

4eu+

4EU+ Education Framework

examples of good practices in
teaching and learning



Research-based education

is a student-centred form of active education based on the practical approaches, methods, processes, and results of research, particularly recent research: students learn as researchers, with a curriculum largely designed around inquiry-based activities; teachers keep the division of roles between teacher and students to a minimum, and facilitate, supervise, and mentor students as if they were early-career researchers. The expected outcome are a young professionals that can investigate problems with a critical spirit, collect evidence by referring to a variety of sources, make rational decisions based on discussions/interactions with interested parties, fully aware of the consequences that these decisions can have, and are able to simplify and communicate complex content outside academia.

Research-based education

Examples of related learning approaches and techniques

- [inquiry-based learning](#)
- [problem-based learning](#)
- [research-led and research-tutored activities](#)
- [experiencing the research-cycle](#)
- [team-based learning](#)
- [flipped classroom](#)
- [peer assessment of students' work](#)
- reading/discussing draft articles
- students' involvement in ongoing research projects
- students' preparation of micro-research
- [case studies](#)
- project seminars, workshops, [journal clubs](#) or experimental work
- production of research lab procedures and protocols
- [classroom discussion in small/big groups](#)
- «what/if» cases
- [think-pair-share](#)
- [buzz groups](#)

Transfer-oriented education

Transfer-oriented education is a related and equally important cornerstone of the 4EU+ educational mission: in this student-centred approach, students are encouraged to apply what they have learned in one context (e.g. concepts, procedures,...) to other contexts. Transfer-oriented education is a particularly practical and hands-on form of teaching and learning and further serves the 4EU+ mission by creating a bridge between university and society: students are actively engaged in projects that address challenges within society and thus develop problem-solving, entrepreneurial, and critical thinking skills through their active participation in the challenges of the twenty-first century. Suitable projects can be situated around service-learning (where learning is combined with volunteer activities relevant to society), or projects can be practice-oriented (students learn and develop skills in the context of real-life problems in partnership with external partners from industry). By actively tackling problems identified by society, students immerse themselves in both worlds - university and society -and thus directly contribute to the 4EU+ focus on social engagement.

Transfer-oriented education

Examples of related learning approaches and techniques

- [Integrative think tank \(ITT\) \(industrial partners\)](#)
- Challenged based formats (partners from NGOs, society)
- Project oriented teaching (real life projects)
- [Service Learning](#)

Active learning

occurs when the students are actively involved in the learning process and participate beyond passive listening to support their own learning. It is an overarching concept for a range of empirically validated teaching strategies, the teacher assigns encouraging tasks and supports students in performing them and in learning how to learn effectively through meaningful activities. Learning thus becomes active knowledge construction, in which new information is being connected and related to prior knowledge of the student. Active learning has been demonstrated to improve student engagement and outcomes as well as their problem-solving skills.

Active learning

Examples of related learning approaches and techniques

- [one-minute paper](#)
- [muddiest/clearest point](#)
- [problem-based learning](#)
- [flipped classroom](#)
- summarizing/paraphrasing
- questions and answers/quiz
- [fish bowl](#)
- application cards
- turn-and-talk
- [think-aloud pair problem solving \(TAPPS\)](#)
- concept tests/polling
- concept mapping
- group evaluations and group discussion
- debate/panel discussion
- role playing
- active-review sessions
- brainstorming
- [jigsaw](#)
- [think-pair-share](#)
- case-based learning
- experiential learning technology-enabled active learning (TEAL)

Critical thinking

may be defined as careful, goal-directed thinking, i.e. the ability to engage in purposeful, self-regulatory judgment based on rigorous intellectual concepts and principles. It allows students to orchestrate and self-regulate their own learning strategies and it describes the ability to analyse information objectively, evaluate this information, and come to an informed judgment. Critical thinking plays a special role in academic learning by providing an opportunity for students to reflect on the nature of knowledge; inquiring into the process of knowing, making connections between areas of knowledge, becoming aware of their perspectives and those of the various groups whose knowledge they share, and coming to conclusions about issues by directly contributing to knowledge. Beyond being an academic value, critical thinking is crucial in any democratic society to face challenges unbeknownst at present, and against populist usage of distorted news.

Critical thinking

Examples of related learning approaches and techniques

- [problem-solving approach](#)
 - course focused on critical interpretation of theories, analysis of literary sources, correct interpretation of research results, critical evaluation of articles.
 - introducing elements of [academic debate](#) in class
 - exposing [logical errors, fallacies, invalid and faulty reasoning](#)
 - exposing students to real-life cases of scientific or scholarly controversy,
 - [questioning prior assumptions](#)
- myth-bashing courses
 - critical research reading
 - teach how to use the critical thinking model
 - [spider web model](#)
 - [oxford-style debating](#)
 - [scaffolding method](#)
 - activities that facilitate self-disciplined reasoning, logical thinking abilities for reaching the affective dimension of thinking
 - use professional texts that offer multiple perspectives

Self-directed learning

is a process in which students take responsibility for their learning (student-centered learning). It is first and foremost the external management of the learning process which can lead to high levels of active engagement, as students take initiative in their own learning – they can identify their learning needs, set their learning goals, formulate appropriate learning strategies, monitor and evaluate them, and choose resources and methods for learning in order to perform at their best.

