



SMART TECHNOLOGIES FOR INNOVATION IN TEACHER TRAINING

THE EKT HANDBOOK



Smart Technologies for Innovation in Teacher Training

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About this publication

The Education Knowledge Transfer (EKT) Project is an Erasmus+ KA 2 Knowledge Alliance addressing the EU educational practice in Initial Teacher Education (ITE). The project focuses on improving the in-school placement experience for future European teachers, which is a crucial component of ITE.

In-school placement provides student teachers with an opportunity to learn about teaching and learning, gain practice in teaching, apply educational theory in a variety of teaching and learning situations and school contexts and participate in school life in a way that is structured and supported. This experience involves collaboration between university lecturers (academic mentors) and non-university teaching tutors (school mentors) and plays a vital role in training future teachers. Through EKT, a group of teacher education institutions and e-learning service providers have come together to enhance the teaching practice experience to meet the needs of future teachers and schools.



EKT addresses this through the use of e-learning methods and resources. The e-learning methodologies and solutions developed in the EKT Project are designed to promote dynamics of coordinated work between academic and school mentors who supervise and accompany the student teacher during the in-school placement experience and provide individualized support to student teachers. The EKT approach also facilitates self-learning and reflective thinking, skills that are essential for future teachers.

A key focus of the project is to pilot, test and evaluate the educational methodologies and technical solutions to inform the final design of the EKT System. This enabled the project partners to see what works well for the target audiences and which methods and approaches are appropriate. This in turn has informed decisions regarding the final design of the EKT Platform and accompanying online tutorials. The EKT Project brought together 11 institutions and organisations from Austria, Belgium, England, Ireland, Portugal, and Spain. This consortium has many years of experience in both educational and technological innovation and teacher training. The results of the project are expected to have a positive impact on the selection process of prospective teachers and be transferable to future systems of access to the teaching profession in Europe.

The EKT Handbook shares the experience gained in the project with teacher training institutions, schools, education authorities and e-learning service providers. The publication focuses on the:

- Analysis of the main ITE stakeholders and their needs (Chapter 2)
- Pedagogical and methodological approach addressing these needs (Chapter 3)
- Online platform: its architecture, functionalities and technological achievements (Chapter 4)
- Piloting activities and the impact these experimentation exercises had on the development and evaluation of the methodology and the platform (Chapter 5).





The whole Handbook, and in particular Chapter 5, bears in mind that the emphasis of “Knowledge Alliances” in the Erasmus + programme is not in the first place on creating and disseminating “products”, but on reflecting and generating methodological and technical knowledge, and sharing this among different - academic, educational and entrepreneurial - actors. To this end, the planning and development process of the EKT Project is described in the Handbook, as well as the insights gained and lessons learnt in the process. The Handbook is not so much intended as a promotional brochure presenting the EKT Platform as the ideal solution to placement stakeholders’ needs but rather as inspiration for adequately addressing these needs by the informed deployment of pedagogy and technology to facilitate a productive in-school placement. The authors believe that the EKT experience will enable teacher education providers to offer more individualized follow-up of students during in-school placement practice. This can enhance in-school teaching practice for ITE as well as enabling new systems of access to the teaching profession that can be implemented in Europe in the future.

The triad of the main stakeholders and their needs

In-school placement has long been recognized as a critical component of Initial Teacher Education (ITE) programmes for the professional and personal growth of student teachers (e.g. opportunities for observation, lesson study, mini-action research, taking up responsibility). This type of placement ensures that student teachers develop a sense of belonging and professional identity, it provides an opportunity for critical reflection and constructive engagement with others and extends the student teacher's range of teaching experiences, e.g. extra-curricular activities, parents meetings, co-teaching etc. (e.g. Flores, 2016; MacBeath, 2011). In this crucial period, student teachers require much support and guidance from their teacher educators and school 'mentors' and need regular feedback (Caires, Almeida & Vieira, 2012).



The role of teacher educator and school 'mentor' is extremely complex and has two complementary aspects: learning about teaching and teaching how to teach. The level of cooperation between the key actors involved in school placement, and the expectations from pre-service teachers during the placement, are determined by the local conceptualisation of school placement and influenced by policy, conditions, and traditions. Support and guidance from students, academic tutors and school 'mentors' is vital (Caires, Almeida and Vieira, 2012), but the provision of such support is often challenging because of the workload of mentors and the geographical distance of placement schools.

This calls for efficient channels of communication to support student teachers and provide prompt feedback with the use of electronic tools between all actors involved in the “triadic relationship” (Hall et al., 2016): student teacher, academic mentor or tutor and school mentor, i.e. school teacher. Figure 1 demonstrates the importance of the “triadic relationship” for student teachers’ professional learning throughout the entire in-school placement (preparation for; entrance to the school; observation of classes; first attempts; and retrospective reflection as well as “reflection for action”).

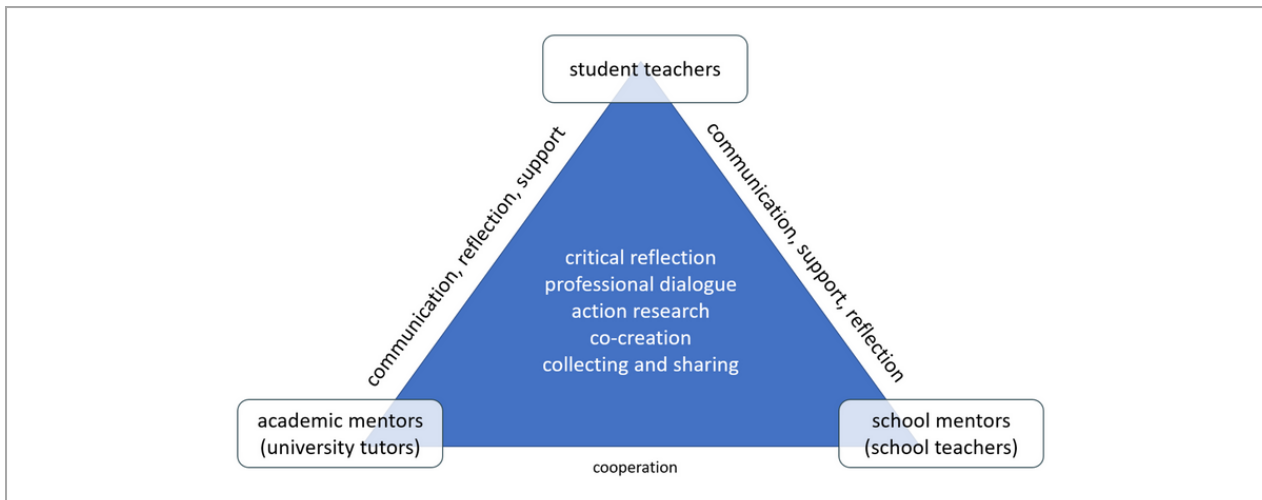


Figure 1. The Triadic Relationship

It has been suggested that for the holistic art of teaching to develop, a number of abilities and capacities are required. These include cognitive abilities (understanding, analysing and communicating information, reflecting on experience); interpersonal abilities (empathizing with, relating to and supporting others); motivational abilities (personal goal setting, risk-taking and commitment to achieve, goal sharing and teamwork); rational analysis; intuition and imagination (Klemp, 1977, as cited in Pollarg & Triggs, 1997, p. 18). Literature would suggest that both formal and informal learning opportunities are important, which should most usefully be social in nature; that is involving actively working with others to jointly advance professional abilities. The ‘triadic relationship’ combined with informal peer learning offers a hybrid space between what is learnt independently and through formal teaching (Hilsdon, 2014) and a space where individuals can learn together. It is likely that the next generation of student teachers will seek out both formal and informal spaces online (Moreno-Guerrero et al., 2020). The myriad of affordances that peer learning supported by experienced mentors in an online ‘community’ could provide are powerful and include the creation of a supportive micro-context for teachers’ intellectual and emotional reflection, and open conversation (Holmes, 2013). Thus, there is a need for the design of the EKT Methodology and tools aimed to support professional dialogue, co-creation, and reflection with a critical stance on experiences and structured guidance as well as informal peer learning, in an online space.

Moreover, during the COVID-19 restrictions, teacher educators and schools have had to reimagine learning practices and administrative support during placement, while seeking to maintain continuous communication between all actors involved in the 'triadic relationship'. The COVID-19 crisis has also brought into focus the need to have a user-friendly space for collecting, sharing and discussing plans and examples of work – things that remind pre-service teachers and mentors of activities that worked and resources that helped children learn.

“Good practice lies in critical thinking through more open and dialogical forms of communication”

(West, 2010, p. 68).

Individual and reflection with others is another important need that has been identified in the EKT Project research, i.e. promoting a reflexive and critical attitude of the student teachers regarding their activity and development as trainee teachers. Though management and support of reflection by teachers is a particular challenge (Revyakina, 2013), special conditions and circumstances conducive to reflection need to be created. There is a need and a challenge to create an online space (in the form of an ePortfolio) that could support engagement with reflective activities through a conducive structure and an environment for open dialogue and inquiry.

The EKT Project developed an online platform which can be considered comprehensive e-learning and communication support for all the actors involved in school placement support, delivery, and teaching (Conolly et al., 2020; Egan et al., 2021).



The methodological approach of EKT at in-school placement

Preliminary considerations

The development of pedagogical solutions supported by technologies requires thorough knowledge of the contexts where they will be implemented, the pedagogical objectives that give meaning to their use and the needs and problems to which they respond. The EKT System - methodology and technological solution - aims at improving the processes of coordination, communication and collaboration that take place between academic mentors, school mentors and student teachers during in-school placement and promote reflective learning of the profession through individualized advice to the student teacher throughout the process. The "triadic relationship" that takes place during in-school placement is a key element in initial teacher training, but in its execution, it entails serious challenges that were considered in the design of the EKT System. Among the most prominent challenges are physical distance and different professional cultures separating the academic and school worlds, which influence both types of mentors. The EKT proposal is based on an analysis of the different visions and needs of the mentors that reinforces the importance of establishing channels and tools to help them collaborate in the process and share observations and responsibility from the beginning to the end of training. This analysis and knowledge about initial teacher training and in-school placement provide direction to the entwined EKT methodological proposal and technological solution.





