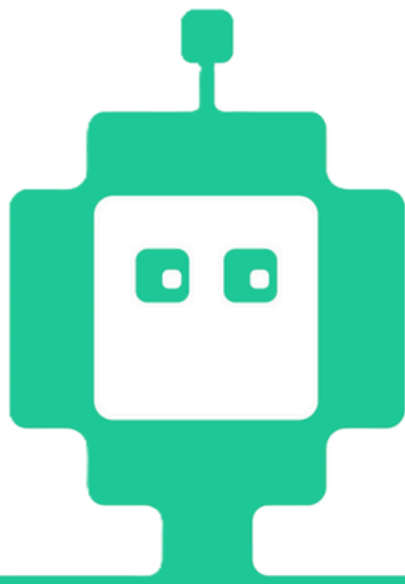




COCREATE

Computer-Supported Collaborative Learning: Best Practices

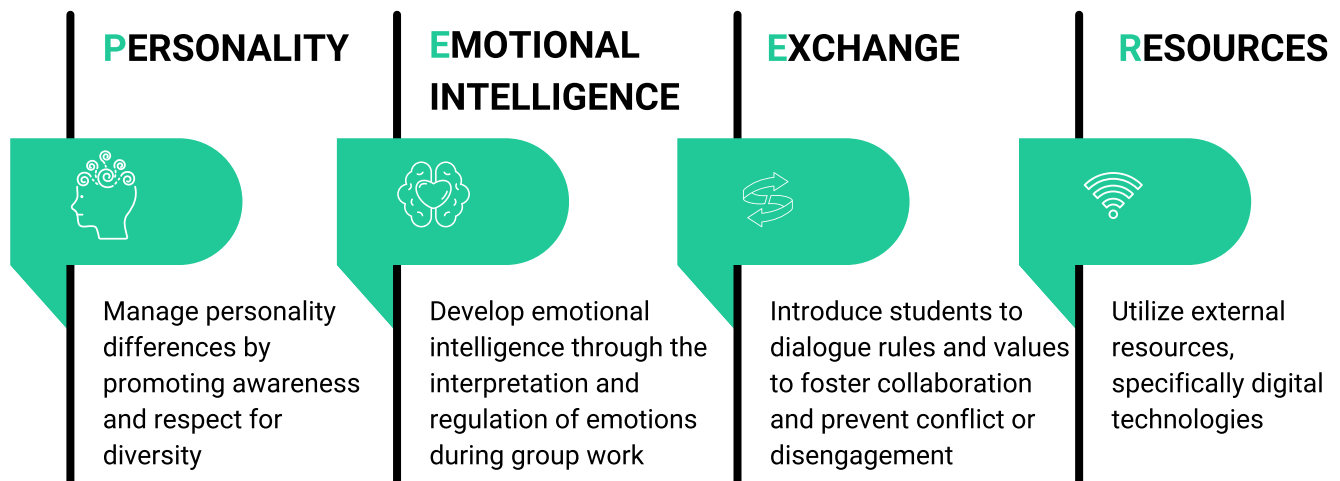
The Co-CREATE project, funded by Erasmus+, promotes **inclusivity and digital transformation in education** across Croatia, Portugal, Serbia, and Spain. It uses an interdisciplinary approach and Computer-Supported Collaborative Learning (CSCL) to develop key competencies in students, including those with special educational needs and disabilities (SEND), while enhancing digital and collaborative skills for teachers and policymakers.

A key goal is **to create innovative CSCL practices** through participatory research, engaging students and teachers as co-researchers, and **upgrade an e-learning platform** to be multilingual, accessible, and collaborative.

Collaborative Learning

An instructional strategy where students **work together in groups** to solve problems, complete tasks, or explore concepts. It involves **exchange** among peers, **interaction** among equals, fruitful **negotiation** of power relationships inside the group and exchange of roles.