Self-directed learning

Examples of related learning approaches and techniques

- [foster intrinsic motivation of students by providing space for autonomy, opportunities for social-relatedness, and experiencing their own competence \(Deci & Ryan\)](#)
 - [surface and deep-level learning \(Marton & Saljö\)](#)
 - making learning objectives transparent to students
 - development of flexible learning environments i.e. brainstorming / brainwriting, wall of questions as formative assessment
- flexible forms of assessment to foster autonomy (final exam vs. term paper / oral presentation vs. recorded video presentation)
 - constructive feedback (from teacher and peers) to reflect on learning process and outcome
 - challenge-based activities
 - development of metacognitive competencies such as self-reflection through student portfolios

Intercultural and inclusive education

refers to a set of educational strategies developed to assist teachers in responding to the many issues created by the rapidly changing demographics of their students. Beyond including different values, beliefs, and perspectives in teaching, inclusive education is predicated on the principle of equity for all students by removing the barriers to educational opportunities and success. It is not just delivering course content about diversity. It involves fostering an inclusive climate in the classroom and a sense of community among students and facilitating student learning with a variety of instructional techniques and assessments. A intercultural teaching approach includes not only knowledge about the histories, cultures, and contributions of diverse groups but also affective competencies such as self-reflexion, change of perspective, flexibility, openness, and tolerance as well as behavioral skills like stress and conflict management, communication skills, and strategies to handle critical incidents and culture shock. In addition, the instructor formulates the course material, the activities, and the modes of delivery in such a way that they reach each member of the class independent of their social, economic, or ethnic background. Intercultural and inclusive education thus empowers all students to attain their maximum potentials as learners and to become socially cognizant and dynamic people in local, national, and international situations.

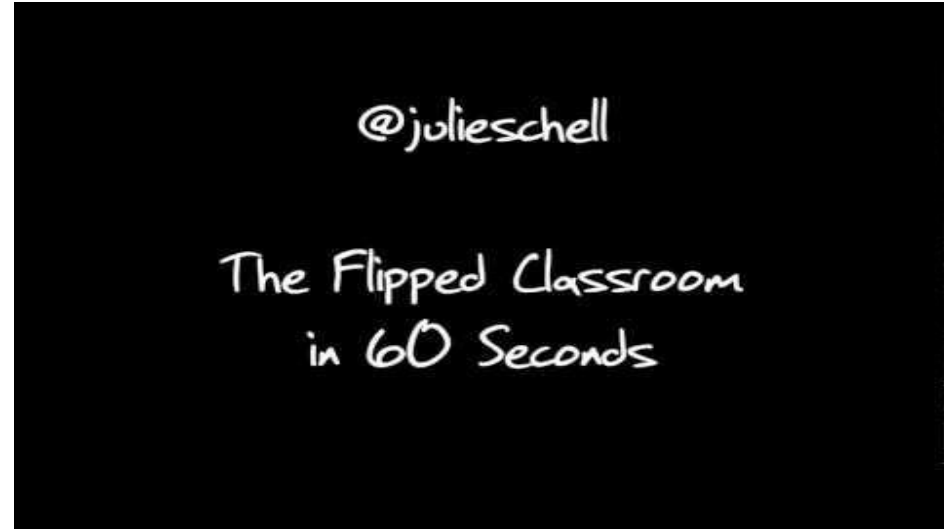
Intercultural and inclusive education

Examples of related learning approaches and techniques

- critical readings that include various perspectives (diverse readings) – e.g. choosing content that reflects a range of races, ethnicities, gender identities, sexualities, abilities, ages, religions, etc. - and are written by diverse people
 - sharing teaching practices, decisions, and rationales with students
 - Encouraging students to share experiences and background knowledge in class
 - exploratory projects on educational challenges in international classrooms
- 5 inclusive teaching principles (Columbia University):
1. [establishing and supporting a class climate that fosters belonging for all students.](#)
 2. [setting explicit student expectations.](#)
 3. [selecting course content that recognizes diversity and acknowledges barriers to inclusion.](#)
 4. [designing all course elements for accessibility.](#)
 5. [reflecting on one's beliefs about teaching to maximize self-awareness and commitment to inclusion.](#)
- strategic use of several languages for learning purposes
 - supporting open dialogue
 - [experiential learning component and customized courses](#)
 - openly addressing cross-linguistic issues
 - [learning in intercultural teams](#)
 - developing assignments that showcase students' different backgrounds and experiences. (portfolio)
 - scaffolding knowledge and addressing cultural gaps
 - [promoting student-student relationships and student study groups](#)
 - assigning projects that foster student autonomy (e.g. by allowing space for individual students' choices and preferences)
 - designing assessment rubrics collectively (e.g. guidelines for oral participation, good writing, etc.)
 - class contracts, teaching-learning contracts (e.g. for class conduct, as social contracts, etc.)
 - [creative / reflective journals](#)
 - [testimonial readings](#)

Flipped classroom

Flipped /inverted classroom is a pedagogical approach that reverses the traditional learning environment: The acquisition phase takes place outside the classroom, with the student using online tools, videos, e-learning platforms etc. Students work through the theoretical background themselves activating knowledge and comprehension, with some additional tasks in terms of application. The face-to-face situation will be used for more discursive formats (collaborative, active learning) to reach for the domains of application, analysis, synthesis and evaluation. The application of flipped classroom allows students to consolidate their knowledge in practice and it also develops students' communication, team working and critical thinking skills. Typical flipped classroom scenarios include Problem-Based Learning (PBL) and Team-Based Learning (TBL).



