training environment.

The formative technology environment is then supported by the community and is conceived as a challenge management tool, ready for teachers in transition to describe, present, and share their personal experiences and follow up on problems with mentors and/or the learning community.

Any platform to support reflective practice must be accessible, safe, and secure. It is important that it provides multiple modes of interaction, communication and representation of ideas, as well as multiple ways to engage in reflective practice. Thus, for example, the platform has to contain alternatives that allow us to go through such heterogeneous situations as, for example, the following:

- Participants need ample support and time when engaging with the reflection, especially in familiarizing themselves with the online approach; therefore, mentoring and coaching will be vital. Likewise, mentors require affective training to support commitment to the process. In both cases, technological mediation must make it possible to improve and expand the channels, means, and languages to promote effective communication among the members of the community.
- Teachers need scaffolding, so that they do not simply write or describe the subject matter but engage in a process of reflection that leads to new learning and practice. There must be a link between theory and practice as part of the cyclical process. The platform must therefore include elements that allow for an innovative and creative reconstruction of the cases. For this purpose, the use of interactive tools, immersive reality, or mixed reality, for example, is favored.
- It is important that the users (in-service or in-service teachers) do not feel that they are being accompanied indifferently or feel that they are reflecting for no one else but themselves. Otherwise, honesty and true criticality in reflection are compromised. The environment must contain safe spaces that promote data protection while enabling more ethical ways to share information and open the conversation to the educational community.
- Reflection and reflective practice should be explicitly defined so that pre-service/ in-service teachers feel comfortable and instructed to participate in the experience. Consideration of incentives and benefits for teachers to engage with the platform is important and important to make explicit and clear to the users.

The platform will be a common open virtual environment aimed at teachers in transition that, based on the needs detected within the communities, can be presented as follows:

- **A tool for the daily challenges of pre-service and in-service teachers.** By providing a specific peer-to-peer social network combined with individual support to students and newly qualified teachers during their initial and induction stages, the environment can contribute to training by providing a safe space to address and alleviate some of the concerns that cause these teachers to consider leaving the profession.
- **A European platform for effective learning.** Effective learning will be possible through the formation of a Community of Practice that will be sustained and grow from the reflection on

the situated experiences of its participants.

- **A digital platform as a linkage tool.** Conceived as an open space, the tool will provide meeting spaces where it will be possible to create a formal link between schools, teacher training institutions, and universities, during and after the development of the project. This is done by creating formal links between all stakeholders and between experienced teachers and newly qualified students/teachers.
- **A platform to support newly qualified teachers, students in training, and teachers who want to improve their educational practices in their schools.** Support students and newly qualified teachers to engage in collaborative critical reflection. In this way, we seek to avoid conformity to dominant schooling practices (De Roiste et al., 2012) and to engage participants in an enriching socialization process, improving their practices.
- **A European and intercultural tool.** Finally, and through the linking of students, teachers, mentors, and recently graduated experts from different countries will allow these teachers to explore different European and cultural perspectives. The views of other teachers from a different culture, as well as the approaches of different educational systems, will enrich the new teachers.

Thus, the virtual learning environment must take into account the following elements in its construction in order to favor reflective practices and metacognition of the participants.

Starting from a multimodal approach. It is to promote the combination of educational modalities that are developed recognizing their benefits and potentialities, incorporating the principles of flexibility of educational processes and academic innovation, which favors the consolidation and operability of the guiding principles of the Model. The multimodal approach is conceived as an element that facilitates reflection, as it promotes the use of TICCAD and the use of agile methodologies to promote learning, and for this purpose proposes different spaces and modalities of reflection that can work individually, mixed (teacher-tutor), collective (community of peers), according to the needs and conditions of each participant and the guidelines established for each reflective modality.

The incorporation of the multimodal approach has a positive impact on the coverage of the training environments designed, as well as on the support services and on the diversification of means and learning experiences during the trajectory of each participant within the space.

