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# METHODOLOGY &



# TECHNICAL FEATURES

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# 1. OBJECTIVES OF THE DIGITEACH TO DIGITEACH METHODOLOGY

The **DIGIteach** Methodology provides a comprehensive and innovative framework for transforming art education in European schools through digital tools, collaborative practices, and inclusive approaches. Developed as a central intellectual output of the **DIGIteach** project, the methodology aligns pedagogical, technological, and ethical dimensions into a coherent model.

This document includes several interrelated components:

1. General Methodological Framework – outlining the structure and vision behind the methodology.
2. Teachers' Role – exploring how educators mediate between the digital resources and students' learning experiences.
3. Target Characteristics – analysing the learners' profiles and their specific educational needs.
4. Core Methodology – defining pedagogical strategies and didactic principles.
5. Educational Paths – offering practical learning journeys using digitalised artworks.
6. Technical Component – explaining the digital infrastructure (ArtCloud and eLearning platform) that supports implementation.

At the core of this methodology are the objectives that guide its development and application, both during the project and in future educational contexts.



## 1. Digital Preservation of Artworks

- Ensure the systematic digitisation of artworks from diverse cultural and historical backgrounds across Europe.
- Establish high-quality standards for digital archiving that preserve the integrity, detail, and authenticity of original artworks.

Promote the use of cutting-edge technologies—such as high-resolution imaging, focus stacking, and panoramic stitching—for long-term cultural preservation.

## 2. Educational Enhancement through Digital Art

- Integrate digital art tools and resources into school curricula to enhance both artistic expression and technological competence.
- Develop immersive, student-centered learning materials (e.g., virtual galleries, interactive platforms) to increase student engagement.
- Encourage interdisciplinary learning by blending visual arts with subjects like history, science, and literature.

## 3. Cross-Cultural Artistic Exchange

- Facilitate meaningful collaboration between students and educators across partner countries through shared digital experiences.
- Support the creation and dissemination of digital educational paths that reflect both national identity and European values.
- Use digital storytelling to highlight the unique cultural significance of each country's artistic heritage, promoting intercultural understanding.



#### 4. Accessibility and Inclusivity in Art Education

- Make art education more accessible to students with disabilities through assistive technologies and universal design principles.
- Provide multilingual and open-access learning materials to ensure broad participation across varied socio-economic and educational contexts.
- Develop teacher training resources that promote inclusive teaching practices using digital tools.

#### 5. Sustainability and Ethical Digitisation

- Advocate for eco-responsible digitisation practices, reducing unnecessary travel and optimizing digital infrastructure.
- Promote ethical usage of digital reproductions, ensuring museums retain ownership and licensing control over their content.
- Encourage sustainable data storage solutions for maintaining access to digital artworks over time.

#### 6. Technological Skill Development

- Equip students and teachers with digital competencies related to art creation, exploration, and preservation.
- Foster critical thinking, visual literacy, and digital fluency through hands-on activities, workshops, and collaborative projects.
- Inspire the adoption of new artistic forms and techniques through digital media (e.g., digital drawing, animation, VR/AR experiences).



## 7. Community Engagement and Public Awareness

- Involve schools, families, and local communities in exploring digital heritage through exhibitions, podcasts, and virtual events.
- Raise awareness about the role of digital art education in safeguarding European cultural heritage.
- Use the project's online platform and social media to showcase outcomes, share good practices, and engage broader audiences.

These objectives reflect the broader mission of DIGIteach: to foster a digitally enriched, inclusive, and culturally rooted approach to art education that resonates with students, empowers teachers, and bridges the past with the future. Together, they serve as the backbone for the methodology's implementation and long-term impact.



## 2. THE ROLE OF TEACHERS IN THE DIGITEACH METHODOLOGY

The successful implementation of the DIGIteach methodology depends fundamentally on the active and evolving role of teachers. As the primary facilitators of digital transformation in art education, educators are called to blend traditional artistic practice with digital innovation, using tools like the eLearning platform and the ArtCloud to create engaging, inclusive, and culturally rich learning experiences. Far from being passive users of content, teachers in the DIGIteach framework become curators of learning, interdisciplinary connectors, and mentors for creativity. Their capacity to harness digital tools while maintaining a strong pedagogical foundation is essential to unlocking the methodology's full impact in the classroom.



## 2.1. ESSENTIAL SKILLS AND COMPETENCIES FOR TEACHERS

To navigate and implement the **DIGiteach** methodology effectively, teachers are encouraged to develop a balance of technical, pedagogical, and intercultural competencies:

- Digital Literacy
  - Confident use of the eLearning platform and related tools (e.g., ArtCloud, Procreate, Blender, Google Arts & Culture)
  - Ability to guide students in accessing, exploring, and interacting with digitalised artworks
  - Basic troubleshooting and digital facilitation skills
- Pedagogical Adaptability
  - Integration of digital and traditional art techniques within project-based learning frameworks
  - Design of lessons that encourage experimentation, interdisciplinary thinking, and meaningful use of technology
  - Familiarity with structured educational paths and flexible adaptation to different classroom contexts
- Cultural and Interdisciplinary Awareness
  - Ability to contextualise artworks within European heritage, linking them to history, science, literature, and sustainability
  - Sensitivity to cross-cultural dimensions, enabling comparisons between national and transnational artistic themes
- Facilitation and Mentorship
  - Guiding students through educational paths and interactive projects while offering meaningful, formative feedback
  - Fostering inclusive environments that celebrate diversity and accommodate various learning styles and abilities