The challenges of the EKT System: horizontal collaboration, interaction, and personalised follow-up

The EKT methodological proposal was formulated taking into account two fundamental elements: the research carried out in the five countries that make up this project (Austria, England, Ireland, Portugal and Spain) and the subsequent assessment of the possibilities of innovation and improvement that e-learning technologies and services could contribute to improving in-school placement. The results revealed the existing difficulties in the processes of student teacher support and enabled the design of a creative training proposal backed by technologies on which the characteristics, functionalities and tools of the EKT Platform were defined. This methodology underwent testing in two pilot periods in real training contexts that allowed adapting and improving it from an initial test version to the final version system in this publication.



The exploratory research carried out in the initial phases of the EKT Project provided valuable information based on the perceptions of 347 experienced mentors from the five countries, with a representative sample of both academic (117) and school (230) mentors (Brandão Carvalho & Fernández-Morante, 2022). It also allowed knowing the extent of the importance attributed to initial teacher training and the specific organisational characteristics that they adopt in each of the countries and their higher education.



In all cases, in-school placement is a key component of initial teacher education, implemented in collaboration with academic and school mentors. However, the duration, organisation in terms of the learning tasks they entail, and the evaluation instruments used vary greatly. Despite this variability, it is possible to state that in all countries there is a shared concern in improving the reflection processes on training experience using appropriate strategies and instruments that promote the development of a critical attitude of the student teacher when performing the different teaching tasks and teaching functions.

Mentors confer vital importance to mutual collaboration in all training activities, related to organisation, the definition of norms, guidelines and learning tasks as well as with regard to the personalised orientation of the student teacher and the monitoring and evaluation of the whole process. On the other hand, the results obtained in the research show that there is a significant gap between the importance placed by the mentors on collaboration in placement activities, and the level of collaboration that actually exists. The study highlighted five areas where collaboration between mentors needs strengthening:

- Curricular coordination, contacts and meetings between the Higher Education Institution and the placement centres throughout the process.
- Preparation of materials, learning resources and assessment tools used in the training process and their presentation to student teachers.
- Development of favourable attitudes and skills towards educational innovation on behalf of the student teacher.
- Preparation of the student teachers and observation of their interventions both in the classroom and in the placement school.
- Joint planning and supervision of all student teacher activities and tasks.
- Feedback (written or oral) to the student teacher during training



Regarding the personalised follow-up and reflective learning of the student teacher during training, the mentors in all five countries highlighted the importance of this dimension in the training process. They also stressed the absence of adequate resources and technological tools that facilitate these processes and allow them to make a continuous and collaborative follow-up in all phases (before, during and after in-school placement) as well as giving individualized feedback to student teachers. The study underlined three types of needs:

- Synchronous and asynchronous virtual communication tools that allow triadic interaction (academic mentor, school mentor and student teacher)
- Tools for recording direct observations, reflections and productions of student teachers during training.
- Instruments for individualised monitoring and assessment of student teachers by mentors.

Considering the aforementioned challenges and needs, the EKT System was conceived with the aim of facilitating all the activities and interaction processes that take place during placements by promoting continuous collaboration between mentors and student teachers, personalised follow-up and feedback to trainees throughout the process. Therefore, the EKT System constitutes a proposal aimed at improving two dimensions that are crucial in the development of in-school placement:

1

The organisation, management, and coordination of mentors throughout the process, from the definition and planning of the training, the arrival of the student teachers at the placement school, during their intervention and performance in the school, to the evaluation and closure of the training period. The EKT System aims to make it possible to bridge school and university contexts and help overcome the associated difficulties in the collaboration that mentors usually experience and that are generally associated, among other factors, with the physical distance between them. It should also contribute to generating a culture of real collaboration between mentors that goes beyond the sum of individual efforts, which all too often are disconnected and sequenced throughout the process. In other words, university mentors should play an exclusive role in the design phase of the training, and school mentors during the intervention of student teachers in the school. Moreover, university mentors should again take part in the assessment phase of the training. The EKT System should therefore consider the necessary means to enable collaboration (training strategies, virtual reference environment for learning and collaboration, tools and functionalities), but also stimulate collaboration between mentors throughout the process by suggesting possible collaboration strategies in all the activities planned during the placement. As for the means necessary to make collaboration possible, the EKT System should consider different channels and communication systems allowing academic and school mentors to work remotely and flexibly, and provide spaces and tools to create, collaboratively edit and share resources and materials in different formats (guides, evaluation instruments, documents, literature, teaching materials in various formats).



2

The collaborative and personalised follow-up and feedback to the student teacher throughout the process; from the preparation of the prospective teachers prior to their arrival at the school, communication of the rules of operation, the responsibilities and the role of each stakeholder, the instruments and tools of work, the characteristics of the context and the criteria and strategies of evaluation, to the accompaniment and personalised guidance throughout the immersion experience in the placement school and progressive acceptance of responsibilities in different teaching tasks. The EKT System contemplates, in addition to means and communication strategies, tools for the creation of collaborative editing and sharing of resources between mentors and student teachers, other elements that would allow to relate and share in first person the experience of the student teacher reflexively and for it to be retaken, reconstructed and accompanied under mentor guidance. It would be necessary to build an ePortfolio of practices and strategies to guide student teachers in the reflective process and mentors in their feedback.

The EKT Methodology: in-school placement as a gradual and reflective experimentation of the teaching profession

This section presents the sequence EKT proposes for the development of in-school placements: the suggested stages, guides and instruments designed to implement it. It is a flexible model, which must be contextualized by the mentor with each prospective teacher (Fernández-Morante, Cebreiro, Casal-Otero & Mareque-León, 2023).

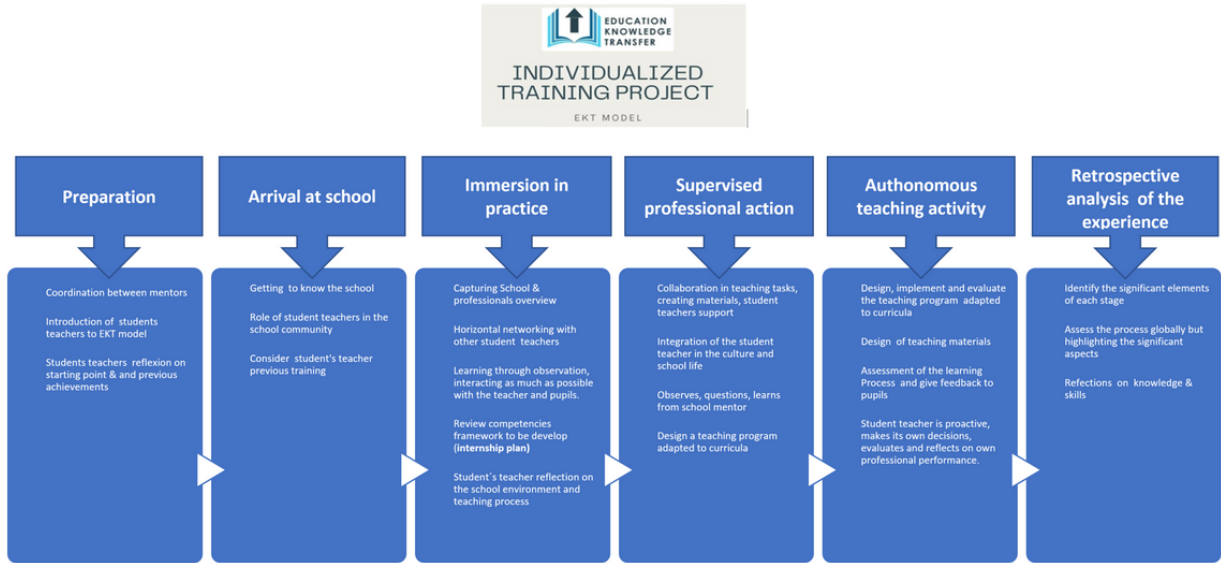


Figure 2. Stages of the EKT Methodology

The EKT Methodology promotes an autonomous and reflective learning process in such a way that the student teacher identifies, analyses and understands how to build their professional identity. For this, the prospective teacher experiences at each stage include different learning processes with the support of their mentors and other agents in a collaborative and mutually supportive environment, sustained with educational technologies that, together with the methodology, configure the EKT training system.

The proposal involves two types of mentors - academic and school - who, in a coordinated manner and throughout the process, support and guide the student teacher. Other individuals and groups from the educational community (placement school) and peer groups (other student teachers or mentors) will also participate naturally and spontaneously.



The EKT training process is designed with the intention of promoting and achieving an oriented and gradual involvement of the student teacher, both in the placement school, as well as in the teaching tasks they perform. This way, the student teacher takes on responsibilities progressively, from little to greater autonomy under the supervision of the mentors. Thus, the sequence of training consists of six stages involving different objectives and levels of responsibility and autonomy. Each of these stages focuses on specific aspects of the teaching profession that lead the student teacher to look at all dimensions of the process and guide their reflective learning while linking their previous knowledge and attitudes which are contrasted during training.

The stages follow a chronological order accompanying the development of the experience. Each stage has its own objectives, activities and proposals for the use of the EKT Platform.



