iPeer Project

Reinventing the STEM VET via Peer-assisted Learning and Innovative Pedagogy

iPEER

Peer-Assisted Learning

Methodologies and tools

Erasmus+

Document control

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2 Summary

This handbook is designed to support educators, coaches, teachers, and trainers in implementing effective peer-assisted learning methodologies. It offers a step-by-step exploration of various PAL techniques, including Peer Teaching, Peer Review, Peer Instructions, Peer Coaching, and more. The handbook also highlights the importance of digital tools in enhancing PAL experiences and provides an overview of popular platforms such as Mastodon, Snapchat, ComPAIR, and Google Classroom which can also be used for peer-assisted learning.

With a focus on promoting active student engagement, collaborative learning, and knowledge sharing, this handbook serves as a valuable resource for educators seeking to transform their classrooms into dynamic and interactive learning environments. It delves into the pedagogical foundations of PAL and provides practical insights on how to integrate these methodologies into different educational settings.

Additionally, the handbook recognizes the significance of social and emotional learning (SEL) in fostering a supportive and inclusive learning community. It explores the intersection between PAL and SEL, emphasizing the development of essential life skills and promoting positive interpersonal relationships.

By equipping educators with a diverse range of PAL strategies and digital tools, this handbook aims to empower them in creating meaningful and impactful learning experiences for their students. Whether you are a seasoned practitioner or new to peer-assisted learning, this handbook offers valuable guidance and inspiration to enhance your teaching practices.

3 Terminology

Term	Definition
PAL	Peer Assisted Learning (PAL) refers to an educational approach that involves learners supporting and guiding each other in the learning process. It is based on the belief that students can learn effectively from their peers and benefit from collaborative interactions. PAL encompasses a range of methodologies and strategies, including Peer Teaching, Peer Review, Peer Coaching, and more. Through PAL, learners actively engage with their peers, sharing knowledge, exchanging ideas, and providing feedback, which enhances their understanding and retention of the subject matter. PAL promotes a learner-centred environment, fostering teamwork, communication, and critical thinking skills. By harnessing the power of peer interactions, PAL facilitates a dynamic and interactive learning experience for students.

4 PAL methodologies

This chapter presents the following methodologies which are related to Peer-Assisted Learning Peer Teaching, Peer review, Peer instructions, Peer Coaching, Action Learning Groups, Discussion Groups, Debates, Teams, Think-Pair-Share, Round Robin, Jigsaw, PBL - Peer Assessment, Social and Emotional Learning (SEL), Fishbowl, Gestalt pedagogy.

Each methodology is presented with a short summary, basic information, explanation, how to demonstrate it and additional information and sources.

4.1 Peer Teaching

4.1.1 Summary

Peer Teaching is a method in which students take turns leading classroom discussions or activities related to a specific topic. The student who is serving as the peer teacher is responsible for presenting information, facilitating discussion, and answering questions from their peers.

4.1.2 Basic info

Methodology name: Students as Teachers

Also known as: Students as Teachers, Peer-led learning, Peer-led instruction, Student-led learning, Student-led instruction, Student-led teaching, Student-led facilitation, Peer mentoring, Peer facilitation

Derived from: Zone of proximal development

Author of the methodology: Lev Vygotsky

4.1.3 Explanation

Students as teachers is a method that is gaining more and more popularity. This approach enables students to be more engaged in the subject they are studying and also develops their leadership, listening and discussion skills.

The opportunity to teach other students creates a feeling that you are trusted to pass on what you have learned to others, to support them in acquiring knowledge, to motivate them to learn more, to use examples that you find interesting for this age and to be understood by others.

This method can also be successfully applied in vocational education and more specifically in practice classes, where students from higher grades can demonstrate the skills they have acquired in a specific profession.

Communication can also be taken outside the classroom, such as a group chat between the student-teacher and the others, discussing issues related to the lesson.

4.1.4   How to demonstrate it

A student from a higher class explains what 3D printing is as a technology, what we can print on a 3D printer, what materials are used and how a 3D model is created.

The information is visualized with the help of the 3D printer, which is located in the classroom alongside presenting objects made by upper-class students.

4.1.5   Steps to conduct the lesson (example - 3D printing lesson):

Steps to conduct the lesson (example - 3D printing lesson):

1.   What is 3D printing?

Creation of 3D details by overlaying material using melting or solidification.

2.   What materials are used?

The most common material is various types of plastic (PLA, PETG, nylon, ABS,…). Powders, stainless steel, gold and silver, titanium, ceramic, and carbon fibres are also used.

3.   What kind of 3D models can be created?

Any kind of 3D models can be designed using various tools (TinkerCad, FreeCad, OpensCad, Blender, Fusion360,…). There are a lot of already designed 3D models (www.printables.com, www.thingiverse.com, www.thangs.com, www.cult3d.com …) For printing already designed models, it is usually enough to load the pre-configured settings.

4.   Can I create 3D scans with my mobile phone?

Many free applications allow us to create a 3D model even through our phones. (Examples: **Scandy Pro** for iOS, **SCANN3D** for Android).

5.   Let's scan a 3d image and 3D print it!

4.1.6   More info and sources

- https://www.youtube.com/watch?v=G0btIYY90qA

4.2 Peer review

4.2.1 Summary

Peer review is a method where students review and provide feedback on each other's work, such as papers, projects, or presentations. The process of peer review involves one student (the reviewer) reading and evaluating the work of another student (the author) to identify strengths and areas for improvement.

4.2.2 Basic info

Methodology name: Peer review

Also known as: Peer evaluation, Peer assessment, Peer criticism, Peer critique, Peer examination, Peer appraisal, Peer commentary, and Peer evaluation of scholarship.

Derived from: –

Author of the methodology: –

4.2.3 Explanation

Peer review is a procedure where professionals in a certain field assess a piece of work's quality and correctness, usually before it is published or made public. Also, peer review is a technique where students critique and offer comments on one another's written work, projects, or presentations. A student reads and evaluates the work of another student (the author) as part of the peer review process to identify areas of strength and improvement. The reviewer is free to offer feedback or recommendations regarding the work's structure, tone, and mechanics. Peer review is intended to give students the chance to get feedback and helpful criticism on their work from their peers. They may be able to develop their abilities and generate work of higher quality as a result. Also, it promotes a sense of community and collaboration among students and enables students to learn from their classmates by reading and analyzing various writing or presentation styles.

4.2.4 How to demonstrate it

Peer review demonstrations in a STEM classroom can be an effective way to foster critical thinking and advance writing abilities. Following are some detailed guidelines for putting peer review into practice:

1. Explain the idea of peer review to your students. Begin by outlining what peer review is and its significance. Provide some instances of papers or articles that have undergone peer review from respectable scientific journals.

2. Set down specific guidelines: Provide precise instructions for the peer review procedure and criteria that include the standards that students should take into account while evaluating the work of their peers. The use of scientific vocabulary, structure, and clarity, among other things, may fall under this category.

3. Give students a writing assignment that enables them to use the scientific principles they have studied. This can be a writing assignment for a lab report, a research article, or another STEM-related project.

4. Students should be paired up, and their writing tasks should be traded. Encourage them to concentrate on providing specific, unbiased, and courteous criticism.

5. Fix a due date: Establish a due date for the peer review procedure and motivate the pupils to meet it. For their input, you might offer a template or checklist.

6. After the peer review process is over, lead a discussion in the classroom so that the students can share their feedback and talk about any points of uncertainty or disagreement. Urge your students to back up their claims with facts and logic from science.

7. Provide feedback: Comment on the effectiveness of the peer review process and make suggestions for enhancements. You might want to think about evaluating both the final written assignment and the peer review procedure.

8. You can assist your STEM students in strengthening their writing talents, sharpening their critical-thinking skills, and learning more about scientific principles by following the methods listed below.

You can assist your STEM students in strengthening their writing talents, sharpening their critical-thinking skills, and learning more about scientific principles by following the methods listed above. Peer review as a formative practice and collaborative learning was researched (Søndergaard & Mulder, 2012).

4.2.5 *More info and sources*

Søndergaard, H., & Mulder, R. (2012). Collaborative learning through formative peer review: Pedagogy, programs and potential. Computer Science Education, 22. https://doi.org/10.1080/08993408.2012.728041

4.3 Peer instructions

4.3.1 Summary

Peer instruction is a teaching method where students work in groups during class to solve problems or answer questions related to the material being covered. The instructor presents a concept or problem, and then students work in small groups to discuss and solve it. This can be done through written exercises, discussions, or other interactive activities. After the group work, the class comes back together, and the instructor leads a whole-class discussion where students share their solutions and reasoning.
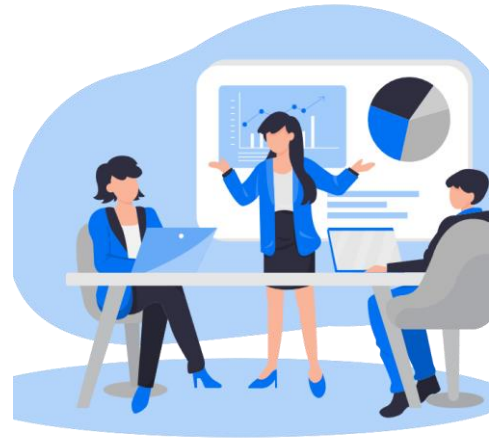
4.3.2 Basic info

Methodology name: Peer instruction

Also known as: Peer-Led Team Learning (PLTL), Peer-Facilitated Learning, Peer Teaching, Student-Led Instruction, Collaborative Learning, Peer-to-Peer Instruction, Group-Based Learning, Peer-Mediated Instruction

Derived from: -

Author of the methodology: Eric Mazur

4.3.3 Explanation

Peer instruction is a teaching method where students work in groups during class to solve problems or answer questions related to the material being covered. The instructor presents a concept or problem, and then students work in small groups to discuss and solve it. This can be done through written exercises, discussions, or other interactive activities. After the group work, the class comes back together, and the instructor leads a whole-class discussion where students share their solutions and reasoning.

4.3.4 How to demonstrate it

Example for physics teachers:

1. Start with a specific physics problem related to free fall, for example: "A ball is dropped from a height of 100 meters. How long will it take for the ball to reach the ground?"
2. Ask students to work in small groups (ideally 2-3 students per group) and discuss their answers to the problem.
3. After a few minutes, ask each group to come up with a consensus answer.
4. Collect the consensus answers from each group and present them to the class.

5. Ask the class to vote on the best answer, using a show of hands or a voting tool.
6. Discuss the reasoning behind the most popular answer, and use this as an opportunity to address any misconceptions and reinforce key concepts related to free fall, such as the formula for free fall, the relationship between time, velocity, acceleration, etc.
7. Provide feedback on the answers presented by each group, pointing out the strengths and weaknesses of each answer and explaining how they can be improved.
8. Repeat the process with a few more physics problems or questions related to free fall.
9. At the end of the session, summarize the key takeaways and emphasize the importance of working together with peers to deepen understanding and improve problem-solving skills when it comes to free fall.

By following these steps, I would engage students, encourage active learning, and reinforce key concepts in a fun and interactive way.

Reproduced from Eric Mazur
(search "Confessions of a converted lecturer" on YouTube)
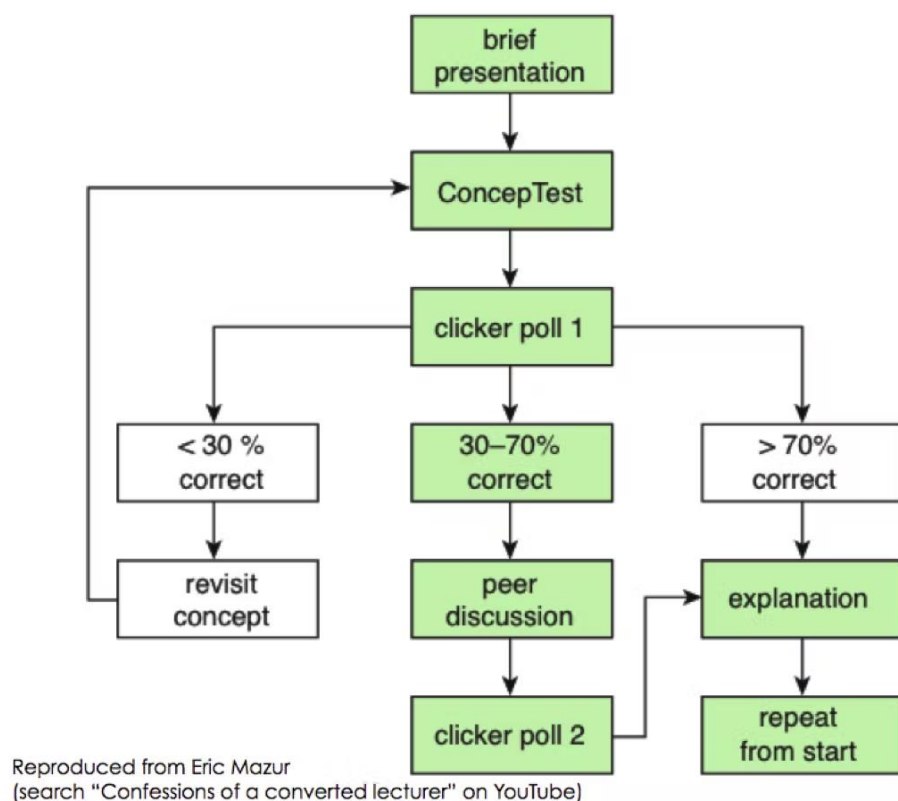
Figure 1: Peer instruction process

4.3.5 *More info and sources*

- https://mazur.harvard.edu/research-areas/peer-instruction
- https://www.kuleuven.be/english/education/teaching-tips/activating-students/peer-instruction
- Picture 1 source: https://www.wooclap.com/blog/en-gb/harvard-professor-eric-mazurs-peer-instruction-method/

4.4 Peer Coaching

4.4.1 Summary

Peer coaching is a process in which two or more individuals work together to support each other's professional or personal development. In a peer coaching relationship, one person acts as a coach, offering support, guidance, and feedback to the other person, who is known as the coachee.

4.4.2 Basic info

Methodology name: Peer coaching

Also known as: Peer mentoring, Colleague coaching, Peer-to-peer coaching, Peer support coaching, Peer development coaching, Peer growth coaching, Professional peer coaching, and Peer-led coaching.

Derived from: Hands-On Educational Consultancy, PLOT.

Authors of the methodology: Marcia S. Hagen, Tani K. Bialek, Shari L. Peterson, Hodges Simons

4.4.3 Explanation

Peer coaching is a process in which two or more individuals work together to support each other's professional or personal development. In a peer coaching relationship, one person acts as a coach, offering support, guidance, and feedback to the other person, who is known as the coachee.

Peer coaching can take many forms, but it typically involves regular meetings between the coach and coachee, during which the coachee sets goals, discusses challenges, and receives feedback and support from the coach. The coach may also offer specific strategies and tools to help the coachee achieve their goals.

4.4.4 How to demonstrate it

1. Define the purpose and objectives of the program
   a. For example, if the goal is to improve the team's efficiency, focus on relevant objectives, such as increasing the team's knowledge sharing, developing leadership skills, or improving communication.
2. Orient the team members regarding the program
   a. Orienting the team members involves letting them know the program's purpose, objectives, structure, desired outcomes, and benefits.
3. Create a coaching culture

       a. You can create a coaching culture by providing training and resources on coaching, which may be as workshops, reading materials, or online courses.
4. Assign coaches to facilitate group coaching sessions
       a. Peer coaches help facilitate the learning process and ensure that the team stays focused during group coaching sessions.
5. Develop a system for receiving feedback

You can develop a feedback system by setting up a way for employees to provide feedback regularly. This may include surveys, interviews, observations, or focus groups.

Listening, questioning, skilful dialogue and non-judgment are essential as the coachee and coach engage in the three phases of the coaching cycle:

1. a planning conversation in which the role of the coach is to help the coachee determine their goals and their plan and processes for achieving them;
2. an observation phase where the coach observes the teaching session and collects the relevant data asked for by the coachee and
3. a reflective conversation where data collected is presented back to the coachee. The coach does not provide feedback or interpret the data. The conversation is focused on assisting the teacher to reflect on what they did and how they did it, to interpret their data, identify their learning, and next steps forward.
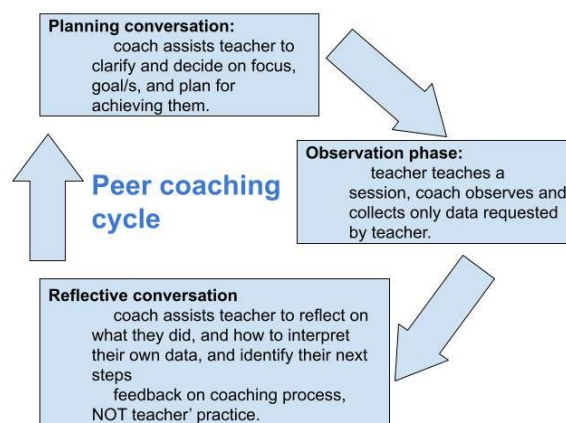
Figure 2: Peer coaching process

The Coaching Cycle diagram further specifies the roles and responsibilities of the coach and coachee:

Planning conversation: the coachee decides on their goal & success criteria and shares how they will achieve their goal determines the role of the coach & observational focus.	**Planning conversation:** coach listens, pauses, paraphrases, asks questions clarifies focus & summarizes the coachee's goal draws out the specifics of how this will be achieved clarifies expectations & their role
Observation phase: the coachee -teaches the session -makes mental notes (meta-cognitive)	**Observation phase**: coach -observes specified focus collects agreed data documents evidence
Reflective conversation: the coachee -reflects on the session outcomes -articulates what happened, how & why -interprets & reflects on the data -makes forward plans & next steps -provides feedback on the coaching process	**Reflective conversation:** coach -inquires: asks probing questions to guide the coachee's reflections -clarifies & extends the coachee's thinking -assists coachee to make connections -shares data collected: reports without judgment (description, not interpretation) -summarizes coachee's reflections & next steps -asks for feedback on the process -clarifies on-going support desired

Table 1: Peer coaching process

In summary, group coaching will require you to step outside your comfort zone. To create learning, you'll need to be vulnerable in exploring your challenges and in summoning the courage to question others on sensitive issues and give direct feedback.

4.4.5 More info and sources

- https://ca.indeed.com/career-advice/career-development/peer-coaching
- https://hbr.org/2021/04/the-surprising-power-of-peer-coaching
- Images source: https://www.allthingsplc.info/files/uploads/types-of-coaching.pdf

4.5 Action Learning Groups

4.5.1 Summary

These are small groups, usually of the same people, working on current and important real-world priorities by sharing questions, taking actions, and learning especially   from reflecting on the questions and actions. There are various formats of Action Learning, but there usually is an equal and strong focus on intentionally generating new actions and learning from the sharing in the group.

4.5.2 Basic info

Methodology name: Action Learning Groups

Also known as: Action Learning

Derived from: Peer Coaching Workgroups

Author of the methodology: Reg Revans

4.5.3 Explanation

These are small groups, usually of the same people, working on current and essential real-world priorities by sharing questions, taking actions, and learning especially from reflecting on the questions and actions. There are various formats of Action Learning, but there usually is an equal and strong focus on intentionally generating new actions and learning from the sharing in the group. Thus, Action Learning can be very effective for solving complex problems and/or achieving significant goals.

4.5.4 How to demonstrate it

A typical set meeting might last 2-3 hours and might have a structure something like this:

1. At the start of the meeting each member 'checks in'- feeding back on progress or changes since the group's last meeting.
2. One or more members then seek permission from the others to share/present- an issue they're dealing with at work they'd like to explore. This should be a concrete project and not one with a simple solvable answer.
3. The set agrees on an initial person to focus on and the issue to be addressed- this is sometimes called 'claiming airspace.' The presenter outlines the issue or challenge they'd like to consider.
4. Set members to ask questions designed to help the presenter analyse the concern they have, and clarify what the challenge is and why they're struggling to deal with it.

5. These questions can take several forms: e'. g. clarification – 'Are you saying that…?', understanding – 'Could you explain this issue a bit more…?', checking implications – 'You said before that.. so If that's so then what would happen if…?'
6. Set members mustn't offer advice or opinions. They also need to avoid using airspace for telling their own stories or discussing their issues.
7. At the end of a period – 15 minutes or so – the presenter reviews their thinking and selects one or more courses of action which they then commit to. In doing so they are committing to take action and to be held accountable for action at the next meeting. Then another group member presents.
8. The group might then typically reflect on the quality of the group process, and reflecting on what was successful and less successful and how they might improve for next time.
9. Once back at work, the presenter applies the insights they gained to their work issue. They will consciously choose to note what worked and not to report back to the group on effectiveness. And they bring that learning back to the next meeting.