[What is a flipped classroom? \(in 60 seconds\) – YouTube](#)

(Julie Schell ad Josh Walker, The Center for Teaching and Learning at The University of Texas)

TO KNOW MORE:

https://flippedlearning.org/wp-content/uploads/2016/07/FLIP_handout_FNL_Web.pdf

<https://www.adelaide.edu.au/flipped-classroom/about/>

https://www.pok.polimi.it/courses/course-v1:Polimi+FC101+2020_M11/about

Peer assessment of students' work

Peer assessment or peer review provides a structured learning process for students to critique and provide feedback to each other on their work. It helps students develop lifelong skills in assessing and providing feedback to others, and also equips them with skills to self-assess and improve their own work *(Cornell University - Center for Teaching Innovation)*



TO KNOW MORE

<https://isit.arts.ubc.ca/ideas-and-strategies-for-peer-assessments/>

<https://www.mcgill.ca/tls/instructors/assessment/peer>

<https://www.celt.iastate.edu/teaching/assessment-and-evaluation/peer-assessment/>

<http://www.celt.mmu.ac.uk/lta/issue4/langanwheater.shtml>

<https://teaching.cornell.edu/teaching-resources/assessment-evaluation/peer-assessment>

[Module 3: Peer Assessment – YouTube](#)

(Michigan Department of Education, Formative Assessments for Michigan Educators)

Case studies

Case studies are stories that are used as a teaching tool to show the application of a theory or concept to real situations. Dependent on the goal they are meant to fulfill, cases can be fact-driven and deductive where there is a correct answer, or they can be context driven where multiple solutions are possible. Various disciplines have employed case studies, including humanities, social sciences, sciences, engineering, law, business, and medicine *(Carnegie Mellon University, Eberly Center; Vanderbilt University, Center for Teaching)*

TO KNOW MORE:

<https://cft.vanderbilt.edu/guides-sub-pages/case-studies/>

<https://www.cmu.edu/teaching/designteach/teach/instructionalstrategies/casestudies.html>

Classroom discussion in small/big groups

A classroom discussion is a sustained exchange between and among teachers and their students with the purpose of developing students' capabilities or skills and/or expanding students' understanding - both shared and individual - of a specific concept or instructional goal (Witherspoon, M., Sykes, G., & Bell, C., 2016).

Class discussions can be utilized in seminar and lecture courses, and their variety allows instructors to fit particular strategies to class needs (Yale University, Poorvu Center for Teaching and Learning)

TO KNOW MORE:

<https://files.eric.ed.gov/fulltext/ED570574.pdf>

<https://tlc.umd.edu/classroom-discussions>

<https://teachingcenter.wustl.edu/resources/teaching-methods/discussions/tips-for-teaching-with-discussions/>

<https://poorvucenter.yale.edu/EffectiveClassDiscussions>

<https://kb.wisc.edu/remote-instruction/104409>

Journal clubs

A **journal club** is a group of individuals who meet regularly to critically evaluate recent articles in the academic literature. They usually organized around a defined subject in basic or applied research. Typically, each participant can voice their view relating to several questions such as the appropriateness of the research design, the statistics employed, the appropriateness of the controls that were used, etc. Journal clubs are used in the education of graduate or professional students. These help make the students become more familiar with the advanced literature in their new field of study. In addition, these journal clubs help improve the students' skills of understanding and debating current topics of active interest in their field (*"Journal club"*, Wikipedia, Wikimedia foundation, 24 May 2022, https://en.wikipedia.org/wiki/Journal_club)

TO KNOW MORE:

<https://www.ucl.ac.uk/intelligent-imaging-healthcare/cdt-journal-club>

<https://obgyn.onlinelibrary.wiley.com/doi/pdfdirect/10.1576/toag.8.3.186.27256>

https://en.wikipedia.org/wiki/Journal_club



[The CDT Journal Club – YouTube](#)

(UCL EPSRC CDT in i4health)

Think-pair-share

Students work individually on an active learning assignment or formative assessment activity such as a one-minute paper, example problem or other topic (Think). Students then compare their responses with a partner and synthesize a joint solution (Pair). Some pairs share with the entire class (Share). This method helps increase the frequency of responses from quiet members of the class
(Yale University, Poorvu Center for Teaching and Learning)

TO KNOW MORE:

<https://poorvucenter.yale.edu/EffectiveClassDiscussions>

<https://teaching.utoronto.ca/teaching-support/active-learning-pedagogies/active-learning-adapting-techniques/think-pair-share/>

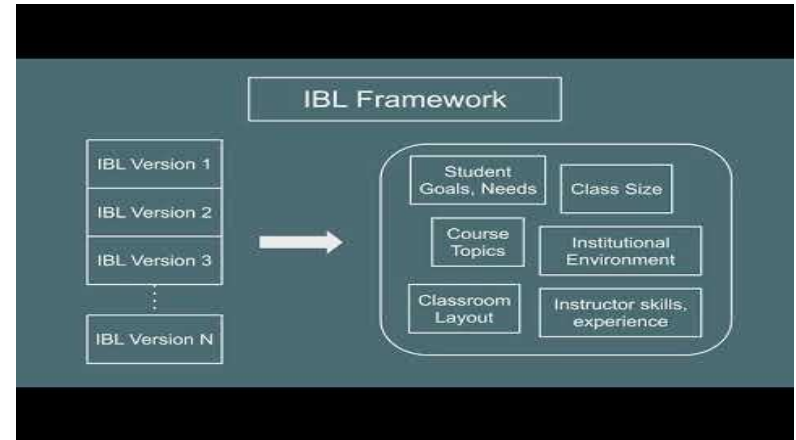


[Think Pair Share – YouTube](#)