The EKT Methodology is designed to promote autonomous learning and student teacher reflection with the continuous support of their mentors and in a learning community in which other student teachers participate (from the same group, from their placement school etc.). The EKT ePortfolio, the central tool of the process and the system, is interconnected with all the tools of the EKT Platform providing multiple functionalities for collaboration, creation and co-creation, communication, training and the realization of all the planned activities.

The EKT ePortfolio allows each student teacher to share their reflections and guide them through the placement, including evidence on the activities carried out at each stage and the contributions of others through the feedback of the mentors, discussions with other student teachers about their experience, materials to learn, their own productions (placement project, didactic materials ...) and tools for self- and peer evaluation.

The EKT Methodology is a comprehensive but flexible model of in-school placement to adapt to the timing and organisation of the training according to the specificities of the ITE of each national and institutional context. Thus, it is designed to be adapted in a flexible way both to processes in which in-school placement is carried out during a single academic year or across academic years. The guides and instruments provide guidelines for the two mentors and for the student teacher so it can also be adapted to the objectives of each in-school placement in the ITE curriculum of each country.

The EKT Methodology: in-school placement as a gradual and reflective experimentation of the teaching profession

As explained above, the stages were designed to ensure the coordination of mentors in the implementation of the training process. These stages are accompanied by guides and instruments that facilitate the reflection process of the prospective teacher. Each guide details instructions for the performance and collaboration of the student teacher and both mentors. Other instruments are proposed to support the process and consist of study materials and action guides, materials for recording and evaluating the process, and recommendations to guide the reflection that will be included in the ePortfolio. All instruments are presented at the time required by each stage, but they continue to be used throughout the process. Each of the stages is now presented with its guide and training instruments.

STAGE 1. PREPARATION

This stage entails the first step of institutional coordination through the necessary prior organisational procedures between the institutions, the coordination between the heads of training of each institution and between the mentors and the organisation of the activities to be developed jointly during the in-school placement. It is a process prior to the arrival of student teachers at their respective placement school. At this stage, the mentors will negotiate and agree on the work dynamics and responsibilities of each prospective teacher. This includes the collaboration, communication and monitoring of the student teacher, as well as the tools and communication channels of the EKT Platform that will be used to support the student teacher during training.



During this phase, the student teacher will be fully prepared to begin their in-school placement activities. They will do so by examining their personal and formative experiences that will inform their in-school placement. This includes their teaching competencies, in-school placement objectives, and previous training. The student teacher will be prepared to become a reflective and autonomous professional and will be supported through the EKT System which provides the virtual environment for training, communication, and collaboration for in-school placement. The EKT ePortfolio will be a key tool in their reflective process, which they will use throughout the internship process. The Guide 1. Planning and coordination of the in-school placement and related instruments have been developed and can be found in Fernández-Morante, Cebreiro, Casal-Otero & Mareque-León's (2023) publication on ektproject.eu/resources to help achieve the expected objectives of this stage.

Guide 1. Planning and coordination of the in-school placement

- Instrument 1: Coordination plan between mentors.
- Instrument 2: Code of ethics and informed consent of participation.

STAGE 2. ARRIVAL TO THE SCHOOL

When the student teacher arrives at the placement school, the school mentor introduces the student teacher to the context; their role is defined as well as the levels of participation in the educational community that they will assume. In this phase, the EKT communication tools and ePortfolio will be key to establish contact with the academic mentor from the placement school and to reflect on the first impressions and the process of incorporation and interaction with the assigned school mentor. Fluid communication and reflective notes in the portfolio will allow the academic mentor to accompany the student and help them to adapt to the new situation.

The observation focuses on the placement school and its context, on the educational community, institutional documents, educational organisation systems (structure and management), educational projects and innovations underway, the climate and professional culture of the school, co-existence, etc.



At this point in time, the entire training and learning process is reconstructed with the help of the ePortfolio, but also with other materials and tools available in the EKT System. For this purpose, a training activity was designed and integrated into the EKT SPOC (Small Private Online Course) that focuses on the reinforcement of skills for observation, reflection and research-action of the student teacher as a professional who learns from practice. The EKT training course promotes a dynamic in which, while reinforcing these professional skills, student teachers and mentors who take the course experiment with the different tools and functionalities of the EKT Platform. In this way, they discover the opportunities that the EKT Platform offers for interaction at different levels and moments as well as the training value of the EKT ePortfolio to document their learning process as well as individual reflection and receive feedback from their mentors and peers.

The possibilities of the EKT System to interact with both mentors and peers who want to comment and participate in the student teacher's reflection are very flexible. In the EKT System the two mentors provide comments, provide guidance and materials to each student teacher in their ePortfolio throughout the experience, which is a stimulus to constant reflection through this online platform. The EKT Platform is also a communication space for student teachers to interact flexibly among their peers. That is, between those who carry out the placement in the same school and / or is part of their reference group and those doing it in other placement schools. The functionalities and tools available for communication and collaborative work between students allow mutual support, collaborative creation, discussion, or the organisation of joint activities (innovation projects, extracurricular activities, school events, etc.). To achieve the expected objectives of this stage, the following guides and instruments were designed:

Guide 2. Observation about the school and the teaching profession

- Instrument 3: Record of expectations.
- Instrument 4: Analysis of previous training.
- Instrument 5: Observation sheet on school life and educational practice

STAGE 3. IMMERSION IN PRACTICE

This stage the school mentor supports the student teacher in the daily life of the school. In this phase, the school mentor serves as a model teacher, shares and explains the daily activity at school and in the classroom, thus helping the future teacher to understand the different skills and tasks of an educator.

At this stage, the observation focuses on how much the student teacher knows of the group/class with whom they are working and its group dynamics. It is necessary to observe the individual aspects of the student teachers that will allow them to understand fundamental issues of class management, the climate of coexistence, pupils' development, level of maturation and learning processes, as well as the interaction between pupils and the interaction with the pupils.

With this knowledge, the student teacher will be able to design and share their "Placement Plan" in which the specific tasks and responsibilities to be assumed in the process of co-teaching in the classroom and the collaborative activities to be carried out in the school are detailed. This can be done with the guidance of the two mentors (academic and school) through the EKT System's document tool. To achieve the expected objectives of this stage, the following guide and instruments were designed:

Guide 3. Classroom life and teaching tasks

- Instrument 6: Teacher competence framework.
- Instrument 7: Student teacher internship plan.



STAGE 4. SUPERVISED PROFESSIONAL ACTION

This stage deals with the development of teaching under the supervision of mentors. In this phase, the student teacher assumes a particular teaching task and begins to elaborate a contextualized didactic proposal. All supervised professional activity will have been previously defined in the student teacher's In-school placement Plan (Instrument 7). The student teacher's performance will focus on collaborating with their school mentor in all issues deemed relevant. The EKT content creation tool is particularly important in this phase. It will allow the student teacher to start developing digital materials to carry out teaching proposals.

The observation and reflection at this stage revolves around their own performance as student teachers and starts with a process of self-evaluation and reflection on previous knowledge and expectations. To this end, it will reuse the materials created in Guide 2 and will have new tools suitable for recording the process. They will also analyse their experience in training from the action research approach worked on in Stage 2 and collect evidence from their practice, which they will record in the ePortfolio. To achieve the expected objectives of this stage, the following guide and instruments were developed:

Guide 4: Getting started in supervised teaching role activities.

- Instrument 8: Analysis of learning about the profession
- Instrument 9: Self-assessment I

STAGE 5. AUTONOMOUS TEACHING ACTIVITY

This stage focuses on the student teacher's involvement in the development of the teaching with a full level of autonomy. In this phase, the student teacher designs a didactic proposal, implements it autonomously and evaluates the entire process. Their two mentors observe and assess the level of performance and help the student teacher in the subsequent reflection of their performance.

A range of EKT tools such as **content creation, documentation, communication and ePortfolio** will allow student teachers to develop their creative activity, share with other student teachers, reflect on their practice and receive improvement-oriented feedback from their mentors.

At this stage, importance is also placed on interaction with others to share and understand their first experiences as a fully-fledged teacher. The reflection in the ePortfolio on each personal experience in each placement school will allow access to multiple and very different contexts and situations, expanding the learning possibilities of the profession. To this end, the EKT System not only allows evidence and experience to be recorded through the ePortfolio, but also offers other functionalities and tools to establish real-time interaction dynamics (specific communication channels and instant messaging) and collaborative work sessions by videoconference that enrich these processes. To achieve the expected objectives of this stage, the following guide and instruments were designed:

Guide 5. Performance and reflection from the practice of the teaching role

- Instrument 8: Planning and development of the didactic proposal
- Instrument 9: Contribution of interaction with other peers

STAGE 6. RETROSPECTIVE ANALYSIS OF EXPERIENCE

This stage concludes and closes the process. The student teacher and mentors review the process in order to understand how the prospective teacher assumed and carried out the teaching role. The student teacher must critically assess the learning process of teaching from the experience gained in the placement school and with the support of the ePortfolio and the different instruments used from previous stages.



This final phase has a strategic value in the process since it will allow to endorse the learning carried out, understand it in a global way and identify areas for improvement in the construction of their professional identity that they will consider in their stage of initiation to the profession once they have finished their initial training. To achieve the objectives of this stage, EKT provides a guide with instruments focused on the organisation of the assessment process, the preparation of the final report by the student teacher and contrasting the entire process with the evaluation criteria and indicators defined for the realisation of the in-school placement:

Guide 6. Performance and reflection from the practice of the teaching role

- Instrument 10: Self-assessment II
- Instrument 11: Evaluation of the experience in the centre where training took place.
- Instrument 12: Training assessment with the EKT System (learning analytics)
- Instrument 13: Final In-School Placement Report
- Instrument 14: Academic mentor's report on the student teacher training process
- Instrument 15: School mentor's report on the student teacher training process

The technological solution proposed by EKT

The complexity of the EKT technical solution

The EKT Project developed an advanced e-learning system to support communication and collaboration in in-school placements. This platform was created by identifying, integrating and adapting different existing software tools, as well as designing from scratch new features to suit the main stakeholders' specific needs. The EKT Platform is complemented by a mobile app to provide access to communication and reporting of online and offline activities from students to their mentors.