The process:

- Step 1: Confirm the Topic to Address
- Step 2: Appoint Set Members
  - Try to choose participants with a variety of backgrounds.
- Step 3: Appoint a Leader
  - Some people find that it's helpful to appoint a set leader or facilitator.
- Step 4: Choose a Setting
  - Action Learning Sets are often most effective when they take place in an unfamiliar setting.
- Step 5: Run the Session

Use Revans' Action Learning Cycle as a basis for your set. As we show above, the four steps are:

- Reflect - first, present the problem. Set members should then ask questions about the issue, check assumptions, and discuss potential solutions.
- Learn - after the initial discussion, talk about what each person has learned from it.
- Plan - your goal in this phase is to identify activities that could help resolve the problem, and develop an effective plan to undertake them.
- Act - listen to members' reports, and examine what worked, what didn't, and what action members need to take now. Then, schedule another meeting to reflect on and discuss your newly agreed action.
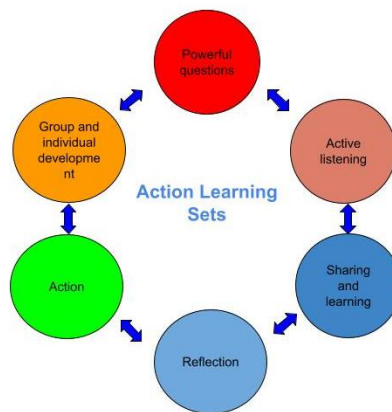
Figure 3: Action learning set process

4.5.5 *Conclusion*

In summary, action learning is a collaborative problem-solving strategy that involves several people working on an identified problem together. While action learning is a problem-solving process, the most important stage of it does not involve finding solutions but rather a line of insightful questioning and reflection on the actions undertaken. The emphasis is on learning by doing.

Action learning requires an empathetic, open-minded and reflective process. Skills developed during action learning include critical thinking, questioning and reflective listening.

4.5.6 *More info and sources*

- https://www.managementcentre.co.uk/blog/action-learning-sets-group-problem-solving/
- https://www.mindtools.com/anbk5zv/action-learning-sets
- https://utas.shorthandstories.com/PP_Action_Learning/index.html
- Picture source: https://utas.shorthandstories.com/PP_Action_Learning/index.html

4.6 Discussion Groups

4.6.1 Summary

In discussion groups, people share comments and opinions sometimes in a random order to make a decision or enhance understanding about a topic or activity. There usually is no focus on intentionally generating new actions and learning, although implicit learning can occur for the thoughtful members of the groups.

4.6.2 Basic info

Methodology name: Discussion Group

Also known as: Dialogue groups, Talk groups, Roundtable discussions, Brainstorming sessions, Deliberation groups, Debate clubs, Discussion forums, Discussion circles, Chat groups, Talk shows

Derived from: -

Author of the methodology: N/A

4.6.3 Explanation

Discussion is important to learning in all subjects because it helps students process information rather than simply receive it. It requires vastly different skills for teachers rather than traditional lecturing, as students need to be engaged and deliver content in a quasi-independent way.

The main aim of the discussion group is to provide students with improved critical thinking skills that allow students to reflect on the particular content of the class rather than simply memorizing and regurgitating information delivered by the teacher.

4.6.4 How to demonstrate it

1. Preparing for Discussions

To start planning a discussion (or any instruction, for that matter) decide what you want your students to get out of the discussion. For example, do you want them to share responses, make new connections, and articulate the implications of a text?

Should they be able to work on certain problems by the end of the hour? Should they be able to interpret and critique a journalistic photograph or a piece of art? Deciding on and articulating the objective for the discussion will help you decide what kinds of discussion activities will best help your students reach that objective. Remember that you can organize a discussion in many

different ways: you can have students work in small groups, role-play, choose sides for a debate, or write and share a paragraph in response to the theme in question. You will also want to leave time to wrap up and summarize the discussions for your students (or have students summarize them), or to debrief after activities such as debates or role-plays.

2. Develop a Clear Goal for the Discussion

Knowing the content to be covered is not enough. Naming the chapter your students will read is not enough. If you've only thought as far as "I want students to know …" you haven't thought through enough what needs to be accomplished. You should be able to articulate what the students will be able to do with the information or ideas. For example, in a philosophy class for which students have read a chapter on epistemologies or theories of knowledge, you might want students to be able to construct legitimate arguments for and against any epistemology about which they have read.

3. Problematize the Topic

Having a clear goal in mind makes it much easier to plan a discussion. You know what you want students to get out of it. But it is not enough: An instructor at IU several years ago told the story of how she wanted her students to deal with the issue of prejudice. She tried to start the discussion merely by saying "Discuss prejudice." No one spoke. She then asked if anyone had seen prejudice. One student raised a hand. When she asked what it was like, the student merely said "awful." She had a goal, but not a problem or an activity to get the students to engage in the ideas to achieve the goal.

The opposite end of the spectrum is also a problem. While "**Discuss prejudice**" is too **open-ended**, merely asking for the basic facts won't work either. You've probably heard a professor rattle off a list of questions that require only brief **factual replies and little student involvement**:

"Who was the first President of the United States? George Washington"

Either you have your students an open-ended problem to solve, a task to complete, a judgment to reach, a decision to make, or a list to create, something that requires closure.

4. Select a Discussion Format

Many discussion activities can be used in the classroom. Choose one that will help your students meet your goals for the discussion. The more specific you can be in assigning the task, the more likely your students will be to succeed at it.

5. Choose a Method to Assign Students to Groups

When assigning students to groups, consider the following questions.

- How big should the groups be: Two to six is ideal. Smaller groups (two-three) are better for simple tasks and reaching a consensus. Also, students are more likely to speak in smaller groups. Larger groups of four-five are better for more complex tasks and generating lots of ideas.

- How should students be assigned to groups: Randomly assigning students to groups avoids the problem of friends wanting to get off track. For long-term groups, you may want to select certain attributes or skills (e.g. a statistician, a geology major, and a writer) or by interest in the topic, if different groups have different tasks.
- How long should the groups meet: Just for this activity or for all semester? Stop the discussion groups while they are still hard at work; next time, they will work doubly hard. Long-term groups allow students to practice collaborative skills and make stronger bonds, but sometimes they get tired of each other.

6. Choose a Debriefing Method

Always debrief students; it is the most important part of a discussion, the time to summarize and synthesize. Most of the learning in discussions happens during debriefing, so don't squeeze it in— a rule of thumb is to use one-third of the total discussion time for debriefing.

You can use debriefing to correct incorrect notions. You can slip in any points that students neglected but that are important. You can pick which student reports from each group, though you should tell them in advance that you plan to do this. This makes everyone in the group responsible. You don't have to hear back from every group, but can instead choose a few at random. When groups start repeating ideas, it's time to stop.

Many techniques can get students to share what their smaller groups have done with the entire class: verbally, on newsprint/flipchart, blackboard or overhead, ditto/photocopy, etc. And you don't have to hear from everyone; calling on a few groups at random to report works quite well. To encourage student cross-team competition in Team-Based Learning, reporting out from groups is simultaneous. Answers can be posted on a Powerpoint slide or pieces of newsprint hung on the walls of the class.

(Note: text was taken from the following source to complete the example[2])

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[2] https://citl.indiana.edu/teaching-resources/teaching-strategies/discussions/index.html
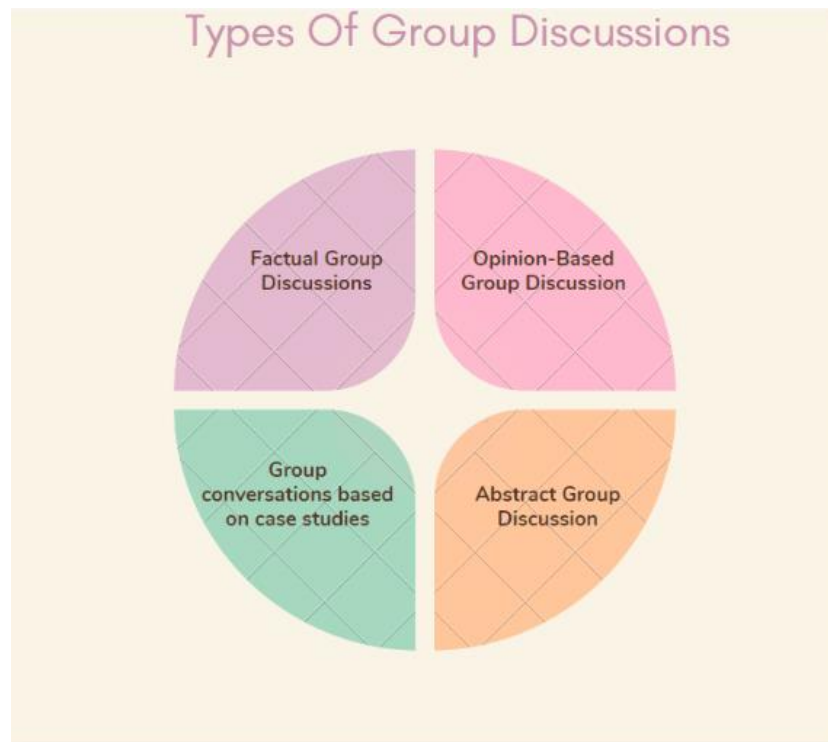
Figure 4: Four types of discussion groups

4.6.5 *More info and sources*

- https://www.mygreatlearning.com/blog/group-discussion-in-interviews/
- Image 4 source: https://www.mygreatlearning.com/blog/group-discussion-in-interviews/)

4.7 Debates

4.7.1 Summary

Debates are formal activities in which members having a particular point of view attempt to convince others having a different point of view to arrive at the members' particular point of view. There is not always a focus on intentionally generating new actions and new learning, although members often implicitly learn a great deal about other points of view than their own. Dialogue groups are generally more collaborative and less confrontational than debates, which can sometimes become heated.

4.7.2 Basic info

Methodology name: Debating

Also known as: arguments, discussions, dialogues, forums, and disagreements

Derived from: -

Author of the methodology: Not attributed to any specific person, it's a long-standing practice.

4.7.3 Explanation

Example:

Debate is a discussion in which more than two people advocate opposing positions on a topic or question in an attempt to make an audience (or the other advocates) accept their position. A reasoned debate allows students to explore and gain an understanding of alternative viewpoints and, for the participants, develops communication, critical thinking and argumentation skills. The approach is often used in disciplines where practitioners are required to present and defend particular positions against other parties, such as Law, Politics, and Social Work. These skills however are also critical for other subjects where language, communication and critical thinking are essential. For example, students in design-based subjects, such as engineering, graphic or product design, could use the skills they have learned through debating to give well-qualified justifications for making particular design choices in response to a project brief[3].

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[3] https://blogs.shu.ac.uk/shutel/2014/09/02/debate-an-approach-to-teaching-and-learning/

4.7.4 *How to demonstrate it*

1. Introduce the topic

Step one is to introduce a topic. The topic depends on which class you teach. It is useful to create a topic that could have practical applications for the students to better understand the utility of the debate. For example, if you are a teacher of engineering you could debate whether new structural designs of buildings are better or worse than the traditional structural designs used for buildings in the 19th century as it relates to sustainable development. So the affirmative statement that would be debated is 'Old structural designs of buildings are more sustainable than new structural designs of buildings'.

2. Assign the Affirmative and the Negative

There are two sides to any debate. So the online classroom will be divided into three sides, one will argue for and another against the resolution; then another group of students will be the judges. It is best to group your students into teams to research and argue the issue rather than expecting one student to do all the work. This way one student does not have all the pressure to perform, and the other group members can help with comprehension and strategy. During the debate, the other groups will serve as the judges and decide which side presented a stronger case voting at its conclusion for the winners of the debate.

3. Give Time for Research

Your students will need time to research the issue. Give the students at least 30 minutes to prepare for the debate. Encourage each group to form a strategy to decide who will do most of the talking during the debate though remind them that all of them are expected to participate in the research and strategy of the debate. Then, during the preparation time in anticipation of the rebuttal (each side has at least two minutes to present their case) after both sides have presented you then continue to the rebuttal phase or counterarguments to the arguments made for and against. Your students should discuss the points the opposition made with their teams and decide how to refute them.

4. Keep Track of Time

If you are unfamiliar with the formal debate, the speakers follow a set order. The following is the most basic debate structure:

i.   First, the affirmative group receives two minutes to present their case to the audience.
ii. The negative group then receives two minutes to present their case.
iii. After both sides have a chance to speak, both teams receive two minutes to prepare a rebuttal and summary.
iv. The order of speech is reversed now and the negative side presents their rebuttal and summary for the first two minutes.

The last to speak is the affirmative team who then presents their rebuttal and summary for two minutes. The debate is now concluded.

There are other structures that you can follow for debate, and they may be useful once your class is familiar with the process and strategy of debate, but if this is the first time your students are formally debating, keeping things simple is best.

5. Make a Judgment

Usually, in a debate, the winner is the one who has presented the strongest case. To determine the winner, have the audience vote on which team they thought made the most convincing argument. With this, weigh your own opinion as to who communicated clearly and refuted the opponent's arguments best. This combination will identify your winners.

Your grading process, on the other hand, does not have to name a winner and a loser. As long as your students were able to communicate, use good grammar, and have good pronunciation, the debate was a success, and their grades should reflect that success.

Although debates are often formal and structured, don't let them intimidate you. Controversial issues are always a great resource for ESL students' speaking practice, and formally discussing the issues is just as valuable as informal class discussions[4].

4.7.5 *More info and sources*

- https://www.makeuseof.com/best-debate-sites/
- https://blogs.shu.ac.uk/shutel/2014/09/02/debate-an-approach-to-teaching-and-learning/
- https://busyteacher.org/7245-conducting-class-debate-essential-tips.html

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[4] https://busyteacher.org/7245-conducting-class-debate-essential-tips.html

4.8 Teams

4.8.1 Summary

Teams are groups of people working toward a common purpose or goal. There is always a focus on intentionally generating new actions to address the purpose or goal. Well-designed teams also focus on intentionally generating new learning, especially to enhance the performance of the teams.

4.8.2 Basic info

Methodology name: Teams

Also known as: TBL - Teams Based Learning

Derived from: -

Author of the methodology: N/A

4.8.3 Explanation

Team-based learning is a collaborative learning and teaching strategy that enables people to follow a structured process to enhance student engagement and the quality of student or trainee learning. Rather than memorizing and learning knowledge teams based learning allows students to apply that knowledge by working in teams.

1. Set up learning objectives for the class
2. Divide students into groups. Before any class, students have to study an assigned piece of material. Specifically, they will be assessed as individuals and then as a group with immediate feedback on their answers, at the beginning of each new learning unit. This process, which is called the TBL "rhythm", starts with out-of-class preparation, the Readiness Assurance Process (RAP), and is then followed by Application Activities.
3. Students then have the opportunity to write evidence-based appeals if they feel they can make valid arguments for their answers to questions which they got wrong.
4. The final step is a mini-lecture in which the instructor explains or clarifies any problems or misperceptions that arise during the team test and the appeals.
5. Once the Preparation and RAP stages are completed, the rest of the learning unit is spent on in-class activities that require students to apply the study content for problem-solving. In detail, students work in teams to analyze, discuss, and carry out solutions to a presented problem or challenge. The challenging scenario is often structured around the

TBL's 4S framework: Significant problems, Same Problem, Specific Choice, and Simultaneous Report. [5]

Four key components of TBL
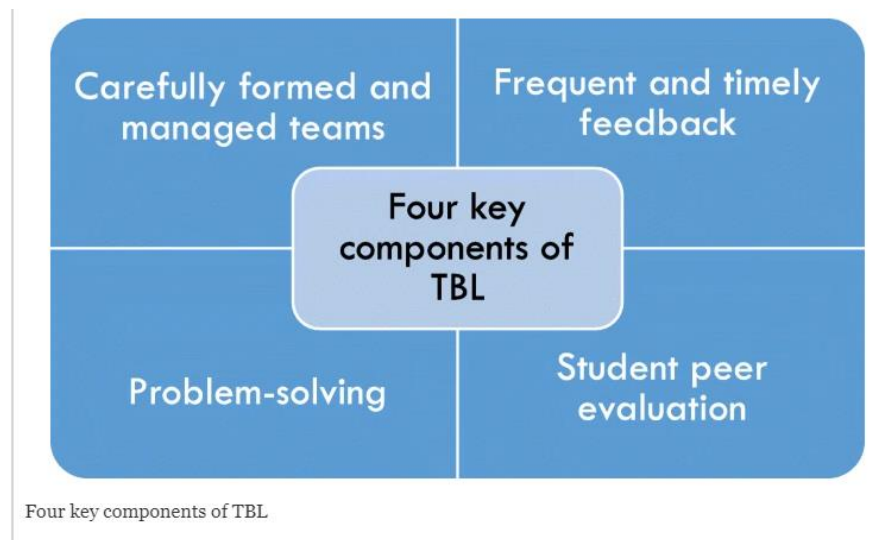
Figure 5: Four key components of TLB

4.8.4 *More info and sources*

- https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-020-02287-y
- https://cdn.ymaws.com/teambasedlearning.site-ym.com/resource/resmgr/Docs/TBL-handout_February_2014_le.pdf

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[5] http://www.teambasedlearning.org/definition/

4.9 Think-Pair-Share

4.9.1 Summary

Think-Pair-Share is a teaching strategy where students think about a question or problem individually, and then share their thoughts with a partner before discussing as a whole class.

4.9.2 Basic info

Methodology name: Think-Pair-Share

Also known as: -

Derived from: learning processes, CT development, and cooperative learning.

Author of the methodology: prof. Frank Lyman

4.9.3 Explanation

Think-Pair-Share is a collaborative teaching-learning strategy in which students work together to solve a problem or answer a question on an assigned topic in three steps:

1. **Thinking.** The teacher provokes students' thinking with a question, prompt, or observation. Once given the topic and question, students should spend a few minutes THINKING about the question.
2. **Pair up.** Students get into PAIRS to discuss the answer and identify the best answers.
3. **Students SHARE** their results of the discussion with the rest of the class.

The method aims to maximize participation, focus attention, and engage students in understanding class topics.

4.9.4 How to demonstrate it

Example instructions for language teachers:

1. To promote a class discussion, use "Think-Pair-Share" (TPS) to help students discuss a specific topic in books they're currently studying. For example, Hamlet by William Shakespeare "What do you think is the main message and the most important lesson of the book?"
2. Give students some minutes to pause to reflect and answer the questions. They can take notes, but it is not necessary.
3. Ask students to work in pairs and discuss their answers to the questions.