- Lifelong Learning
  - Commitment to ongoing professional development in digital education and emerging artistic technologies
  - Engagement in peer exchange and collaborative reflection, both locally and through European networks

## 2.2. THE TEACHER AS A FACILITATOR OF DIGITAL-ARTISTIC EXPLORATION

Within DIGlteach, the teacher's role is redefined: not as a sole transmitter of knowledge, but as a facilitator of inquiry, co-creator of content, and architect of digital learning experiences. Their tasks include:

- Curating Content: Selecting and sequencing resources from the ArtCloud and eLearning platform that align with curricular goals and student interests
- Guiding Educational Paths: Helping students navigate through structured paths and use them as springboards for further exploration and creative output
- Supporting Collaboration: Encouraging peer-to-peer learning, cross-border virtual exchanges, and collective projects using digital media
- Building Inclusive Learning Spaces: Adapting tools and methods to ensure participation and engagement of all learners, including those with specific needs



## 2.3. INSTRUCTIONAL STRATEGIES WITHIN THE DIGITEACH FRAMEWORK

To fully activate the methodology's potential, teachers may apply a range of evidence-based instructional strategies:

- **Structured Scaffolding:** Offering step-by-step support for exploring digital artworks and completing activities, while gradually fostering learner autonomy
- **Differentiated Support:** Using tiered instructions, tutorials, or peer mentoring to accommodate various digital competencies within the classroom
- **Feedback Loops:** Implementing digital portfolios and review sessions to monitor progress and provide targeted feedback, promoting self-reflection and growth

## 2.4. MINIMUM IMPLEMENTATION REQUIREMENTS

To effectively adopt **DIGiteach**, educators should be able to:

- Navigate the eLearning platform and ArtCloud with confidence
- Integrate at least one digital tool into their lesson planning and delivery
- Create or adapt learning experiences that incorporate digital artworks and promote active engagement

The **DIGiteach** methodology positions teachers as key agents in the transformation of art education. Through their ability to integrate digital tools, encourage interdisciplinary thinking, and foster inclusive learning environments, they bridge the gap between cultural heritage and contemporary pedagogy. Sustaining this evolution will depend not only on individual motivation but also on structured institutional support and ongoing professional development—ensuring that teachers feel equipped, valued, and inspired in this new educational landscape.

# 3. TARGET CHARACTERISTICS IN THE DIGITEACH METHODOLOGY

The **DIGIteach** Methodology is built around a deep understanding of its two core learner groups—students aged **11–13** (lower secondary education) and **14–16** (upper secondary education). These two age groups are the direct beneficiaries of the eLearning platform and the ArtCloud, and the methodology has been intentionally structured to reflect their developmental, cognitive, and emotional profiles.

By acknowledging the differences in how these students learn, interact, and interpret artistic content, DIGIteach ensures that the platform is not only engaging but also pedagogically appropriate and accessible. Each feature, educational path, and interaction on the platform has been designed with these learner profiles in mind.

## 3.1. LEARNERS AGED 11-13: LOWER SECONDARY STUDENTS

Students in this age group are typically in a stage of curiosity, playfulness, and sensory learning. While they respond well to visual and interactive stimuli, their analytical thinking is still developing, and they benefit greatly from structured guidance.

### Key Characteristics:

- Highly curious and eager to explore visual content
- Shorter attention spans, requiring engaging and varied stimuli
- Prefer learning through hands-on experiences, games, and visuals
- Limited prior knowledge of art history or heritage
- Need for clearly guided instructions and supportive frameworks



## 3.2 DIGITEACH APPROACH FOR 11-13-YEAR-OLDS

- Interactive visual content: High-resolution artworks are presented with simplified explanations and highlighted visual elements (color, shape, form).
- Gamified learning: Quizzes, games (e.g., “find and seek”), and playful challenges foster attention and memory retention.
- Clear learning sequences: Short, well-structured activities guide exploration and encourage understanding of basic artistic concepts.
- Progressive engagement: Information is gradually deepened based on interest, allowing students to “unlock” more complex content as they explore.
- Supervised digital exchanges: Collaborative projects or discussions with European peers are introduced in a simplified format, guided by teachers to ensure clarity and inclusion.

## 3.3 LEARNERS AGED 14-16: UPPER SECONDARY STUDENTS

At this stage, learners exhibit greater intellectual autonomy, critical thinking, and personal interest in cultural and artistic themes. They are more capable of connecting artworks to broader socio-historical and interdisciplinary contexts.

### Key Characteristics:

- Develop critical and reflective thinking
- Growing sensitivity to historical and cultural relevance
- Increasingly independent in their learning and interpretation
- Motivated by personal connections and thematic exploration
- Capable of engaging in collaborative and analytical discussions



## 3.4 DIGITEACH APPROACH FOR 14-16-YEAR-OLDS

- Analytical depth: Artworks are accompanied by detailed explanations, historical context, and critical reflections.
- Open-ended learning scenarios: Students are invited to analyse, interpret, and critique artworks through guided reflection or creative responses.
- Collaborative projects: Students co-create digital content—presentations, critiques, or exhibitions—building from the artworks in the ArtCloud.
- Interdisciplinary exploration: Thematic links to science, literature, and history are suggested within the educational paths, encouraging holistic learning.
- Independent peer interaction: Virtual exchanges take the form of debates, cross-school discussions, or co-developed projects, with teacher facilitation where necessary.

The strength of the **DIGiteach** methodology lies in its ability to adapt to the cognitive, emotional, and pedagogical needs of both learner groups. For younger students (11–13), the emphasis is on playful, visual, and structured engagement, while for older students (14–16), the focus shifts toward critical analysis, autonomy, and interdisciplinary learning.