Technology platform or learning management system (LMS). The technological platform that supports this model is constituted as a virtual training space, aimed at facilitating a technology-mediated learning experience. Therefore, the environment has to integrate interconnected and feedback tools that collaborate with the development of the various actions that will take place in it, such as, for example:

- **Tools for education:** technological infrastructure necessary to meet the needs of academic training and digital information management for use in the learning units, with access to the services available to consolidate the Model project.
- **Communication tools:** are those that use information and communication technologies as a means to develop dialogue, discussion and debate, interaction and communication skills, and in short, information skills: Synchronous; Asynchronous.
- **Tools for learning evidences:** they are characterized by being developments that allow recognizing what the participant knows and/or can do in a given situation, in a given context, in relation to the monitoring criteria established in the reflective process: Learning Management Systems (LMS); Cloud-based file storage systems; Video-on-demand platforms; Productivity tools.



Among the characteristics foreseen for the choice of the platform are also the following elements:

- Centralization and automation of learning management.
- Flexibility. The platform can be adapted to the cases to be studied, as well as to the pedagogical and reflective style of the participants, which allows it to be organized very easily and quickly.
- Interactivity and personalization. Each participant becomes the protagonist of his or her own learning through self-management of the available inputs, which are put at the service of the topic, problem, or challenge that each member wishes to raise.
- Standardization. The reuse of previous resources is proposed, personalizing content and knowledge.
- Scalability. To ensure the comprehensive care required by society.
- Functionality. To meet the requirements and needs of users.
- Usability. Ease with which people can use the platform.
- Ubiquity. To generate peace of mind for the user and give them the certainty that they will find everything they need on the platform.
- Integration. To be able to integrate with other future applications still under development, allowing to measure the impact, effectiveness, and above all, the cost of training activities.

As an example, we could consider starting from a collaborative framework of free and open-source content based on JavaScript. The framework consists of a basic content editor website and a content type sharing website, it can be installed or added as a plug-in for use in content management systems and can also be downloaded with a file format for HTML5 resource bundling.

An example could be the H5P. A tool for creating interactive web experiences, specifically designed for the world of education.

H5P can be integrated into Moodle (Global Classroom platform) and is an agile and efficient tool that allows to:

- Create rich content from Global Classroom.
- Share content quickly.
- Reuse and modify the content at any time.

This tool or work environment is free software, and within the licenses, it implements the MIT license². The MIT license allows you to reuse software within proprietary software. The text of the license is not copyrighted, which allows its modification. Therefore, it is a software license that does not prevent or limit its use in the creation of educational content. The important thing for the education sector is to use it for learning purposes, as it has done with other tools, such as the well-known LMS (Learning Management System) Moodle.

On the other hand, the tool provides integration with other existing publishing systems, such as:

- Canvas LTI integration
- Brightspace LTI Integration
- Blackboard LTI integration

Among the advantages of H5P, we can point out that:

- Its main objective is to create more engaging interactive content for the community.
- Helps to increase the motivation of participants with the presentation of interactive content.

- It allows you to create interactive content, activities, images, and videos.
- Interactive videos, for example, include the ability to create questions within the video itself, explanations, or feedback.
- The results of the activities can be reflected through the Global Classroom grade book.
- The resources created can be reused between virtual spaces.

H5P allows you to create, share, and reuse created content such as images, presentations, timelines, interactive scenarios and videos, a virtual tour, personality quizzes, questionnaires, etc. In addition, it gives access to many types of content that have been developed and shared using H5P. Among the resources available in H5P we find, for example:

- **Interactive video:** allows the introduction of information within the video itself, as well as questions that allow to evaluate the students' attention, generating a direct interaction.
- **Branched scenario:** allows the creation of bifurcated learning scenarios to adapt to the pace and needs of the learners.
- **Interactive book:** allows you to group a large amount of content, whether textual or visual, in the form of a book that can be interacted with.
- **Image Hotspots:** allows you to make an image interactive by including hotspots with which you can interact and to which you can add videos, text, other images, explanations, feedback...
- **Dictation:** it is a simple activity that allows to know the listening and spelling comprehension of the students through a dictation. This resource is very interesting for language learning.

All these types of content can be created from the H5P.org web interface itself as well as within the LMS or educational content management systems mentioned above, i.e., from Moodle or WordPress. Portability between content managers is very simple. Therefore, the potential of the tool is also its versatility to allow sharing and creating a community of users who can benefit from the advantages of creating interactive content for related subjects and themes.