4. After providing sufficient time for students to speak with their partners, select some pairs to share their responses with the whole class.
5. In the end, provide additional note points and a concise summary/synthesis of this activity.
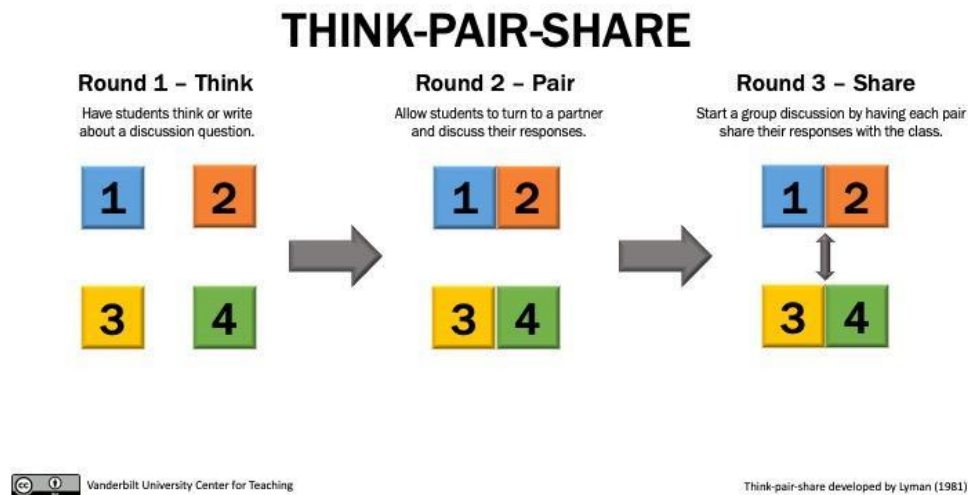
Figure 6: Think Pair Share process

4.9.5 *More info and sources*

- https://files.eric.ed.gov/fulltext/EJ1061947.pdf
- https://www.adlit.org/in-the-classroom/strategies/think-pair-share
- https://www.wgtn.ac.nz/learning-teaching/support/approach/steps-to-teaching-success/think-pair-share
- Picture source: https://cft.vanderbilt.edu/guides-sub-pages/setting-up-and-facilitating-group-work-using-cooperative-learning-groups-effectively/

4.10 Round Robin

4.10.1 Summary

Round robin is a teaching method where students take turns sharing their ideas or responses to a question. One student speaks at a time while others listen. This method promotes active participation and engagement among students while giving each student an equal opportunity to share their thoughts.
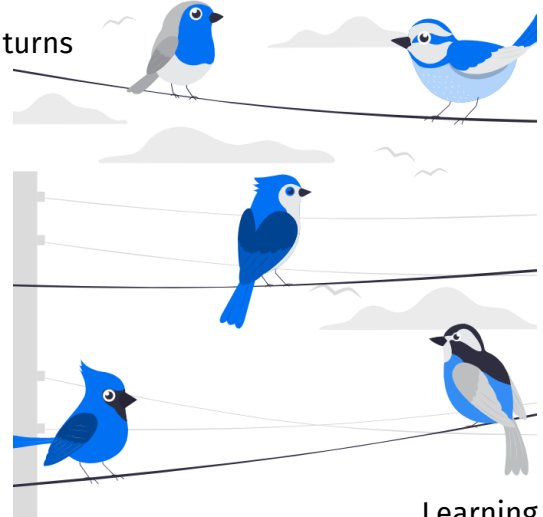
4.10.2 Basic info

Methodology name: Round Robin

Also known as: -

Derived from: Engineer inclusion, Emints (Cooperative Learning Strategies)

Author of the methodology: Rally Robin, Spencer Kagan

4.10.3 Explanation

Round Robin is a cooperative learning strategy where students work together in small groups to share information, ideas or opinions. The process typically follows these steps:

1. The teacher divides the class into small groups, usually of 3-5 students.
2. Each student in the group has an opportunity to speak or share their information, idea or opinion one at a time.
3. The group members listen actively, ask questions and provide feedback to the speaker.
4. Once each student has had a turn, the group can then discuss the information, ideas or opinions shared and come to a conclusion or solution.

4.10.4 How to demonstrate it

Follow these steps to effectively use the Round Robin Discussion strategy in your classroom.

Steps:

1. The best way to implement this strategy in your classroom is to first think of the topic that you want students to discuss.
2. Next, decide on the number of questions or topics you would like to be discussed so you know how many tables/groups you will need.

3. Arrange the desks or tables so that the discussion flows nicely and students can move about easily. Also, consider the placement so that groups won't be distracted by other groups.
4. Give each table one discussion sheet (preferably a different colour) along with a variety of different-coloured pens (this will help distinguish groups from one another). Assign one person the leader of the group and another the recorder.
5. Set a timer for each group. Also, give groups tokens so that when it's each student's turn to talk, they must turn in a token. This helps the groups move along.
6. Once each group has gone (and before they move to the next group), have the leader present their group's ideas.

Round Robin

1. Place students in groups of 3 to 5.
2. Pose an open-ended question or problem to the class.
3. Provide time for students to think about the question or problem.
4. Team members take turns sharing responses to the question/problem within teams in a round-robin fashion.
5. Team members continue generating ideas or answers until the time is called.
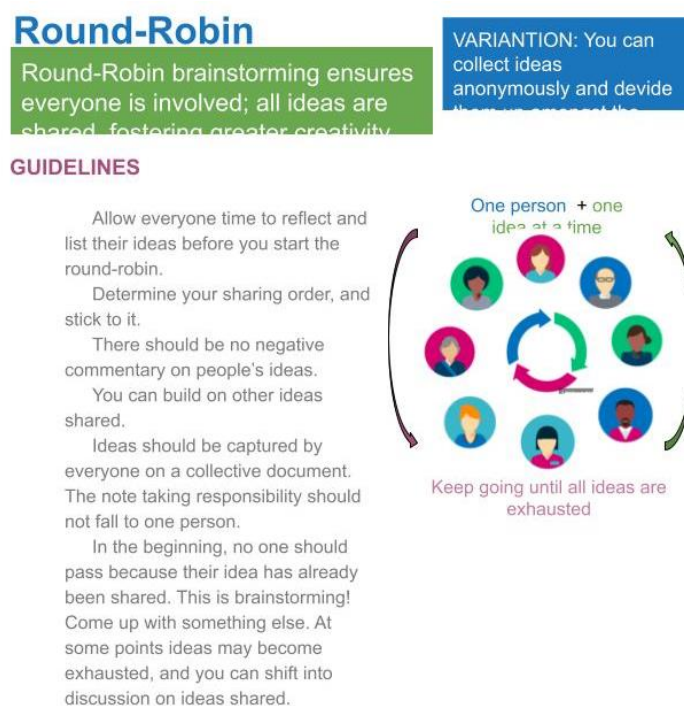
Figure 7: Round-robin technique

All in all, the Round Robin technique promotes brainstorming. Students are encouraged to generate as many responses as possible during an established amount of time. At the end of the 'round robin' session, groups can share their answers and ideas with the class. The instructor can solicit volunteers or randomly call on individuals to share group responses. Other members of the group can clarify what was said during the 'round robin' session.

4.10.5 *More info and sources*

- https://engineerinclusion.com/what-is-round-robin-brainstorming/
- https://www.unige.ch/innovations-pedagogiques/application/files/1115/8877/8105/Jorg_Balsiger_SocDur_How_to_Use_the_Round_Robin_Discussion_Teaching_Strategies.pdf
- https://sites.google.com/a/emints.org/cooperative-learning-strategies/round-robin
- https://www.schreyerinstitute.psu.edu/pdf/alex/roundrobin.pdf
- Picture source: https://prezi.com/dgulaexyjpr1/rally-robin-kagan-strategy/

4.11 Jigsaw

4.11.1 Summary

The jigsaw method is a teaching approach where students work in groups to learn a topic or concept. Each student becomes an expert in one aspect of the topic and then shares their knowledge with the group. In this way, students become responsible for their learning while also relying on their peers.

4.11.2 Basic info

Methodology name: Jigsaw

Also known as: –

Derived from: –

Author of the methodology: Elliot Aronson

4.11.3 Explanation

Jigsaw is a cooperative learning strategy that allows students to be specialists/masters in a topic and teach it to their peers. It works in groups of 3 to 6 students where they can share relevant aspects of an assigned topic through communication and debate since the students will first meet with people who have the same question or topic. Students form a specialist team by sharing their research, and options (expert groups) to strengthen their presentation on the topic and then they will go to the Jigsaw group where each one will present a report on their assigned topic. Asking students to work together in a Jigsaw builds comprehension, encourages cooperation, and improves communication and problem-solving skills.

4.11.4 How to demonstrate it

Example instructions for Science teachers:

1. Topic: Animal Analysis. Divide the sub-topic into different segments, for example
   a. Sponges and flatworms;
   b. Cnidarians, ascarids and molluscs;
   c. Annelids, arthropods and echinoderms;
   d. Fish and amphibians;
   e. Reptiles, birds and mammals)

Select the material you want students to explore.

2. Put students into groups of four. These groups will be the "home groups" of the Jigsaw and assign the subtopic.

3. After students have conducted some research, divide the class into their home groups and explain to students that they are going to be responsible for teaching their subtopic to the group they are sitting with now.
4. Break the class into expert groups so everyone can share their research and give their feedback and opinions.
5. Regroup the class with Jigsaw groups "Home Groups" and each student is responsible for teaching their topic. All students are responsible for learning all material.
6. Finally, conduct an activity to summarize all the information they've learned. For example, ask them to make a poster to share with the class.
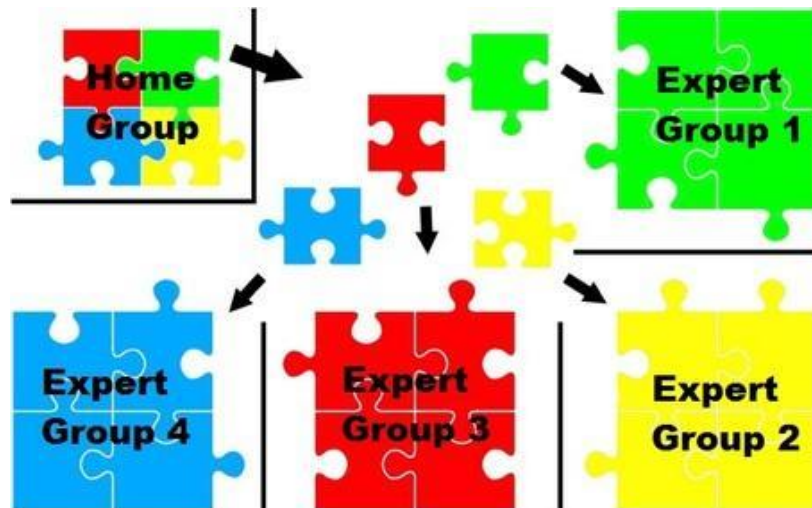
Figure 8: Jigsaw Groups
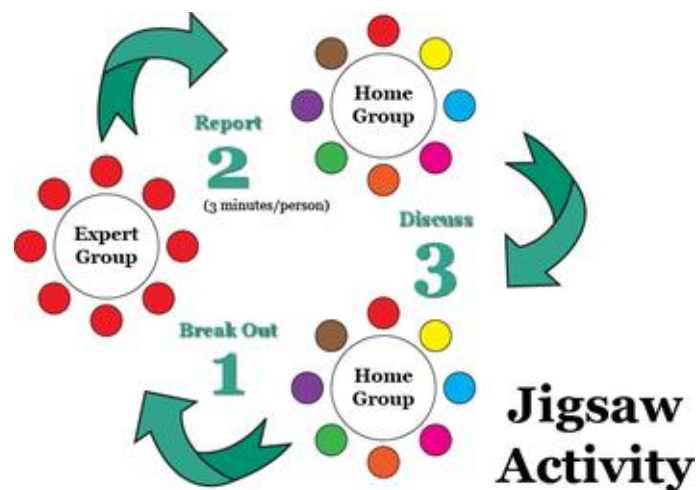
Figure 9: Jigsaw process

4.11.5 *More info and sources*

- https://www.theteachertoolkit.com/index.php/tool/jigsaw
- https://www.jigsaw.org/overview/

- https://www.facinghistory.org/resource-library/jigsaw-developing-community-and-disseminating-knowledge
- Picture source: https://strategiesforspecialinterventions.weebly.com/jigsaw1.html

4.12 PBL - Peer Assessment

4.12.1 Summary

Peer assessment is a process in which students provide feedback and evaluate the work of their peers based on established criteria. This type of assessment is usually used in educational settings as a form of formative assessment, where the focus is on providing feedback to improve learning rather than assigning grades or marks.

4.12.2 Basic info

Methodology name: Project-based learning PEER Assessment

Also known as: PBL Peer Assessment

Derived from: -

Author of the methodology: N/A
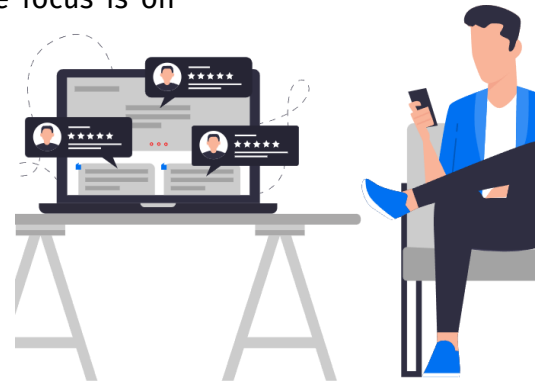
4.12.3 Explanation

Project-based learning /PBL/ is an opportunity for students to be involved in real projects from different fields, combining their knowledge and skills on different topics, making decisions, managing time and tasks, working in a team and solving problems from real situations. This enables students to prepare for the world outside school and the professions of the future.

Project-based learning focuses on assigning students a project to work on. In this way, they collaborate and work together, sharing and exchanging ideas, resources and knowledge. PBL is based on some of the following elements: acting out real-life scenarios, role-playing, learning lessons, assessment, communication methods, and most of all, the real-world experience brought into the classroom.

PBL allows the group assessment to be replaced by an individual one which is more realistic because it represents the true level of each student. And the assessment itself can be done by peers. This has its advantages because in this way students learn to take responsibility and develop their critical thinking by analyzing and discussing the tasks completed by their peers.

4.12.4 How to demonstrate it

After completing a project, the students who act as project leaders evaluate the performance of each of the participants. This can be done through pre-set criteria such as: completing tasks, meeting deadlines, applying skills, teamwork and collaboration, sharing information, listening to other team members, areas for improvement, etc.

This assessment allows identifying the strengths and weaknesses of each participant. Thus, everyone will become familiar with the areas in which to improve further, as well as in which area they would be most useful depending on their skills and competencies.

Assessment is useful both for the students and for the proper distribution of roles, responsibilities and tasks in future projects.

	Bad	Good	Great	Excellent
	1-2	3-4	5-6	7-8
Completing tasks				
Meeting deadlines				
Sharing				
Used skills (reading, writing, speaking, listening)				
Digital skills				
Collaboration				
Team work				
Listening to team members				

Total score:

Figure 10: Example of an assessment form

4.12.5 *More info and sources*

- https://mindhub.bg/blog/kakvo-e-proektno-bazirano-obuchenie
- https://prepodavame.bg/trite-nay-chesti-problema-pri-pbo-i-tehnite-reshenia/

4.13 Social and Emotional Learning (SEL)

4.13.1 Summary

Social and Emotional Learning (SEL) refers to the process of acquiring and applying knowledge, skills, and attitudes to understand and manage emotions, set and achieve goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. Activities that promote active and collaborative learning: role-playing, group discussions, reflective journaling, and problem-solving.

4.13.2 Basic info

Methodology name: Peer Social and Emotional Learning

Also known as: Peer SEL

Derived from: -

Author of the methodology: N/A

4.13.3 Explanation

Social-emotional learning is the process of developing social-emotional competencies, such as beliefs, attitudes, and behaviour patterns, which help us make good decisions. Similar activities can also be included in lessons to develop students' skills to manage their emotions, communicate more easily with their peers and other people around them, make decisions, and solve problems.

Developing social-emotional skills is even more necessary for students who are exposed to additional stressors (low socioeconomic status, unstable family environment, sick relative or younger siblings to care for etc.). Social-emotional skills will help these students ask for help when needed, manage their emotions, and cope with the challenges of the environment in which they grow.

Similar activities can also be carried out individually or in a peer group without the direct involvement of a teacher, for example, the application of the 4 7 8 breathing technique for overcoming distraction and stress before an exam.

4.13.4 How to demonstrate it

Application of the 4 7 8 breathing technique for overcoming distraction and stress before an exam.

Steps:

1. Sit comfortably
2. Close your mouth and inhale through your nose to a mental count of four.
3. Hold your breath for a count of seven.
4. Exhale slowly through the mouth to a mental count of eight.
5. Repeat the process three more times for a total of four breath cycles.

The ability to remain calm in difficult circumstances leads to better concentration and better memory. This, in turn, allows students to focus their attention on a specific task rather than side factors.
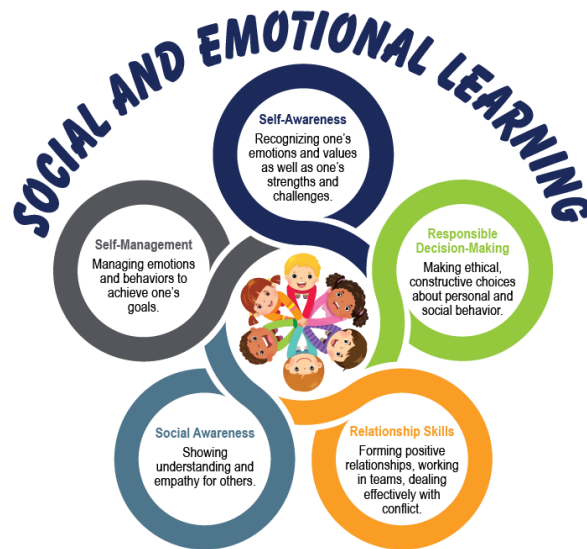
Figure 11: Social and emotional process
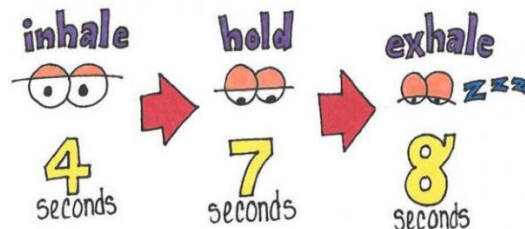
Figure 12: 4-7-8 Breathing Technique – Bring the body into a state of deep relaxation

4.13.5 *More info and sources*

- https://prepodavame.bg/sotsialno-emotsionalno-uchene-kakvo-e-tova/
- https://www.healthline.com/health/4-7-8-breathing#How-to-do-it-
- https://hypnotherapycenter.co.za/4-7-8-breathing-technique-bring-the-body-into-a-state-of-deep-relaxation/

4.14 Fishbowl

4.14.1 Summary

The fishbowl method is a discussion technique where a small group of participants, usually four to six, sit in a circle in the centre of the room and have a conversation while the rest of the group sits in a larger circle around them and observes silently. The inner circle discusses a topic or question for a set time, while the outer circle listens and takes notes. After the discussion, the outer circle can ask questions or make comments, and then the two groups switch places.

4.14.2 Basic info

Methodology name: Fishbowl

Also known as: Inner-outer circle

Derived from: -

Author of the methodology: N/A

4.14.3 Explanation

The Fishbowl method. is a cooperative learning structure for small group discussions and explicitly teaches a variety of social skills. The idea is that a small group (ideally 3 to 6 people) discuss while the rest of the participants sit around and observe without interrupting. Facilitation focuses on the main group discussion. Fewer people = easier to facilitate.

4.14.4 How to demonstrate it

Example instructions for international relations teachers:

1. Present students with the question/problem. For example: "How has the Russia-Ukraine affected economy, health and immigration aspects in the EU?
2. Create groups of 3-6 students. Place the group members, one by one, on chairs forming a circle.
3. Position chairs as an outer circle from where the rest of the classmates will listen and take notes.
4. Encourage the participation of all students by allowing groups to rotate once a topic has been discussed.
5. Make sure that only the students in the inner circle speak, while others must be quiet and take notes.

6. Leave some time for reflection. After all of the students rotate and the Fishbowl discussion is finished, ask students how they think the discussion went and what they've learned.
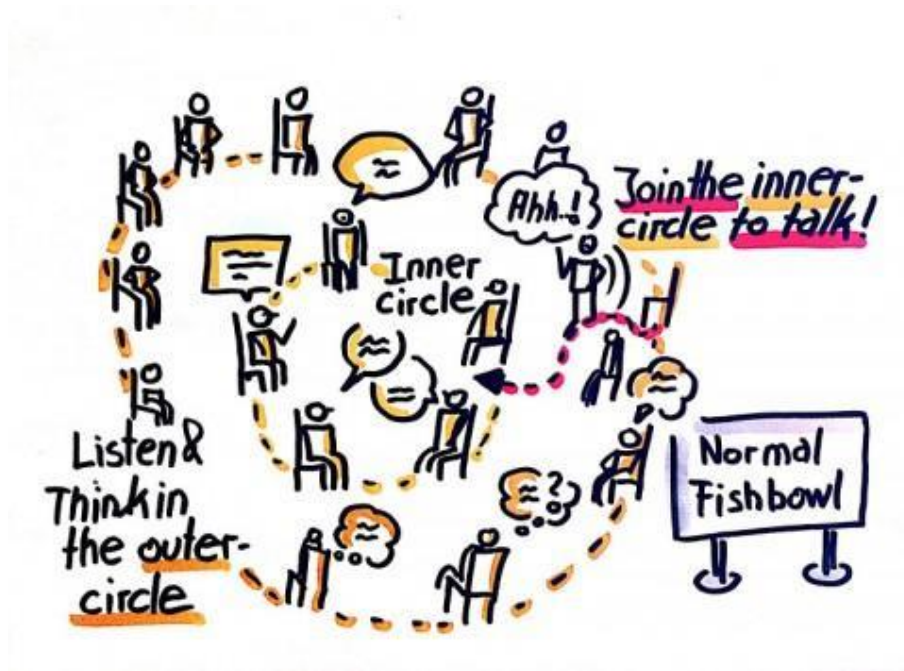
Figure 13: Fishbowl Groups

4.14.5 *More info and sources*

- https://www.facinghistory.org/resource-library/fishbowlb
- https://www.edutopia.org/pdfs/coop_math_bowman/bowman_fishbowl_metho.pdf
- https://www.betterevaluation.org/methods-approaches/methods/fishbowl-technique
- Picture source: https://mspguide.org/2022/03/18/fish-bowl/

4.15 Gestalt pedagogy

4.15.1 Summary

Gestalt pedagogy represents a holistic experience and expression of oneself through drawing, movement, dance, touch, smell, music, design, and guided meditation. It emerged in the mid-70s primarily because certain educators felt it was a shame to use Gestalt therapy only for healing and not for personal development.