PEER model

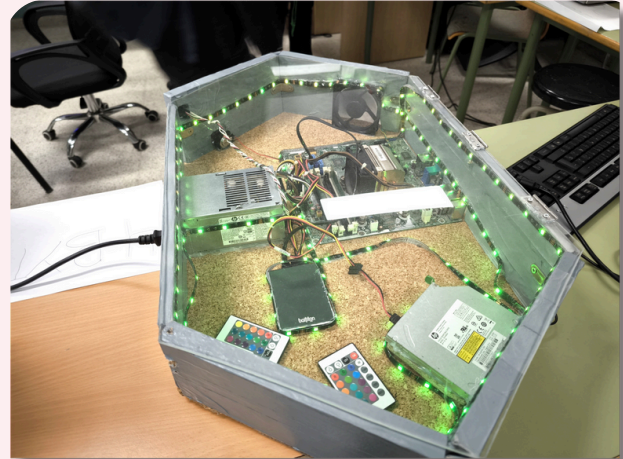


[Source](#)



Find concrete activities to foster student collaboration through the four PEER model elements in the handbook [Collaborative Solutions – Handbook for the Implementation of the PEER Model of Collaborative Problem Solving](#).

Case Study



Interdisciplinary Project-Based Learning

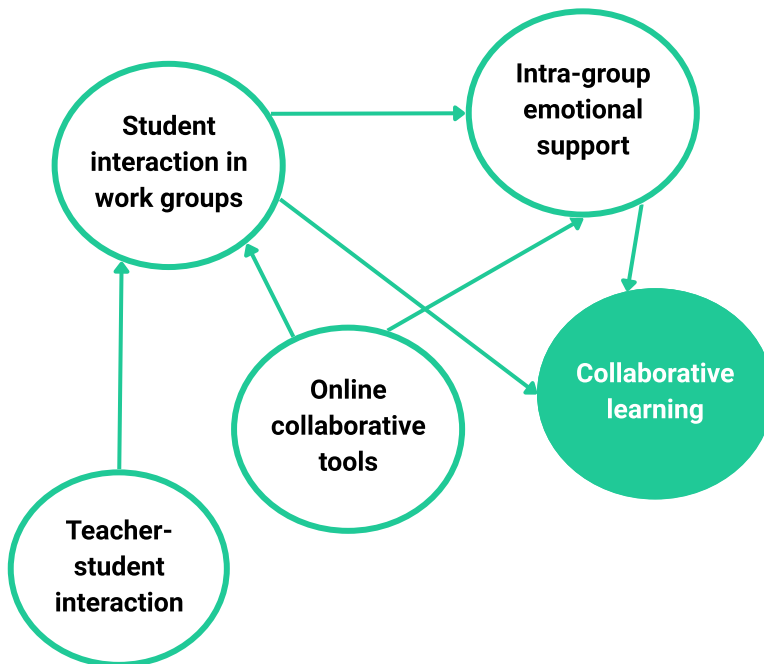
This interdisciplinary, hands-on, project-based learning activity culminated in a tangible outcome and concluded with a competition, effectively engaging students and enhancing their learning experience. The project involved students from various subjects, including Assembly and Maintenance of Equipment, Sustainability Applied to the Production System, Office Applications, Operating Systems, and Computer Security. It was carried out by first-year vocational training students in computing, aged 16-17, providing them with an opportunity to apply their knowledge in a real-world context.

Source: Project teacher focus groups

Computer-Supported Collaborative Learning

CSCL refers to the activity of peers **interacting** with each other for the purpose of **learning** and with the support of **information and communication technologies (ICT)**.

[Source](#)



The CSCL model emphasizes **interaction** as the foundation of collaborative learning, both in teacher-student exchanges and peer group work. **Emotional support** within groups plays a vital role in maintaining engagement and cooperation, and **online collaborative tools** help strengthen these interactions and facilitate emotional support.

[Source](#)

Good practices for CSCL

Type of task: Carefully designed tasks with clear guidance foster effective collaboration ([Source](#)).