(Teach for Life)

Inquiry-based learning

IBL refers to a range of strategies used to promote learning through students' active, and increasingly independent, investigation of questions, problems and issues, often for which there is no single answer. A range of teaching strategies is consistent with inquiry-guided learning including interactive lecture, discussion, problem-based learning, case studies, simulations, group projects and independent study (University of Reading, Centre for excellence in teaching; New York University, Teaching and Learning Resources)



[AIBL Video 1 \(2019 version\) – YouTube](#)
(AcademyIBL)

TO KNOW MORE:

<https://www.nyu.edu/faculty/teaching-and-learning-resources/strategies-for-teaching-with-tech/best-practices-active-learning/active-learning-techniques/techniques-13.html>

[https://www.reading.ac.uk/ceitl-aurs/LinkingTeachingandResearch/Enquiry-BasedLearning/What_is_Enquiry_Based_Learning_\(EBL\).aspx](https://www.reading.ac.uk/ceitl-aurs/LinkingTeachingandResearch/Enquiry-BasedLearning/What_is_Enquiry_Based_Learning_(EBL).aspx)

<http://www.inquirybasedlearning.org/>

Buzz groups

Buzz groups is a cooperative learning technique consisting in the formation of small discussion groups with the objective of developing a specific task (idea generation, problem solving and so on) or facilitating that a group of people reach a consensus on their ideas about a topic in a specific period of time *(Universitat Pompeu Fabra Barcelona, Engineering School and ICT Department Innovation Area)*

Buzz groups encourage more efficient discussion. They are often used in combination with other techniques, such as a lecture. Buzz groups set the groundwork to get discussion started. They are most often used when dealing with controversial subjects or difficult questions and problems *(Samar Education)*

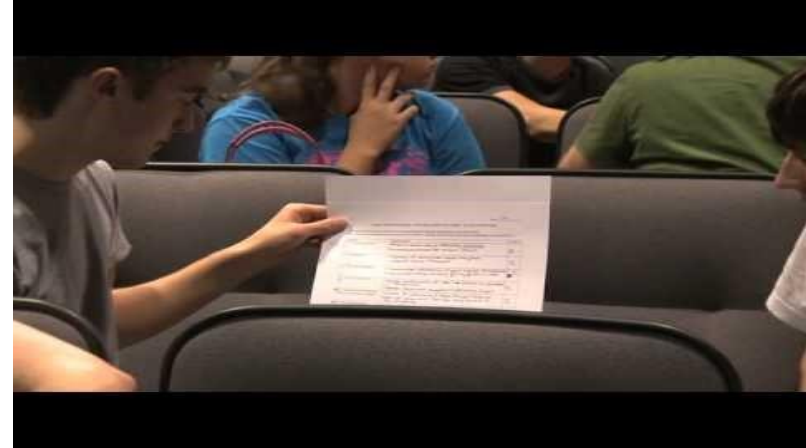
TO KNOW MORE:

<https://www.upf.edu/en/web/usquid-etic/buzz-groups#:~:text=Buzz%20groups%20is%20a%20cooperative,a%20specific%20period%20of%20time.>
<http://web.utk.edu/~ewbrewer/pdf/books/13%20proven%20ways/Buzz%20Groups.pdf>
<https://journals.sagepub.com/doi/pdf/10.1177/0310057X0703500420>
<https://kb.wisc.edu/remote-instruction/104151>
<https://www.samareducation.com/2022/06/buzz-group-teaching-method.html>

Team-based learning

TBL is a pedagogical strategy that engages student knowledge through individual testing and group collaboration. Following individual answers, students join teams and work through problems, appealing when they are incorrect. This process motivates students by holding them accountable to themselves and one another, while introducing them to a variety of thought processes devoted to a single problem. To increase motivation and introduce a fun gaming environment, instructors often group their students into teams and have them compete on various classroom learning tasks.

The strategy is flexible enough to be implemented in classes of varying sizes including large lecture courses (*Yale University, Poorvu Center for Teaching and Learning*)



[Team based Learning at UT – YouTube](#)
(University of Texas)

TO KNOW MORE:

<https://poorvucenter.yale.edu/Team-Based-Learning>

<https://cft.vanderbilt.edu/guides-sub-pages/team-based-learning/>

<https://ciel.viu.ca/teaching-learning-pedagogy/engaging-your-students/learning-through-groups-teams/what-team-based-learning-quick-guide-busy-faculty-members>

Problem-based learning

PBL is a learning strategy where problems are introduced at the beginning of the instruction cycle to provide the context and motivation for learning. It is always active and usually collaborative or cooperative. PBL typically involves significant amounts of self-directed learning. Some evidence shows that PBL develops enhanced problem-solving skills and that these skills can be improved further by coupling PBL with explicit instruction in problem solving (*The University of Maryland, Baltimore; Purdue University*)

