Innovative Measurement Tool towards Urban Environmental Awareness
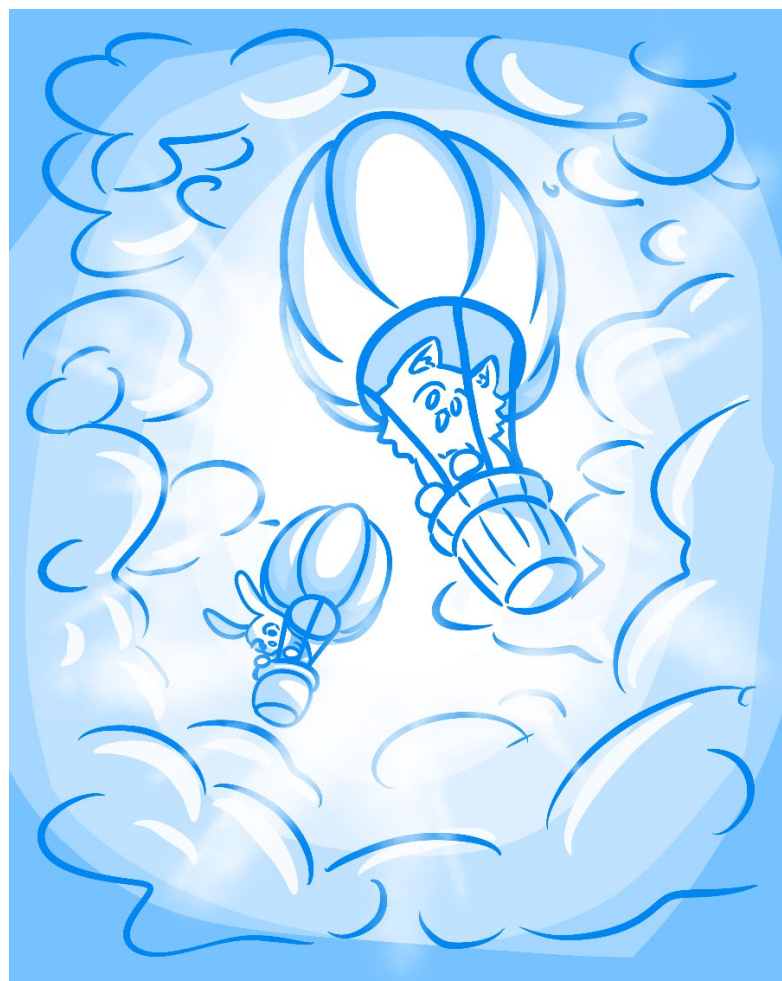
Teaching Guidelines

First edition, 30 December 2022

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1   Mysteries of learning

> **True education means fostering the ability to be interested in something.**
>
> Sumio Iijima, Physicist
> *'About myself, To the younger generation'*
> Innovative Engine (September 25, 2007)

1.1 Why do we learn?

Learning ensures our survival, because it allows us to adapt to the changing conditions of the world around us. Learning is about eliminating ineffective activities that involve risk and punishment. However, we use the activities that bring us profiles and rewards for as long as possible. We need to learn about how high the effectiveness of action is. We gain this knowledge through observation, modification, experiment or exercise. This allows us to know, experience and record actions that are beneficial to us.

Our brain consists of about 85 billion neurons, which acts as a messenger, sending information from one neuron to another. While learning there are observed changes in the brain, including the creation of new connections between neurons. Physical and permanent changes take place in our brains, and although sometimes we are unable to access this knowledge, it is still there, in our brain. This brain's ability to change and adapt due to experience is called neuroplasticity is the.

However, when you stop practicing something, the connections between your neurons weaken. Thus it is worth to pick up learning strategies more compatible with our brain and focusing on repeatable activating neurons.

It should be also remembered that some changes in the brain are genetically controlled, e.g. maturation. Until the brain is not mature enough to assimilate specific knowledge, we are not able to learn. Thus the knowledge should be selected accordingly to the age of the student.