The platform supports this differentiated approach by offering predefined educational paths tailored to each group. These paths can be used as they are or serve as inspiration for teachers to create their own, based on their students' needs, classroom dynamics, and national curriculum.

By combining adaptability with structure, the **DIGiteach** Methodology ensures that all learners—regardless of age, ability, or background—can engage meaningfully with European cultural heritage and develop both artistic and digital competencies for the 21st century.



## 4. PEDAGOGICAL PRINCIPLES



The **Digi-TEACH** methodology looks at the fruitful exploitation of the teaching potential triggered by the adoption of the Art-Cloud to support teachers - in particular art teachers - and students in dealing with the European cultural heritage in an innovative and engaging way. The proposed approach revolves around the educational proposal set by the e-Learning platform and by the Art-Cloud itself - the rich digital archive fed with high-definition art pieces and manufactures conserved in different museums from partner countries - offering students the opportunity to strengthen knowledge, art competencies and digital skills at the same time.

Integrating digital dimension within art education, indeed, has the double purpose of enhancing students' interest, comprehension and motivation towards these subjects and to sustain the digital responsiveness of the teaching-learning in this area. The specific features of the eLearning platform and the educational paths it offers, favor a multidisciplinary and up-to-date view of art education sustaining creativity and interest in students but also cooperation and exchange among teachers, overcoming the traditional barriers between subjects for a full and holistic approach to cultural heritage at school.

Our multi-dimensional view of art teaching – indeed - relates to the more general features of cultural heritage education, which distinguishes itself as global education, naturally linked to different knowledge areas sustaining people's awareness, critical thinking and active civic engagement (Copeland, 2006<sup>1</sup>).



[1] The role of heritage education in contemporary society has been developed in Europe finding its maximum expression and conceptualization in the so-called "Faro Convention 2005" (COUNCIL OF EUROPE - (CETS NO. 199) FARO, 27.X.2005, Council of Europe Framework Convention on the Value of Cultural Heritage for Society) and in the report by Tim Copeland "European democratic citizenship, heritage education and identity", drawn up for the Council of Europe in 2006, which fully acknowledges this spirit and introduce the concept of heritage education as global education. Cultural heritage education is therefore a precious global educational resource for human development, enhancement of cultural diversity and promotion of intercultural dialogue.

According to these premises, interdisciplinarity and flexibility become the distinctive traits of the Digi-TEACH educational proposal: the specific activities defined by the e-Learning paths and centered on the digitized art pieces in each partner country allow to create engaging multi-subject lessons encouraging the circularity of knowledge and the development of metacognitive abilities in students.

The paths - properly designed for lower secondary (11-13 years old) and upper secondary (14-16 years old) students - can be used by teachers both in lessons specifically dedicated to art, art education and art history, but also in lessons for other disciplines such as history, literature even towards science, technology, chemistry, that can be treated starting from/through art (a sort of CLIL method applied to art).

Interdisciplinarity and flexibility aspects also make the **Digi-TEACH** educational proposal suitable to match the requirements of different school curricula for art teaching all around Europe - as they may differ - and to be profitably used in different curricular or extra-curricular activities focused on art and on cultural heritage education in general. Versatility can be considered the methodological strength of the several learning paths proposed by **Digi-TEACH** as this feature allows teachers to easily adapt the activities to the different educational needs due to the various school programs in partner countries as well as to the official topics and expected learning outcomes determined according to the students's age range or to the specific study course (among the different partner countries they may differ too).

For these reasons, to properly adopt and exploit the specific educational activities provided by the e-Learning platform, the use of active and participatory methodologies is strongly recommended. These approaches indeed favor the fruitful combination between Formal and Non-Formal learning, leading students to nurture not only specific sectoral competences, but also social competencies and soft skills essential for their cognitive and personal growth.

## 4.1 SOCIAL MEDIATION METHODOLOGIES

- Social mediation methodologies are part of the wider range of active and participatory approaches. These methodologies differ from traditional "teacher mediation" methods because they center the students within the learning process making them protagonists of their own acquisition path, encouraging also their creative thinking, problem solving and the improvement of other soft skills. Adopting these practices can help teachers to value each student's learning potential, support their self-confidence as well as the right development of one of the most relevant key competences for lifelong learning: the learning to learn competence<sup>2</sup>. These approaches are particularly fitted to deal with the interdisciplinary art-based activities provided by the educational paths offered by the **Digi-TEACH** e-Learning platform.
- Here below, we're going to present the key features of such educational strategies as cooperative learning and the flipped classroom that can be easily adopted by teachers to carry out their lessons through the educational materials from the Art-Cloud and by the e-Learning Platform. To properly apply these strategies, basic operational indications will be presented together with the main aspects featuring the role to be assumed by the teacher accordingly. In the Social Mediation Methodologies – indeed – a change of perspective is required to teachers to look at the teaching and learning dynamics. They leave the traditional asymmetrical teaching position to design, coordinate and supervise the lesson activities while they manage even all those social, organizational and emotional factors that frame the learning process. The teacher's key task in this kind of methodologies is therefore to create in class an educational setting that is inclusive, dynamic, open to dialogue and discussion where students can be active protagonists of their own path of knowledge and growth by giving their tangible contribution to the development of the activity and to the circulation of knowledge.

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• [2] EU Council Recommendation on Key Competences for Lifelong Learning, 22 May 2018 (2018/C 189/01).