4.15.2 Basic info

Methodology name: Gestalt pedagogy

Also known as: -

Derived from: Gestalt psychology, gestalt therapy

Author of the methodology: Fritz&Laura Perls (gestalt therapy)

4.15.3 Explanation

The purpose of the group session for trainers is to facilitate their reconnection with their core values and visions before they can teach others.

"Gestalt pedagogy is considered one of the most integrative pedagogical approaches and its fundamental 'method' is the use of creative media, from drawing and sculpting to working with body and voice. It builds on the legacy of humanistic psychology and is becoming an ever more significant factor in pedagogical-psychological work and consulting within formal and informal institutions for upbringing and education. As holistic pedagogics, it is compatible with integrative and inclusive pedagogics, and is based on life-long biographic and experiential learning."[6]

"Aspects of the continuing learning process in Gestalt pedagogy are:

- the experiential realization of one's personal learning history,
- a more complete biographical personal reflection to acknowledge and understand one's behaviour patterns,
- a consideration of the conditions involved in one's learning process
- the ability to understand and to communicate different ways of learning and emotional qualities."[7]

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[6] [from Gestalt pedagogy presentation journal](#)
[7] from GESTALTPÄDAGOGIK TRANSNATIONAL PROJEKT 71520 -CP-1-1999-1-AT-COMENIUS- C3.1 ZUR FÖRDERUNG DER LEHRERKOMPETENZEN UND DER LERNKULTUR IN EUROPA,

4.15.4 How to demonstrate it

1. Preparation for a group session, facilities and materials. We need:
   a. a quiet room
   b. chairs and/or something to lie on (for meditation)
   c. relaxing music
   d. paper
   e. crayons
   f. people :)
2. Initiation and the circle
   a. all participants (up to 20) sit in a circle
   b. avoid obstacles (e.g. tables) in front of chairs
3. Guided meditation/fantasy journey
   a. guide sets up the music player (e.g. CD player, mobile phone + BT speaker) and selects calm music.
   b. A guide starts the meditation/relaxation: a fantasy journey.
   c. Participants close their eyes and follow the meditation speech.
   d. "Think about your core values related to your profession."
   e. "Think about your visions – what is your endgame"
4. Drawing with crayons
   a. Draw a tree with crayons.
   b. It doesn't need to be perfect - we're not assessing your artistic skills.
   c. Put your visions in the branches
   d. Put your core values at the roots
5. Forming smaller groups
   a. Form groups of four to five.
   b. Facilitator: prepare circles with four to five seats.
   c. Attendees: Walk around the room.
   d. Sit in the group of chairs where you feel most comfortable.
   e. If the group is full, choose another group OR stand beside the circle. Wait.
   f. If you don't feel well in the group, stand up and walk around.
   g. Repeat until all people in all groups are seated.
   h. Rule: avoid joining a group with a (work) colleague or family member.
6. Small group process
   a. Form groups of four to five.
   b. Select a group guide/facilitator.
   c. Select the focus person (who will ask who wants to put their drawing in the centre first/next).
   d. Put the drawing in the centre of the circle.
   e. The guide asks the group members (the author is quiet):
      i. What do you see in the picture? (group members reply, e.g. "green colour", "dark branch" or similar.

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http://www.gestaltpaedagogik-europa.net/english/hintergrund.html

           ii. What surprises you about the picture? (e.g. "…there are so many dark tones…")

           iii. Which part of the picture makes you feel good? Bad? Touch the spot on the drawing.

           iv. What do you hear/smell/feel? Where do you feel it in your body?

           v. Title the picture (e.g. "The title of the picture is Hope.")

    f. The guide asks the author (the author answers):

           i. What did you want to express with the picture? (the story behind the roots and branches).

           ii. What would you change in the picture? (and then invites the author to update the drawing).

           iii. The guide invites the group members to express their best wishes to the author.

    g. The guide closes the session and thanks the participants.

7. Closing the session. When all the small groups have finished, have a short break (15 mins), then:

    a. All participants sit in a circle.

    b. Invite participants to put their drawings in the middle of the circle.

    c. The guide asks participants:

           i. "If you look back, what did you learn?"

    d. Attendees answer in no particular order.

    e. Silence is good. Don't rush it.

    f. Stand up:

           i. "Turn right, put your right hand on the right shoulder of the person next to you and your left hand on your left shoulder."

    g. Thank you and goodbye.

4.15.5 More info and sources

- http://www.teof.uni-lj.si/uploads/File/BolonjskiProgram/ENG/Predstavitveni_zbornik_ANGL_GEST_2016-2017.docx
- http://www.gestaltpaedagogik-europa.net/english/hintergrund.html
- https://www.grid.uns.ac.rs/symposium/download/2018/grid_18_p63.pdf
- Pictures source: https://freesvgillustration.com/

5 PAL-supporting (digital) tools

The following chapter presents a handful of digital tools which can be used by educators to facilitate peer-assisted learning. The collection is far from comprehensive and emerged from the direct or indirect experiences of project partners.

The following tools are presented: Social media peer groups (Mastodon), Peer networking groups (Meet breakout rooms), Chat apps for peer learning (Snapchat), Online peer reviewing (ComPAIR), Quizlet, Learning to code (Tynker), TimelineJS, Teachfloor/EdApp, Crowdsourced Q&A (Brainly), Edu 4.0, Google Classroom, Game-based learning (Kahoot) and Digital whiteboarding (Jamboard).

Each tool is presented with a short summary, basic information, the problem and the context, an example of real life usage, step-by-step instructions on how to use it, advantages and disadvantages, short description and additional information and sources.

5.1 Social media peer groups (Mastodon)

5.1.1 Summary

Case study: Learning niche skills from fellow experts - for example, how to automate your home.

5.1.2 Basic info

Tool name: Mastodon[8]

Related peer learning methodology: Networking Groups

Category: Social media

Target group: Expert (professional)

Age group: Adults

Context: Learning niche skills from fellow experts

Topic: IT / Automation / IoT /Learning how to automate home using open source tech.

Relation to in-class pedagogy: Networking Groups

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[8] https://en.wikipedia.org/wiki/Mastodon_(social_network)

Link to EQF level[9]: 9

Link with Bloom's taxonomy[10],

- knowledge domain: create
- emotion domain: valuing
- action domain: adaptation

5.1.3 The problem

Learning about the newest developments in the IT field is nearly impossible using traditional education institutions. For example, the home automation market is developing so fast, some of the wireless communication standards for IoT home devices e. g. Matter) are already released before the devices hit the market. Moreover, the documentation for HA systems is often old and deprecated.

If you are a home automation enthusiast and want to automate your home, where & how can you learn about these things? From peers, and enthusiasts, who are posting and discussing their real-life examples and problems, of course!

5.1.4 Objectives

The objective of the usage of Mastodon (or other social media groups) is to learn about the newest home automation developments and related open-source technologies. The ultimate goal is to make energy-efficient, independent (avoiding vendor lock-in) and livable homes with as few resources as possible.

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[9] https://europa.eu/europass/en/description-eight-eqf-levels
[10] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

5.1.5   Real-life usage - the story

Joannes is interested in **building his own smart home**, but he's not sure where to start. For example, he wants to trace the temperatures in all rooms, energy and water consumption and control the lights, everything via web/mobile app. He's heard about Mastodon and decides to create an account and start exploring the platform. He discovers a community of people who are also interested in home automation and joins the community.

Through the community, Joannes discovers that many other people are willing to share resources and offer help and support. Joannes starts using the hashtags #HomeAutomationDIY and #HomeAssistant to share links to tutorials and guides that he finds useful and starts asking questions to other members of the community (peers) using hashtags like #HomeAutomation.

He also starts following other users who are experts in the field of home automation, following their posts using the #HomeAutomationExperts hashtag.

As he continues to learn and grow, Joannes starts sharing his projects and setup using the #MySmartHome and #SmartHomeTour hashtags, starts getting positive feedback from other community members, and even receives some boosts to his post which expands the reach to more users.
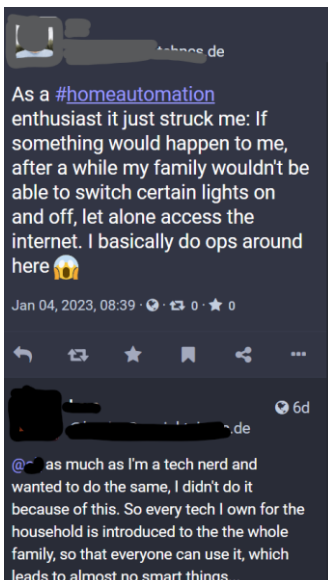
Over time, Joannes becomes more proficient in home automation, and he starts offering help to peers and support to other community members who are just starting, answering their questions and sharing his tips and tricks. He even creates his instance for the community, which attracts more enthusiasts in the field.

In this example, Mastodon's decentralized and federated structure, as well as its additional features such as instance creation, boosts and hashtags, allows Joannes to easily find and connect with a community of like-minded people who are also interested in home automation, and to share resources and offer help and support to one another as they learn.
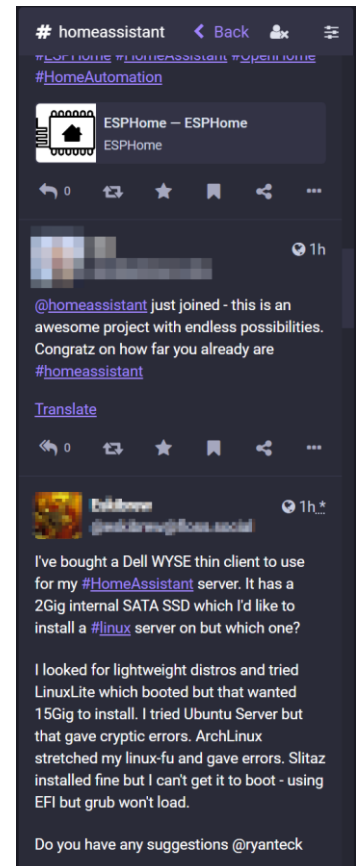
5.1.6   A step-by-step scenario of using hashtags

1. Search for the Mastodon server of your interest[11]
2. Join Mastodon, and create an account
3. Search for hashtag # of your interest (e. G. #homeassistant, #homeautomation)
4. Follow hashtag #
5. Publish the post using #
6. Involve yourself in the discussion (ask questions, comment posts)
7. Learn from interesting projects published by peers!

Using hashtags for peer learning on the topic of home automation can be a great way to connect with other users who are interested in the same topic and share resources, ask questions, and offer help and support. Here are a few ways to use hashtags specifically for the topic of home automation:

Creating a common hashtag: A group of users who are interested in home automation can create a common hashtag to use when posting content or starting conversations related to that topic. For example, a group of users interested in home automation could use the hashtag #HomeAutomation to make it easy for other users to find and join their conversations.

Sharing resources: Hashtags can also be used to share resources related to home automation. For example, users could use the hashtag #HomeAutomationDIY to share links to tutorials and guides for building their own smart home devices or #HomeAutomationProducts to share information about different smart home devices and systems available in the market

Asking questions: Users can use hashtags to ask questions related to specific aspects of home automation such as #HomeAutomationSecurity for questions related to securing the smart devices at home or #HomeAutomationIntegration for questions related to connecting different smart devices to work together.

Showcasing your own smart home: You can also use hashtags to showcase your smart home projects or setup using hashtags like #MySmartHome or #SmartHomeTour

By using hashtags in these ways, users can easily find and connect with other home automation enthusiasts, share resources and information about different smart home devices and systems, and offer help and support to one another. Using a specific hashtag for the topic of home automation can also make it easier for users to filter through the noise and only see content relevant to their interests.

What is unique to Mastodon about using hashtags in posts is that you can follow a hashtag too (not only a person). The result is that all posts on a specific topic (e. g. #smartthermostat) from peer experts are shown in your timeline.
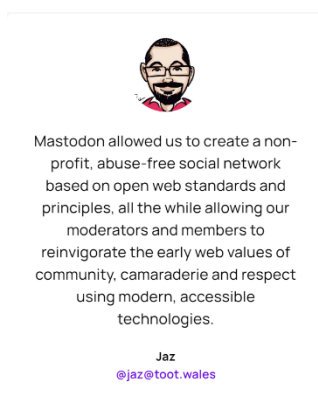
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[11] [there are over 20 000 different servers (May 2023)](#)

5.1.7   What is Mastodon[12]?

Mastodon is a free, open-source social media platform that is similar to Twitter, but it is built on a decentralized ActivityPub protocol. It is decentralized and federated, meaning that it is not controlled by a single company or organization.

This allows users to create their instances of the platform, which can then interact with one another in a decentralized network.

Great community, friendly atmosphere, and free software! What else would you possibly need?

autumncheney
@AutumnCheney@mastodon.social

One way that Mastodon can be used for peer learning is by creating a community of users who share a common interest or goal, such as learning a new language or skill. Within this community, users can share resources, ask questions, and offer help and support to one another as they learn.

Mastodon allowed us to create a non-profit, abuse-free social network based on open web standards and principles, all the while allowing our moderators and members to reinvigorate the early web values of community, camaraderie and respect using modern, accessible technologies.

Jaz
@jaz@toot.wales

For example, someone might create an instance of Mastodon specifically for learning French, and then invite others who are also interested in learning French to join the community. Within this community, users could share links to French-language resources such as websites and apps, ask questions about grammar or vocabulary, and offer help and support to one another as they learn.

Another feature of Mastodon that can be useful for peer learning is the ability to follow and interact with users across different instances. This means that even if a user is not part of a specific community, they can still connect with other users who are interested in the same topic, and thus expand their learning possibilities.

Additionally, Mastodon allows the use of hashtags, similar to Twitter, which makes it easy for users to find and participate in conversations around specific topics, which can be helpful to join a specific learning group.

Overall, Mastodon can be a useful tool for peer learning because it allows users to easily connect with others who share their interests and goals, and to share resources and offer support and feedback to one another as they learn.

5.1.8   Advantages and disadvantages

There are several **advantages** of using Mastodon for peer-assisted learning:

1. Decentralized and federated structure: Mastodon's decentralized and federated structure allows users to create their instances and communities, which can be a great way to connect with other users who are interested in the same topic.

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[12] https://joinmastodon.org

2. Targeted and specific communities: By creating specific instances or joining specific communities, users can more easily filter through the noise and only see content that is relevant to their interests. This can make it easier for users to find and connect with others who share their goals and interests.
3. Interaction across instances: Mastodon's ability to follow and interact with users across different instances allows users to connect with other users who are interested in the same topic, even if they are not part of a specific community, which expands the learning possibilities.
4. Boost feature: Mastodon also allows you to boost other user's posts, which is a way of re-sharing someone else post to your followers, this feature can make it easier for information to reach a wider audience, and this can be especially helpful for users who are looking for new resources or experts in a specific field.
5. Flexibility on moderation: Mastodon allows users to moderate their instances, this means that each community can set its own rules and norms, making it comfortable and safe for users to share and learn.
6. Open-source: Mastodon is open-source software, meaning that it is free to use, and the code is available for anyone to view, modify, and distribute. This can be beneficial because users can have more control over their data and privacy, and can also have the ability to adapt the platform to their specific needs.

In summary, Mastodon's decentralized and federated structure, as well as its additional features, such as instance creation, boost and open-source, allows users to easily find and connect with specific communities of people who are interested in the same topic, and to share resources and offer help and support to one another as they learn, which can lead to a more effective and efficient peer-assisted learning experience.

While Mastodon offers many advantages for peer-assisted learning, there are also some **potential disadvantages** to consider:

1. Limited user base: Mastodon is not as widely used as some other social media platforms, which means that it may be more difficult for users to find others who are interested in the same topic or subject.
2. Lack of discoverability: Without a centralized algorithm that promotes posts or accounts, it can be more difficult for users to discover new communities or individuals to follow. However, hashtags can be helpful in this aspect.
3. Steep learning curve: Mastodon has a different interface than other social media platforms and may take some time for new users to get familiarized with it, so it may not be the best choice for those who are not comfortable with technology.
4. Limited monetization options: As Mastodon is open-source and decentralized, there are limited options for monetizing the platform or the communities. This may make it less attractive to some creators or educators who use peer-assisted learning as a way to monetize their knowledge.
5. Requires self-motivation and self-direction: Peer-assisted learning relies on the participation and engagement of the users, in Mastodon, which may not be as easily enforced as in a traditional online course, which could be a challenge for some learners.
6. Less control over moderation: Mastodon allows users to moderate their instances, but that could mean that some communities could become echo chambers or harbour harmful content or individuals, which could be detrimental to the peer-assisted learning process.

Mastodon can be a great tool for peer-assisted learning but it's important to keep in mind that it may not be the best option for everyone. It may require more self-motivation, self-direction and effort from users to find relevant communities and individuals, but it can provide a lot of flexibility and freedom to create a learning environment tailored to the specific needs of the community.

5.2 Peer networking groups (Google Meet breakout rooms)

5.2.1 Summary

Case study: Learning business pitching from fellow entrepreneurs in small groups.

5.2.2 Basic info

Tool name: Google Meet Breakout rooms

Related peer learning methodology: Networking Groups

Category: Communication tools

Target group: Executive (management)

Age group: Adults

Context: Entrepreneurship education

Topic: Learning how to pitch your business from peers in virtual sessions

Relation to in-class pedagogy: This case study is targeted at adult learners. Nevertheless, this tool can be used in elementary (after 5th class, secondary or tertiary edu.)

Link to EQF level[13]: 9

Link with Bloom's taxonomy[14],

- knowledge domain: evaluate
- emotion domain: responding
- action domain: complex overt response

Relation to PAL pedagogy:

Several peer-assisted learning methodologies can be implemented using Google Meet breakout rooms.

Think-Pair-Share: Participants are given a prompt or question to consider and then break into pairs to discuss their ideas before reconvening as a larger group to share their findings.

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[13] https://europa.eu/europass/en/description-eight-eqf-levels
[14] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

Jigsaw: Participants are assigned to small groups and each person is responsible for researching and presenting a specific aspect of a larger topic. They then join new groups to teach their peers about their specific areas of expertise.

Round Robin: Participants take turns leading a discussion on a specific topic or question, with each person building on the ideas of the previous speaker.

Debate: Participants are split into teams to argue for or against a particular viewpoint.

Fishbowl: A small group of participants discuss while others observe and take notes. The observers then switch with the participants in the fishbowl.

5.2.3   The problem

One of the most prominent problems that video conferencing tools and breakout rooms solve (in adult learning and business environments) is the lack of flexibility and productivity due to geographical barriers. By allowing for remote participation and recording, video conferencing tools can provide flexibility for adult learners and business professionals, which can help make the learning or meeting accessible for those who are not able to attend live sessions. This can increase the productivity and effectiveness of team members, regardless of their location, which can save time and money by reducing the need for travel. Google Meet and Zoom provide breakout room functionality.

Moreover, video lectures can quickly become boring and inefficient if we don't include interactivity and communication between attendees.

5.2.4   Objectives

Using Google Meet breakout rooms we want to improve the motivation to attend online learning sessions. We want to show that even virtual presence in video sessions can be used for peer-assisted learning.

5.2.5   Context

Case of BICERO, adult learning provider: As adult learning providers, we often use video conferencing tools to perform training sessions. If an online lecture is performed in the traditional style of 'ex-cathedra', the knowledge transfer is questionable. Especially adults who want to advance in their field are more interested in exchanging experiences, networking and real-life cases. As we often organize such sessions for entrepreneurs, we use guided break-out rooms so participants can exchange their experiences and get to know each other better.