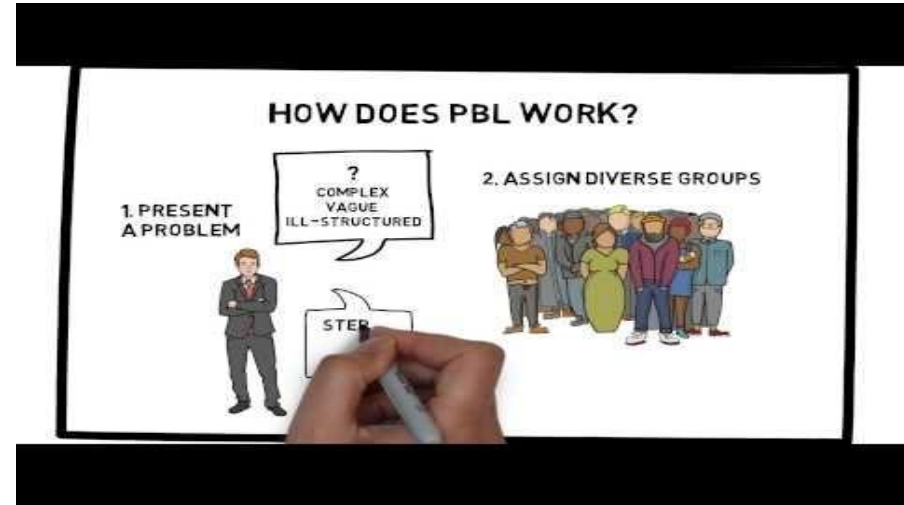
TO KNOW MORE:

<https://library.spalding.edu/c.php?g=623364&p=4342660>

<https://docs.lib.purdue.edu/ijpb/>

<https://www.umaryland.edu/fctl/resources/planning-learning/problem-based-learning-pbl.php>

<https://teaching.cornell.edu/teaching-resources/engaging-students/problem-based-learning>



[Problem-Based Learning \(PBL\) – YouTube](#)
(OITutorials)

Research-led and research-tutored activities

- Research-led activities envisage activities in which students learn about current research in the discipline and are frequently an audience. The emphasis is put on the research content.
- Research-tutored activities envisage activities where students are participants, they are engage in research discussions and emphasis is put on the research content.

TO KNOW MORE:

https://www.researchgate.net/publication/256208546_Developing_Undergraduate_Research_and_Inquiry

<https://www2.le.ac.uk/offices/academic-practice/resources/learning-teaching-conference/workshop-resources/ResearchLedTeaching%20PC%20Changes%202.pdf>

Experiencing the research-cycle

Research can be divided into individual phases thereby taking into account the particular characteristics of each individual academic disciplines. It is important that teachers make the research process clear and understandable to students by breaking it down into specific student learning activities.

Step-by-step division of research activities:

- Formulating a general question
- Overview of research-literature
- Defining the question
- Planning research activities, clarifying methods/methodologies
- Undertaking investigation, analyzing data
- Interpretation and consideration of results
- Report and presentation of results

TO KNOW MORE:

<https://bit.ly/3nZyQci>

Fish Bowl and Fishbowl Discussion

- Students are asked to write down on cards one question regarding the course material, especially some aspects of the material that they do not fully understand. Students deposit cards with their questions in a „fish bowl” and the teacher/instructor draws several of them and asks the class to answer them or answers them herself/himself. This technique can be also understood as helping small groups of students can engage in discussion while trying to answer raised questions.
- Another technique that is called **Fishbowl Discussion** helps to facilitate group discussion during class. A selected small group of students engages in a discussion about ideas or concepts on a given topic, while the rest of the class observes and takes notes. An inner circle of students engages in the discussion, while the rest of the class either sits in an outer circle, or remains in their regular seats and observes. Then the students switch. This method helps the teacher/instructor to manage the discussion and promotes active listening, it also presents an opportunity to introduce elements of peer evaluation.

TO KNOW MORE:

<https://teaching.utoronto.ca/resources/active-learning-at-the-university-of-toronto/#elementor-tab-title-1227>

<https://www.calstatela.edu/dept/chem/chem2/Active/main.htm#:~:text=%22Active%20Learning%22%20is%2C%20in,listening%20to%20an%20instructor's%20lecture.>

<https://teaching.berkeley.edu/resources/course-design-guide/active-learning>

<https://mcp.hs.libguides.com/centerteachinglearning/activelearningstrategies#s-lg-box-wrapper-20010245>

https://www.edutopia.org/pdfs/coop_math_bowman/bowman_fishbowl_method.pdf



Jigsaw

It's an active group organization model that, using student-centered approach, supports peer teaching and cooperative learning. Students work in small groups to read information that has been organized into sections. Each student studies the topic materials and becomes an „expert” on one part of the material. Then, students work in groups to share ideas, debate different views and teach each other, in order to complete the task or project which can only be done by cooperation.



[Jigsaw - LEARN Strategy – YouTube](#)
(K20 Center for Educational and Community Renewal)

TO KNOW MORE:

<https://mcpshs.libguides.com/centerteachinglearning/activelearningstrategies#s-lg-box-wrapper-20010245>

<https://teaching.utoronto.ca/resources/active-learning-at-the-university-of-toronto/#elementor-tab-title-43912>

<https://itali.uq.edu.au/files/3077/Resources-teaching-methods-jigsawtechnique.pdf>

<https://ctl.utahtech.edu/teaching-resources/teaching-resources-list/active-learning/>

<https://cetl.uconn.edu/resources/design-your-course/teaching-and-learning-techniques/active-learning/>

<https://teaching.berkeley.edu/resources/course-design-guide/active-learning>

Integrative think tank (ITT) (industrial partners)

ITT is one-week challenge workshop with industrial partners. Students and lecturers work together with experts from the companies to investigate topics from the area of research and development relating to current developments at these companies.