Today a number of comprehensive e-learning tools exist that provide generic educational services: communication tools, document repositories, ePortfolios, agendas, etc., but there are no specific platforms that support the process of future teachers in-school placements, providing a tailored response to the needs of all participating actors in the process as well as their access from different institutions (schools, universities, etc.).



The complexity of this task required the identification of the most appropriate features and tools and their adaptation to create a unified platform, providing seamless connection and exchange of information between tools to constitute an informative dashboard for teacher students and their academic and school mentors, meeting the methodological requirements and the needs for improvement detected in teaching practices. The challenge was also to make interoperable technological tools available by both private service providers and open-source developers and articulate them around a versatile system of tools and digital resources for training in student teachers' practice.



Development process and structure of the EKT Platform

The EKT Platform provides technological support for the needs identified in the previous steps as described in Chapter 2 (stakeholders, their needs and relationships). Chapter 3 (user profiles, requirements and expectations). The final version of the platform was developed in a continuous dialogue between the potential users (teacher training institutions, mentors and student teachers) and the developers (partners of the EKT consortium) following a Design-Based Research process in pedagogical terms. Groups of discussion between technicians and academics that led to the definition of the platform structure and user profiles, and the piloting in real contexts during two academic years.

This led to an iterative design process in various cycles, from a "Minimum Viable Product" that was tested in two academic years and analysed from the point of view of the needs for improvement and problems posed to users. It was improved, giving rise to two piloted versions in Cycle 1 (academic year 2021-22) and in Cycle 2 (academic year 2022-23) that were successively launched for experimentation. In this process, two ways of creating knowledge were aligned, pedagogical and technological, through educational and user research.

Alignment of requirements with technological solutions

The final implementation of the software solution for the EKT Platform, based both on Open-Source software and own development, was brought about considering:

- 1** The differences between the different educational systems in each of the countries participating in the project.
- 2** Each of the main challenges planned, such as horizontal collaboration, interaction, and personalized follow-up suited to the established user roles. These roles have different responsibilities throughout the training process during in-school placement.
- 3** The level of cooperation between the key actors involved in in-school placement.
- 4** Support and guidance from students, academic and school mentors.
- 5** The specific characteristics of the training process, the training sequence and its different stages, as in-school placement implies a gradual and reflective experimentation of the teaching profession.
- 6** The professional learning of student teachers throughout their time at school: preparation for school entrance, classroom observation, real practices and retrospective reflection. Both individually and with others, fostering a reflective and critical attitude regarding their activity and development as teachers in training.
- 7** Informal learning among peers to offer a hybrid space between what is learned independently and through formal teaching and a space for collaborative exchange.
- 8** The need for a user-friendly space to collect, share and discuss plans and examples of work maintaining continuous communication between the actors involved.
- 9** The necessity to obtain relevant learning data from students, such as interactions with other actors or with the system and its contents, their subsequent analysis and visualization, in order to support and guide their own learning, as well as help teachers in their decisions and evaluations. (Fernández-Morante, C., Cebreiro-López, B., Rodríguez-Malmierca, M.-J., & Casal-Otero, L. (2021))

Most of the functionalities identified at the beginning of the project to meet the users' needs were implemented with a self-developed platform (CAS, EKT Application, web services, own mobile application) and completed with several existing Open Source based technological solutions (Chamilo, NextCloud, OnlyOffice).

This required extensive multidisciplinary and transnational work to adapt them in a way to make them interoperable. Other tools were created in the project to integrate specific functionalities according to innovative specifications, e.g. the ePortfolio module.

Development process

The EKT Platform underwent several phases to reach its final version: Beta 1, Beta 2 and Final version. The development was an iterative process, in which the technical team produced and tested solutions, received validation and feedback from the educational team and final users in successive pilot cycles, following the Agile Application Development methodology (Martin, R. C. (2003)).

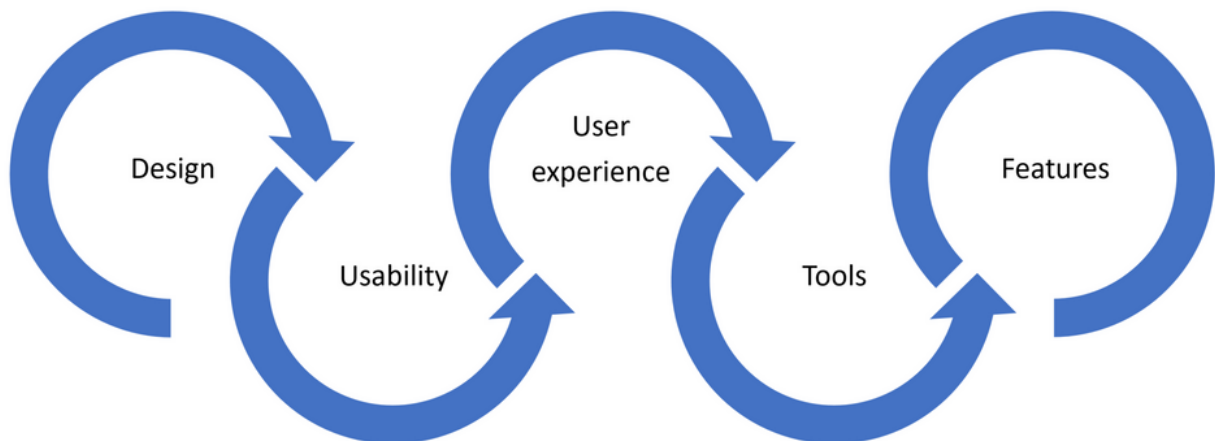


Figure 3. Key elements of EKT Platform development

The deployment and development process EKT Platform had to be aligned with the school piloting calendar to keep functional and stable versions of the platform to optimise the results obtained in each piloting cycle.

Platform structure

EKT functional requirements defined the technological structure to be used, adapted from existing software solutions or created from scratch for this project. In the course of the development process (Beta 1 and Beta 2), the initial structure of implemented services evolved to meet the challenges posed by the evaluations obtained after each of the piloting cycles carried out.

At a technological and technical level, the implemented services were adapted to achieve improvements in the performance, stability and security of the entire system.

At the level of usability and integration of the parts that make up the EKT Platform, from the initial design (Beta1) to the final version, the changes and improvements were even more noticeable externally than internally.

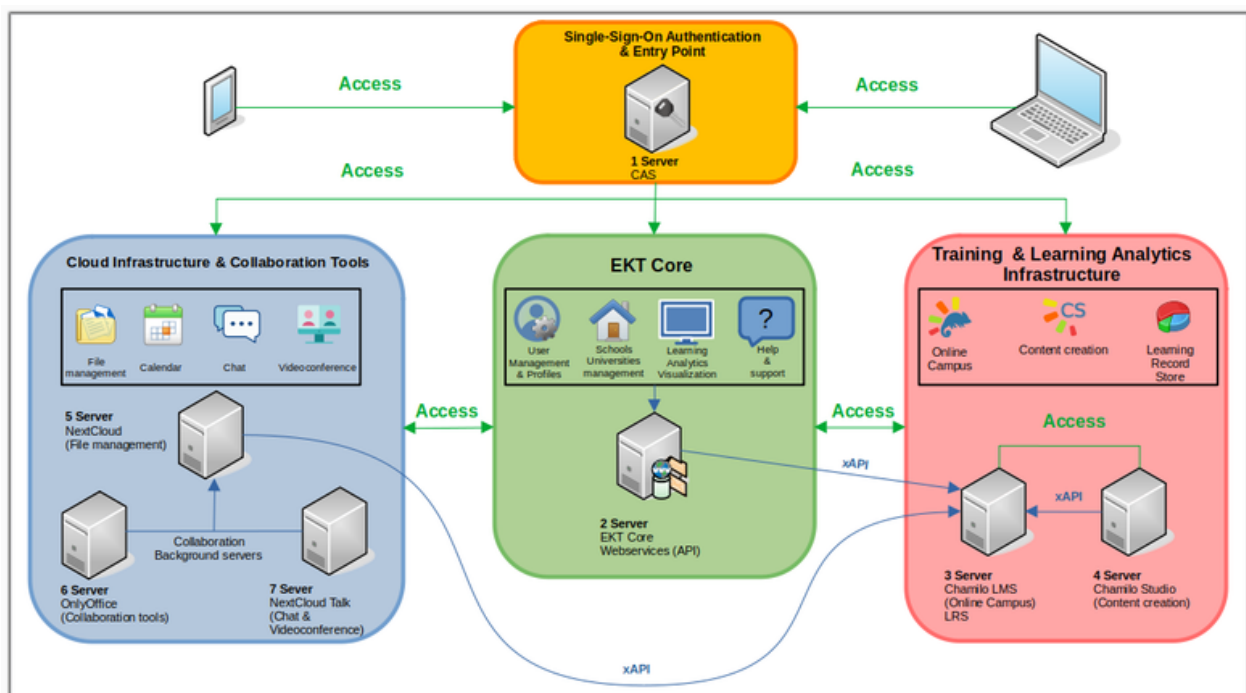


Figure 4. Final infrastructure version of EKT Platform

Platform development

Platform development started in January 2020, setting a first deadline to have a functional Beta version ready for Pilot Cycle 1 in October 2020, although pilot dates varied from one participant country to another, also due to the disruptions caused by the COVID-19 situation in those months.

The EKT Platform development initially worked to set up the infrastructure and main tools, with the following elements:

Single-Sign-On Authentication& Entry Point.