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1.2 Education reflecting changes

The modern world is changing in front of our eyes and these changes are very dynamic. The reasons are different:

1. Covid-19 pandemic – it hit us suddenly, practically overnight. It was surprising and in the initial phase it gave hope for a short-lived nature. However, it turned out that the pandemic was not going to end soon, forcing changes in many aspects of our functioning as individuals and society.
2. Climate change – it is a global problem and in order to live on, humanity must change its approach to many issues in the long term. Introduce solutions that effectively reduce threats resulting from climate change or slow it down.
3. Development of digital technologies – digitization of many administrative processes – we strive to translate into digital language everything that is possible both in private and professional life. The introduction of digital tools supporting decisions, monitoring, purchases, etc. and their popularity in use makes young people expect such solutions also in the learning process. The result of this synergy with business and science are innovative solutions implemented in our lives. We need to learn how to employ design to create innovative and more meaningful product, and it does not matter if it is a strategy or a new construction.

These reasons force a change in the approach to many areas, including also education in particularly at the university level.

Contemporary didactic must therefore focus on the use of innovative technological solutions and changing the methodology in the education process, developing soft and knowledge competences also in an interdisciplinary perspective and practical skills of using this knowledge.

Education before the Covid19 pandemic will no longer be the same as after as it forced quick development of e-learning and digital tools and methodologies. Both lecturers and students acquired new skills in the field of digital technologies, which, in their opinion, should be partially still used and support learning in a hybrid approach: in contact and online classes.

The university is a physical place, where students can gain knowledge and learn, but not the only one. Field work, internships, traineeships and study visits bring practical aspects to education and often generate non-standard problems to be solved. Each place has its own individual features, which means that the scientifically described processes taking place in them also have their own individual characteristics forcing a non-standard approach. The student's involvement in a non-standard problems is one of the elements of developing problem-solving skills. The importance of the observation, experiments in real situations make universities develop field labs and teaching scenarios for students gaining the knowledge and skills in the field.

Teaching about the climate changes is a new challenge as the subject covers an interdisciplinary science, needs understanding of the holistic approach and is based on processes that are not stable and may change in the future. Climate changes force development of innovative solutions in mitigation and adaptation to climate changes, and also develop teaching / learning methodologies dedicated to citizens to raise their awareness, for example narrative maps. Considering higher education this topic is still difficult to teach and learn, at most universities, the knowledge is rather spread among different subjects and modules. Presenting it in this way the students loses the general overview and do not understand the relations.

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1.3 Information and communication technologies ICT

One of important aspects of education is the digitization of processes and the development of digital technologies and tools.

The results of the questionnaire (see: Attachment – the questionnaire) indicate that Covid-19 has influenced our approach to the teaching and digital technologies. Most teachers are ready for a long term change from the full time in contact teaching to blended-learning and e-learning (Figure 1 and Figure 2) where:

- Full-time in contact (teachers' and students' contact hours),
- Blended-learning (hours in contact supported with online activities and materials),
- E-learning (combined use of computer hardware, software, and educational theory and practice to facilitate learning).
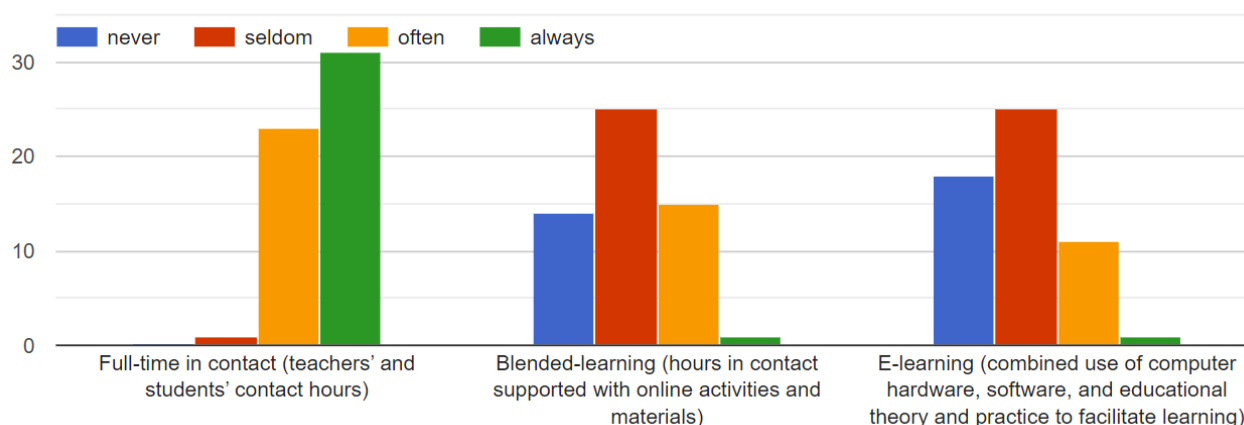
Figure 1. How often are you going to use following approaches – before Covid times.
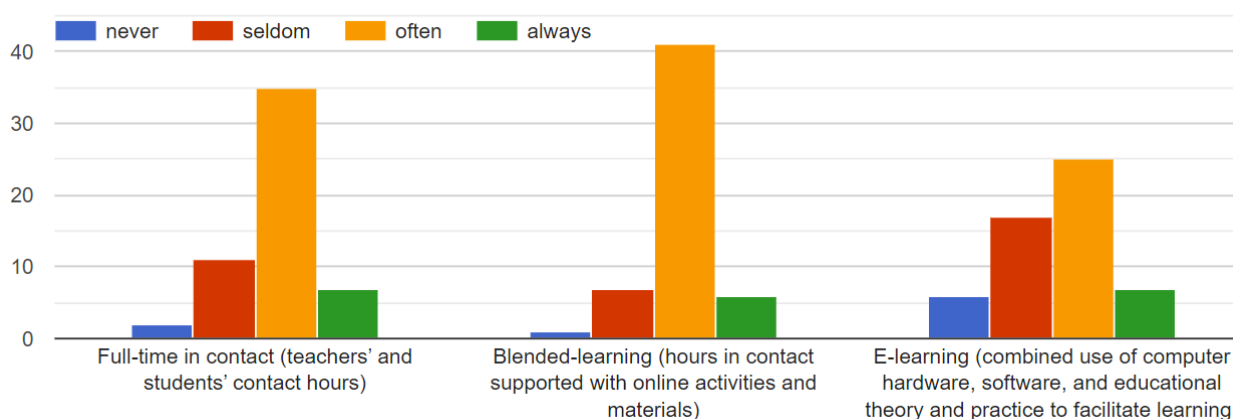
Figure 2. How often are you going to use following approaches – after Covid times.