VI.3 Collaborative resources for reflective learning

One of the main objectives of this model focuses on supporting the reflective processes that the members of this learning community could carry out individually, accompanied, or collaboratively within the framework of the network community. A second objective is to promote the use and production of innovative digital educational resources, aligned to the reflective processes and attentive to the real needs that the members of the community will raise through their interactions.

Digital resources are materials composed of digital media and produced with the purpose of facilitating the development of monitoring, reflection, and learning activities in the various spaces that make up the network. Through the development of these resources, the incorporation of the most current technologies for the development of virtual, and face-to-face learning environments will be promoted in order to provoke a dynamic of self-directed, interactive, and impactful learning for the development of digital competencies of students and teachers.

Likewise, under the umbrella of collaborative learning, one of the tasks when developing new resources will be to promote the development of learning actions based on work in small groups, where network participants with different levels of ability use a variety of activities, tools, and communication environments to share their reflections, request support to investigate what is happening in their practice, or dialogue with the network of teachers about their classroom experiences.

In this space, the available resources must be used so that each member of the group takes responsibility not only for his or her own learning but also for accompanying other members in



learning how to teach, thus creating an atmosphere of shared reflection.

At this level of collaboration, we consider that we have to provide a series of tools that allow interaction among participants at different levels of commitment that they assume when participating in the reflective network. In this sense, we understand that for each level of interaction (individual, support, or collaborative network) we must provide a series of resources to facilitate communication among participants.

This set of resources must be flexible and scalable insofar as it must take into account the multiplicity of disciplines, knowledge, and know-how, and at the same time, it must be attentive to technological advances in order to incorporate among the resource's tools adapted to the times and contexts of real practices. Among the resources we initially plan to offer in this first stage of the network's development are, for example:

- Shared documents in multiple formats
- Gamification tools
- Educational mini-games
- Interactive videos and audios
- Immersive Worlds
- Augmented, virtual, and mixed reality

VI.4 Educational resources for self-directed reflection

On the other hand, and as we point out in other sections of the document, the ecosystem that we present must also allow for self-directed reflection and provide elements to develop the capacity for reflection at the individual level. Self-directed or self-regulated learning is the process by which individuals take the lead in their own learning by taking the initiative (with or without the help of others) to identify their learning needs, formulate their goals, distinguish their strengths and areas of opportunity, and obtain the resources, materials, and elements that will enrich their learning experiences.

Some of the resources that can be found on the platform for the development of self-directed learning competencies are:

- Learning objects
- Interactive Presentations
- Digital animation and multimedia
- Educational videos
- Podcasting
- 360° Videos
- Graphic organizers
- Video games
- 3D models
- Augmented, virtual, and mixed reality

VII. ANNEXES

VII.1 Agile methodologies for reflective coaching

The commitment to agile methodologies is based on the fact that they promote an interactive and flexible approach to project development, and they can be applied in the context of training to improve its efficiency and effectiveness. By using an agile approach, participants will be able to work in small *sprints*, receive constant feedback, and adapt to changes and challenges as they arise. This will enable them to continually improve their understanding and skills, and offer a personalized approach tailored to individual and/or community needs.

Certainly, a pedagogical model that incorporates agile and reflective learning methodologies to accompany teaching practices could look like this:

- Agile planning: the first step in this model is to plan the coaching sessions using agile methodologies. The coach and participant(s) would work together to establish clear goals and expectations for each session. The tutor would then prioritize the most important topics to cover and create a flexible plan that can be easily adjusted as needed.
- Active and collaborative learning: during tutoring sessions, the tutor would encourage active and collaborative learning. This could include group discussions, problem-solving exercises, or hands-on activities. The tutor would facilitate the learning process, providing guidance and support as needed.
- Reflection and evaluation: periodic reflection and evaluation would be included in the mentoring sessions. The tutor and students would reflect on their progress and identify areas for improvement. They would also assess their understanding of the material and use this information to adjust the pace and direction of the tutoring sessions.
- Interactive development: the tutor and participants would use agile methodologies to interactively develop their understanding and skills. They would work together to make adjustments and improvements based on their reflections and evaluations. The mentor would encourage participants to take ownership of their learning journey and become more self-directed.
- Continuous improvement: finally, the tutor and the participants would continuously strive for improvement. They would regularly reflect on their progress and use this information to make adjustments and optimizations in their mentoring approach. They would also celebrate their successes and recognize the challenges they have overcome.