We usually use Google Meet or Zoom. Any video conferencing tool with breakout rooms functionality is appropriate for PAL.

5.2.6   Real-life usage - the story

Joannes started his own business a year ago. He works a lot and delivers his services to his customers. He struggles with acquiring new customers. He knows that using referrals is one of the best ways to make new customers. He wanted to learn about marketing and sales approaches from other entrepreneurs, but he doesn't have time for training courses and travel. He also hates ex-cathedra lectures and loves interactive and involved learning.

Then he founds out about the online entrepreneurship group, which meets every week on Friday morning on Google Meet. He joins it and discovers they are using smaller breakout rooms (3-4 people).

They are practising 30-second pitch presentations in these breakout rooms. One entrepreneur starts and the other three are listening and providing feedback. Observers respond with: "I was convinced/not convinced". Then the roles rotate.

At first, he was observing and listening to others. At the same time, he was preparing his pitch in his mind.

After several rounds of unconvincing pitches, he managed to polish and present a better pitch.

He learned from his peers that firstly he should address the pain point his service is solving. Then, he must address a target group. Lastly, he should present the advantages for the customers.

Every time the moderator closed breakout rooms, the best pitch was presented in a larger setting.

After several meetings, his pitch was chosen as the best pitch and he could present it to the whole group of entrepreneurs.
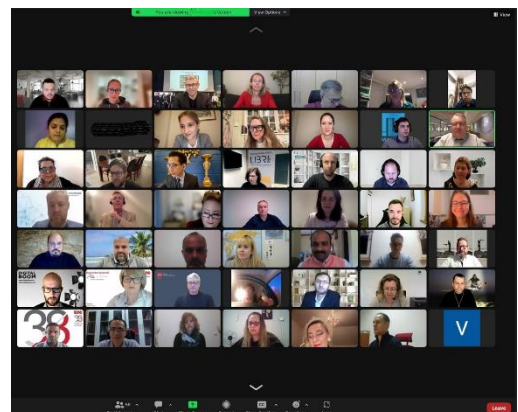
He found out that smaller breakout rooms in the virtual meetings are a great approach to learning from peers.

5.2.7   A step-by-step scenario of using hashtags

(short instructions for teachers/educators)

1. Announce the video meeting session - send an invitation link and short agenda. Don't forget to tell participants about their active participation.
2. At a specified date, start a Google Meet session: Go to https://meet.google.com and start a new meeting or use a calendar invite to join an existing meeting. Optionally: start recording the session. Each breakout room will be recorded in a separate video.
3. Enable breakout rooms: During the meeting, click on the three dots in the bottom right corner of the screen and select "Breakout rooms". Then, click "Create rooms".
4. Assign participants to rooms: You can either manually assign participants to rooms or allow Google Meet to randomly assign them. You can also assign a moderator for each room. Also, set a timer.
5. Give instructions: Before starting the breakout session, give instructions to participants on what they should do during the breakout session (e. g. Each participant has 30 seconds to pitch their business idea).
6. Start the breakout session: Click "Start breakout session" to begin the breakout session. Participants will be moved to their assigned rooms.
7. Monitor and switch between rooms: You can monitor and switch between rooms by clicking on the "Switch room" button. You can also rejoin the main room by clicking "End breakout session".
8. Reconvene: After the breakout session, reconvene the group in the main room, and give time for participants to share what they have discussed or learned during the breakout session.
9. End the meeting: Click "End meeting" when you are finished.
10. After the meeting, send the recording to the participants.
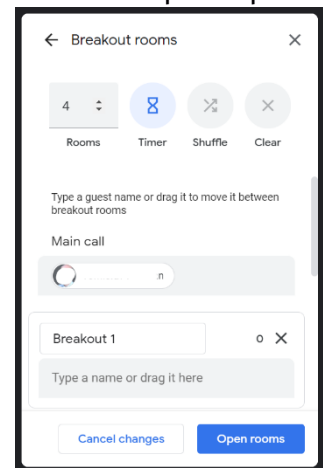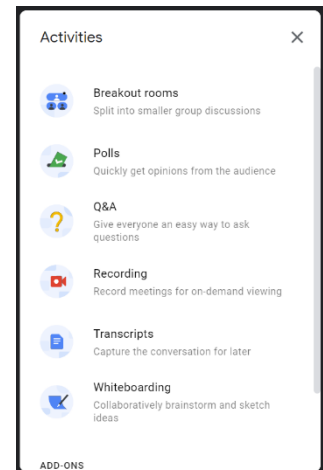
5.2.8   What is Google Meet

Google Meet breakout rooms are a feature of the Google Meet video conferencing tool that allows users to split into smaller groups for group discussions or activities. This feature is particularly useful for facilitating peer-to-peer learning and collaboration in an online setting. Teachers or facilitators can assign participants to rooms, either manually or randomly, and can also assign a moderator for each room. This allows for different learning styles and different needs, interests or levels of understanding. During the breakout session, the facilitator can monitor and switch between rooms, and after the session, the group can reconvene in the main room to share what they have discussed or learned. Furthermore, Google Meet breakout rooms can be used to facilitate collaboration and teamwork and to improve access to education by reducing the need for travel. It is available for business and enterprise users.

Google Meet breakout rooms are available for business and enterprise users, and you can also assign different rooms to different subjects, or levels of understanding, depending on the goals of the session.

The equipment needed to use Google Meet breakout rooms is relatively minimal. All you need is:

- A device with internet access: This can be a computer, laptop, tablet, or smartphone.
- A web camera: This is necessary for video conferencing. Most laptops and tablets come with built-in web cameras, but if you are using a desktop computer, you will need to purchase an external webcam.
- A microphone: This is necessary for audio conferencing. Most laptops and tablets come with built-in microphones, but if you are using a desktop computer, you will need to purchase an external microphone.
- Speakers or headphones: This is necessary to hear the audio during the meeting.
- Reliable internet connection: A stable internet connection is essential for a smooth video conferencing experience. A minimum of 1 Mbps upload and download speed is recommended for a smooth experience.
- Google Meet account: You will need to have a Google Meet account to use the breakout rooms feature.

5.2.9 Advantages and disadvantages

Advantages

1. Facilitating small group discussions: By splitting a large group into smaller breakout rooms, participants can have more focused and meaningful conversations without the distractions of a larger group. This can increase engagement, participation and understanding.
2. Encouraging participation: Breaking participants into smaller groups can make it easier for quieter or less confident students to contribute their ideas and share their knowledge. This can increase the number of perspectives and ideas in the discussion.
3. Supporting collaboration and teamwork: Breakout rooms can support collaboration and teamwork, by allowing participants to work together in small groups, even when they are not in the same physical location. This can foster a sense of community and can improve the quality of the discussion by allowing for different perspectives and ideas.

Disadvantages

1. Technical difficulties: As with any technology-based solution, there is a risk of technical difficulties, such as poor internet connection, audio/video issues, and difficulties using the breakout room feature. These can disrupt the flow of learning and can cause frustration among participants.
2. Limited interaction with the facilitator: During the breakout session, participants are in smaller groups, which means that the facilitator's interaction with each group is limited. This can make it more challenging for the facilitator to monitor the progress and understanding of each group.
3. Limited control over group composition: When the facilitator randomly assigns participants to groups, there is a risk that groups may not be well balanced in terms of skill level, background knowledge, or other relevant factors. This can lead to uneven participation and learning outcomes.

These disadvantages can be mitigated by preparing for the session, providing participants with clear instructions and troubleshooting tips, and monitoring the breakout sessions closely.

5.2.10 Additional information

- Use breakout rooms in Google Meet, https://support.google.com/meet/answer/13054147?product_name=UnuFlow&hl=en&visit_id=638094743700448412-1170865210&rd=2&src=supportwidget0&hl=en
- How to Use Google Meet Breakout Rooms for Jigsaw Activities, https://www.teq.com/google-meet-breakout-rooms-jigsaw-activities/
- How to do a fishbowl activity in the virtual space? https://www.barbaracv.com/blog/a-virtual-fishbowl/

5.3   Chat apps for peer learning (Snapchat)

5.3.1   Summary

Case study: Exchanging the study content between students, teaching assistants and professors in a lab setting.

5.3.2   Basic info

Tool name: Snapchat

Related peer learning methodology: Self-Help Groups (Support Groups)

Category: Communication tools

Target group: Students

Age group: Students

Context: Laboratory experiments

Topic: Learning about how to make laboratory experiments from short videos from peers

Relation to in-class pedagogy: This case study is targeted at students.

Link to EQF level[15]: 9

Link with Bloom's taxonomy[16]:

- knowledge domain: understand,
- emotion domain: receiving,
- action domain: guided response.

Relation to PAL pedagogy:

Peer Feedback: Students can use Snapchat to share their work with their peers and receive feedback and suggestions for improvement.

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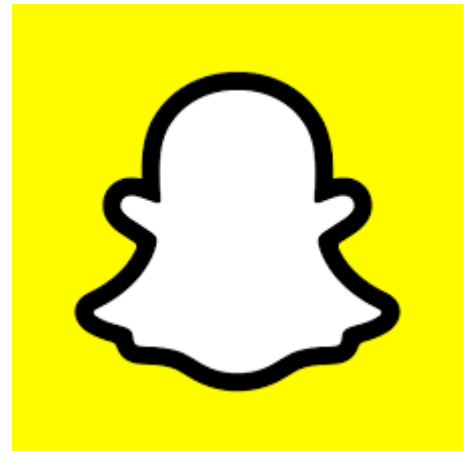
[15] https://europa.eu/europass/en/description-eight-eqf-levels
[16] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

Collaborative Learning: Snapchat can be used to facilitate collaborative learning between students. For example, students can use the app to create and share videos, images, or text to complete a group project or assignment.

Study Groups: Students can form study groups on Snapchat, where they can share notes, ask questions, and provide support to each other.

Class Discussions: Teachers can use Snapchat to facilitate class discussions by creating a group for their class and encouraging students to share their thoughts and ideas on a particular topic or question.

Jigsaw: Jigsaw is a learning strategy where students are divided into small groups, each group focuses on a specific topic or task and then shares their knowledge with the class. Using Snapchat, students can share their findings with the group members and can also share their knowledge with the other groups.

Think-Pair-Share: This method can be adapted to be done online, with students sharing their answers or thoughts on the topic with a partner or small group through Snapchat before sharing with the class.

5.3.3   The problem

One example of a problem that Snapchat can solve concerning peer-assisted learning is the lack of opportunities for students to collaborate and work together outside of the classroom. Traditional classroom settings may not provide enough time for students to work together on projects or assignments, or for students to provide feedback to each other. This can limit the effectiveness of peer-to-peer learning. By using Snapchat, students can easily share resources and work together on projects and assignments, regardless of their physical location or time constraints. This can provide students with more opportunities to collaborate and learn from each other, increasing student engagement and motivation, and ultimately, the effectiveness of peer-assisted learning.

5.3.4   Objectives

Using Snapchat we want to provide more opportunities to collaborate and learn from each other, as well as to support the communication and engagement among students, teachers and the learning material.

5.3.5   Context

Many students nowadays have a short attention span. Teachers at the National University of Singapore addressed this problem by using Snapchat in laboratory classes (chemistry)[17]. On occasions when the lecturer demonstrated the use of lab instruments, a teaching assistant recorded the snaps. Students could view the stories during the laboratory session, as well as after their sessions.

5.3.6   Real-life usage - the story

A group of students attended a laboratory class at a university in Singapore[18] (Lim et al., 2017). The class was led by a professor and a team of teaching assistants. The students were excited to learn about the latest scientific techniques and technologies in the lab, but they found it difficult to keep up with the fast-paced class and often felt lost during the experiments.

One day, one of the teaching assistants suggested using Snapchat to connect with the students outside of class. The students were hesitant at first but soon found that using the app to communicate with their classmates and TAs made a huge difference in their understanding of the material.
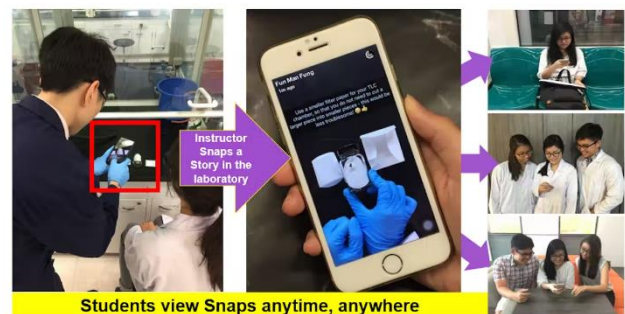
The TAs used Snapchat to share pictures and videos of the experiments they were conducting in class, giving the students a better understanding of the procedures and techniques. They also used the app to create group chats where students could ask questions and share their observations, which helped to create a more collaborative learning environment.

The students also used Snapchat to form study groups, where they could share notes and provide support to each other. The TAs also used the app to give feedback on the students' lab reports, which helped them to improve their writing and analytical skills.

5.3.7   A step-by-step scenario of using hashtags

(short instructions for teachers/educators)

1.   Download the app: https://www.snapchat.com/

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[17]   https://theconversation.com/how-to-use-snapchat-in-the-laboratory-for-better-student-engagement-105146
[18]   Image: How   to   use   Snapchat   in   laboratory   education.   Fun   Man   FUNG, https://theconversation.com/how-to-use-snapchat-in-the-laboratory-for-better-student-engagement-105146 (Fung, 2018)

2. Setting up a class group on Snapchat[19]: The teacher or TA creates a class group on Snapchat and invites all the students to join. This will be the main platform for communication and collaboration between the students and the TAs.

3. Sharing pictures and videos of experiments: The TAs can use Snapchat to share pictures and videos of the experiments they are conducting in class. This can help the students to better understand the procedures and techniques used in the laboratory.

4. Creating group chats: The TAs can create group chats on Snapchat where students can ask questions and share their observations. This can help to create a more collaborative learning environment and facilitate peer-to-peer learning.

5. Forming study groups: Students can form study groups on Snapchat, where they can share notes and provide support to each other. This can help to increase student engagement and motivation.

6. Giving feedback: The TAs can use Snapchat to give feedback on the students' lab reports. This can help the students to improve their writing and analytical skills and enhance their learning experience.

7. Collaborating on projects: Students can use Snapchat to collaborate on projects and assignments, share documents and images, and give feedback on each other's work.

8. Sharing announcements and reminders: The TAs can use Snapchat to share announcements, class schedules, and reminders about upcoming deadlines and lab sessions.

9. Using polls, quizzes, and surveys: The TAs can create polls, quizzes, and surveys on Snapchat to gauge student understanding and engagement.
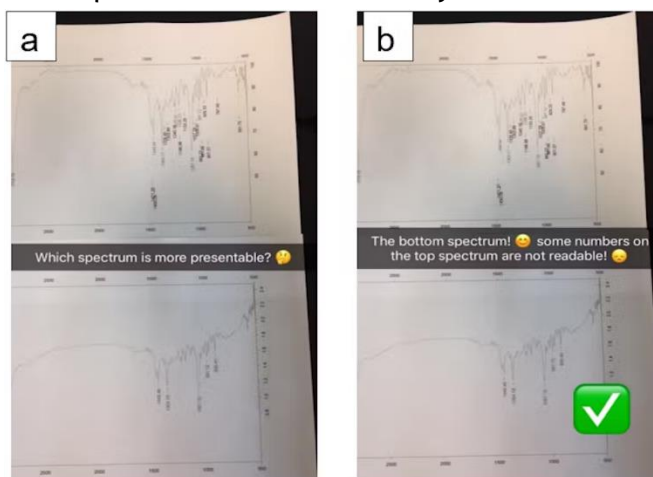
5.3.8 What is Snapchat

Snapchat is a multimedia messaging app that allows users to send and receive photos, videos, and text messages, as well as make voice and video calls. It is known for its unique features such as "snap stories" which allow users to share images and videos that disappear after 24 hours, and "filters" which are special effects that can be applied to photos and videos. The app also includes features such as chat, group chat, and a "Discover" section for viewing content from publishers and media companies. It is widely used by teenagers and young adults.

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[19] Figure 1. Flowchart of the steps taken to upload a Snapchat story. Fun Man FUNG, https://theconversation.com/how-to-use-snapchat-in-the-laboratory-for-better-student-engagement-105146

5.3.9 Advantages and disadvantages

Advantages

1. Snapchat allows for real-time communication and collaboration between students and teachers, which can increase student engagement and motivation.
2. Snapchat can be used from anywhere and at any time, making it a great tool for remote learning and for students who have limited access to traditional classroom settings.
3. The app's features such as "snap stories" and "filters" can also create an informal and less intimidating environment for students to share their ideas and thoughts.

Disadvantages

1. **Privacy concerns:** As with any social media app, there are concerns about privacy and the security of personal information. It's important to set guidelines and boundaries for appropriate usage and ensure that the student's safety and privacy are protected.
2. **Technical requirements:** Not all students may have access to smartphones or a good internet connection, which could create barriers to participation in peer-assisted learning activities on Snapchat.
3. **Age restrictions:** Snapchat has an age restriction of 13, which means that students under this age may not be able to participate in peer-assisted learning activities using this app, and it may not be suitable for all grade levels.
4. **Distraction:** The app's features such as "snap stories" and "filters" can be a source of distraction for students, the teachers need to set clear guidelines on the appropriate usage of the app during class time.
5. **Non-acceptance:** nevertheless, some teachers are reluctant to use it in a classroom setting (Rothwell, 2020).

5.3.10 Additional information

- Fung, F. M. (2018). How to use Snapchat in the laboratory for better student engagement. The Conversation. http://theconversation.com/how-to-use-snapchat-in-the-laboratory-for-better-student-engagement-105146
- Lim, R. R. X., Ang, A. S., & Fung, F. M. (2017). Application of Social Media in Chemistry Education: Incorporating Instagram and Snapchat in Laboratory Teaching. In Teaching and the Internet: The Application of Web Apps, Networking, and Online Tech for Chemistry Education (Vol. 1270, pp. 37–53). American Chemical Society. https://doi.org/10.1021/bk-2017-1270.ch003
- Rothwell, G. (2020). Perceptions of Snapchat as an Asynchronous Educational Discussion Platform. 24–34.

5.4   Online peer reviewing (ComPAIR)

5.4.1   *Summary*

Online peer reviewing based on Adaptive Comparative Judgement.

5.4.2   *Basic info*

Tool name: ComPAIR

Related peer learning methodology: Study Groups

Category: LMS

Target group: Students

Age group: Secondary

Context: Peer Evaluation and Review

Topic: Cross-disciplinary peer answer comparison tool

Relation to in-class pedagogy: Adaptive Comparative Judgement (ACJ) is a modification of Thurstone's method of comparative judgement that exploits the power of adaptivity, but in scoring rather than testing. This makes it an accessible form of peer assessment. ACJ is appropriate for performances like writing or art, and for complex portfolios or reports, but may be useful in other contexts too. The model provides strong statistical control to ensure quality assessment for individual students.

- Potter, Tiffany, Letitia Englund, James Charbonneau, Mark Thomson MacLean, Jonathan Newell, & Ido Roll. "ComPAIR: A New Online Tool Using Adaptive Comparative Judgement to Support Learning with Peer Feedback." Teaching & Learning Inquiry, vol. 5, no. 2, 2017, p. 89., doi:10.20343/teachlearninqu.5.2.8.

5.4.3   *The problem*

Student-centred learning can be challenging to achieve in large classes and/or online educational processes, especially when it comes to nuanced, subjective critical processes like literary analysis, illustrating math concepts, and answering complicated, open-ended physics questions.

5.4.4   *Objectives*

One common approach to facilitating active learning in large classrooms is using peer feedback. The compare tool is employed to save teachers time and improve students' understanding of

course materials as well as improve their metacognitive skills. 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 work.

5.4.5 Context

My social studies teacher used similar approaches during class, so my classmates and I would check each other's homework. However, at that time there were no tools like ComPAIR.

5.4.6 Real-life usage - the story

<Jaclyn Stewart from the University of British Columbia (UBC) set up a "choice project" in her Organic Chemistry class. Her students worked with ComPAIR, an open-source tool developed by UBC that is free to use. The project encouraged students to connect course content to their lives and allowed them to choose their presentation format.

Quickly, Stewart realized it was not sustainable to grade 150 such elaborate projects. It also didn't make sense to her that she was the only person to see these projects. She decided to integrate peer assessment through ComPAIR, based on adaptive comparative judgment.>

Figure 14: CompAIR example

5.4.7 A step-by-step scenario of using hashtags

(short instructions for teachers/educators)

1. Create

Students read the assignment instructions and submit their responses using the built-in text editor box.