We are now prepared to transfer the entire education to a digital platform and the introduction of virtual reality will allow us to supplement the offer of moodle courses also for laboratories with specialized infrastructure, which today is only available in contact. The standard educational courses can be standing alone once or supervise by teachers. They can be the whole digital or blended-learning with traditional approach in contact.

The digital world of science innovation enters is 3D Technology, Robot Teachers, Animation VR, Interactive Games, Cloud computing, Artificial Intelligence and Machine Learning or Multi-Touch LCD Screens. These methods are now being quickly developed and the solution in use across the

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globe. Using the newest technology and multimedia makes education material more interesting and effective. We are able to develop virtual courses, laboratories using augmented reality or virtual reality, which attracts students. The question is how effective can they be considering money, time and teaching / learning results comparing to classical presentations, videos etc.

1.4 Change of perception and communication

Teaching methods should be adapted to changing the perception and learning abilities of the contemporary student. Above all, he or she is used to short text information presented in a visually attractive form of communication. From the academic textbook, we take students to science blogs, discussions with the use of social media.

Moreover, the life of a young person in the virtual world causes a constant supply of emotions. Therefore, in order for science to become attractive, it should also be associated with emotions, which we can provide through, for example, gamification, escape rooms, etc.

Another challenge in education is the ability to cooperate not only in a group on a task, but also to communicate with the client and the potential beneficiary of the project results. Social participation in decision-making processes consisting in recognizing the needs of stakeholders, consulting and social discussion on proposals is particularly important today, as project models based on public participation are increasingly used in decision-making and investment processes. This means the acquisition of many soft skills, primarily in the field of communication.

1.5 Why do we need teachers?

THE ROLE OF THE TEACHER CHANGES WITH THE WAY YOU LEARN

The role of the teacher changes with the way you learn. Today we are ready to acquire knowledge and skills on our own using, for example, MOOC courses. So why do we need teachers and what is his / her role in the education process? According to Sebastian Leitner (Leitner S., 1972/2003) teachers are to instruct the students how to learn, present the material to be learned, help with revisions and correct any mistakes.

Teacher play different roles in contemporary education. For sure no longer they are the delivers of the knowledge but they:

- create a learning environment,
- are mentors who motivate you to work,
- give substantive, practical and knowledge support,
- organize learning process,
- participates in students activities,
- acts as an tutor of students individual work.

The teacher prepares an educational plan in which he sets goals to be achieved, sets a schedule of activities and principles of operation as well as course and student evaluation indicators, develops tools and methods supporting the student's work and motivates. Teachers also play a crucial role in building relations with and between students.