Own development of a CAS (Central Authentication Service), as a Single Sign On (SSO) to authenticate the platform users in a single place so they could access all functionalities without having to log several times.

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EKT Application.

Entry point of EKT Platform to which each of the subsystems are linked. It also provides user role assignment across all applications that are part of EKT Platform. It consists primarily of a Dashboard and a Management tool. This part was EKT own development.

Training Infrastructure.

It provides access to an LMS tool/virtual campus, as a customized Chamilo LMS, to provide achieve the features required in the project.

Educational LTI content Creation.

Initially provided by "ContentCloud" a proprietary solution by Netex. In the last stage (Beta 2 and final version), "Chamilo Studio" an open-source development substituted ContentCloud.



Cloud Collaboration Infrastructure.

The cloud communication and storage-defined services were implemented with the NextCloud open-source software, which provided calendar, chat, videoconferencing and document repository tools. To allow document collaborative editing, OnlyOffice software was implemented.

Learning Analytics (LA).

In EKT, LA is proposed as a pedagogical strategy to work on the collaborative and personalized learning process that takes place during the school placement period of initial teacher education. To implement it, xAPI standard was followed and implemented own development of LA traces in all elements of the platform. Collected data is centralized in a Learning Record Store (LRS), which is part of Chamilo LMS and serves as a repository for xAPI compatible traces from the tools that make up EKT intelligent system.

LA data visualization is implemented for the different profiles of users, in order to facilitate student teachers' self-reflection on their learning process, as well as tutors and coordinators' understanding of the learning dynamics, coordination, and taking measures to improve results.

The following table compares the most important changes that illustrate the evolution of the EKT Platform.

	Beta 1 (Pilot 1)	Beta 2 (Pilot 2)	Final
Single-sign-on unified user access & entry point	CAS Own development	CAS Own development	CAS Own development
EKT Application Dashboard	Own development	Own development	Own development
EKT Application User and school management tool	User roles Own development	User roles Own development	User roles Own development
e-learning campus	Chamilo LMS Own implementation	Chamilo LMS Own implementation	Chamilo LMS Own implementation
Responsive web	Own development	Own development	Own development

	Beta 1 (Pilot 1)	Beta 2 (Pilot 2)	Final
e-Portfolio	EKT Project design	EKT Project design (version 1)	EKT Project design (final version 2)
Content creation	ContentCloud	Content Cloud Chamilo Studio	Chamilo Studio
Communications	NextCloud Talk (without WebRTC server)	NextCloud Talk (WebRTC server)	NextCloud Talk (WebRTC server)
Documents	NextCloud OnlyOffice	NextCloud + custom shared folder development OnlyOffice	NextCloud + custom shared folder development OnlyOffice
Mobile application			
Web services	No	No	Own development
Learning Analytics	No	No	Metabase / Own development

Figure 5. Relation of services and software used

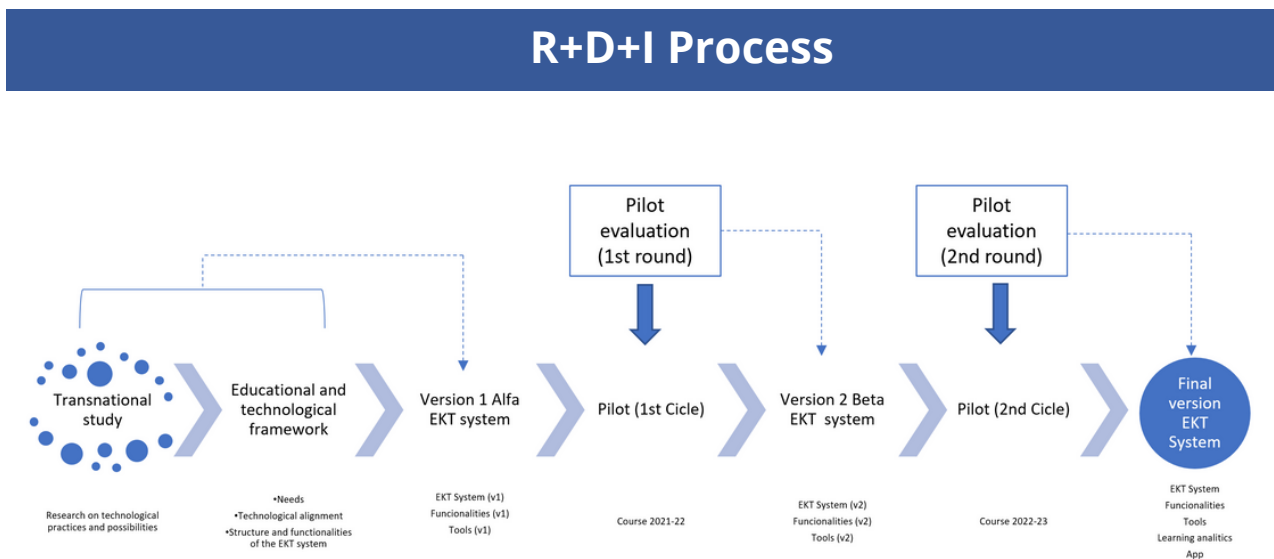


Figure 6. Alignment of piloting stages and platform development

This resulted in two cycles of development and testing aligned with the piloting experiences at the participant universities: course 2021-22 and 2022-23.

Usability. One of the most noticeable changes in the process of building the EKT Platform was the evolution of the design and usability features. From Beta 1 to the final version, there was a continuous commitment to make the platform easier for all users and more responsive to all devices. This implied, among other procedures, to homogenize the visual aspect and response from all parts of the platform, despite being based on different pieces of software, as well as to simplify the access to the most used sections and tools.

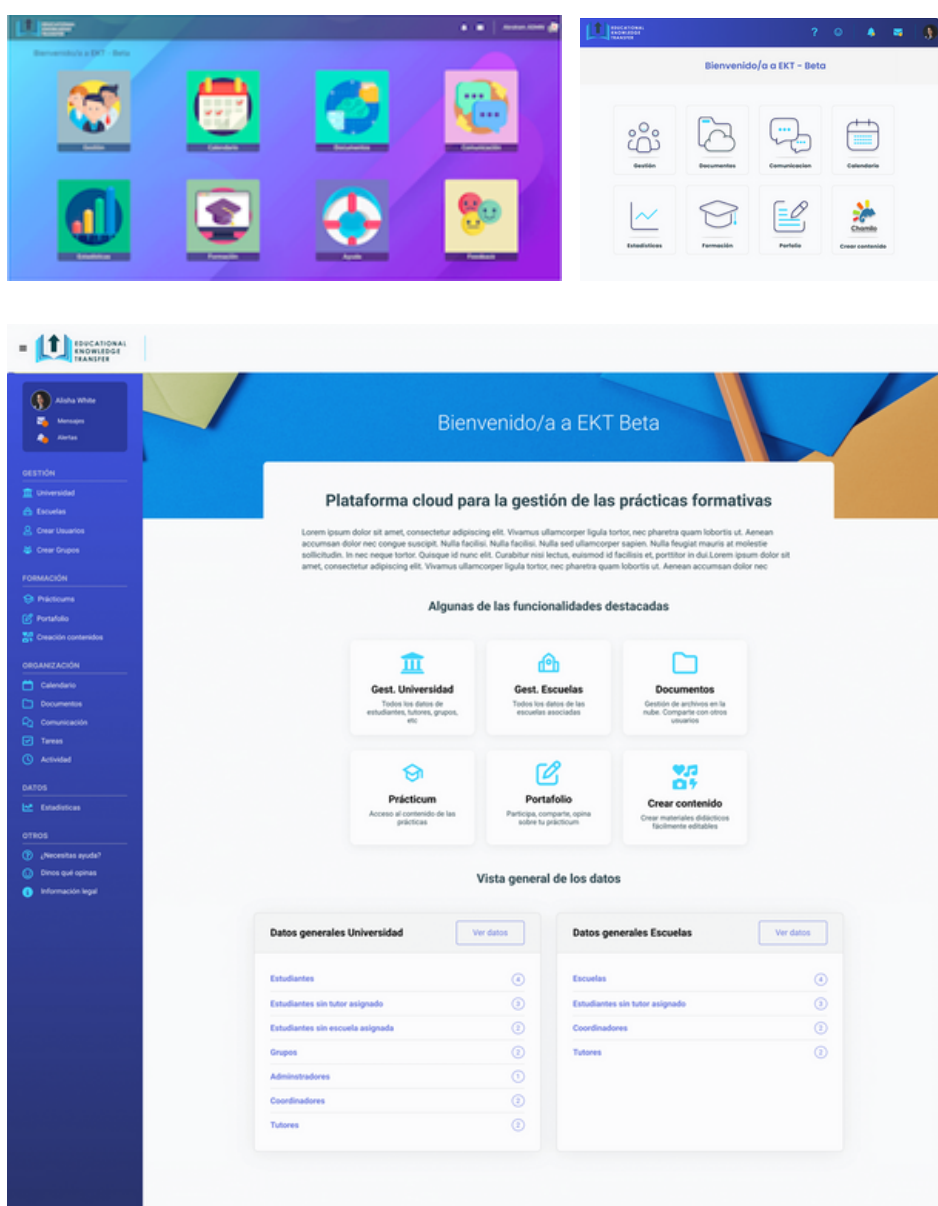


Figure 7. Visual appearance of EKT Dashboard in Beta 1, Beta 2, and final version

EKT in practice: piloting format and results

Piloting format

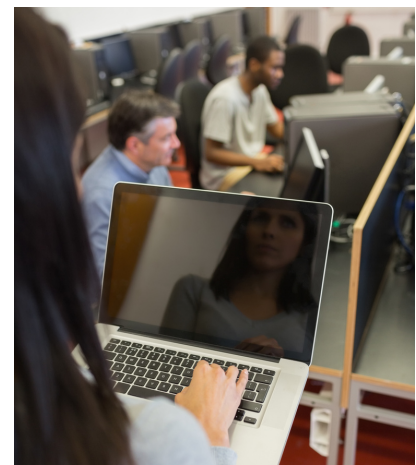
The EKT piloting was a key activity of the project where five partner universities applied the EKT Methodology, developed materials (SPOC), and the e-learning system (EKT Platform) during in-school placements of student teachers of the five teacher training institutions involved in the consortium:

- ➔ Pädagogische Hochschule Wien (Austria)
- ➔ University of Plymouth (England)
- ➔ Marino Institute of Education (Ireland)
- ➔ Universidade do Minho (Portugal)
- ➔ Universidad de Santiago de Compostela (Spain)




with the support of the EKT technical team coordinated by the Spanish partner CESGA.