2. Assess

Students compare and evaluate two of their classmates' answers randomly assigned to them by referring to the rubric/criteria posted by the instructor.

3. Review/ Reflect

Students review, reflect, and learn from the peer feedback they received.

4. Evaluate (View Grades)

Instructors can view and evaluate class performance.

Example 1: An instructor is using ComPAIR to evaluate artwork and give peer feedback to four colleagues to help improve their projects. The students answer three specific questions for each student pair, choosing the better of the pair for each question, and giving generous and thoughtful constructive feedback to each student. The students are then graded based on their feedback, ranking, and self-critiquing.

Example 2: An instructor is using ComPAIR to assess her students' understanding of class readings. Students write a short paragraph response to a question about the latest reading, and then they receive three pairs of their peers' responses to evaluate based on the criteria posted by the instructor. After this evaluation phase is complete, students then receive feedback from their peers. Revising their paragraph afterwards is optional.

5.4.8 What is ComPAIR

ComPAIR is an open-source online peer review tool that allows students to formulate answers to questions and then compare and assess pairs of their peers' answers based on criteria provided by the instructor. It was developed as a collaborative project between developers at the Center for Teaching and Learning Technology and several faculty members, including Tiffany Potter (English), James Charbonneau (Physics) and Mark MacLean (Math), among others. Students write feedback for each answer as they compare, and then have the option of using the feedback provided to them to reflect on their work.

5.4.9 Additional information

- Link to the online tool: https://ubc.github.io/compair/

5.5 Quizlet

5.5.1 Summary

Platform for teacher-student online learning crowded with flashcards and study materials.

5.5.2 Basic info

Tool name: Quizlet

Related peer learning methodology: Study Groups

Category: LMS

Target group: Students

Age group: Secondary

Context: Flash-cards for memorising

Topic: Cross-disciplinary tool

Relation to in-class pedagogy: Various studies show that students who check themselves with flashcards learn the material more effectively compared to rereading their notes. Cards are a standard digital flashcard method where you cycle through your study set and try to memorize the information. Quizlet is a powerful study aid, one that works well in a variety of settings from traditional schooling to online learning.

5.5.3 The problem

Students may have trouble remembering new vocabulary or facts and figures in class. Students may also incompletely take notes during class, so their preparation for exams will not be successful.

5.5.4 Objectives

Quizlet can support peer learning in the class through individual sets of cards created by students for their classmates on each topic covered or to be learned.

5.5.5 Context

Quizlet is popular among primary and secondary school students and is also well known among university students, medical students, law students, and adult learners who need to memorize information—including those studying for standardized tests and trade exams.

Teachers also can use Quizlet to make study sets for their students. Instructors can upload and organize information that they want their students to master. Then they can invite their classes to access the study sets they have created.

5.5.6 Real-life usage - the story

Quizlet has even been used in private industry. For example, it has been used to train grocery store cashiers and for onboarding new employees at a software company[20].
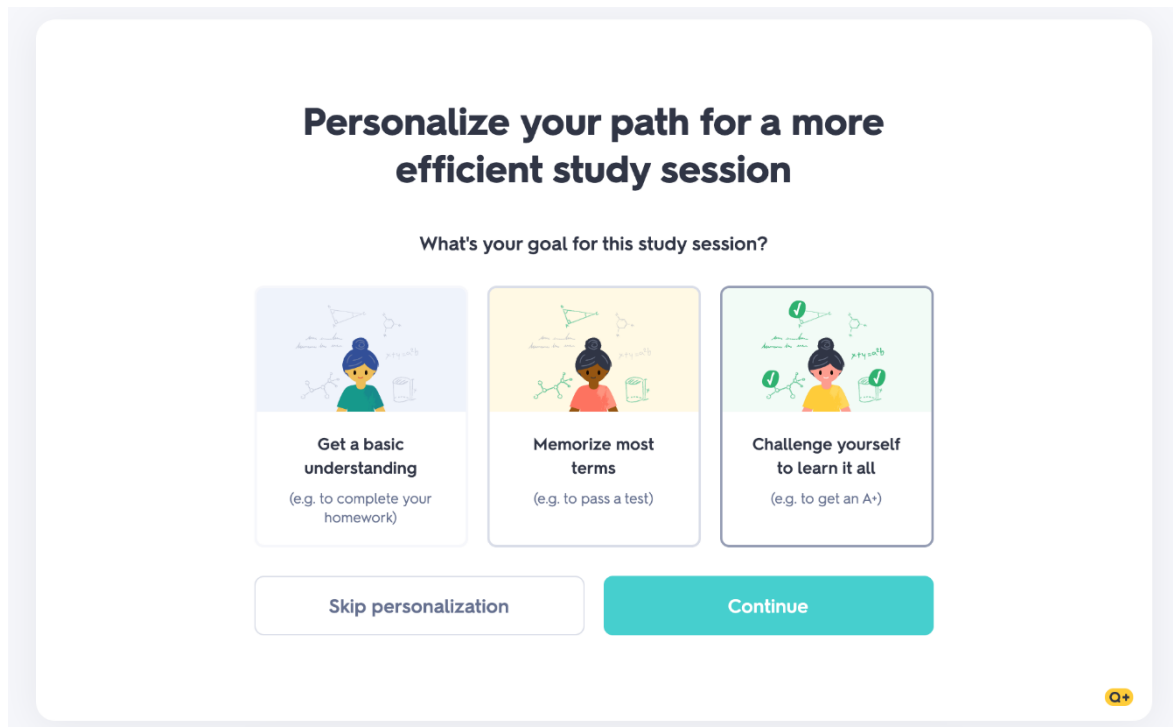
Figure 15: Quizlet screenshot

5.5.7 A step-by-step scenario of using hashtags

(short instructions for teachers/educators)

1. Go to www.Quizlet.com
2. To browse user-generated study sets, click search, and type in a topic.
3. To create your own study set, sign-up for an account by clicking "Sign Up."
4. Click "Create" to make your first study set.

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[20] https://www.getapp.com/education-childcare-software/a/quizlet/reviews/

5.5.8   What is Quizlet

Quizlet is a study aid in app form. In essence, it's a flashcard app with smart features, and it can handle images, diagrams, various languages, and even audio uploads. It's ideal for self-paced, rote-style learning.

5.5.9   Advantages and disadvantages

Advantages

1. Flexible mobile and website use
2. There is some room for gamification
3. Flexible mobile and website use
4. Promotes collaborative learning with other users, so they can make, share, and find study sets from other users
5. Allows students to be responsible for content curation.

Disadvantages

1. User-created content may contain errors or intentionally misleading information, or be problematic in other ways.
2. Many technological features are restricted to Plus members.

5.5.10 Additional information

- www.Quizlet.com
- https://www.getapp.com/education-childcare-software/a/quizlet/reviews/

5.6 Learning to code (Tynker)

5.6.1 Summary

The platform for kids to learn to code.

5.6.2 Basic info

Tool name: Tynker

Related peer learning methodology: Study Groups

Category: LMS

Target group: Students

Age group: Primary

Context: Platform for kids to learn to code

Topic: Coding

Relation to in-class pedagogy: When kids teach and learn from each other – like by using Tynker – they "have the chance to experience and learn that 'teaching is the best teacher.'" Tynker users know the perks of coding and the excitement that comes with making something of their very own; kids who code cite benefits like expanded creativity, a greater sense of perseverance, focus, and more. By teaching and learning together, they gain all these skills and more – they stay engaged, form connections, and enhance their learning.

5.6.3 The problem

Coding is a discipline which requires a great level of focus, and also different students will learn the material according to their paths.

5.6.4 Objectives

Tynker is an online platform where through its self-paced online courses children can learn coding at home, as well as an engaging programming curriculum for schools and camps. Tynker can support peer-to-peer learning in the IT classroom, where fast learners can help slower learners.

5.6.5 Context

Very often, we have seen children being dependent on either elder siblings or someone else to learn to code but Tynker allows them to make something of their very own; be it correct at first or not. It helps them grow and learn more day by day. Also, kids who code cite benefits like

expanded creativity, a greater sense of perseverance, focus, etc. Hereby teaching and learning together, they gain all these skills and more – they stay engaged, form connections, and enhance their learning.

5.6.6   Real-life usage - the story

"Tynker is a great option for introducing K–12 students to computer science (CS) concepts, from basic block coding to AP computer science content. It's also great for non-CS classes with its cross-curricular options, as well as in after-school activities, coding camps, and Hour of Code pushes."[21]

Figure 16: Tynker example

5.6.7   A step-by-step scenario of using hashtags

1. Create new virtual classrooms
2. Import Students from CSV files to create student accounts
3. Manage students – change passwords, add and delete students
4. Assign lessons to a classroom
5. View projects that students have built
6. Publish a class showcase
7. Communicate with parents
8. Track the students' progress via dashboards

5.6.8   What is Tynker

Tynker is an online platform where through its self-paced online courses children can learn coding at home, as well as an engaging programming curriculum for schools and camps. Tynker

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https://www.commonsense.org/education/reviews/tynker#:~:text=Tynker%20is%20a%20great%20option,and%20Hour%20of%20Code%20pushes

is a great option for introducing K–12 students to computer science (CS) concepts, from basic block coding to AP computer science content. It's also great for non-CS classes with its cross-curricular options, as well as in after-school activities, coding camps, and Hour of Code pushes. There are several subscription options, depending on grade level.

5.6.9 Advantages and disadvantages

Advantages

- Varied content, customizable assignments, and integration with popular platforms (Minecraft, Lego WeDo) make coding fun and relatable.

Disadvantages

- Instructions are mainly text-based; lessons would reach more learners through a multimodal delivery and more extensive multilingual support.

5.6.10 Additional information

- https://www.tynker.com/

5.7   TimelineJS

5.7.1   Summary

This tool can be used as a way to register collective processes and the learning that derives from it. We used it within a Community of Practice, a Transnational Partnership, as well as a way to share the Participatory Process at the local level.

5.7.2   Basic info

Tool name: TimelineJS

Related peer learning methodology: Committees

Category: Socia media

Target group: Students

Age group: Secondary

Context: Open-source tool that enables anyone to build visually rich, interactive timelines. It works on any site or blog.

Topic: Storytelling and Collaboration

Link to EQF level[22]: 4

Link with Bloom's taxonomy[23],

- knowledge domain: understand
- emotion domain: organizing
- action domain: guided response

Relation to in-class (or PAL) pedagogy: Adaptive Comparative Judgement (ACJ) is a modification of Thurstone's method of comparative judgement that exploits the power of adaptivity, but in scoring rather than testing. This makes it an accessible form of peer assessment. ACJ is appropriate for performances like writing or art, and for complex portfolios or reports, but may be useful in other contexts too. The model provides strong statistical control to ensure quality assessment for individual students.

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[22] https://europa.eu/europass/en/description-eight-eqf-levels
[23] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

5.7.3   The problem

Collaboration and systematization of knowledge are learning are often big challenges in schools.

Combined with peer learning, storytelling is a powerful tool to empower people of all ages. Storytelling allows not only enhances self-esteem and values individual profiles and abilities, but bit it also has a learning-to-learn feature about it, that allows one to inscribe experiences and the learning that comes from it.

TimelineJS is a digital storytelling tool, which allows for collaboration, making it inherently a peer learning tool.

5.7.4   Objectives

To (collaboratively) systematize and share knowledge and/or experiences, generating and allowing for a better conscience of significant learning outcomes.

5.7.5   Context

This is a strong tool to use as a way to register collective processes and the learning that derives from them. We used it within a Community of Practice, a Transnational Partnership, as well as a way to share the Participatory Process at the local level.

5.7.6   Real-life usage - the story

Here below are three examples of the usage of the tool.

The first one, it was used as a way to facilitate the partnership process around a transnational research project.
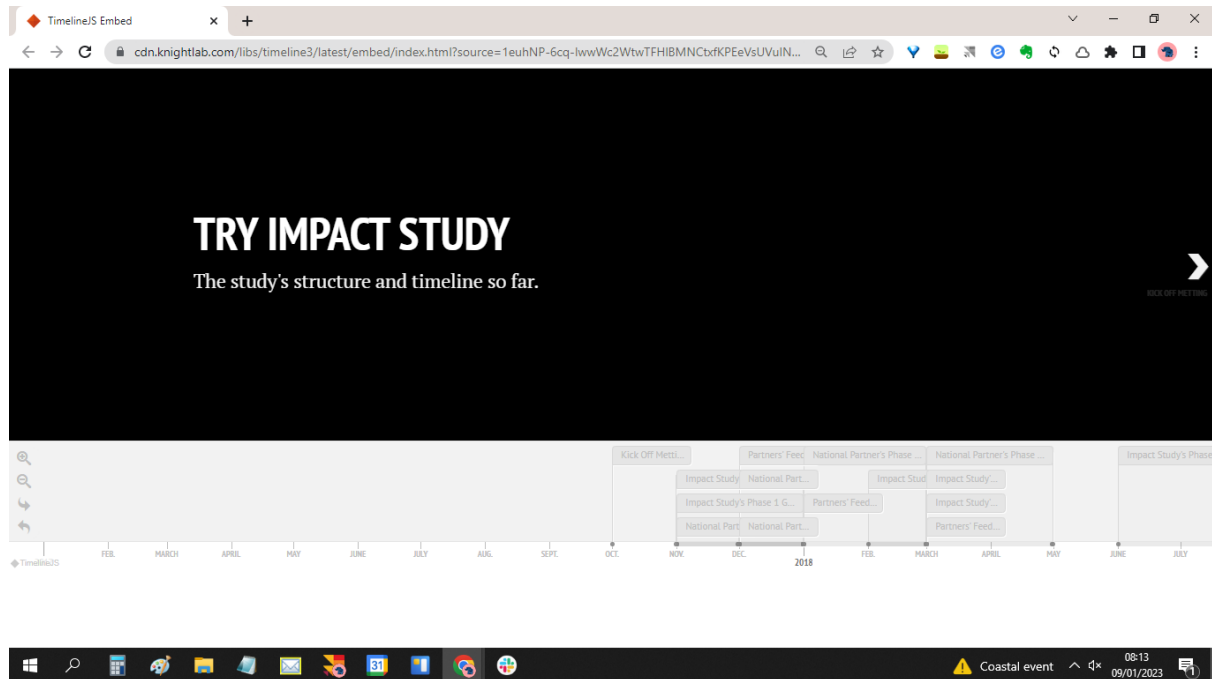
Figure 17: TimelineJS example
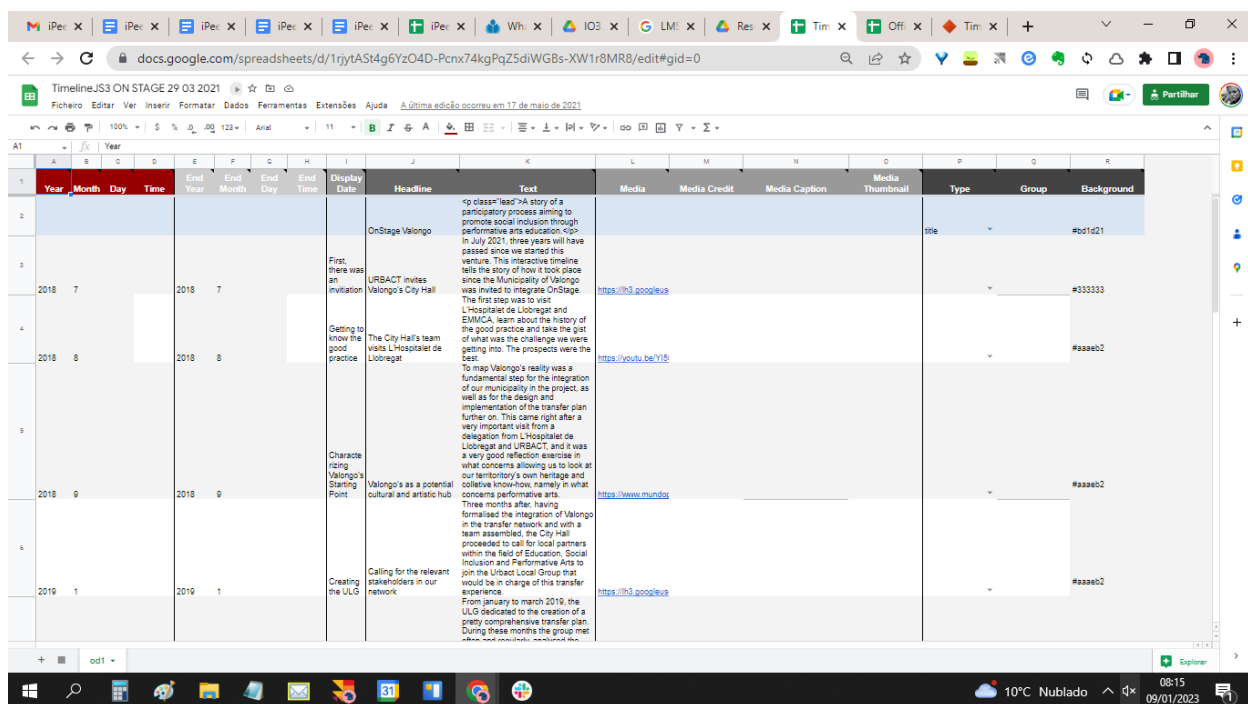
Figure 18: TimelineJS example

The second one, it was used as a way to register the participatory process that took place amongst local stakeholders around the transference of good practice.
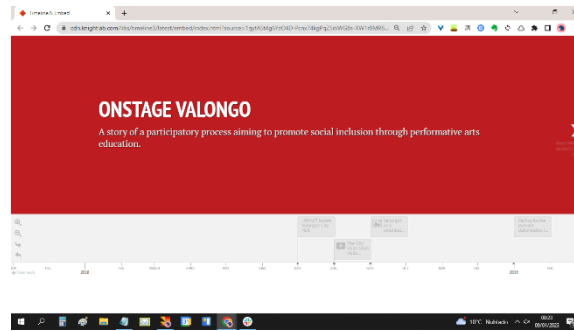
Figure 19: TimelineJS example
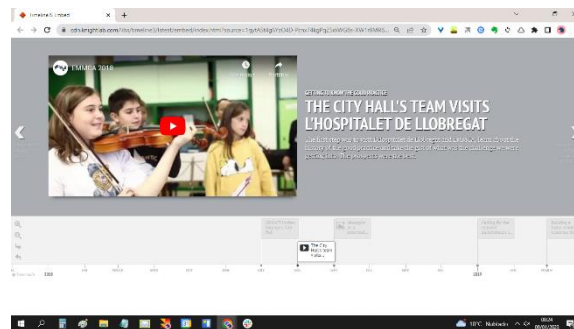
Figure 20: TimelineJS example

The third one was used to share the story of a long-term project (now 10 years) that involves a broad Community of Practice of researchers and practitioners in the field of Development Education.