Group size: Smaller groups tend to have higher participation rates ([Source](#)).

Role allocation: Assigning specific roles encourages productive interaction patterns ([Source](#)).

Peer assessment: Sharing peers' work helps students prepare for more meaningful interactions ([Source](#)).

Collaboration scripts: Structured interaction flows enhance cognitive engagement, support meaning negotiation, and promote knowledge co-construction ([Source](#)).

Debriefing: Helps students reflect, address misunderstandings, and consolidate learning ([Source 1](#); [Source 2](#)).

Teachers' role in CSCL

Digital tools complement but **do not replace teacher guidance**.

Teachers remain essential for:

- ✓ Directing student focus
- ✓ Providing context-specific support
- ✓ Responding to individual or group needs

Sample Prompts for Guiding Students' Synchronous Discussions Online

Epistemic guidance: assist the group in presenting clear, sound arguments and counterarguments and in considering different perspectives

What do you mean? Can you clarify yourself? Can you please elaborate this issue further?

What other alternative exist? Is there another point of view that hasn't been considered yet?

Does anyone like to respond to the contribution of X? Does anyone want to oppose to X? Does anyone want to question the contribution made by X? Does anyone want to strengthen X's view or ask X a question?

Interaction guidance: encourage students to express their own views, engage with differing opinions, and respond through agreement or disagreement.

[Source](#)

CSCL: Advantages and Challenges



PERSONALIZED AND INCLUSIVE LEARNING

A transversal, project-based approach that adapts to individual learning paces promotes inclusive, personalized education and supports gradual, collaborative knowledge building.

INCREASED STUDENT ENGAGEMENT AND MOTIVATION

Creative, gamified, and collaborative activities—especially those involving friendly competition and group work—boost student engagement by reducing pressure and making learning more enjoyable than traditional assessments.

REAL-WORLD APPLICATION AND WORKFORCE PREPARATION

Integrating real-world simulations and project-based learning helps students apply theoretical knowledge to practical scenarios, preparing them for the workforce.

PEER LEARNING AND INTERDISCIPLINARY COLLABORATION

Students enjoy peer learning, especially when older students teach younger ones, and enthusiastic teachers can foster interdisciplinary lessons that connect subjects like computer science with biology or sports with data science.

TIME EFFICIENCY IN ASSESSMENT

Some teachers claim that assessment of PBL assignments takes less time than that of traditional tasks.



CLASSROOM MANAGEMENT AND STUDENT ENGAGEMENT

Managing classroom discipline, maintaining student engagement in collaborative activities, and balancing freedom with structure to foster creativity while ensuring focus can be challenging, especially when transitioning between group work and quieter tasks.

COLLABORATION AND WORKLOAD DISTRIBUTION

Uneven workload distribution, lack of collaborative skills, and students forming friendship-based groups hinder effective teamwork, making it challenging for teachers to ensure diversity and balanced participation.

ASSESSMENT

Teachers find it challenging to assess individual contributions in collaborative projects due to the lack of standardized rubrics, concerns about unjust grading, and doubts over whether group work leads to in-depth learning.

TIME AND RESOURCE CONSTRAINTS

Collaborative learning is limited by the time-consuming preparation, ongoing monitoring, and coordination, as well as technical challenges, access to digital tools, and the effort needed for intermodular projects and effective implementation within curriculum constraints.