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Considering rapid development of knowledge, we should also be aware that the knowledge acquired in many areas at the beginning of studies may be "old" after their completion. Students have two paths to develop their skills and knowledge:

- research, development and acquisition of highly specialized knowledge (at the level of master's and doctoral studies),
- to work in business where a holistic approach, the ability to self-improve, openness to the implementation of innovative solutions (at the level of engineering studies).

Whatever they choose at this stage the role of teacher is limited. Thus the question appears weather we should learn or how to learn to make students further career depending on their self-development. The answer can be the Finish education system where students are **learnt to learn not to pass the tests**. Pasi Sahlberg, Finish educator indicates that the reason for this success lays in approach to education. For more of Pasi Sahlberg opinions and texts see: https://pasisahlberg.com/.

1.6 New skills

The future relevant student's skills and goals, which reflect the local / global economical, political and social changes and may be important for future professional work in different environments (Ulf-Daniel Ehlers, 2020). The contemporary education should allow to equip students with the skills that will enable them to be successful, productive citizens in the Digital Economy, it is essential to teach them not just the traditional core subjects but also the sets of skills most in demand in the 21st century as below:

- **critical thinking** refers to logically assessing information to make up decisions.
- **creativity** involves seeing concepts in a different light and to innovative thinking and problem solving.
- **collaboration** involves group work to achieve a common goal.
- **communication** is the practice of conveying ideas.
- **information** literacy gives the tools needed to distinguish fact from fiction.
- **media literacy** helps analyze media and digital tools.
- **technology** literacy involves understanding different applications.
- **flexibility** is an ability to adapt to changes.
- **leadership** involves abilities to influence and guide others.
- **initiative** relates to employees starting projects, creating plans, and executing strategies on their own.
- **productivity** measures how well someone is able to prioritize, plan, and manage their work.
- **social skills** refer to the skills needed to interact effectively with others.

According to the research conducted within IMPETUS, teachers feel ready to teach most of them and they already do or intend to do. But they still understand the need of self-development and gaining the knowledge about teaching methods and tools (Table 1).

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Table 1. What skills would teachers like to acquire or develop? IMPETUS research.

Skills teacher would like to acquire or develop	% Of 100% = 54 responses
Motivation and student activation methods	50
Design Thinking	48
Critical Thinking	43
Digital Competence Framework (apps, Moodle, free software, social media...)	41
Project-based Learning	39
Active learning	37
Creativity	35
Collaboration and teamwork	33
Universal Design for Learning (engagement, representation, action and expression)	33
Agile education	32
Game-Based Learning and Gamification, Escape rooms	32

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2   Collaboration and teamwork

> **Talent wins games, but teamwork and intelligence wins championships.**
>
> Micheal Jordan, Basketball Hall of Fame Player and Businessman
> As quoted in *The Victory Letters: Inspiration for the Human Race,*
> Cheri Ruskus (2003) p. 68.

Groupwork means that students work together on the assigned task, preferably without teachers' help. It is an effective tool to gain collaborative skills needed for the professional world as well as knowledge. The role of the teacher is to build the team and tutor the group, and monitor the progress. The teacher also helps to solve social problems of the group and motivates it to further work. Research studies reveal that students working in small groups tend to learn more of what is taught and retain it longer than when the same content is presented in other instructional formats (Cockrell et al., 2000; Johnson & Johnson, 2000).

To make groupwork possible we need to understand that:

- **The responsibility for the task belongs to the group** not to the teacher or individual member. The teacher is a guider in the process of interaction but not the source of ideas for solutions. Even though there is also the individual work, still the responsibility for gaining goals is of the whole group.
- **The members need themselves to finish the** task as they have selected roles depending on complementary skills or knowledge. Thus we need to be active and participate in all steps of the process to understand it clearly.
- **The task for groupwork may have several paths** to follow to pose complex problems. The choice of the best one solution is not always easy or obligatory when the deadline is the most critical issue.
- **Groupwork has its pros and cons,** so some conflicts may also appear, which is normal. They should be solved as quickly as possible.