Figure 21: TimelineJS example

5.7.7   A step-by-step scenario[24]

In the case of the educational context and peer learning in specific:

1. Define the purpose of using the tool.
2. Explore TimelineJS's gallery with the group.
3. Get the Spreadsheet Template and test how it works (following the 'Make a timeline' instructions until the preview part).
4. Make a copy of the template and start filling it in with the relevant data (this task includes gathering the media you want to use).
5. Customize the timeline (where you want to start, dimensions, colours, etc).
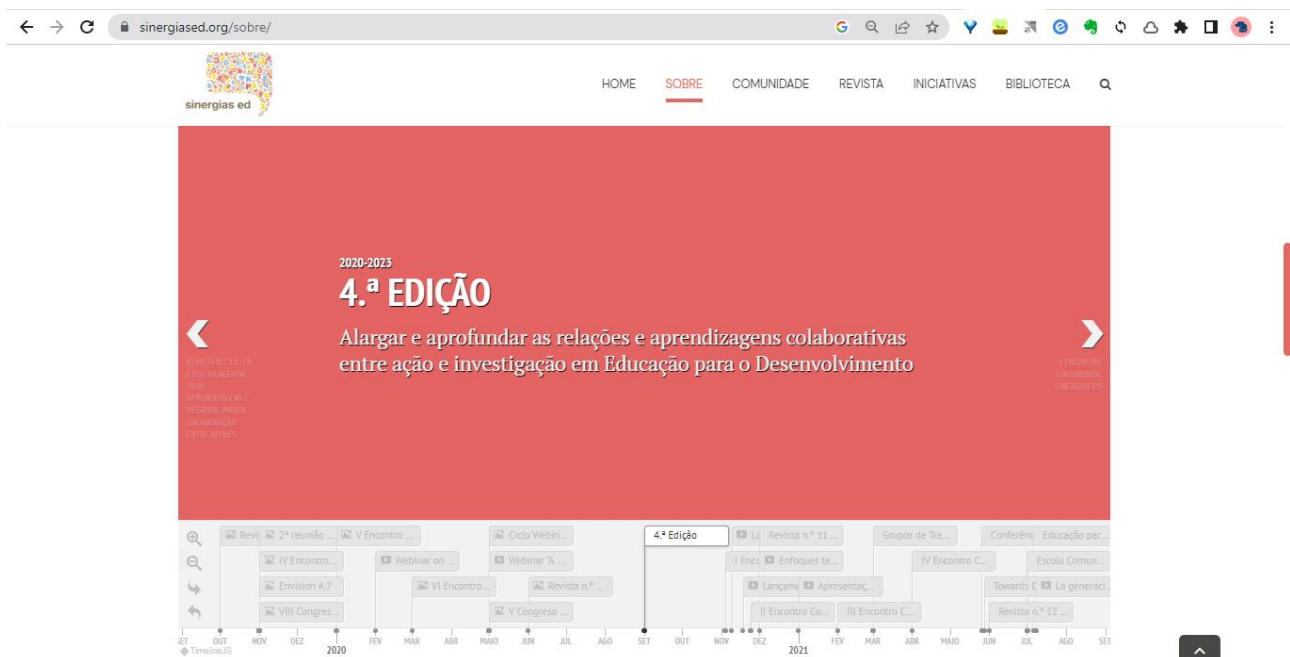6. Embed the timeline in your website, or blog or create a Google site to display it.

5.7.8   What is TimelineJS

Created by Northwestern University Knight Lab, TimelineJS is an open-source tool that enables anyone to build visually rich, interactive timelines. It works on any site or blog. As a platform, it allows users to integrate interactive, visually rich and multimodal digital items in a chronologically ordered way, including multimedia in the form of videos, images, and audio. Along with linked tweets, digital visualization assignments and resources can be added. It's easy for users to use and collaborate with peers to build and develop timelines that can do more than present a static linear progression of dates and names.

5.7.9   Advantages and disadvantages

Advantages

- it is open source

Disadvantages

- it implies some training and exploring to grasp its functioning

5.7.10 Additional information
- https://www.amicalnet.org/assets/files/najla-jarkas-timelinejs-2.pdf
- https://jitp.commons.gc.cuny.edu/classroom-timeline-projects/
- https://www.colorado.edu/assett/2016/01/20/using-timeline-js-self-directed-learning-adils-course
- https://www.youtube.com/watch?v=T8G0cHUkW-c
- Potter, Tiffany, Letitia Englund, James Charbonneau, Mark Thomson MacLean, Jonathan Newell, & Ido Roll. "ComPAIR: A New Online Tool Using Adaptive Comparative Judgement

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[24] https://vimeo.com/143407878

to Support Learning with Peer Feedback." Teaching & Learning Inquiry, vol. 5, no. 2, 2017, p. 89., doi:10.20343/teachlearninqu.5.2.8.

5.8 Teachfloor/EdApp

5.8.1 Summary

Teachfloor allows any course creators and trade schools to move online; creating and selling cohort-based courses.

5.8.2 Basic info

Tool name: Teachfloor allows any course creators and trade schools to move online; creating and selling cohort-based courses

Related peer learning methodology: Peer Coaching

Category: Communication tools

Target group: Students

Age group: Students

Context: Building a virtual school for educators and teachers

Topic: Course creation and interactive communication with students

Relation to specific class: 1. (tertiary)

Link to EQF level[25]: 4

Link with Bloom's taxonomy[26]

- knowledge domain: remember,
- emotion domain: receiving,
- action domain: perception.

5.8.3 The problem

During the pandemic vocational educators and more broadly educators had a host of challenges moving their content online. Moreover, there we do not have a large array of tools available to them to create interactive and dynamic ways to interact with their students.

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[25] https://europa.eu/europass/en/description-eight-eqf-levels
[26] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

5.8.4 Objectives

The objective of Teachfloor is exactly what the name suggests. To provide the floor, or framework needed for teachers to move their courses online and interactively deliver content to students of all age groups.

5.8.5 Context

You enter the website and you can set up an account. With this account set up, you can build your course step by step. An example is the coding boot camp you see below. What is also good about this resource is that you can add a calendar, activities and people whom you would like to add to your course.

5.8.6 Advantages and disadvantages

Advantages

1. Build your live online academy
2. Create and sell online live courses under your brand
3. Run virtual live classes and sync appointments with Zoom
4. Sync all of your classes with Zoom
5. Add your brand logo, upload images, or change the palette to reflect your style and mood
6. Send automated reminders via email before classes begin
7. Zoom Integration
8. Whatsapp Integration

Disadvantages

1. It's priced high.
2. The pricing structure is very unclear.
3. Unable to personalise emails or email addresses when communicating with students.

5.8.7 Additional information
- https://www.teachfloor.com/

5.9 Crowdsourced Q&A (Brainly)

5.9.1 Summary

Brainly is a crowdsourced questions and answers site for homework, with content covering 20 subjects.

5.9.2 Basic info

Tool name: Brainly

Related peer learning methodology: Self-Help Groups (Support Groups)

Category: Communication tools

Target group: Students

Age group: Students

Context: Poor understanding of class topics

Topic: Any

Relation to specific class: These tools can be used for all subject fields

Link to EQF level[27]: 1

Link with Bloom's taxonomy[28]

- knowledge domain: understand,
- emotion domain: receiving,
- action domain: guided response.

5.9.3 The problem

Very often learners face difficulties in understanding content in the classroom. Moreover, homework is oftentimes given that is complex and hard to solve without the support of peers or mentors who may understand course content better than those students asking the questions. Students can spend hours, days or even weeks trying to obtain a better understanding of course content or specific assignments wasting precious time that could be used more effectively.

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[27] https://europa.eu/europass/en/description-eight-eqf-levels

[28] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

Imagine your computer has stopped working and you spend days trying to figure out what is wrong with it. Then you take it to an IT specialist and in a few minutes they explain the problem and fix your computer. If you had access to the information needed to fix it you could have potentially fixed it on your own in a matter of minutes. This is how many students feel in the classroom.

5.9.4   Objectives

Brainly is a place where students can go when there's a problem they can't solve by themselves. The knowledge-sharing community crowdsources answers to any question, helping students tackle their toughest assignments with expert guidance, 24/7. Parents and teachers can create their accounts to follow their kids' educational progress and help them find the right answers.

5.9.5   Context

You as a student have a question regarding a math equation you were given in your mathematics class. You work hard to try and figure out the answer, but you just cannot get it.

5.9.6   A step-by-step scenario

You as a student go to Brainly and ask the question you were given in your mathematics class.
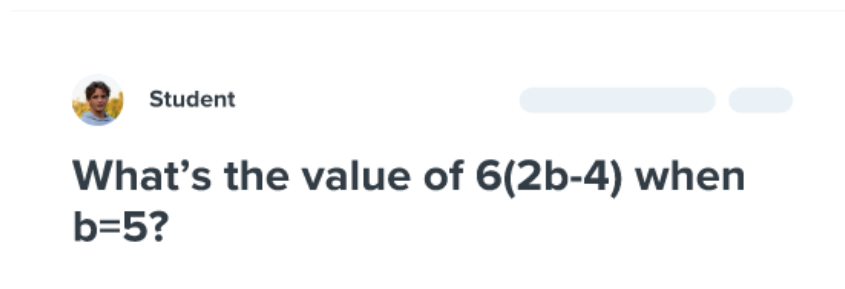
Figure 22: Brainly example

You as a student enter the website and ask the question. You receive an answer and then those answers are verified by expert moderators of the website with a green check mark. Moreover, as a teacher, you can encourage your students to use this online resource and you can pair your students' email addresses with your email address so you can see what they search for and the answers they get. Moreover, you as a teacher also have the function to write answers online to your students.

Answer:
The value of 6(2b-4) when b=5 is 36.

Step-by-step explanation:
Given expression: 6(2b-4)
To find the value of 6(2b-4) at b= 5, we need to substitute the b=5 in the expression, we get
6(2(5) - 4)
= 6(10 - 4)...[solve parentheses]
= 6(6)
6 * 6 = 36
=> 6(2(5) - 4) = 36
Therefore, the value of 6(2b-4) is 36, when b=5.

★★★★★

Figure 23: Brainly example

5.9.7   *Advantages and disadvantages*

Advantages

1. quick answers
2. multiple languages
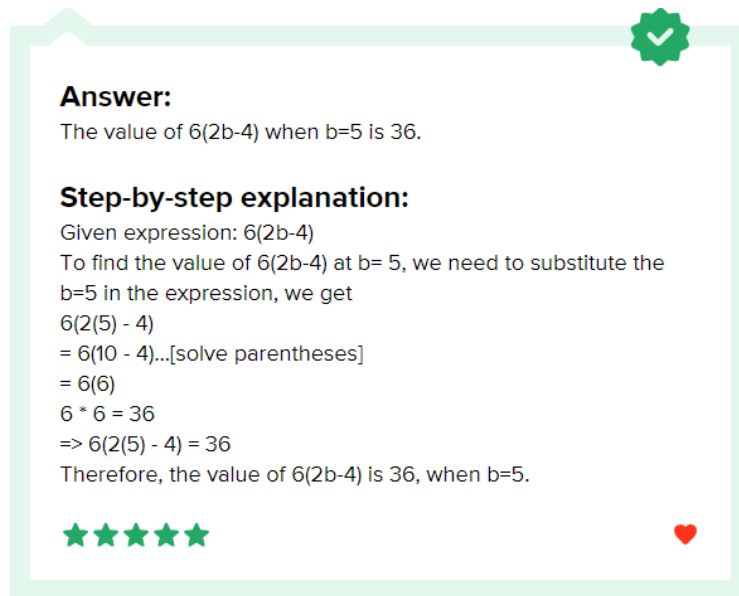3. expert moderators verify quality answers
4. function for pairing with teachers
5. good accuracy with answers

Disadvantages

1. not always accurate answers
2. could be used by students for cheating

5.9.8   *Additional information*

- https://brainly.com/

5.10 Edu 4.0

5.10.1 Summary

3D models with augmented reality supporting the learning content in vocational training subjects in the fields of Mechanical engineering, Electrical engineering and Automation.

5.10.2 Basic info

Tool name: EDU4.0

Related peer learning methodology: Peer Coaching

Category: Mobile application, Physical accessory

Target group: Students

Age group: Secondary

Context: Practical skills

Topic: Learning via virtual simulation of various processes in the fields of Mechanical engineering, Electrical engineering and Automation.

Relation to specific class: EDU4.0 is a free tool supporting 10th, 11th and 12th-grade students of vocational high schools who are preparing to work in professions such as Mechanic, Electrician and Automation Technician, Fitter, and Welder.

Link to EQF level[29]: 6

Link with Bloom's taxonomy[30],

- knowledge domain: understand
- emotion domain: organizing
- action domain: adaptation

Relation to in-class (or PAL) pedagogy: 3D models with augmented reality supporting the learning content in vocational training subjects in the fields of Mechanical engineering, Electrical engineering and Automation.

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[29] https://europa.eu/europass/en/description-eight-eqf-levels
[30] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

5.10.3 The problem

A fundamental component in professional education is the link between theory and practice, i.e. theory assumes an outcome, while practice allows you to test the theory and see if it is accurate. The platform facilitates the practical understanding and perception of the lessons by the learners, as it will enable virtual simulation of different processes as a result of production commands and actions, showing the corresponding results of these actions. The analysis of these results will help to make optimal decisions in different real production situations in the future professional development of the students.

5.10.4 Objectives

This is a platform funded by the Erasmus + program and developed between 4 different countries (Bulgaria, Slovenia, Croatia and Poland) that is determined to help students learn about metalworking technologies and other engineering-related fields with the help of 360 Virtual Reality and Augmented Reality.

5.10.5 Context

The application is used in the lessons on automation, electrical machines and devices, electrical installations, power supply and electrical equipment, welding, metalworking machines and tools, and other subjects of vocational training for students of the 10th, 11th and 12th grades in vocational high schools.

5.10.6 Real-life usage - the story

A student from the "Automation" speciality - 11th grade in a vocational school studies the principle of operation of Asynchronous motors. The student knows about the EDU 4.0 tool and decides to use it. All he needs is to download the FREE app on his Android phone.

After launching the application, the student has the option to select a language in which to use it. The options are in English, Bulgarian, Polish, Slovenian and Croatian.

The next step is to **select** the category of the lesson - **with or without a test** and from the drop-down menu to select **the topic of the lesson**.

In this case, our student chooses a lesson with a test from the Electrical Engineering category, unit - Induction motor, which is accompanied by a short theoretical part.
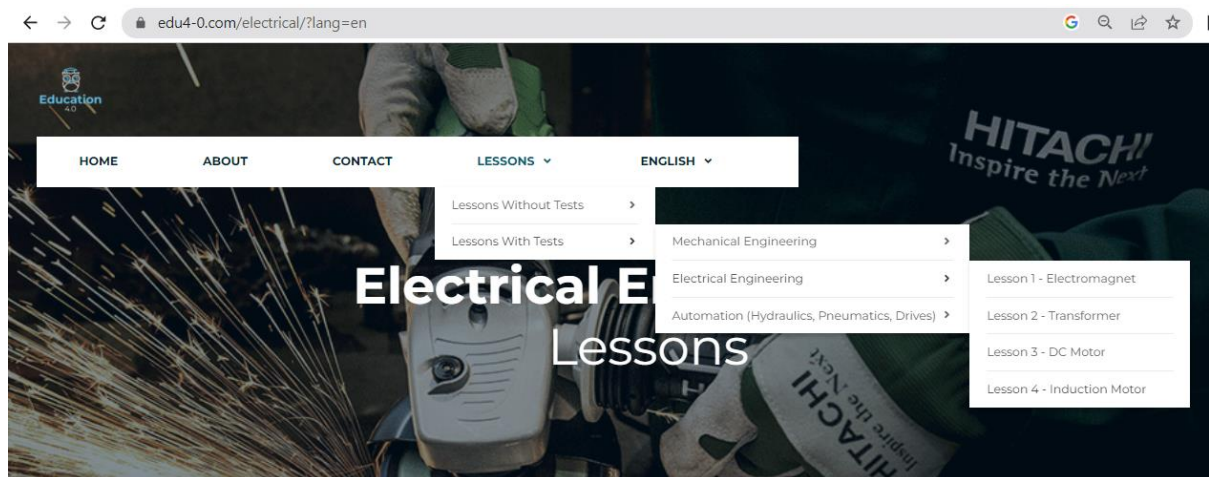
Figure 24: EDU4.0 example
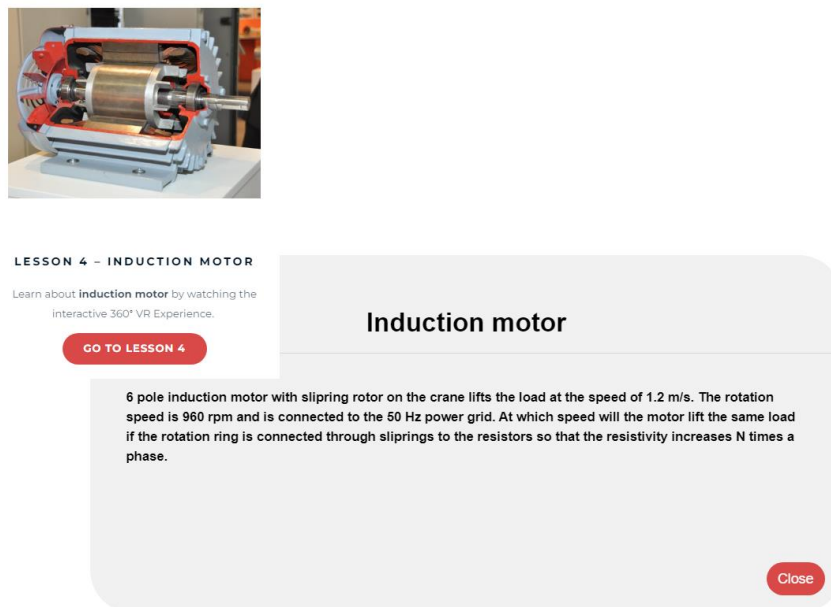
Figure 25: EDU4.0 example

The student permits the camera of his device to access this application and once it is activated, the student selects a plane (surface) on which to place the 3D engine model. The student can interact with the object by rotating it and zooming in and out to view it in detail. The visualization of the object allows all its constituent parts to be seen separately. Meanwhile, a simulation of the engine disassembly and assembly processes is carried out.

Figure 26: EDU4.0 lesson example

Figure 27: EDU4.0 lesson example

After completing the lesson, the student has the opportunity to check his knowledge by taking a lesson test.

5.10.7 A step-by-step scenario

(short instructions for teachers/educators)

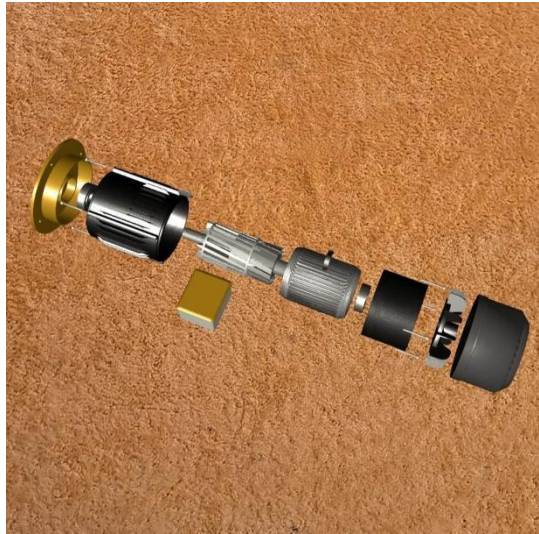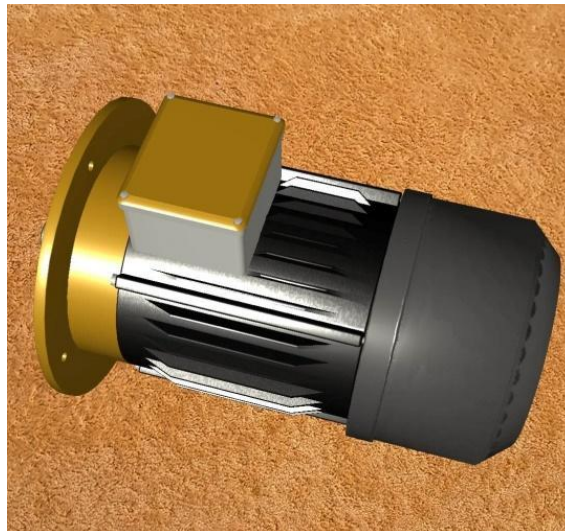1. Install the Edu4.0 App on your Android Device.
2. Choose a language.
3. Open a lesson of your choice.
4. Point the camera towards the image.
5. Enjoy the 3D visualization.