Source: Project teacher focus groups

Case Study

Minecraft-based Escape Room

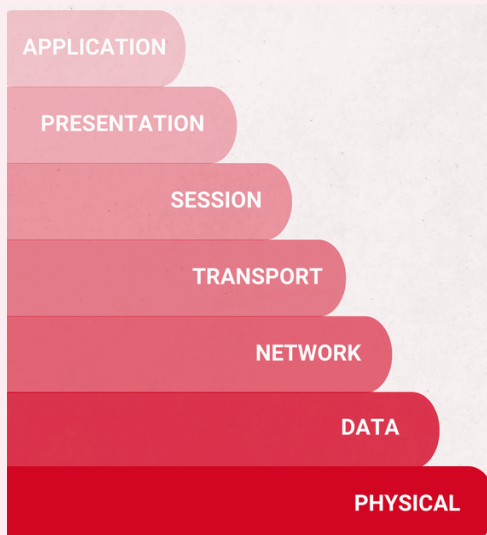
In this project, the teacher and primary school students transformed the entire **computer science curriculum into an immersive virtual world**. Students explored different scenarios, solved puzzles, answered questions, and—supported by their peers—learned about internet safety and responsible online behavior. This approach, though engaging and innovative, is best suited to specialized classes with highly capable students, as it demands extra class time and a strong commitment to working on the project beyond regular school hours.



Source: Project teacher focus groups

Image generated using ChatGPT

Introduction to main concepts in computer networks course e.g The Open Systems Interconnection (OSI) model



This example illustrates how LAMS (Learning Activity Management System) can support **collaborative learning in a Basic Computer Networks course** through a structured 60–90 minute session on the OSI model. The sequence begins with an introductory video and a quick knowledge check, followed by individual reflection on the model's relevance. Students then work in small groups to analyze a real-world example (e.g., sending an email) and collaboratively create a diagram showing how data moves through the OSI layers. Afterwards, they review and vote on peer diagrams, promoting peer assessment and critical thinking. The session concludes with instructor feedback and a reflection activity to surface common challenges and reinforce learning.

OSI Model Layers

[Source](#)

Applications of CSCL and useful tools

Click each tool link
to explore



Learning Management & Assessment:

Moodle for submitting and receiving assignments, grading, evaluating other students' work, and receiving feedback on those evaluations.

Collaborative Active Learning & Interactive Assessment:

Kahoot!, Gimkit, Quizizz as engaging tools for formative assessment and active learning, also used to prepare students for exams.

Padlet for collaborative activities and enhancing student engagement.

PhET Interactive Simulations for scientific experimentation.

Collaborative Coding & Programming:

App Inventor to encourage learning through play and experimentation.

GitHub's real-time collaborative code editor, which is extensively used, allows students to work on the same project, collaborate on coding, divide tasks, or work simultaneously, with updates reflected automatically.

Scratch for block-based programming.

Visual Studio Code

Collaborative Mind Mapping & Problem-Solving:

Nimultism and mind-mapping applications like Miro, Coggle or MindMeister, which help in resolving real-world problems through simulation and visual organization of concepts.

PyramidAPP authoring tool designed to support flexible collaborative learning using the Pyramid or Snowball flow pattern.

Collaborative Design & Creation:

Figma to create collaboratively.

Tinkercad for hands-on simulation.

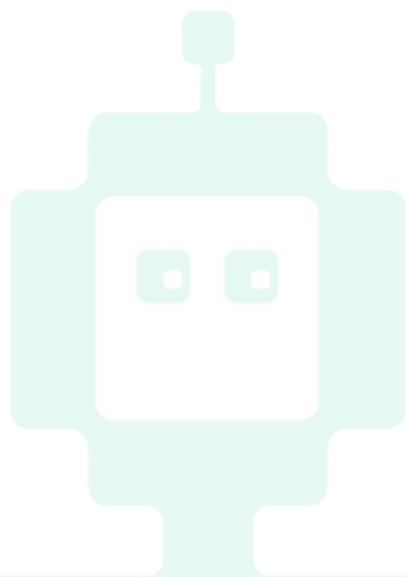
Collaborative Document & Resource Sharing:

Google Drive (Docs, Sheets, Slides) for collaborative work and sharing materials. It is particularly useful for tracking each student's contributions and progress through the version history; for real-time collaboration and document sharing

Collaborative Project Management:

Trello for project planning and task organization, and idea mapping.

Source: Project teacher focus groups



CÓCREATE



Visit the project webpage