It is a new approach to generate research ideas at the industrial-academic interface.

The aim is to understand big challenges, identify and test preliminary routes to a solution and map mechanisms to carry forward. Specific questions can be identified at the end of the workshop week and the university and the partner companies join forces to convert the project outlines into actual research projects.

On days 1 and 2 real-life challenges from the R&D sector are presented by the industry partners and group discussions take place to identify questions for further consideration. On days 3 and 4 project teams work on drafting a proposal for a project idea, reviewing literature and identifying milestones. On Day 5, project team present their project ideas to the industry partner.

TO KNOW MORE:

[Winckler, Michael: "Mathematics for the real world" in: HINT: Heidelberg Inspirations for Innovative Teaching Vol. 3](#)

Service Learning

Service learning is a teaching and learning strategy that moves students beyond the classroom to become active participants in their learning and develop civic knowledge and skills. It combines academic work with applying institutional resources to address challenges facing communities through collaboration with these communities. The experiential learning it provides connects personal and interpersonal development with cognitive and academic advancement, providing opportunities to acquire new skills, knowledge, leadership and a sense of caring and social responsibility.

It provides direct benefits to students that deeply learn and practice course content by working on a real, community-identified need. Students learn the course material (*What is Service-Learning? - Suffolk University*), gain practical experiences and develop a concrete understanding of an issue facing the community by experience it. It broadens knowledge and critical thinking skills for social change and improves students' ability to apply what they have learned in a real-world context.

TO KNOW MORE:

[What is Service-Learning? Suffolk University](https://www.elmhurst.edu/blog/what-is-service-learning/)

<https://www.elmhurst.edu/blog/what-is-service-learning/>

<https://communityengagedlearning.msu.edu/about/defining-community-engaged-learning-at-msu>

[Johns Hopkins University SOURCE](#)

[Iowa State University Center for Excellence in Learning and teaching](#)

Eyler, Janet; Giles Jr., Dwight E. (23 April 1999). *Where's the Learning in Service-Learning* (1st ed.). San Francisco, CA: Jossey-Bass



One-Minute Paper

One-Minute (or Two/Three-Minute) Paper is a short „paper” that students individually complete in a minute (under five minutes) in response to a specific question asked by the teacher/instructor at the beginning, in the middle or at the end of the class. It is a highly effective method for checking student progress and for providing a consistent means of communication during classes. It provides rapid feedback on whether students understand the concepts and which areas need further learning. When the students reflect and write their responses, they are actively engaging in the content, and that enhances their long-term learning transfer. Minute papers provide students with opportunities to reflect on course content, to summarize information, and identify what they do not understand.

TO KNOW MORE:

<https://itali.uq.edu.au/teaching-guidance/teaching-practices/active-learning/class-active-learning-activities#0>

<https://oncourseworkshop.com/self-awareness/one-minute-paper/>

<https://cft.vanderbilt.edu/guides-sub-pages/active-learning/#tech>

<https://ctl.columbia.edu/resources-and-technology/teaching-with-technology/teaching-online/active-learning/>

https://www.queensu.ca/teachingandlearning/modules/students/22_active_learning_strategies.html

<https://cetl.uconn.edu/resources/design-your-course/teaching-and-learning-techniques/active-learning/>



Muddiest or Clearest Point

It's a variation on the one-minute paper, designed for determining gaps in student comprehension. The teacher/instructor requests a one-minute written response to the question about what was the muddiest/clearest point in lecture or during discussion. The aim of this technique is to have students themselves reflect on what they do and don't understand.

TO KNOW MORE:

<https://teachingblog.mcgill.ca/2019/03/14/strategy-bites-the-muddiest-point/>

<https://cetl.uconn.edu/active-learning-strategies/#>

<https://www.unthsc.edu/center-for-innovative-learning/muddiest-point/>

<https://cetl.uconn.edu/resources/assessment-of-learning/assessment-design/assessment-as-feedback/>



Think-Aloud Pair Problem Solving (TAPPS)

In this technique, students pair up with another class member to engage in problem-solving. Its aim is to enhance collaborative work and problem solving, students actively engage in the learning process by identify relevant information and applying it in the solution of a problem. Students get into pairs, receive a series of problems and the teacher/instructor designates one pair member as the explainer or problem solver, and the other one as the questioner or the listener, after a while the role reverse. Explainers are required to „think-aloud” while they are resolving the issue, introduced by the teacher, while their partners ask questions in the meantime.

TO KNOW MORE:

<https://www.engr.ncsu.edu/wp-content/uploads/drive/1YB2KK3wLqP3EhXyYdKtE9-4mBJzc2rc2/Active%20Learning%20Tutorial.pdf>

<https://kb.wisc.edu/instructional-resources/104148>

<https://sites.google.com/a/svcc.edu/svcc-instructional-strategies-library/interactive-instruction/think-aloud-pair-problem-solving>

https://www.researchgate.net/publication/275643101_Applying_the_Thinking_Aloud_Pair_Problem_Solving_Strategy_in_Mathematics_Lessons



Academic debate

Teams of students take part in a debate conducted at an educational institution. Usually, the teams are supposed to defend their positions, search for facts that promote the position of their team, weaken the position of the opponent's team and face the arguments of the other team in a competitive, but still a fair manner. Both sides are presenting their case to each other and sometimes even to the audience or to a judge. The debaters can be coached. Various debate formats are available, e.g. The British Union Debate, The National Debate Tournament, The Policy Debate, Lincoln-Douglas Debate, and Public Forum Debate.