## 4.2 COOPERATIVE LEARNING STRATEGY

Cooperative Learning (CL) is an educational approach which aims to organize classroom activities into social learning experiences. This teaching-learning approach is based on the interaction within a students' group who cooperate for a common goal, helping each other and feeling co-responsible for the reciprocal knowledge path. Thanks to the cooperative dynamics triggered by the group, the students can build knowledge and acquire skills through positive interactions, making their own individual learning a teamwork result. Different intelligence and competences are mixed within the group, allowing students to more easily overcome possible difficulties in tackling complex assignments and to learn more quickly than if they were working individually. There are a great number of cooperative learning techniques available, some of them utilize student pairing, while others utilize small groups.

For the multidisciplinary art-based activities promoted by the **Digi-TEACH** educational proposal, the most suitable cooperative learning techniques could be those to be carried out in small groups of four-five students<sup>3</sup>. The class will be divided into preferably **heterogeneous** groups within themselves and homogeneous among themselves to stimulate comparison and interaction and avoid imbalances between the groups. The heterogeneity inside the group – e.g mixing students with different levels of competence for the treated issues or showing different levels of school performance in the focused subjects – profitably contributes to sustain positive interdependence among the members.



[3] Despite the above-mentioned indications for group working, in general, the cooperative learning is a very flexible and handy approach, therefore teacher is anyway free to adopt it modelling the lessons - in pairs or in small groups - according to the specific expected educational purposes and results he/she expects.

the learning environment where the students can actively convert the didactic activities into a collective problem-solving process supported by a constructive relational climate. These main aspects constitute the key strength of the cooperative strategy, configuring this approach as a valid alternative to the traditional frontal lesson.

According to D. Johnson & R. Johnson Theory (1994), five essential elements are identified for the successful incorporation of cooperative learning in the classroom:

**1. Positive interdependence**, students are engaged in improving the performance of each group member since, to reach the goal, individual success can't be disjunct from collective success.

**2. Individual and group accountability**, the group is responsible for reaching the assigned goals, and each student, as group member, is committed to contribute to this purpose.

**3. Promotive interaction (face to face)**, students are in relation, promote and support each other's efforts by working interactively, check together the chain of reasoning and the feedback, knowing how to give up their own individual opinion in favor of that of their partner if it is better.

**4. Relevance of social competences**, CL promotes specific social skills which are essential to the proper establishment of effective interactions inside the group such as communication skills, leadership, decision-making, problem solving and negotiated conflict resolution skills. Students do not necessarily have to already possess these skills, but they acquire, mature or perfect these abilities thanks to group work and the teacher-led reflection on these aspects.

**5. Group processing as review**, activity control (individual and group assessment), this activity increases the students' individual responsibility towards the goal as they assess if the group achieved the expected goals and how the work was and - starting from their observations - they also set improvement objectives. Properly managed CL activities require 2-steps control made by students themselves inside the group and by the teacher as external: ongoing control, during task execution (monitoring), and final control at the common activity closing (process evaluation).