This pedagogical model provides a flexible and adaptable approach to mentoring that incorporates agile methodologies and reflective learning. It emphasizes collaboration, active learning, and continuous improvement, encouraging participants to develop important 21st century skills and become more self-directed learners.

A pedagogical model that incorporates agile methodologies and reflective learning should contain the following elements:

- Agile methodologies: the model should include a clear understanding of Agile methodologies, including Agile principles, practices, and values, such as interactive development, collaboration, and subject focus.
- Reflective learning: the model should also incorporate reflective learning, which is a process of critically examining one's own experiences and thoughts to gain knowledge and make

improvements. This could involve journaling, self-reflection, or other reflective activities.

- Flexibility and adaptability: the pedagogical model should embrace the idea that learning is a continuous process, and that students should be able to adapt their learning experiences as they acquire new insights and knowledge.
- Collaboration and teamwork: the model should emphasize the importance of collaboration and teamwork in the learning process, encouraging students to work together to solve problems and produce results.
- Participant-centered approach: the model should be participant-centered, putting the needs and perspectives of teachers at the forefront of the reflective process. This could involve participant choice and ownership of the learning process, as well as opportunities for each participant to provide feedback and shape their own learning experiences based on their knowledge and needs.
- Evaluation of the accompaniment: the model must include a variety of evaluation methods that reflect the principles of agile methodologies and reflective learning in order to promote a process of accompaniment that is itself reflective, allowing for personalized formative instances, dialogue among peers, self-evaluations.
- Continuous improvement: the pedagogical model must foster a mentality of continuous improvement, so that the reflective process is incorporated into the daily work of the centers, making the learning experience multiply, as teachers will have the ability to regularly reflect on their experiences and make changes to improve the learning process of their students.

These elements should be integrated into the design of the mentoring experience to foster a reflective process about teaching practice, creating a flexible, adaptive, and collaborative learning environment that supports the community in their journey to becoming lifelong learners.

By the very nature of trends and education, agile methodologies are constantly changing, so although at this moment there are many of them and they are constantly used in virtual classrooms, it is convenient to detail that the trends considered below are only an example applicable to the current context and may be modified as required by the programs and/or institutional educational purposes.

There are several examples of the application of these trends in digital environments involving agile methodologies and reflective learning, among them could be highlighted:

Active learning. It is an educational strategy focused on learning where the student has a main role in the construction of his/her learning experience through continuous participation in activities of search, analysis, and synthesis of information, as well as problem solving. The objective of active learning is that students can "learn by doing" in learning environments that allow them to assume a greater commitment and self-regulate their learning process, favoring autonomous learning.

Microlearning. Strategy that has emerged to be used in the context of online learning (*e-learning*) and mobile learning (*m-learning*), which promotes learning through small units or content capsules, i.e., short content with information, with a maximum duration of 15 minutes that are dynamic and can be viewed and performed at any time, place, and device. The content capsules can be presented in different formats such as videos, audios, and presentations, with effective results for self-directed learning and applicable to specific topics.

Project-Based Learning (PBL). Project-based learning allows students to acquire knowledge and skills through the development of projects that respond to real-life problems. By starting from a concrete and real problem, this methodology guarantees more didactic, effective, and practical learning processes, and it allows the student to develop complex skills such as critical thinking, communication, collaboration, and problem-solving.

Challenge-Based Learning (CBL). Approach in which the participant is inserted in a real situation, which may be related to his/her environment, which implies that he/she has to implement a solution to a problem, thus encouraging his/her active participation. This learning helps students learn to develop key skills such as collaborative and multidisciplinary work.

Gamification. It is an emerging educational strategy that transfers the principles and elements of the game to a learning environment in order to achieve better results, and it is useful for the acquisition of knowledge and improve some skill to reward specific actions. According to the definition proposed by Burke (2012), gamification refers to the "use of game-like designs and techniques in non-game contexts in order to develop developmental skills and behaviors." Gamification refers to those initiatives aimed at increasing student motivation through the proposal of game experiences in educational contexts, providing a favorable environment for the development of skills and learning of various kinds, seeking greater student participation based on a climate of competitiveness and/or cooperation aimed at achieving specific educational objectives in a similar way as video games do (Del Moral, 2014).