6. Test what you have learned (optional).
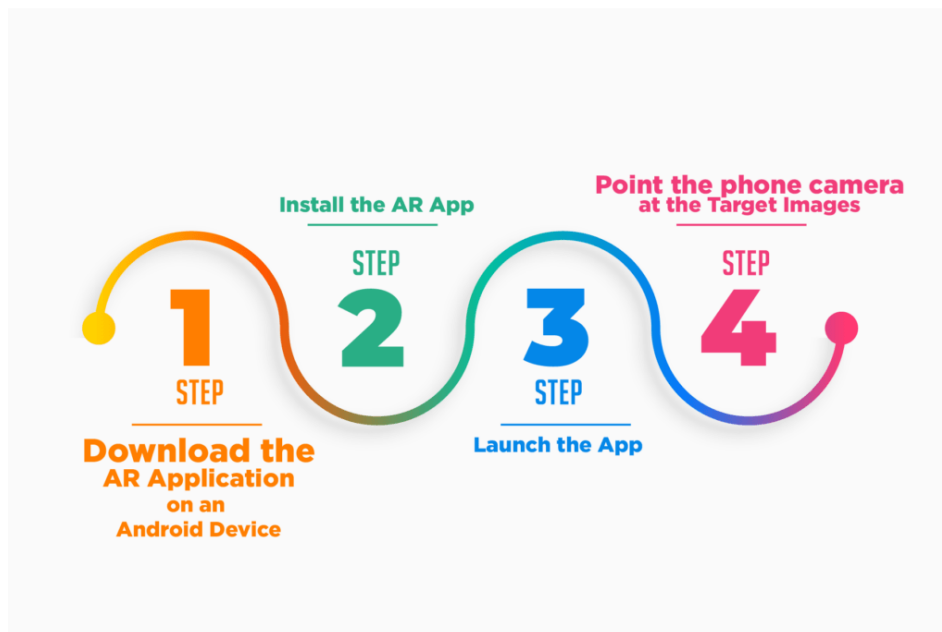
Figure 28: EDU 4.0 process of usage

5.10.8 *What is EDU4.0?*

The EDU4.0. application is developed within 26 months under an Erasmus + project, in cooperation with:

- Vocational School of Mechanical and Electrical Engineering – Pirdop, Bulgaria;
- SMC Industrial Automation Bulgaria EOOD;
- SMC INDUSTRIAL AUTOMATICS Ltd., Slovenia;
- Technical School, Croatia;
- Perfect Project, Poland.

The project aims to create educational content using augmented reality and 3D visualization technologies in the fields of Electrical and Mechanical engineering and Automation.

The application can be downloaded for free on any Android device allowing using augmented reality while learning, as well as, virtual simulation of various processes and detailed explanations.

5.10.9 *Advantages and disadvantages*

Advantages

1. Free application

2. Easy to download
3. Easy to use
4. Easy to understand
5. 3D visualization with augmented reality of individual objects, units, and production processes.

Disadvantages

1. Low popularity
2. The functional upgrade is needed – sometimes the app stucks on loading
3. Available for Android devices only

5.10.10   *Additional information*

- https://edu4-0.com/

5.11 Google Classroom

5.11.1 Summary

Google Classroom is a digital space that allows educators to post assignments, educational material, and grades.

5.11.2 Basic info

Tool name: Google Classroom

Related peer learning methodology: Action Learning Groups

Category: LMS

Target group: Educators

Age group: Secondary

Context: Digital skills

Topic: Scheduling a specific date and time for an assignment to be seen by students in Google Classroom.

Relation to specific class: N/A.

Link to EQF level[31]: 3

Link with Bloom's taxonomy[32]

- knowledge domain: understand,
- emotion domain: organizing,
- action domain: adaptation.

Relation to in-class (or PAL) pedagogy: N/A.

5.11.3 The problem

Time management is key for everyone, but for teachers, it is one of the priorities. Being able to plan your lessons a week or more in advance is essential for how prepared you will be for your lessons. One of the features of Google Classroom is to schedule an assignment that will be sent

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[31] https://europa.eu/europass/en/description-eight-eqf-levels
[32] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

to a certain group of students on a certain day and at a certain time. This is extremely important and at the same time a great convenience for teachers because you can plan everything in advance and not wait until the last minute.

5.11.4 Objectives

The objective is to present a digital tool that is easy to use when it comes to sharing learning content between teachers and learners, but at the same time, it is multifunctional when it comes to creating, distributing, and grading assignments.

5.11.5 Context

Google Classroom is a digital tool designed for the benefit of teachers and learners. Flexible and easy to use, it creates opportunities for good planning and organization of the learning content that is shared, as well as opportunities for timely communication between participants in virtual classrooms.

5.11.6 Real-life usage - the story

During distance learning, a teacher prepares his/her study materials for the following days and has scheduled a quiz during the third class period with a class he/she is teaching. The exam will take place online in Google Classroom within one class period, which lasts from 9:50 to 10:30.

The quiz is ready to be uploaded to the respective classroom but must become active within the above time on a specific date.

Having already logged into Google Classroom with his/her account, the teacher goes to the previously created classroom for the given subject with this class and selects the field **Classwork**.
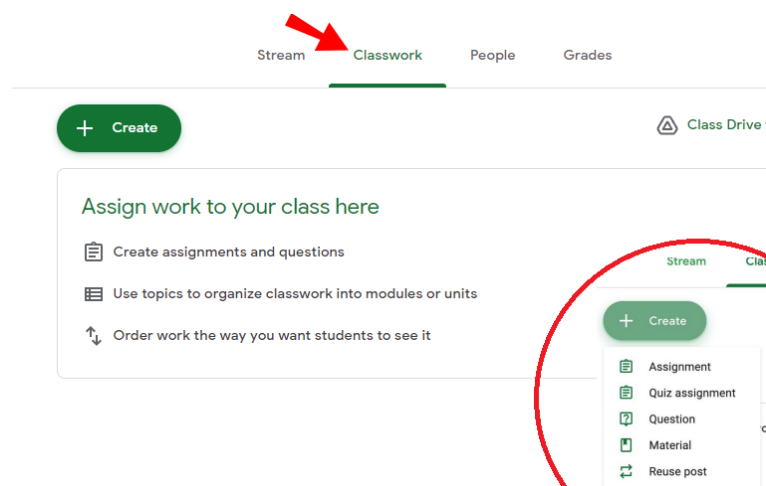

Figure 29: Google Classroom example

From the drop-down menu of the **Create** option, the teacher chooses a **quiz assignment.** In case the teacher has prepared the quiz in advance, he/she can upload the file from his/her computer

or Google Drive. The other option is to create it directly by clicking on the **Blank Quiz** form that will take him to Google Forms where he/she can set the quiz questions.
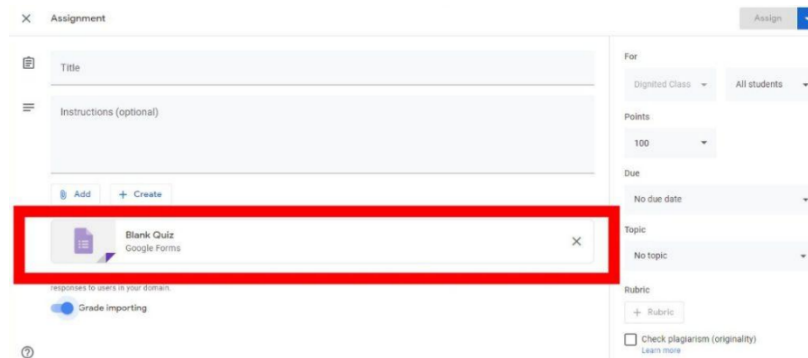

Figure 30: Google Classroom example

What comes next is to follow the instructions and fill in the assignment details such as title, instructions for students and anything relating to the quiz.

The next step is to schedule the quiz assignment for a later date. By clicking the **Assign list arrow** the teacher selects the **Schedule** option and chooses the date, start time, and end time during which the quiz will be active and available to students in this classroom.

Once the quiz is scheduled it becomes visible to the teacher in the classroom, section **Classwork**. On the specific date and time, the assignment is automatically sent to the students and remains active until the time specified by the teacher.

5.11.7 A step-by-step scenario

(short instructions for teachers/educators)

1. Sign in to Google Classroom with your account.
2. Go to the corresponding Classroom.
3. Click the Classwork tab.
4. Click the Create button.
5. Select Quiz assignment.
6. Fill in the assignment details.
7. Upload/Create your quiz.
8. Click the Assign list arrow and select the Schedule option.
9. Fill in the date and the time the quiz should become active.
10. Click Assign.

5.11.8 What is Google Classroom?

Google Classroom is a tool that helps educators create and organize coursework, effectively provide feedback, and easily communicate with their students. On the other hand, learners can organize their work in Google Drive, complete and submit it, and communicate directly with teachers and other learners.

Google Classroom is suitable for educators who do not have good digital skills and much experience working in an online environment, as the interface of the tool is intuitive and easy to work with.

5.11.9 Advantages and disadvantages

Advantages

1. Free tool
2. Easy to use
3. Reducing paper use
4. Schedule assignments in advance
5. Send materials and assignments to specific students or the entire group
6. Integrates with lots of apps and websites
7. Access to information anytime
8. Facilitates communication
9. Quick feedback

Disadvantages

1. Each user needs their own Google account
2. File size limits
3. An Internet connection is needed

5.11.10 Additional information
- https://classroom.google.com/

5.12 Game-based learning (Kahoot)

5.12.1 Summary

Kahoot is an online game-based learning platform. It allows teachers, organizations and parents to set up fun web-based learning for others.

5.12.2 Basic info

Tool name: Kahoot

Related peer learning methodology: Action Learning Groups

Category: Physical accessory, Assessment, Audience Engagement, Presentation, Gamification

Target group: Students

Age group: Students

Context: Kahoot is an online game-based learning platform. It allows teachers to set up fun web-based learning for others.

Topic: Any.

Relation to specific class: None.

Link to EQF level[33]: 1

Link with Bloom's taxonomy[34]

- knowledge domain: apply,
- emotion domain: receiving,
- action domain: guided response.

Relation to in-class (or PAL) pedagogy:

Kahoot is developed on a game-based learning approach. This is a teaching method that uses the power of games to define and support learning outcomes. A game-based learning environment

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[33] https://europa.eu/europass/en/description-eight-eqf-levels
[34] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

achieves this through educational games that have elements such as engagement, immediate rewards and healthy competition. All so that while students play, they stay motivated to learn.

Also, Kahoot! is a used as a game-based learning platform used to review students' knowledge, for formative assessment or as a break from traditional classroom activities.

Kahoot! draws from Malone's (1980) "theory of intrinsic motivation" by challenging students with difficult problem-solving tasks in an audio-visual stimulating environment. The fantasy "game-show" environment further increases their absorption during problem-solving compared to other computer-mediated learning tools.

5.12.3 The problem

The students of young age are expected to use ICT tools in their learning, also, they want to be involved in the learning by doing/experiencing.

5.12.4 Objectives

It would help to check students' knowledge of a certain topic. Also, it could be used instead of standard tests (quizzes). The Kahoot could be used in group work or set as an individual challenge to improve personal results in scores.

5.12.5 Context

Using Kahoot could be in various areas, starting to find out students' expectations for learning, set their level of knowledge at the beginning of the learning, assess their progress in the learning or used as a final test or even assessing the satisfaction by students.

5.12.6 Real-life usage - the story

Jonathan Tepper, Executive Director of Information and Learning Technology, at Greenwood College School successfully combines in-class and online instruction with Kahoot! EDU.

Kahoot! has been integral to our toolkit. It's been woven into the fabric of learning at our school as far as I can remember, and it's one of the most popular tools among our teachers. Students love it as well! When they hear the Kahoot! music, their eyes light up, and they get excited. It's great for **gamifying learning** and building a community. Upgrading to Kahoot! EDU and getting a site license have helped us empower our educators with the tools to collaborate and engage learners both in class and at home.

Figure 31: Kahoot and video conference[35]

From the survey of 12 vocational colleges in Malaysia, we can find that gamification has the potential to foster an active teaching and learning process based on constructivism theory, in which students can construct new concepts and knowledge through their own experiences. Students become more active when a gamification approach is used instead of traditional approaches. Additionally, the researchers discovered that incorporating gamification into teaching and learning can boost students' interest and drive. Gamification can boost students' motivation during the teaching and learning process in the classroom. Gamification strategies incorporating game aspects may shape and motivate students and can help boost students' overall knowledge in a topic course. This is because the gamification approach enables students to be given time and encouraged to seek out new knowledge that is related to previously acquired knowledge. Thus, students evaluate their newly obtained knowledge in light of their current level of comprehension. In short, vocational college lecturers' perceptions of the gamification strategy are favourable. The majority of lecturers feel that in the future, this gamification technique should be incorporated into vocational institutions' teaching and learning processes. This is because

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[35] https://kahoot.com/blog/2020/11/05/greenwood-college-school-uses-kahoot-edu-hybrid-learning/

21st-century learning approaches based on information and communication technology (ICT) are strongly emphasised[36].

5.12.7 A step-by-step scenario[37]

1.   Create your Kahoot game.
2.   Play with the group or set an individual challenge.
3.   Share the results.

5.12.8 What is Kahoot! ?

Kahoot! is a popular, game-based, quiz-style learning platform that is useful to help learners self-assess their knowledge as part of the formative assessment journey.

Kahoot! is a global learning platform company that wants to empower everyone to unlock their full learning potential. The learning platform makes it easy for any individual or corporation to create, share, and host learning sessions that drive compelling engagement. Kahoot! sessions can be hosted anywhere, in person or virtually, using any device with an internet connection.

Kahoot! allows students to have fun while learning, and teachers can use the platform's reports and analytics to track student learning over time.

Kahoot! is a tool that motivates and activates students' learning because it can test their knowledge, reiterate important concepts, and help them retain information. It also provides instructors with the ability to further create class discussion and student-to-student interaction.

Now, Kahoot! is available in English, Spanish, French, German, Italian, Brazilian Portuguese and Norwegian.

5.12.9 Advantages and disadvantages

Advantages

1.   The tool is Interactive, involving with fun
2.   its user-friendly interface and game creation features.
3.   enables users to include gamification components in their classroom, such as score management, leaderboards, and real-time student feedback.

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[36]

https://www.researchgate.net/publication/359645728_Gamification_in_Vocational_Teaching_and_Learning_Perception_and_Readiness_among_Lecturers
[37] https://www.youtube.com/watch?v=KJgZZQcsSPk

4. students find learning to be both enjoyable and motivating, with the majority of them eager to move on to the next subject throughout class; so, motivates and activates students' learning, enhances curiosity

Disadvantages

1. Better results in groups.
2. People should have a game at the same time.
3. Internet required.
4. The answers can only be true or false, yes or no, or multiple choice. This can be a limitation.
5. Since students receive more points for quicker answers, it can emphasize speed over substance. It is a good program for review, but not for instruction.
6. Two screens should be used (e.g. monitor for questions and each student needs to use a smartphone for choosing the answer).
7. Some functions are not free.

5.12.10   Additional information

- What is Kahoot: https://kahoot.com/what-is-kahoot/
- Kahoot! Youtube Channel:
  https://www.youtube.com/channel/UCi8xTp2n_C6beNP5pkvbFBA

5.13 Digital whiteboarding (Jamboard)

5.13.1 Summary

Jamboard is a digital whiteboard that lets you collaborate in real-time.

5.13.2 Basic info

Tool name: Jamboard

Related peer learning methodology: Networking Groups

Category: Document collaboration tools

Target group: Students

Age group: Students

Context: Collaborative Content creation. "Teacher" and peer student can create the content together

Topic: Any.

Relation to specific class: None.

Link to EQF level[38]: 1

Link with Bloom's taxonomy[39]

- knowledge domain: apply,
- emotion domain: receiving,
- action domain: guided response.

Relation to in-class (or PAL) pedagogy: Jamboard is a digital whiteboard that lets you collaborate in real-time. In the classroom, you can engage students in problem-solving exercises.

Google Jamboard is a tool that can be used to support learning fully online and/or with a personalized pedagogical approach.

Jamboard is based on **social constructivism**: a pedagogical approach that believes that knowledge is something that a learner 'constructs' for themselves, rather than passively absorb.

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[38] https://europa.eu/europass/en/description-eight-eqf-levels
[39] https://en.wikipedia.org/wiki/Bloom%27s_taxonomy

Students construct their knowledge through conversation and interaction, with each other and with teachers. In this way, students cultivate a better understanding of concepts when they work together and discuss ideas.

Jamboard is a pedagogical approach that incorporates learning, and social networking in a real-time manner. The problem

The students of young age are expected to use ICT tools in their learning, also, they want to be involved in the learning by doing/experiencing.

5.13.3 The problem

The students could be empowered to act as proactive learners to develop the content together.

5.13.4 Objectives

To promote active collaborative learning in online tutorial classes, a pedagogical approach that incorporates learning, and social networking in a real-time manner by leveraging Jamboard.

5.13.5 Context

Using the Jamboard could be in various areas starting to find out students' expectations for the learning, set their level of knowledge at the beginning of the learning, assess their progress in the learning or used as a final test or even to assess the satisfaction by students.

5.13.6 Real-life usage - the story

Teacher, Ressu Upper Secondary School: *"I've used Google's Jamboard app for tasks that require students to respond quickly during classroom lessons. Students can use a code to access the Jamboard I've opened. They can write, send pictures, and draw there. The application has worked well for the whole class and in smaller group activities. For small group work, I've opened a separate page for each group in the same Jamboard file. Everyone gets to see other groups' outputs. Fast and easy!"*[40]

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[40] https://www.hel.fi/static/liitteet-2019/KasKo/popa/38-tarinaa-etaopetuksesta-english.pdf

Figure 32: Jamboard example[41]

Professor Amanda Izenstark at University Libraries incorporates Jamboard with Zoom breakout rooms to allow students to collaboratively brainstorm their research ideas, utilizing the straightforward and readily accessible platform from Google.

According to Amanda, her students enjoy using Jamboard in their process of collaborative research. Positive comments from the student interaction derived from their ability to collaborate and the ability to readily return to this unofficial idea board to find other ideas to supplement their research thesis. While the simplicity of Jamboard creates an accessible interface for new users, the lack of features can also be limiting for more in-depth usage. Jamboard's overly simplistic interface leaves higher functionality a desire. For example, the ability to quickly add directional or signifying symbols, or icons is something that is missing from the toolbar. Alternately, users can search for images and clipart to import to the Jamboard workspace which can double as directional icons with just a few extra steps. Even without a toolbar readily full of accessible icons and images to add to the workspace, Jamboard is a valuable virtual, collaborative tool that multiple users can simultaneously engage with while working on group projects and discussions.[42]

5.13.7 *A step-by-step scenario[43]*

1. Visit jamboard.google.com
2. Create a new jam.
3. Share the link with other collaborators.
4. It's possible to share created content or download it in pdf.

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[41] https://www.weareteachers.com/jamboard-ideas/
[42] https://its.uri.edu/2022/01/20/amanda-izenstark-introducing-google-jamboard/
[43] https://www.youtube.com/watch?v=GbytD_LNVNM

5.13.8 What is Jamboard?

Google Jamboard is a digital whiteboard found inside Google Workspace. The digital white paper is similar to a traditional whiteboard, which means you can write or draw using a pen as well as erase. The app also allows you to add images, place sticky notes, highlight text, and so much more.

Google Jamboard is a digital whiteboard that allows for remote or in-person collaboration in a shared space. Students or colleagues can sketch out ideas, problem-solve, or draw collaboratively and synchronously. "Jams" can be saved directly to Google Drive or exported as PDFs.

5.13.9 Advantages and disadvantages

Advantages

1. can be leveraged to build communication, collaboration, critical thinking and creativity
2. its user-friendly interface
3. can easily be shared with students to have access during and after class.
4. great collaborative tool for groups, whether remote or in person.
5. students can pull files from Google Drive and use Google Meet to live chat and discuss.

Disadvantages

1. It cannot add media content such as music and videos.
2. limited colours and backgrounds which can stunt creativity.
3. works best when using a touchscreen device and a stylus, especially for the drawing function.
4. only provides for 16 "touchpoints", which means that you can only have 16 persons working on a Jamboard at a time so this makes it tricky for a whole class to work on one Jamboard

5.13.10   Additional information
- This is Jamboard: https://edu.google.com/for-educators/product-guides/jamboard/?modal_active=video-modal
- How to Use Google Jamboard - Beginner's Tutorial'; https://www.youtube.com/watch?v=GbytD_LNVNM
- How to use Jamboard in the classroom: 20+ tips and ideas: https://ditchthattextbook.com/jamboard/

6 Conclusion

We are aware that the re-design of the traditional courses to include peer-assisted learning is not a trivial task. Not only it requires a mindset shift, but it also requires us to challenge the existing educational structures and legislation related to schooling.

Despite that, we believe that peer-assisted learning is one of the most effective learning approaches.

Looking towards the future, the prospects for PAL are promising. As technology continues to advance, new digital tools and platforms will emerge, providing educators with even more opportunities to integrate PAL into their teaching practices. The integration of social media peer groups, online peer reviewing platforms, chat apps, and game-based learning tools showcases the evolving landscape of PAL in the digital age.

In light of the current technological advancements, the integration of Artificial Intelligence (AI) holds immense potential in enhancing the efficacy of PAL methodologies. AI-powered tools can provide personalized recommendations, adaptive learning experiences, and intelligent feedback, further optimizing the learning process and promoting individualized support for students.

If this manual helps educators to get some new ideas and improve their skills a little bit, then our mission was successful.