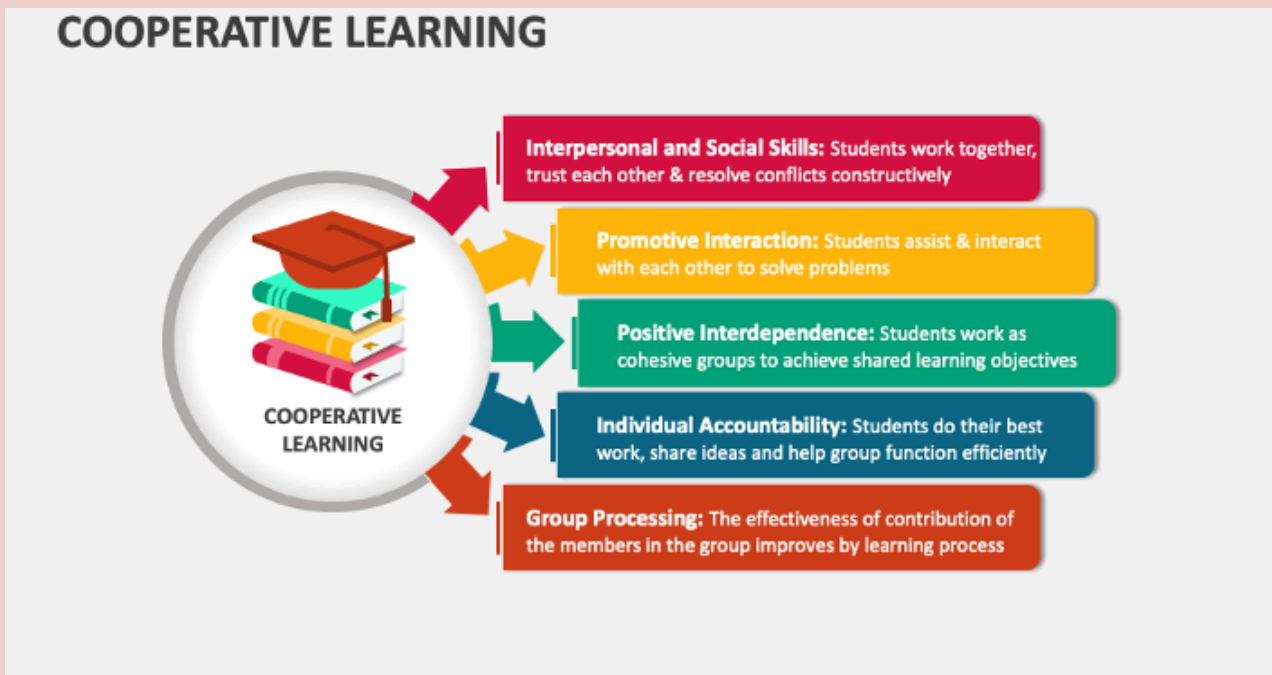


Figure 1 - The 5 elements of Cooperative Learning



# THE COOPERATIVE LEARNING ACTION

1	<b>Definition of the activity's cognitive and social objectives</b>
	The teacher creates the issue/topic to be submitted to students
2	<b>Group setting and roles' assignment</b>
	The groups are heterogeneous within themselves and homogeneous among themselves, and roles' assignment for the group work is based on leadership and single features shown by the members
3	<b>Spaces organization and preparation of the materials</b>
	The teacher can set and use the didactic materials and resources in different ways: <ul style="list-style-type: none"> <li>- Materials delivery per student, all groups with the same materials</li> <li>- Materials delivery differentiated per group</li> <li>- Materials delivery per member, and homogeneous materials per group, to sustain positive interdependence inside the group itself</li> </ul>
4	<b>Monitoring *</b>
	Ongoing assessment inside the group (students' self-assessment) and external monitoring by the teacher
5	<b>Evaluation *</b>
	Processing inside the group (students' self-assessment) and external assessment by the teacher
<p>(*) The assessment strategy and related tools to be applied therein - both by the group and by the teacher - should be previously decided by the teacher according to the planned educational objectives and to expected learning outcomes to be achieved by the students (in terms of specific knowledge and competence to be acquired and social skills to be improved).</p>	

# HISTORICAL INSIGHTS

Cooperative Learning stems from the currents of thought led by the pedagogue John Dewey (1859-1952) and the psychologist Kurt Lewin (1890-1947) who agreed on the necessity, relevance and value of interaction and cooperation in the school environment. These first seeds bloomed by the thoughts and studies carried out by the Swiss psychologist and pedagogue Jean Piaget (1896- 1980), and by the Russian psychologist Lev Vygotskij (1896–1934, ZPD-zone of proximal development Theory).

The Social Psychologist Morton Deutsch (1920-2017) also influenced the cooperative learning theory practiced today, and his contribution to this was positive social interdependence, the idea that the student is responsible for contributing to group knowledge. Since the 1960s, many other pedagogues and psychologists such as Jerome Bruner (1915 – 2016, with the Scaffolding Theory) studied and conducted research to develop cooperative learning, which is now considered an essential element, not only within the school system, but also within our entire system of social interaction.



## 4.3 FLIPPED CLASSROOM

A **flipped classroom** is a didactic strategy and a type of blended learning. It aims to increase student engagement and learning by having complete readings at home, mainly using ICT supports and digital resources, and work on live problem-solving during class time. This pedagogical approach moves activities, including those that may have traditionally been considered homework, into the classroom. With a flipped classroom, students carry out research and study at home, while actively engaging concepts in the classroom with the guidance of the teacher, acting as a mentor.

The key aspect of the flipped classroom, linked to the extensive use of videos and other digital resources as content to study during the home time, make this approach very closely fitted with the educational proposal set by **Digi-TEACH** as students can benefit from the whole educational materials offered by the e-Learning Platform and by the Art-Cloud.

The basic idea of the flipped classroom strategy is that the time in class is used for collaborative activities, experiences, debates and workshops which are centered on the active role played by the students. As for the cooperative approach, even for the flipped classroom, the teacher indeed acts as facilitator of the learning process leaving the students a leading role in exploiting in class what they studied, deepened and prepared at home.

Compared with the transmissive-frontal lesson, totally centered on the teacher, the flipped strategy upsets the traditional didactic mindset: the classroom is converted in a work space for discussion and experimentation and the students become an active learning and research community where each one turns on own resources and learns how to activate and use the knowledge thanks to the exchange with the peers (classmates) and the teacher.



Flipping is therefore a fluid and flexible teaching methodology, fitting different disciplines or types of class and profitably usable to "gain" precious time for the activities to be developed in class, thanks to the work done by the students at home. Individual work at home plays a fundamental role in this teaching strategy, therefore it needs to be carefully organized in advance by the teacher, assigning students with tasks to be accomplished and specific materials to be studied.

For these reasons, having high quality study materials at home is essential. The digital resources offered by the Digi-TEACH e-Learning Platform as well as by the Art-Cloud respect these requisites as they can easily be used at home by students according to the teacher's instructions. The open educational resources available from the Platform are also calibrated on different knowledge levels - being suitable for students of 11-13 years old and 14-16 years old - and on the expected multidisciplinary learning outcomes to be achieved.