TO KNOW MORE:

http://www.ipddebate.info/uploads/4/9/8/1/4981933/v1n1_p_3_18.pdf

Questioning prior assumptions

An assumption is an unexamined belief. Many discussions, opinions or decisions in the academic world or in the real politics are based upon assumptions. Students learn not to take everything for granted, but to discriminate between beliefs, opinions, facts, and experience. They learn to identify any assumptions in the background and to determine if these are accurate or not. The steps to unravel assumptions to become more effective decision makers include:

- Identify your assumption.
- Verify any facts mixed with it.
- Question why you made it.
- Invalidate it with counter assumptions.
- Reset your conclusions.
- Unravel the real issue with proper questioning.

TO KNOW MORE:

<https://learningbyladders.wordpress.com/secret/creative-thinker/question-assumptions/> <https://library.louisville.edu/ekstrom/criticalthinking/assumptions> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6234823/>

Logical errors, fallacies, and faulty reasoning

The students should get familiar with the logical errors and fallacies. These are incorrect reasonings frequently used by speakers in public speeches, debates, and both private and public arguments. The students should learn how to recognize these and how to face these illegitimate arguments or irrelevant points. These are often identified because they lack evidence that supports their claim. The students should avoid these common fallacies in their own arguments and watch for them in the arguments of others. The fallacies often have fancy names, such as:

TO KNOW MORE:

https://en.wikipedia.org/wiki/List_of_fallacies

<https://thebestschools.org/magazine/15-logical-fallacies-know/>

<https://cxl.com/blog/logical-fallacies-optimization/>

<https://cz.pinterest.com/pin/534661787011935915/>

https://owl.purdue.edu/owl/general_writing/academic_writing/logic_in_argumentative_writing/fallacies.html

- Hasty generalization
- Slippery slope
- Circular argument
- Straw man
- Either/Or (Black or White)
- Anecdotal
- Burden of proof
- Tu quoque
- Appeal to emotion
- Post hoc ergo propter hoc
- Red herring
- Genetic fallacy
- Ad populum
- Moral equivalence
- Begging the claim
- Ad hominem

Spider web model

Spider web discussion is an adaptation of the Socratic seminar in that it puts students squarely in the center of the learning process, with the teacher as a silent observer and recorder of what s/he sees students saying and doing during the discussion. The students are trained to work together collaboratively in solving problems and to self-assess that process. The result is deep, high-level inquiry led and assessed by the students themselves

TO KNOW MORE:

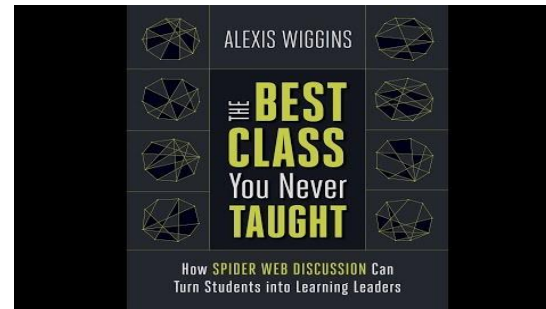
<https://www.youtube.com/watch?v=jHi06vm5uJk>

<https://www.youtube.com/watch?v=Oy8MXxTPjog>

<https://modelsbydesign.wordpress.com/2013/02/17/be-better-spider-web-discussion-and-why-thankfully-teachers-are-not-as-important-as-we-thought/>

<https://www.ascd.org/books/the-best-class-you-never-taught?variant=117017>

- **The acronym SPIDER stays for:**
- **Synergetic**—it's team oriented, balanced, and group graded (the whole class gets a single grade for each discussion).
- **Practices**—it's ongoing, rehearsed, and debriefed. It's not a one-time activity but a process, much like writing.
- **Independent**—the teacher interferes as little as possible; students run the discussion and self-assess.
- **Developed**—the discussion gets deep, builds on itself, goes 'somewhere.'
- **Exploration**—this is the main goal; more than a discussion, it is a discussion-based exploration (of a text, an Essential Question, or a subject-area topic).
- **Rubric**—this is the cornerstone to the whole process: to have a clear, concise rubric against which students can easily self assess.



[Alexis Wiggins on Spider Web Discussion - How & Why - YouTube](#)

Oxford style debating

The students join opposing sides of a topic to intelligently Exchange arguments and rebuttals. There is an “affirmative” team that supports convincing arguments to the motion, while a “negative” team refutes the points made by the affirmative team.