The partner teacher training institutions embedded the EKT Methodology, resources and online tools into their existing teaching programmes, and engaged all relevant stakeholders i.e. academic mentors, school mentors, university and school coordinators, and student teachers.

The piloting activities helped to provide crucial information about the methodology, platform, resources, and online training and informed the final design. It enabled project partners to see what worked well for the target audience and which methods and approaches were appropriate for each placement setting in each country. Furthermore, this test phase provided information that enabled decisions regarding the final design and functionality of the EKT learning platform and online tutorials.




In principle, the EKT piloting process was divided into three phases:

-  1 EKT Pilot Preparation, which included ethics board approvals in each university, recruitment of participants, creation of user accounts and completion of the Small Private Online Course (SPOC);
-  2 EKT Pilot Implementation, when the pilot participants engaged with the EKT Platform during their school-placement period, tried out its features and functionalities;
-  3 EKT Post-Pilot Activities, mainly related to the project's evaluation activities in the form of questionnaires, focus groups and interviews.

The EKT piloting was carried out in two cycles, with the first pilot in the academic year 2021/2022 and the second running in 2022/2023. The pilot implementation approach was flexible, as each piloting partner designed the pilot to fit in different teacher education curricula and approaches during in-school placement. Pilots in each country were therefore unique in terms of students' and mentors' profiles, duration and the way the EKT Platform was merged with the institutions' own Learning Management System.

The project was considerably impacted by the outbreak of the COVID-19 pandemic, and the partners made significant efforts to roll out the pilot implementation activities and make necessary adjustments. In some countries, the number of teachers and mentors involved was by far lower than anticipated. However, some valuable feedback and lessons were derived from all pilot studies:

-  In **Austria**, the first pilot phase was conducted at the University College of Teacher Education Vienna (PHW) from September to January 2022, with five groups participating at different times during this period (70 student teachers, 15 school mentors and 5 academic mentors). The training phase (SPOC) was run together with the placement due to the contextual arrangements; the piloting phase had different periods of time depending on groups and incorporated the preparation phase, immersion into the placement, and analysis of the experience following the EKT Methodology. Most school placements were two weeks in duration, followed by reflective seminars with academic mentors. The e-learning system was used during the entire piloting phase: for coordination between academic and school mentors, communication with student teachers (preparation for in-school placement),

reflections on six observations, teaching trials, reflection (peer reflection and with school mentors during immersion into practicum phase) in school, and post-placement period – reflective seminars happening between student teachers and academic mentors.

In the second pilot carried out in autumn 2022, the same student teachers were asked to reflect on the changes made to the EKT Platform. Since PHW was the first organisation to pilot the EKT Platform they had to deal with certain technical problems which largely were solved by the time the other partners started their piloting phase.



In **England**, the pilot implementation faced many internal and external challenges. In the first pilot academic mentors and two students were involved in direct engagement on the platform, and in the second phase, the pilot focused on the communication needs of mentors. Ten mentors were interviewed, observed during professional development, and invited to engage with the EKT Platform as potential users. Although student teachers were reluctant to join the project as the existing university tools (e.g. One Drive, Moodle, PebblePad, email,) were considered sufficient, they readily discussed their placement experiences and communication needs in Phases 1 and 2. School and academic mentors often lacked digital capital and (paid) time to build digital skills and know-how. However, the pilot has highlighted a real need in the organisation to identify time, space, and resources for connection within as well as between groups - particularly for school-based mentors. The student teachers were looking for safe spaces to support each other during placement and afterwards to debrief. In the second pilot cycle, the organisation investigated the issue of peer support and mentoring as boundary crossing. During the limitations imposed by COVID-19 and other sectoral challenges, the mentor's role as 'boundary crosser' linked the realities of placement practice, and the personal and professional needs of student teachers with the regulatory and academic concerns of the HEI. Mentors were operating between schools, students, and university to make sure the placement process worked for everyone under difficult circumstances. They needed to communicate effectively and efficiently across the triad, but also felt the need for a space (both real and virtual) to develop their own community of practice for advice and professional development.

▶ In **Ireland**, the piloting partner Marino Institute of Education conducted their pilot in November 2022. Nine student teachers and one university tutor participated in the study, and the initial analysis of qualitative comments in the questionnaire noted the need for a mobile app version of the EKT Platform. Participants were impressed by the contents of the SPOC course and found it was presented in an informative, accessible, and interactive way. They were also happy that all materials relating to placement could be found “in one place” but would have preferred if the platform were integrated with college tools they already used, such as Moodle and MS Teams. All participants commented on the communication tools on the EKT Platform, where it was noted that “chats can occur with staff and each other to help and support our peers too” and participants liked that they could “divide their personal and professional life using the platform” instead of using WhatsApp and other social media tools to communicate with each other, during placement.

▶ In **Portugal**, the pilot study took place between January and March 2023 and initially involved 19 students from four different programmes (Portuguese Language, Biology/Geology, Mathematics and Informatics), eight placement schools and four university mentors. Due to various reasons, students’ participation dropped and only 10 students attended the onboarding meeting and further focus group sessions. The reduced participation was mainly due to the timing of the pilot study. In Portugal, ISP takes place throughout the whole school year and implies, in the first phase, the observation of the context and the preparation of a teaching project, and, in the second phase, the implementation of the project in the school mentor’s classes. The EKT pilot occurred in the transition from the first to the second phase; thus, being rather busy, students had little time to explore the platform. Moreover, the way the work involving academic mentors and students is established, with regular face-to-face meetings, created the feeling that the platform might be redundant at the moment. Also, some concerns were raised over the use of the ePortfolio tool as students felt there was little privacy in their communication with mentors, as it involved critical analyses focused on students’ work and materials. Although five school tutors were enrolled in the platform, it was almost impossible to involve them. This is because they are very busy in their activities as teachers and their participation in ISP is voluntary, which means extra work from which they get no benefits.

- ▶ In **Spain**, the first EKT pilot was run by Universidad de Santiago de Compostela from January to May 2022 and involved three groups of students from the final year. 23 student teachers and 7 academic mentors were recruited for the pilot, but 14 students completed the process. The involvement of school mentors was challenging.



The second pilot was carried out with new student groups between October 2022 and February 2023, 81 student teachers, 11 academic mentors and 69 school mentors decided to join. The higher interest among school mentors in this pilot cycle is worth noting, yet not all were actively participating in the platform due to lack of time. In both pilot cycles, there was a high level of involvement from the academic mentors and in the second pilot from a very active group of students. The use of the communication functionalities of the platform and the portfolio was significantly higher in the second pilot. Compared to the first pilot last year, users recognised a positive evolution of the EKT tool and identified further issues to improve in terms of usability and navigation that were considered in the final version of the system, which led to improvements in the user experience. There is also a need to address the integration of the SPOC into the system in terms of data and activity recording. The SPOC was re-designed with a new tool to make it interoperable in the EKT System and to record students' activities and progress in the learning analytics functionality.

Insights gained and lessons learnt in the EKT Project

Methodological insights

In view of the diversity of approaches to in-school placement in European Initial Teacher Education institutions, the EKT Methodology was designed as a flexible proposal that can be implemented in a variety of national and institutional contexts. Its application requires contextualization that is possible since the content of the six stages and the set of guides and instruments can be adapted to different organisational needs and contexts. For the EKT training model to develop with the characteristics that define it (horizontality, co-responsibility, coordination and dedication to the process), the following is recommended:

- It is necessary for the Initial Teacher Education institutions to assume that **the training of a teacher constitutes shared responsibility with the placement schools and requires permanent coordination during the in-school placement**, from its planning prior to the arrival of the student teacher at the school, until the closure of the process and subsequent assessment.
- The institutions responsible for ITE must **attribute to in-school placement the strategic formative value entailed in the training of a teacher, and, consequently, build a coherent programme and enable the appropriate instruments to support** such a complex process as this. This involves providing the necessary tools for interaction, communication, and collaboration between mentors, to record and document observations and thoughts, thus enabling reflection and feedback throughout the process. The tools currently available (virtual campus etc.) do not adapt to such a complex process in which agents from different institutions intervene. The EKT System is a promising answer to the specific needs of in-school placement.



- The **academic and school mentors should be considered partners** in the training process from the design phase in the initial training plans until the closure of the process. This requires further professionalization that includes the definition of the selection criteria for mentors and placement schools as well as the recognition of their dedication as part of their professional activity. This entails the selection of professionals who act as mentors in both institutions (academic and school) and their necessary training for this function.
- In the EKT System, **reflective learning is key, and the entire training process of the prospective teacher is projected.** Therefore, the role of mentors in guiding and supporting student teachers is decisive for them to acquire autonomy. As the final goal of in-school placement, the prospective teacher acquires skills that will serve them in their professional futures and that will guide them to practice the profession by learning continuously as they work.