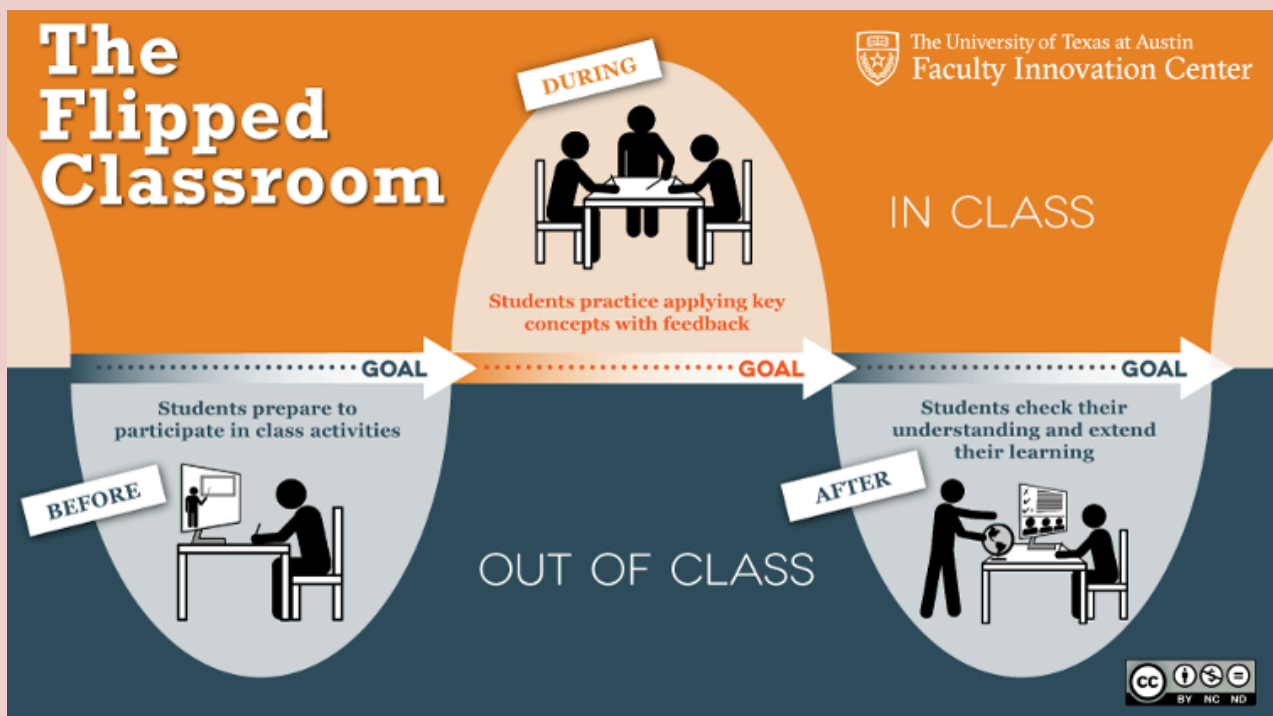


Figure 1- The Flipped Classroom process

Thanks to its peculiar characteristics, the Flipped classroom methodology sustains students in reaching the following educational objectives:

- Acquisition/enhancement of cultural competences, art and other subjects' knowledge, according to the specific multidisciplinary topics focused by the lessons
- Development of art literacy and techniques for art and images production, analysis, etc.
- Media literacy and development of students' digital skills
- Strengthening of active and cooperative methodologies and laboratory activities
- Improvement of students' soft skills such as communication, empathy, leadership, problem solving, creativity, critical thinking, autonomy.

## THE FLIPPING CLASSROOM ACTION

In a traditional school setting, homework is conceived as a-posteriori activity carried out by the student after the teacher's lesson with the fundamental aim of repeating concepts to memorize and acquire them. For the flipped classroom, time at home is used by the student to study the materials assigned by the teacher as preparatory work before dealing with the activity in class.



### **Materials' selection for home activities**

- 1 The teacher selects the materials for students to be used at home as individual preparatory work to that in class. The proposed digital resources - that for flipping approach can be generally self-produced or found from online archives - in our specific case can be drawn directly from the Digi-TEACH e-Learning Platform and from the Art-Cloud. The essential criteria recommended to teachers to select materials require that they should:
- Be anticipatory respect to the contents to tackle in class activity, activating the student's learning process
  - Be challenging for the students, encouraging interest, motivation and engagement in learning
  - Trigger questions requiring further insights and so a step beyond in the learning process.

### **Work in class**

- 2 Students are already equipped with the knowledge/information acquired through home activities and critically use them at school for the problem-solving oriented learning actions. This way, the flipped mechanism allows teachers and students to have more time in class for common research work, participatory involvement and group work on the focused topics. Students can be grouped and/or work in pairs, according to the methodological principles of the cooperative approach, but also individually.
- Active, collaborative and experiential didactic activities are the most fitted ones for the flipped mechanism, especially if they are aimed at developing and/or producing concrete outputs (e.g. a presentation, a video, a podcast, an e-book etc.) in a learning-by-doing logic. This way, the student's learning process started with the homework and then exploited in class will be documented, materialized and fully internalized. Students' products are recommended to be transferable and open to consultation to trigger possible reflections and so launch further educational actions

3	<p><b>Teacher-led metacognitive final reflection</b></p> <p>The teacher supports-guides students in rethinking and in explaining how the learning has been held through the implemented activity, emphasizing the concepts, discoveries and essential results they achieved both at home and school. Within the final reflection, the teacher can also provide additional indications for supplementary study.</p>
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## HISTORICAL INSIGHTS

Militsa Nechkina, a member of the USSR Academy of Pedagogical Sciences, first proposed the flipped classroom model in 1984. Then, Harvard professor Eric Mazur played a significant role in the development of concepts influencing flipped teaching through the development of an instructional strategy he called peer instruction (1997) where he found that his approach, which moved information transfer out of the classroom and information assimilation into the classroom, allowed him to coach students in their learning instead of lecture.

Lage, Platt and Treglia published a paper entitled "Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment" (2000), which discusses their research on flipped classrooms at the college level. In their research focusing on two college economics courses, Lage, Platt, and Treglia assert that one can leverage the class time that becomes available from the inversion of the classroom (moving information presentation via lecture out of the classroom to media such as computers or VCRs) to meet the needs of students with a wide variety of learning styles. These studies highlight the two main characteristics of the flipped classroom: inversion between work in class and work out of class and the use of digital resources for out-of-class activities.