Flipped Classroom. In this pedagogical model, the traditional elements of the teacher-delivered lesson are inverted. The educational materials are studied by the students at home and then worked on in the classroom. The objective: to optimize class time to meet the special needs of each student and to develop cooperative projects.

Storytelling. *Storytelling* is the art of using language, communication, emotionality, vocalization, the psychology of movement (gestures, gesticulation, and expression), and the abstract construction of elements and images of a particular story for a specific audience. A crucial aspect of storytelling is the feedback or connection with the audience to demonstrate a defining visual event that provides details of the story in a creative way (National Storytelling Association, 1997).

Video learning. It is a trend that has the purpose of transmitting content in a fast, entertaining, and pleasant way; this works as an attractive teaching method and serves as a support in any type of course. The transmission of information is done in a simple way, with the help of technology can be done from simple to more complex videos; its accessibility is by any means; the content is attractive.

Vialogues. Nothing better to create *engagement* than to stimulate debates. We are living in an era in which the opinion of the navigator has gained space, and, precisely for that reason, this tool is very interesting. If we look at the main YouTube channels, we can see that many of them are dedicated to discussing current affairs; this platform has become a source of information and discussions on different topics in society. So, if you like debates, this tool will allow you to join a community that uses videos to spark discussion and debate.

Collaborative classrooms. Among the educational trends, collaborative classrooms are gaining weight. **Its purpose is to make users more proactive**, that is, to get them to participate in class and share their knowledge and experiences with the collective that makes up the network. The teacher-tutor/mentor-community communication would not go in only one direction, but the bidirectionality of the interaction would be the key that would mark these relationships. Thus, **collaborative learning will be directed by the users themselves**, relegating the mentor/tutor to a sort of referee or moderator, similar to reverse learning.



Some benefits of collaborative classrooms are:

- Motivates students to develop their creativity.
- Promotes a sense of responsibility.
- Promotes values such as responsibility, solidarity, and teamwork.
- Improves interpersonal relationships and social skills.
- Enhances student learning in the classroom through unique experiences.

Technology as a basis. The development and launch of innovative mobile and online learning apps and services is growing exponentially. Advances in new technologies in recent years have made it possible to model methodologies to adapt them to change. Nowadays, virtual training environments have to propose new learning environments that allow the development of the teaching action. To this end, **new elements such as augmented reality, mobile learning, artificial intelligence, and programming** are proposed to be incorporated into the experience. Some of the benefits of including technology in the reflective environment are:

- It allows the development of new teaching methods.
- Offers alternative teaching materials.
- Increases adaptability.
- Develops critical thinking.
- Streamlines communication.
- Prepares students for the job market.

Design Thinking. Design Thinking is born from the practice of designers and their method of solving problems and satisfying their clients. Applied to education, this model makes it possible to identify more accurately the individual problems of each student, generate ideas, solve problems creatively, and broaden the horizon in terms of solutions. **Design Thinking** a framework for generating innovative ideas. **This innovative teaching methodology focuses on providing solutions to the real needs of users. Design Thinking will make it possible to identify the individual needs of each participant** and, thus, provide them with a more personalized accompaniment. Some of the advantages of *Design Thinking* are:

- Focus on the participating community
- Objective in real situations.
- Creativity and innovation
- Observation, critical analysis, and empathy.

Thinking Based Learning Teaching them to contextualize, analyze, relate, argue, convert information into knowledge, and develop thinking skills beyond memorization. That is the goal of thinking-based learning (TBL).

Action Research is a collective research method carried out by those directly involved in the object of study. In the case of education, it is the **teachers, management teams, and other members of the educational community who lead the process**. This process consists of identifying a problem, formulating hypotheses, carrying out actions, and evaluating the results. Action plans usually last between 8 and 12 weeks, and if the results are positive, the changes are incorporated into the center's daily practice.