Lessons learnt from the technological development process

As with all software developments, many lessons and ideas come out from the piloting experience, as well as from the evolution of software itself. Some of the most relevant are:

- The **availability of Open-Source software makes it possible to implement integrated solutions** with an initial level of maturity that greatly speeds up a global solution. This includes the possibility of adaptation of standard features to suit specific needs from the roles involved in the in-school placement process, as well as localization to local languages. Therefore, Open-Source software allows making systems like the EKT Platform **available for use and exploitation to other educational communities** in any language.
- In the same way, derived from the open development style, it is possible to obtain technical information directly from the original authors in particular and from the related development communities in general, **reducing the cost of development and implementation.**
- The close collaboration between the pedagogical team and the technical team in EKT Project resulted in the **production of a brand new ePortfolio tool** to be used not only in EKT Project, but available **for all users of Chamilo LMS**. This ePortfolio provides innovative features while keeping a simple and highly customizable approach to facilitate self-reflection, communication and sharing among the different roles. BeezNest, partner of EKT and one of the main developers of Chamilo LMS, played a key role in its development and in its latter integration in the latest Chamilo LMS package (1.11.18), which currently serves a community of more than 21 million users worldwide.
- **Chamilo Studio, a brand-new educational and multimedia responsive content tool was successfully tested.** This tool, recently developed as an Open-Source plugin for Chamilo *chamilo-studio.com* allows the easy creation of interactive, customized educational content with a professional look. This tool was first introduced in EKT Platform for the Beta 2 pilot and provided the required functionality of educational multimedia content creation for student teachers in their learning process.
- Gathering **feedback from end users was a key element in improving the technological solution.** From initial features and requirements to usability and accessibility, the EKT Platform was in constant evolution and underwent a thorough redesign of the application to make it easier and more effective for its target users (Beta 1 / Beta 2 / final versions).

- In each version released, it was **important to update the help section** (common to all users regardless of role) of the EKT platform, distinguishing between changes and novelties, which was meant to facilitate the understanding and access to all features regarding access of those user makes it possible to keep in mind the evolution of the platform during its development.
- **Intelligent Learning Analytics provide live feedback and reflection on own learning.** The implementation of the xAPI standard places the EKT Platform in the front line of integration between conventional online training software with the possibility of collecting a wide range of data for learning analytics. During the development of the EKT Platform, the necessary statements were incorporated, not only in the self-developed parts of the platform but also in the third-party accessory tools that complete the functionalities. A future improvement for its configuration would require a centralized database, which keeps all traces of activity across all tools/services of the platform, to simplify and accelerate data collection and visualization.

EKT main analytics were not based on learning objects, so xAPI format had limited use, whereas the majority of traces were related to communication and interactions between users, or with actions (management or document access), due to the specifics of the in-school placement dynamics.

Personalized visualization of Learning Analytics was implemented to differentiate its data according to the different roles defined. This facilitated access to relevant data for each user.





Lessons Learnt from the piloting cycles

The lessons learnt from the two piloting cycles are based on feedback from the pilot participants and observations from each partner organisation. This feedback is presented here in a consolidated and generalized format.

Even intuitive and easy to use systems like the EKT Platform **require basic training and onboarding** of the users to make them acquainted with the system to and aware of its functionalities and tools before starting.

During the placement periods, student teachers are physically separated from their peer group, but the EKT System allows them **to remain united as a learning community** despite the physical distance involved.

The EKT System **reduces the feeling of isolation** from classmates and trainers during the placement. It helps to maintain the link and not feel alone by promoting interaction and reflective learning on a unified platform.

The EKT System helps students **to self-regulate and collaboratively deal with doubts, concerns or uncertainties** that arise in this new scenario of connection with the educational context and professional initiation.

The EKT **methodological versatility and aim to engage all the key actors** (academic mentors, school mentors, and student teachers) on the platform are seen as key assets of a support system like the EKT Platform.

SPOC activities and content were highly rated and seen as well-structured. The topics were seen as relevant, stimulating reflection and reinforcing observation.

The SPOC materials had a positive impact on the student teachers' perceived knowledge in particular:

- Student teachers described that they got to know each other better thanks to the EKT Platform and learned to talk and reflect about issues arising during the in-school placement.
- Academic mentors emphasized that student teachers benefited from tasks aimed at action-oriented reflection and that the EKT Platform had the potential of fostering critical reflection and communication by including the school mentors in the communication channel.

It became obvious that systems like the EKT Platform can facilitate collaboration and rapprochement of the academic and school contexts during placements, but we have also learned that the EKT Methodology must contemplate the possible benefits for school mentors and enable the necessary conditions for a real involvement (time, participation in the design of the student's training proposal and training in digital competence of the mentors)



However, the pilots also revealed **challenges and areas for improvement in future developments** of this kind:

- Support systems like the one presented by EKT, its tools and functionalities are relevant for ISP, but it is crucial the” (academic and school) **“mentor cultures” need to be changed to make real collaboration possible. Favourable conditions** (above all, sufficient time resources) **are needed** to allow for quality dedication to student teacher follow-up.
- The structure for reflection in the ePortfolio was not used in all national pilots. Sometimes it was **difficult to involve school mentors in the portfolio reflections**. The activities designed in the SPOC to encourage reflection were meaningful for students and academic mentors but not sufficiently stimulating for school mentors. They need to be re-thought from the point of view of what value they can create for the school mentor and how they can be linked more to the day-to-day experience in their school.
- **Engaging school mentors proved to be challenging in several countries.** Their roles and responsibilities vary from country to country and the intensity of their work in the classroom makes it difficult to find time for innovation and experimentation.
- **Activation and registration of users** in the EKT System were rather complex as there was no possibility to connect the EKT Platform with the databases of the academic institutions. This was also due to the fact that the users came from two different institutions (academic and school). A future challenge is the **integration of the EKT System in institutional applications** so that they share data. This is a complex challenge as it directly affects the security protocols of academic institutions.
- The **limited functionality of the EKT System's mobile application** that student teachers were able to use on their personal mobile devices during the pilots implied **dependence on EKT Platform's web functionalities**. It was understood that this could have limited their use in different situations such as while in class or in action. In contrast, the interviews conducted in the evaluation process revealed that not all functionalities were used in mobility contexts. Students indicated that complex activities such as SPOC realization or ePortfolio reflection were not carried out during the action, that is to say, during the moments of direct intervention in the placement



schools, since these activities required significant dedication and introspection. On the other hand, instant communication tools were used during the periods of action in the schools. The **functionalities of the final version of the EKT App are therefore closely aligned to the activities that students perform in a specific situation**, such as communicating synchronously, accessing documentation or searching for information, while the **functionalities related to reflection and creation are part of the web version of the EKT System.**

- COVID-19 implied that teacher training institutions had to make widespread use of the tools and platforms they were already familiar with in new and innovative ways to accommodate the online needs of the limited placement events that happened during the project. For example, in the Irish university, Zoom was added to their Moodle LMS and created new Teams notebooks, to allow similar functionalities for their students until the EKT Platform was ready for use by pilot participants. The **challenge now will be how to continuously incorporate the possibilities and functionalities of the EKT System in existing virtual campuses.**

The EKT Project

EKT - Educational Knowledge Transfer was a transnational project, coordinated by Universidad de Santiago de Compostela and co-funded by the European Union's Erasmus+ programme. In this Knowledge Alliance for Higher Education partner institutions from six EU countries with different profiles participate and contribute to the work: on the one hand, educational institutions with a stake in Initial Teacher Education (ITE), and on the other hand, technology companies that offer e-learning services and resources:



Universidad de Santiago de Compostela

usc.es



die Berater

dieberater.com



Galicia Supercomputing Centre (CESGA)

cesga.gal



BeezNest Belgium

beeznest.com



Pädagogische Hochschule Wien

phwien.ac.at



Marino Institute of Education

mie.ie



University of Plymouth

plymouth.ac.uk



Lusoinfo II Multimédia S.A

lusoinfo.com



H2 Learning

h2learning.ie

EKT sought to improve the quality of ITE by providing comprehensive support of the important training element in-school placements, by developing and experimenting collaborative educational methodologies and smart technological frameworks in this context. Innovative strategies were developed and implemented by combining expert knowledge gained through educational research and technological optimization know-how.