## 5. EDUCATIONAL PATHS IN THE DIGITEACH METHODOLOGY



Educational paths are at the heart of the DIGIteach methodology—structured, immersive learning experiences that guide students through the exploration of digitalised European artworks using a blend of pedagogy, creativity, and technology. These paths are not standalone lessons, but coherent learning journeys that merge digital innovation with traditional educational principles to bring art and culture alive in the classroom.

Each partner country has committed to creating two educational paths: one for students aged **11–13 (middle school)** and one for those aged **14–16 (lower secondary school)**. Additionally, at least two transnational paths will be developed, showcasing the richness of European cultural heritage by combining artworks from multiple countries.

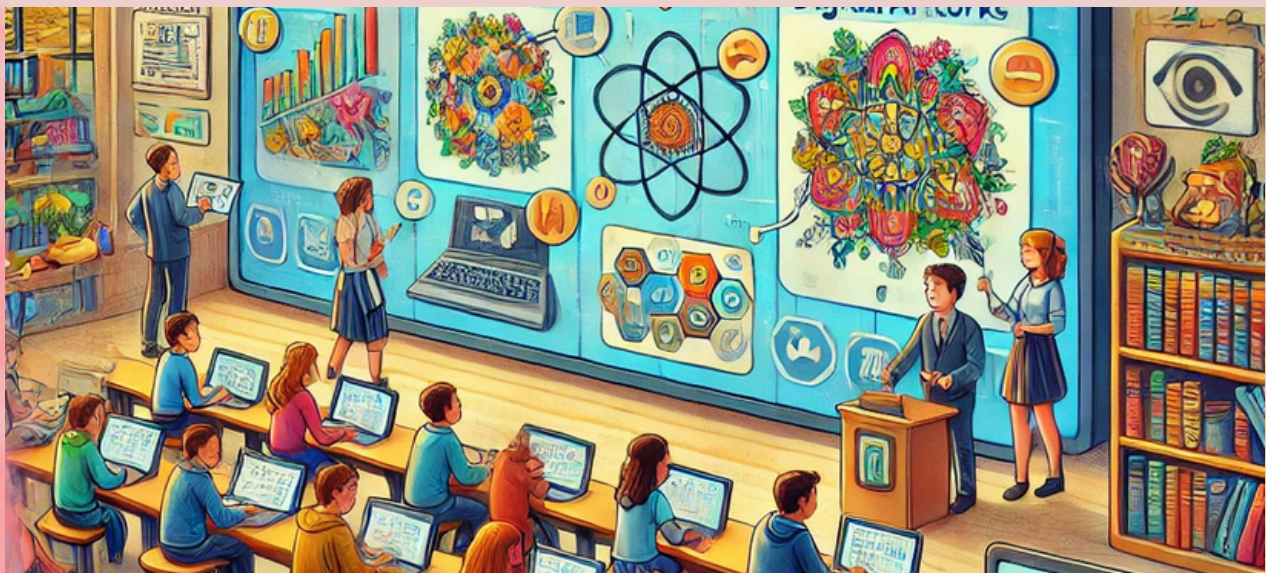
These paths are grounded in the ArtCloud, which hosts 75 high-resolution digitalised pieces from selected museums across Europe. While each partner's path is inspired by their national collections, teachers and students will be encouraged to explore artworks beyond their own borders, fostering intercultural learning and European identity.

A defining feature of these educational paths is their dual purpose. They serve not only as ready-made teaching resources, but also as templates and inspiration for teachers to develop their own paths based on subject area, student needs, or interdisciplinary goals. This flexibility is essential for empowering educators to tailor learning experiences that resonate with their curriculum and classroom dynamics.

The paths reflect a shift toward student-centred, experience-based learning, embracing both the tactile and digital dimensions of education. Each path is structured to support meaningful engagement, critical inquiry, and creative output, while promoting cross-curricular competencies and digital literacy.

## KEY PEDAGOGICAL DIMENSIONS

- Interactive digital exploration of artworks using zoom, annotation, and multimedia narration tools.
- Cross-disciplinary connections, enabling integration with literature, history, civic education, science, and technology.
- Flexible and inclusive design, adaptable to various educational contexts, learning needs, and levels of digital readiness.
- Development of 21st-century skills, including problem-solving, creativity, collaboration, and critical thinking.
- Support for digital citizenship, guiding students to navigate and contribute to digital environments ethically and responsibly.
- Multilingual access, allowing all platform content to be available in English and partner languages (FR, IT, ES, GR, TK), supporting CLIL-based learning and linguistic inclusion.



Each educational path will be structured around:

- A compelling title and theme (e.g., “From Myth to Modernity: Ancient Narratives in Contemporary Eyes”)
- Age-appropriate learning goals, adapted to students’ cognitive development and artistic fluency
- A step-by-step sequence of learning activities, encouraging progression from observation to interpretation, and finally to creation
- Use of the ArtCloud to explore artworks in detail, supported by contextual stories and thematic lenses
- Hands-on, creative tasks like sketching, writing, digital painting, or creating interactive exhibitions
- Assessment tools, including auto-correcting quizzes and reflective tasks
- Collaborative elements, where students may work in teams, co-analyse artworks, or compare interpretations
- Encouragement for personal expression and reinterpretation, enabling students to create their own art inspired by what they explore

Importantly, all the educational paths developed by the partners will be thoroughly explained and documented in the Practical Appendix of the DIGIteach Methodology. This appendix will accompany the research and theoretical sections developed in WP2, offering concrete examples and pedagogical guidelines that teachers can adapt or replicate.