VII.2 Power point model's presentation

D2.2 Harmonized European model of practical trainings providing guidance and support to schoolteachers

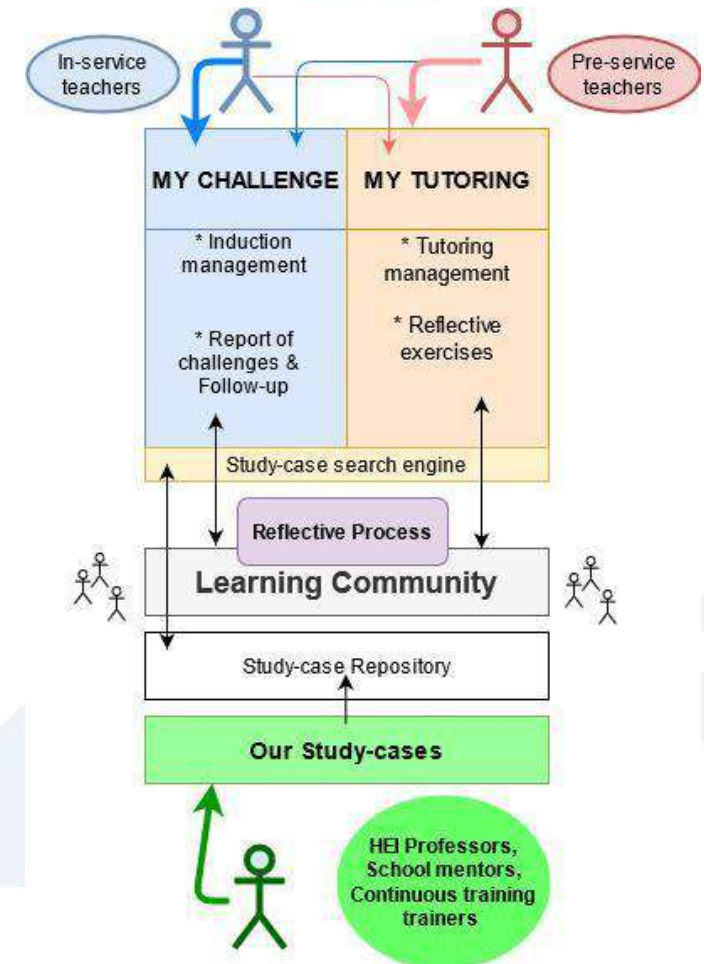
PRESENTATION

Presentation: The EU Model for Digital TA

The document aims to present the bases of the reflective model of guidance and online mentoring for students and education professionals who are in the first years of his professional practice in primary schools and high schools.

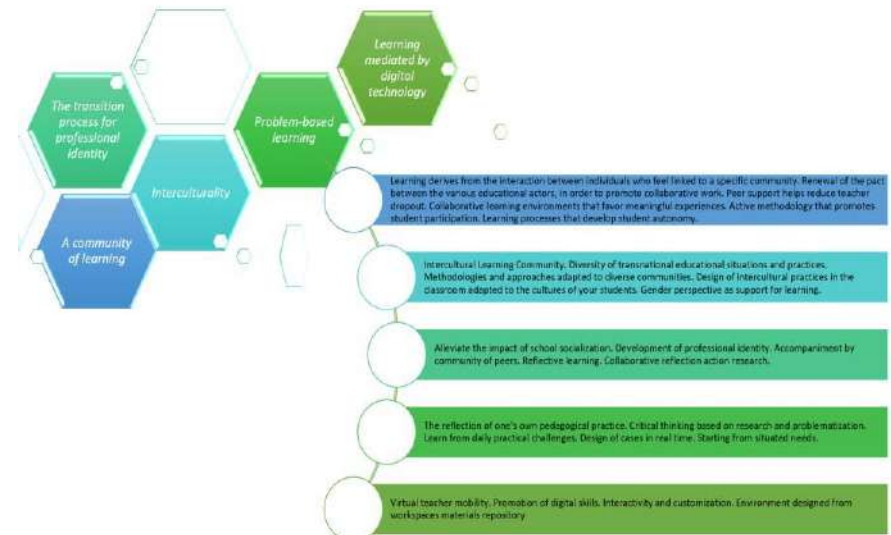
The model proposes the collaborative design of cases of study, using methodologies such as learning based on in problems and the development of a guided reflective practice by a trainer and shared with a learning community.

The document is transversal in nature, it describes the background of the proposal, its theoretical and technological foundations, as well as the components of the model and their strategies of Implementation.