There are following roles:

- Chair: runs the proceedings
- Affirmative team: defends the motion; has to prove all aspects of the case
- Negative team (N) argues against the motion: burdens of the rebuttal
- Captains of each team
- Audience: asks questions to both sides and votes on the motion

Parts of the debate:

- Constructive speech: presentation of each team’s arguments and evidence for each aspect of the case
- Interpellation: opportunity for the opposing debater to ask questions regarding the speech of the speaker
- Rebuttal: summary and defense of each team’s arguments and evidence, to be delivered by the team Captain

Criteria for judging:

- Evidence
- Delivery
- Interpellation
- Rebuttal



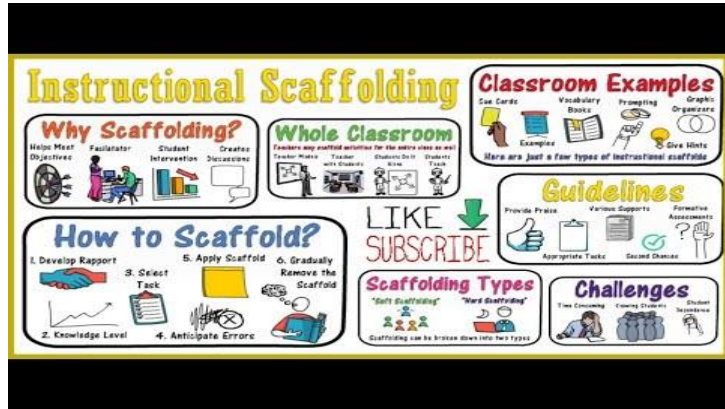
[Oxford-Style Debate, Explained – YouTube](#)
(IntelligenceSquared Debates)

TO KNOW MORE:

- http://www.moszoro.net/docs/Oxford_debate_guidelines.pdf
- <https://www.youtube.com/watch?v=xVmShH0-9xY>
- <https://en.wikipedia.org/wiki/Debate>

Scaffolding method

The teacher models and demonstrates how to solve a problem for their students. Then the students try to solve the problem themselves by taking a step back and only giving support when needed.



Scaffolding Instruction for Students – YouTube
(Teachings in Education)

A **scaffold** is a temporary support provided to students to help them achieve a learning goal. Scaffolds are distinct from accommodations or modifications.

An **accommodation** is similar in concept to a scaffold, but it is usually a legally mandated instructional requirement. An example of an accommodation would be "extra time" on a summative assessment.

A **modification** goes deeper than a scaffold, and changes the actual content and/or learning standards for students.

TO KNOW MORE:

<https://www.uopeople.edu/blog/what-is-scaffolding-in-education/>

<https://blog.innerdrive.co.uk/scaffolding-in-lessons>

<https://eleducation.org/resources/helping-all-learners-scaffolding>

<https://study.com/academy/lesson/scaffolding-in-education-definition-theory-examples.html>

Experiential learning component and customized courses

- Experiential learning is an engaged learning process whereby students “learn by doing” and by reflecting on the experience. Experiential learning activities can include, but are not limited to, hands-on laboratory experiments, internships, practicums, field exercises, study abroad, undergraduate research and studio performances.
- Well-planned, supervised and assessed experiential learning programs can stimulate academic inquiry by promoting interdisciplinary learning, civic engagement, career development, cultural awareness, leadership, and other professional and intellectual skills.

TO KNOW MORE:

<http://www.bu.edu/ctl/guides/experiential-learning/>

<https://www.queensu.ca/experientiallearninghub/about/what-experiential-learning>

<https://carleton.ca/experientialeducation/el-at-carleton/>

<https://online.norwich.edu/academic-programs/resources/4-components-experiential-learning-cycle>

Promoting student-student relationships and student study groups

Inclusive and intercultural education can be implemented through:

- Cooperative learning as an effective strategy to promote **student-student relationship**. It fosters student interaction by encouraging and facilitating students' effort to achieve interpersonal and small groups skills, such as communication, leadership, trust building, decision-making, conflict resolution and group processing.
- Forming and participating in **study groups** can increase both the breadth and the depth of students' learning, create structure for more productive study time, and give students an opportunity for meaningful learning.
- Beyond just supporting students in the formation of study groups, teachers can potentially further benefit their students' learning by integrating a group-based approach into their courses by implementing a few approaches that focus on learning in groups:
 - problem-based learning
 - project-based learning
 - team-based learning

TO KNOW MORE:

<https://bit.ly/39n2J01>

<https://www.uhi.ac.uk/en/t4-media/one-web/university/students/support/mentoring/documents/Effective-peer-support--study-groups.pdf>

https://www.jstage.jst.go.jp/article/arepi1962/47/0/47_29/article

http://ecoasturias.com/images/PDF/ponencia_zaragoza_David_Johnson.pdf

- Students have opportunities to learn from one another's varied experiences and perspectives. To create this learning environment, teachers need to skillfully draw on student experiences to enrich the curriculum.

Some suggested strategies:

- Choosing texts that reflect classroom demographics
- Share stories that make room for student sharing
- Acknowledging students' different identities and experiences; leveraging student diversity as an asset for learning
- Clearly communicating with students about expectations and norms; explaining purpose, task, and criteria for learning activities
- Developing protocols or processes that support equitable access and contributions to interactive elements of the learning environment – and disrupt patterns that reinforce systemic inequities
- Responding and adapting to students' changing and diverse circumstances; engaging empathetically with student needs, both emerging and persistent; balancing intentional design and commitment to providing accommodations for equitable learning.

TO KNOW MORE:

<https://www.tolerance.org/magazine/publications/critical-practices-for-antibias-education/classroom-culture>

[Equity-Focused Teaching Strategies Reflection \(5 principles\) -- crlt.umich.edu - Documenti Google](#)

<https://crlt.umich.edu/multicultural-teaching/inclusive-teaching-strategies>

<https://www.imperial.ac.uk/staff/educational-development/teaching-toolkit/inclusive-learning-and-teaching/inclusive-educational-design/>

<https://teaching.cornell.edu/teaching-resources/building-inclusive-classrooms/inclusive-teaching-strategies>