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2.1 Benefits of groupwork

Groupwork refers to a collaborative learning environment where members work through problems and assessments together and they also are teachers and learners at the same time. This enables to develop communication, management and interpersonal skills for ex.:

- Build positive relationships (working and private),
- Accommodate with different cultural orientations and work habits,
- Expose variety of perspectives, communicate effectively, discuss, negotiate on tasks, present your views, listen to others,
- Refine understanding through discussion and explanation,
- Resolve conflicts and intervening to correct problems,
- Identify group goals and dividing work,
- Plan and comply with timeline,
- Manage time to meet group expectations,
- Monitor group processes.

2.2 Management of groupwork

Groupwork effectiveness occurs when the group has appropriate goals to complete and the confidence to accomplish those goals. It is important to understand how group works and what stages during the process the group goes through. The groupwork consists of the following steps:

Team building, team integration:

- Building trust,
- Knowing personal skill and knowledge,
- Defining rules of actions, sharing work,
- Setting goals and reward.

Preparation phase:

- Getting familiar with the tasks, goals and expected results of the assignment,
- Work on organization plan,
- Define management rules,
- Defining risk,
- Resources.

Task proceeding:

- Share diverse perspectives,
- Keep milestones and deadlines,
- Motivate,
- Solve problems,
- Elaborate the results.

2.3 Team building action scenario

To start the efficient workgroup, the team building stage is very important. The role of teacher in this activity is to monitor the progress of the task and time. For team building following steps should be followed:

Member introduction – let students introduce themselves and tell about 1) their superpower, best skill / ability you are proud of and 2) what skills and knowledge they bring to the team.

Possible knowledge and skills:

- Web page construction, presentation, software, graphic software, video,
- Writing, presenting, drawing, acting, facilitating,
- Effective researching, reading maps, building engineering and construction environmental pollution etc.

Team identification – ask student to assign the name of the group. The name should reflect features of the team members. The name should be short, acronym is possible. This is the first step for recognition which member of the group has leader skills and how the team communicates.

Contract rules – encourage students to define three the most important rules for their team. For example, how they will make up decisions, share work, solve conflicts or problems or keep deadlines. Conflicts and problems are the normal issues and will appear sooner or later in all groupwork. Consider obstacles coming from Covid-19 situation and online work as well. The rules help you to anticipate potential problems.

Possible contract rules:

- What do we expect of one another in regard to attendance at meetings, participation, freqency of communication, the quality of work, etc.?
- What rules can we agree on to help us meet our goals and expectations?
- How will we address non-performance in regard to these goals, expectations, policies and procedures?
- What will we do when a group member does not contribute?

Goals and rewards – help students to gain the motivation. Ask them to think about aims or goals other than the assignment, that can be achieved and discuss the possible reward for the whole team. How will you celebrate achieving the your goal?

Possible goals and rewards:

- Make new friends, learn about other countries, develop spoken English,
- Play online games etc.

Role assignment – to make the team function well, discuss the roles you need to support the team with special roles. It is useful to explicitly allocate these functions. Each of the team member should play one role during the whole process.

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Possible roles:

- **facilitator or leader** (depending on context) ensures the process continuous according to rules,
- **note taker** records ideas and discussion conclusion,
- **time keeper** makes meetings effective,
- **progress chaser** – motivates to get job done by the time,
- **process watcher** – brings problems to the attention of the team,
- **editor** – ensures the consistency in the final submission,
- **devil's advocate, raises counter** – introduces alternative explanations and solutions.

Output requirements – describe students the assignment, criteria of the assessment and deadlines. This will help them to prepare the steps they need to follow to achieve the goal.

Plan of the work – encourage students to make the plan in order to organize their work. Ask them to assign the members of your team to week activities and visualize a project timeline, which is a canvas of project deliverables. It provides a simple, but comprehensive visual overview of a project from start to finish with milestones, tasks, dependencies, and delivery dates. Milestones are tools used in project management to mark specific points along a project timeline.

Students should discuss their resources:

- The tools, resources you need to do the tasks and who will be responsible for them,
- The place they will meet and have a discussion with team members on projects and tasks (zoom, MS Teams ...),
- The digital place to keep and share documents (MS Teams, google disc).

Task assignment – the last step, after having discussed both the roles and the plan of the work with the deadlines and milestones, it is to assign the selected tasks to the responsible persons.

For the team building use the Team building template (Table 2).