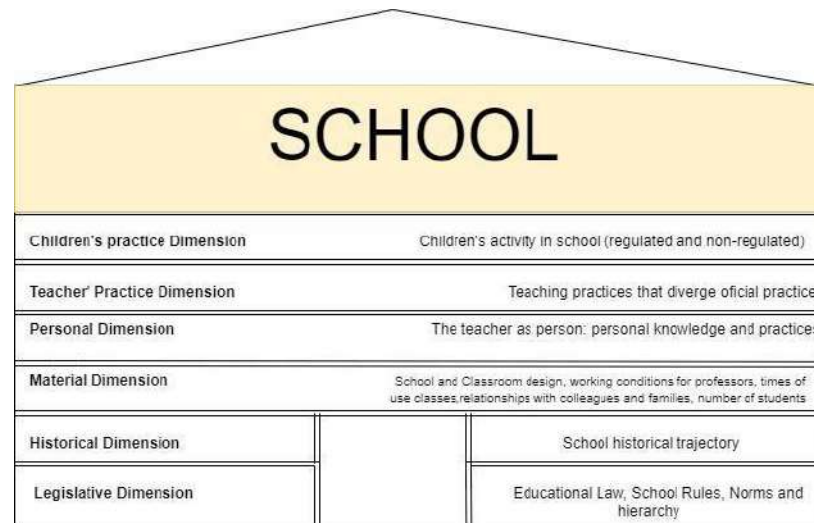
5 basic principles

- Promotion of individual and collective reflection
- Professionals meet in a learning community
- Defense of interculturality
- Collaborative and agile methodologies for learning
- Learning mediated by digital technologies



3 transversal dimensions for the model

- The cognitive dimension (acquisition of knowledge and skills)
- The affective dimension (identification and regulation of emotions)
- The social dimension (dialogue and collaboration)



6 Instructions for design

- Conceive it as a cyclical process
- Empower transformative learning
- Encourage critical reflection
- Placing the individual at the center of the process
- Encourage flexibility, choice and options.
- Foster dialogic learning and shared experiences



4 phases of participation in the platform

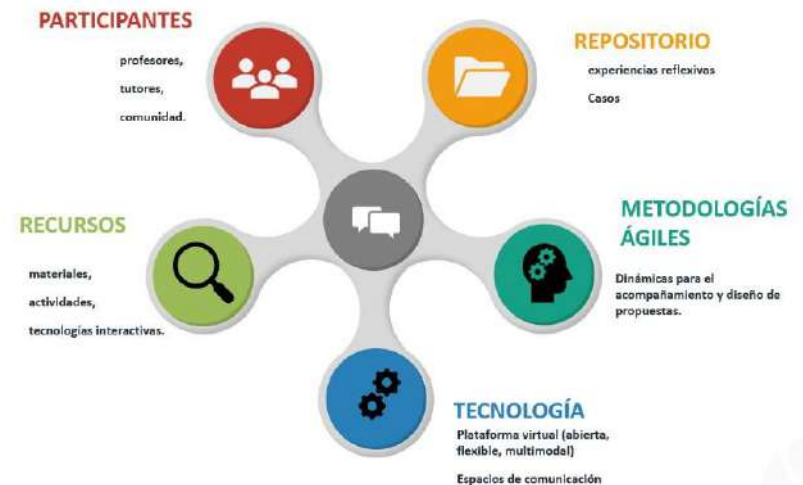
- Phase of exploration and critical understanding of reality
- Dialogue, collaboration and teamwork phase
- Application phase, shared reflection and transformation of teaching practice
- Consolidation phase, transfer and communication with the community

A model for interactions (the hive)

The model integrates five essential components that interact with each other.

This digital reflective cycle process supports the agency and the choice of entry of each of the users.

When entering the platform, you will have a series of environments and scenarios from of which it will be possible to access spaces of reflection and experience different levels of interaction and engagement.



A description of the didactic sequence: define, share, reflect, solve, consolidate

The reflective accompaniment process must be synergistic, cooperative and interactive, promoting: personalized reflection, conversation between participants, the use of technological environments, and the guide of the facilitator.



Considerations for platform development

Each environment or "door" reflects and includes a series of common experiences:

- o Environment Diagnosis or problem: part of a critical piece (case or challenge)
- o Debate/Dialogue Environment: Professional Learning Community, PLN; Learn/Share.
- o Metacognitive environment: explains the process and why these questions are being asked.
- o Environment experiences: link to 'Cases', materials and repositories