Teachers will benefit from:

- Ready-to-use materials, saving preparation time
- A foundation for interdisciplinary planning, with clear links to other subject areas
- A guide to applying active, student-led methodologies that enhance classroom engagement
- Access to formative and summative evaluation tools
- A pathway to professional growth in digital and STEAM education

All educational paths will undergo a **two-stage validation process**, involving review by the **Quality Manager (Centro Machiavelli)** and two experienced art teachers, ensuring each path meets high pedagogical and practical standards before being published on the platform.

The eLearning platform, hosted at [www.digiteach-erasmus.eu](http://www.digiteach-erasmus.eu), will serve as the digital hub of the project. It will house:

- The full set of educational paths and their teaching resources
- The ArtCloud with all digitalised artworks
- Podcast episodes from project partners
- Teacher and student feedback stories
- An open-access section for exploring European cultural heritage

With this integrated, multilingual, and learner-focused platform, **DIGIteach** goes beyond offering a tool—it proposes a pedagogical model. A model that empowers teachers, engages students, and bridges art, culture, and education in a digital age.

In this vision, educational paths are not simply activities—they are journeys. Journeys through artistic masterpieces, across time and borders, where young Europeans can discover not only art, but also themselves.

## 6. TECHNICAL COMPONENT OF THE DIGITEACH METHODOLOGY

The digital backbone of the DIGIteach project is composed of two integrated systems: the ArtCloud, managed by Centrica, and the eLearning platform, developed by Inforef. Together, they provide the foundation for an interactive, multilingual, and accessible educational experience, merging cultural heritage with modern pedagogy.

### 6.1 THE ARTCLOUD DEVELOPED BY CENTRICA

Centrica led the digitisation process of artworks sourced from museums in each participating country. These artworks, digitised using advanced imaging techniques, populate the ArtCloud, a digital repository of ultra-high-resolution cultural content. The ArtCloud functions as both a standalone educational resource and an integrated component of the eLearning platform.

### DIGITISATION TECHNOLOGIES AND WORKFLOW

The digitisation process used a multi-shot photographic capture technique, requiring a minimum distance of three meters from the subject. Artworks in narrow or cornered spaces were excluded due to these technical constraints. There were no limitations regarding the size of the artworks selected.

Centrica implemented a comprehensive color management workflow to ensure faithful reproduction of original pieces. For each work session, a unique ICC profile was created using the Color Checker Camera Calibration tool, supported by Adobe Lightroom and RAW-to-DNG conversion.

The standard process included:

- Setup of the acquisition station
- Calibration shots using color checkers
- Image processing and ICC profile generation
- Post-production adjustments for optimal color and detail rendering

## PHOTO STITCHING AND FOCUS STACKING

For panoramic or large-scale imagery, PTGui Pro was used for photo stitching. For three-dimensional artifacts, Helicon Focus enabled precise rendering through focus stacking, ensuring complete depth-of-field clarity. In some cases, both techniques were combined to produce ultra-detailed, immersive visualisations.

## COPYRIGHT AND LICENSING

All digital files remained the property of the respective museums. They were made available exclusively for DIGIteach project purposes within the agreed timeframe. Museums also had the option to apply Open Access licenses, thereby promoting wider public engagement with cultural heritage.



## 6.2 THE ELEARNING PLATFORM DEVELOPED BY INFOREF

Inforef created a fully customised eLearning platform to host the educational content of the project and integrate the ArtCloud's resources. The platform is live at [www.digiteach-erasmus.eu](http://www.digiteach-erasmus.eu) and serves as both a learning space and the official public interface of the project.

### PLATFORM TECHNOLOGY

### ARCHITECTURE

### AND

The platform was built from scratch using PHP, MySQL, and JavaScript, avoiding traditional CMS systems. This provided full control over structure and design, allowed for increased speed and security, and ensured long-term sustainability. It also reduced environmental impact due to its lightweight footprint.

### MULTILINGUAL INCLUSION

### ACCESSIBILITY

### AND

The entire platform is accessible in English and all partner languages—French, Italian, Spanish, Greek, and Turkish—supporting CLIL (Content and Language Integrated Learning) approaches. An integrated accessibility module ensures usability for individuals with visual impairments or other needs, aligning with the project's commitment to inclusive digital education.



# INTEGRATED DIGITAL ART REPOSITORY

Digitised artworks from the ArtCloud are available on the platform in ultra-high resolution. Users can explore them in detail with zoom functionality and filter them by:

- Artist
- Artistic style or movement
- Date or historical period
- Country of origin

Each artwork features a dedicated page with metadata, context, and links to the ArtCloud for deeper exploration.

## USER JOURNEY AND EDUCATIONAL CONTENT

Upon landing on the homepage, users can navigate between:

- A Project Section, offering detailed insights into the project's objectives, partners, and work packages.
- The eLearning Space, which requires a simple registration (name, email, age group, GDPR consent). Users can choose between two learner profiles—ages 11–13 or 14–16—and switch freely between sections.

Inside the eLearning environment, users access:

- A library of educational paths, developed by partners (12 national + 2 transnational)
- Interactive learning materials and structured learning journeys
- Auto-correct quizzes and creative activities
- High-definition artwork explorations aligned with STEAM pedagogy

The educational paths follow a clear structure and are designed to:

- Encourage critical and creative engagement
- Support cross-curricular connections
- Be adaptable to diverse learning environments
- Promote digital skills and European cultural awareness

All educational paths have been validated by the Quality Manager (Centro Machiavelli) and two expert art teachers, and are thoroughly explained in the Practical Appendix of the DIGIteach Methodology, making them replicable, adaptable, and pedagogically sound.

# ABOUT

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