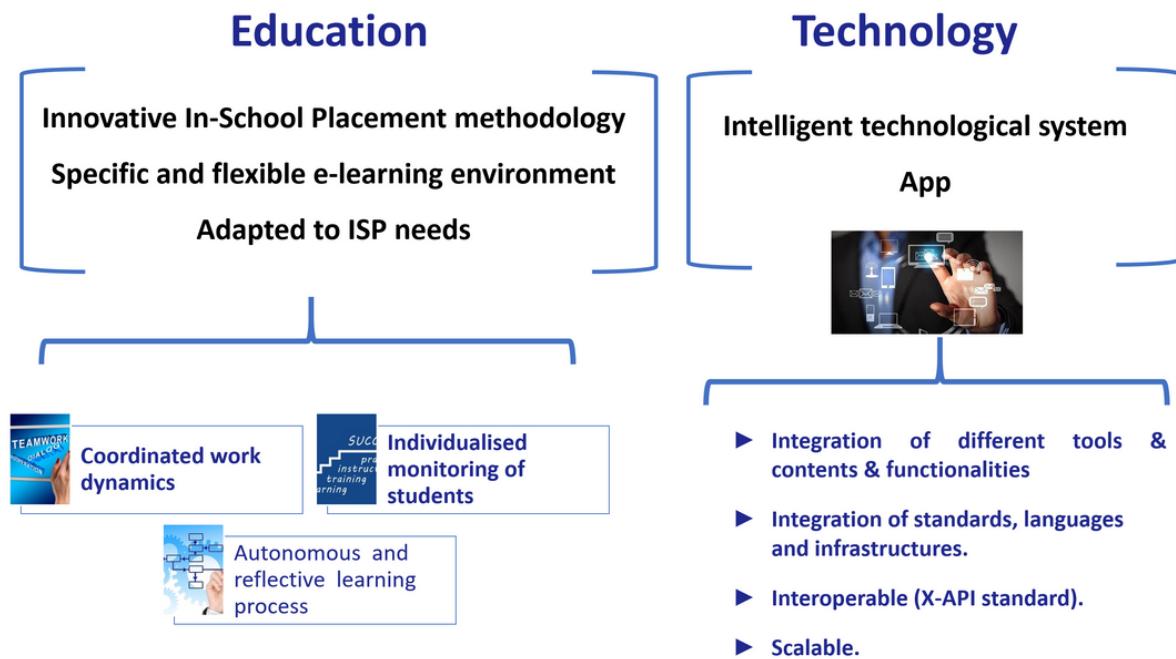


Figure 8. EKT Project Relevance: Educational and Technological Innovation

At the core of the **EKT Project** was the development, testing and evaluation of an advanced, multifunctional online platform, mainly produced by the EKT technical team, which consisted of the project partners CESGA, BeezNest, and Lusoinfo. The solution integrates a set of different e-learning, communication, collaboration and assessment tools and applications from several perspectives, natures, and areas. Integrated into the **EKT Platform** they increase the effectiveness of the teaching-learning process of future teachers by emphasizing key concepts such as self-evaluation and self-reflection but also by facilitating collaboration between students, and by simplifying the management of the internal processes between Higher Education Institutions and schools.

The EKT System is the final outcome of interlinked research, development and testing phases:

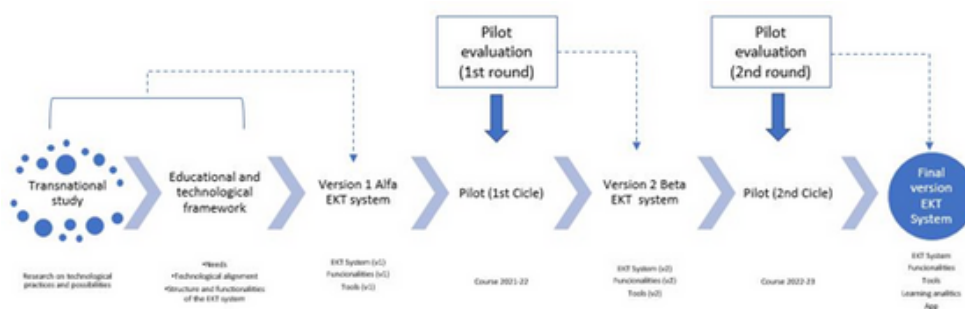


Figure 9. EKT Project: Research, Design and Pilot Process

Amongst other elements, the **EKT** Platform comprises media and text creation tools, centralized storage, course and virtual classroom creation, text and video communication in synchronous and asynchronous modes as well as staff management tools. A mobile app allows all users of the **EKT** solution to use the system from any device, at any place and at any time, and thus benefit from a truly high availability infrastructure.

All EKT products can be accessed through the project website:

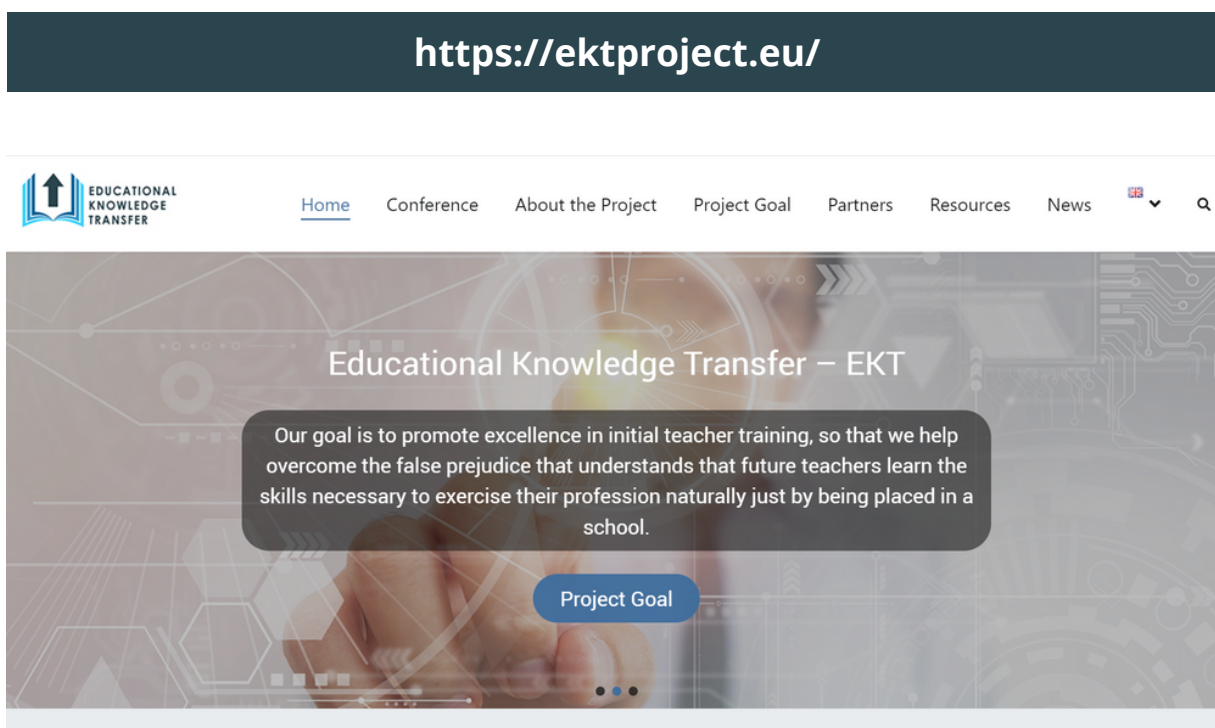


Figure 10. Screenshot of EKT Project website

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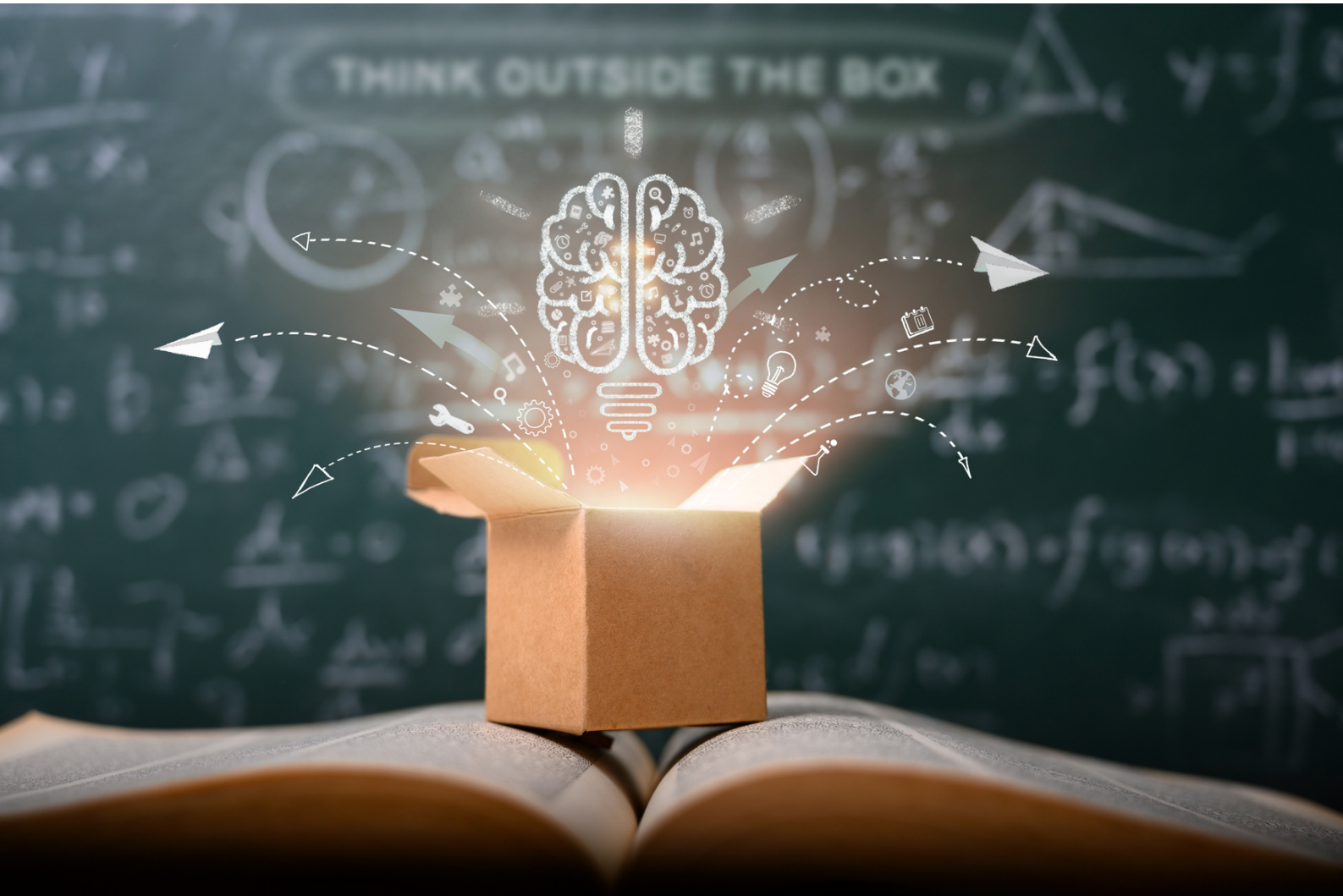
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