Developing collaborative skills with the support of artificial intelligence

Strategies for designing and facilitating collaborative learning

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Learning objective

In today's workplace, increasingly organized around projects, employees are expected to collaborate with colleagues from different fields, share information, coordinate activities, negotiate decisions, and jointly take responsibility for results.

In the age of artificial intelligence, these skills are even more important: complex tasks require people to combine expertise, creativity, and judgment, working effectively with both other people and intelligent technologies.

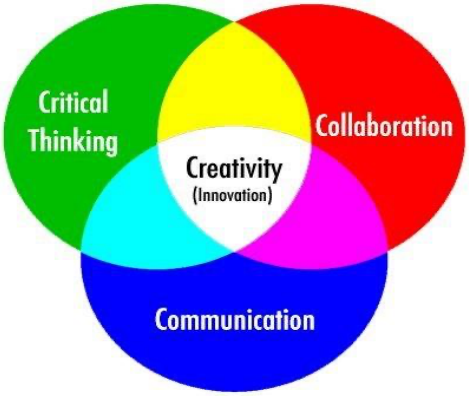
This learning content explores how AI can support active learning, with particular attention to collaborative approaches such as Project-Based Learning (PBL).

The 4Cs

Collaboration is one of the four core skills needed for success in 21st-century society and the workplace.

In 2016, the Partnership for 21st Century Learning (P21), a U.S. coalition bringing together representatives from education, public institutions, and business, including major technology companies, published an updated version of the Framework for 21st Century Learning.

The framework helped popularize the acronym 4Cs internationally, referring to four essential skills for learning and innovation: Creativity, Critical Thinking, Communication, and Collaboration.



4Cs - Interconnected skills for the 21st century

The four skills are interconnected and, when solving complex problems or carrying out complex tasks, are normally applied together, as shown in the figure. Here, the focus is on collaboration.

Project-Based Learning

In projects, collaboration means much more than simply working together: it requires listening to different perspectives, sharing responsibility, making informed decisions, and building knowledge through dialogue.

When learning is at the centre and the computer is only a tool. (Source: Shutterstock)

Project-Based Learning is a teaching-learning method in which a project provides the framework for learning and all activities are designed around the learning objectives defined by the curriculum.

PBL has roots in the progressive education movement of the late 19th and early 20th centuries, particularly in John Dewey's principle of learning through experience, often summarized as "learning by doing"[1].

The 4 principles of John Dewey's education

https://www.youtube.com/watch?v=Uybs0cfJNwg

[1] John Dewey (1859-1952) was an American philosopher of education, psychologist, reformer and reformer educator. He famously said, "Education does not prepare you for life, education is life."

In the age of AI, this principle remains highly relevant, with new tools that can support research, planning, creativity, problem solving, and collaboration.

What does PBL offer pedagogy?

It places learning rather than teaching at the centre: discovering instead of passively absorbing knowledge, building knowledge creatively, working with others, and helping one another make connections.

Collaborative student project (Source: ChatGPT)

Motivating project goals help students understand themselves and others better and, through discussion, support their own ideas in a civil debate.

AI-supported PBL

In pedagogy, “project” has a more specific meaning than in everyday life or the workplace: it refers to forms of learning in which students collaborate, driven by intrinsic motivation, to create an outcome or product that benefits a wider community.

Teachers design experiences in which students investigate authentic problems, make informed decisions, and collaboratively develop possible solutions. The starting point is the curriculum, which defines the expected learning outcomes in terms of knowledge and skills.

The teacher does not direct every stage: instead, they create the conditions for each student to contribute meaningfully, take responsibility, and progressively develop autonomy.

PBL in action: Students Working Together for the Environment (Source: ChatGPT)

Collaboration does not emerge automatically from group work: it is a skill that must be intentionally designed, developed, and strengthened through carefully planned learning experiences.

AI can support every phase of PBL for both students and teachers, acting as a brainstorming partner, planning assistant, tutor, creative tool, and source of formative feedback.

The teachers' perspective

The teacher facilitates the process by creating opportunities for dialogue, promoting active participation, and helping groups reflect on how they collaborate. Uncertainty, disagreement, and the revision of decisions should not be eliminated: they are essential opportunities for developing collaborative competence.

Horticulture student project: drone technology in precision agriculture (Source: mlc.itstudy.hu)

The quality of collaborative learning depends above all on instructional choices: forming groups is only the beginning; learning experiences must be designed to foster active participation, shared responsibility, and constructive dialogue among different perspectives.

AI is also a resource for teachers: it can support the design of collaborative activities, suggest organizational strategies, and help collect evidence about group work.

It can also organize observational evidence, synthesize feedback, identify emerging patterns of collaboration, and stimulate student reflection. As pedagogical and operational support, it can:

- generate authentic project topics and align activities with learning objectives,
- plan tasks and deadlines,
- create differentiated learning pathways, support accessibility, and assist multilingual students,
- provide guiding questions and formative feedback,
- monitor teamwork and progress,
- develop assessment criteria and rubrics,
- analyse project results and student reflections,

Its educational value, however, does not lie in replacing the teacher's professional judgment, but in strengthening their capacity to facilitate learning and promote more reflective, inclusive, and effective collaboration.

Supporting collaborative work also requires continuous observation throughout the project, focused on concrete behaviours that show how students participate in the process.

Artificial intelligence tools supporting teachers in PBL (Source: ChatGPT)

This includes observing how students take part in discussions, listen to alternative perspectives, share responsibilities, address difficulties, negotiate disagreements, and reflect on decisions. This evidence shows how groups

evolve over time and enables timely feedback for continuous improvement, rather than only a final assessment.

For transparent and meaningful assessment, teachers can use rubrics, peer assessment, and self-assessment: tools that help students recognize their own contribution, develop self-awareness, and take increasing responsibility for their learning.

The students' perspective

In PBL, students learn to build a shared understanding of the problem, plan their work, distribute tasks and responsibilities, negotiate different perspectives, and make informed decisions.

AI can support these processes by helping them organize their work, explore alternative perspectives, synthesize information, and reflect on their own learning.

AI tools supporting student collaboration in PBL (Source: ChatGPT)

Throughout the project, AI can act as a conversational assistant to:

- search for, find, and compare information;
- brainstorm and generate ideas;
- plan activities, tasks, and deadlines;
- analyse data and create charts;
- generate and edit images;
- design presentations;
- write code and develop prototypes;
- support translation and multilingual communication;
- create or edit audio and video content.

Students explain how AI was used by the team (Source: ChatGPT)

AI has educational value when it enriches dialogue, supports critical reflection, and strengthens collaborative decision-making without replacing discussion, argumentation, or the collective construction of knowledge.

Key message for teachers

AI is transforming how we access information, solve problems, and generate knowledge. In teams, it can support the definition of shared goals, the distribution of roles and responsibilities, planning, and the organization and comparison of ideas, while encouraging mutual listening, exchange of arguments, negotiation, and joint decision-making.

However, it does not change what makes learning a deeply human experience: dialogue, collaboration, critical thinking, responsibility, and the construction of shared meaning through social interaction. Education can therefore embrace AI not as an end, but as a resource for richer, more inclusive, and more participatory learning experiences.

Further reading

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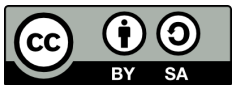

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