2.4 Division into teams

There is always the question how any students should work in the group and how to divide them into it. Usually the optimal number of people is from three up to five. It depends on your goals, length of the project and the level of difficulty of it. If you let students, who know each other to group by themselves, then you make expect that the work will be easier for them. It is because they already know each other and they used to work together before, so they have the experience. But if students do not know each other before, then you, as a teacher should divide them. The profits are that students should gain new skills, learn how to organize work with new people. This is more challenging for both tutors and students. But in both cases, it is recommended to do a team building activity as it brings benefits: make great teams ready to finish the project on time and high level.

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2.5 Team work assessment

Team work assessment is unfortunately very often omitted. The reasons may be different: lack of time, feeling it is not important as the team worked well and the results of the projects / exercises are satisfying. But to enrich students with the skills of teamwork and team building this part is necessary as it allows to analysis of group creating process, work efficiency due to team decisions, and individual role within it. The assessment of following categories and criteria can be proceeded as the questionnaire before and after the course to measure the skills income level and indicate the problems for the future:

Time Management & Responsibility:

- I can assess the time-consuming nature of a task,
- I can plan a project action plan in a way that ensures the completion of a task within the set deadline,
- I can manage a small team in a manner ensuring the completion of a task within the set deadline,
- I can assess the risks in the implementation of engineering projects.

Adaptability:

- I can work individually,
- I can implement appropriate actions to ensure that the task is carried out in the event of an emergency,
- I can flexibly adapt to the situation.

Creativity / Originality:

- I can be creative,
- I can think critically,
- I can initiate an innovative approach to the tasks and problems.

Students may be asked to grade the categories or to comment them. The summing up discussion on the assessment's results are beneficial either. It clearly articulates if group worked well and why, what did not work well and why, and helps to learn ways to increase effectiveness and efficiency of group process in the future, considering self as well as others (Table 3).

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Table 2. Team building template.

Team identification			
Name 1	Write your skills / knowledge which are valuable For the project / activity		
Name 2			
Name of the group	Find the best name of the group reflecting the members or the main ideas the group would like to follow		
Logo of the group	Logo should be as simple as possible reflecting somehow your team		
Motto of the group	Find the statement which will be motivating you		
Our goal	Define the most important goal apart from learning new things		
Our reward	What will you do when you finish the activity successfully?		
Contract rules			
Rule 1	For example: decisions are made by voting		
Rule 2			
Project Management			
Name 1	Assigned roles		
Name 2	Assigned roles		
Server	Virtual disc to upload and share files on tasks		
Communication channel	MS Teams / zoom / FB / other		
Task assignment			
Date	Name of the team member	Activity she / he will conduct	What is needed?
Make as many rows as you need			

Table 3. Self assessment group work template.

|	Skills	Points
Communication Skills	I can lead a discussion regarding a presentation presented	
	I can draw conclusions and formulate fully justify opinions	
	I Can be Effective in resolving problems	
General Team Skills	I can obtain information from literature, databases and other sources	
	I can work efficiently	
	I can integrate socially	
	I can critically evaluate my work	
	I can integrate the obtained information, interpret and critically evaluate it	
	I can motivate and support team members	
Technical Skills	I can document the results of an analysis	
	I can prepare project documentation	
	I can prepare and make a presentation on the implementation of a project or research task	

3   Active learning

> **The most important thing any teacher has to learn, not to be learned in any school of education I ever heard of, can be expressed in seven words:**
> **Learning is not the product of teaching. Learning is the product of the activity of learners.**
>
> John Holt, Author and Educator
> *Growing Without Schooling*
> Issue 40 (1984)
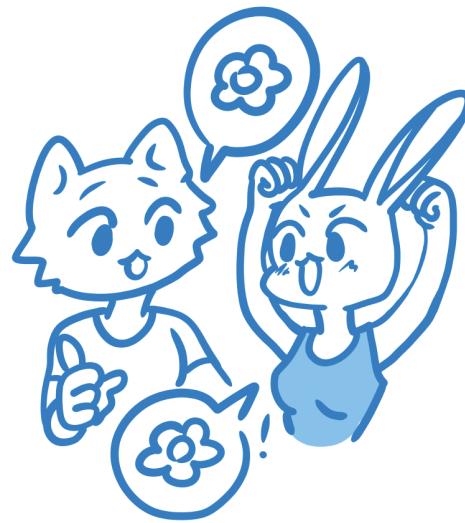
Active learning means learning by doing things. Active learning has been defined by Prince (2004) as any type of instructional method which engages students in their learning process and requires meaningful learning activities.

Conservative teaching models are based on the transmission and memorization of information. Here the teacher delivers the knowledge, he or she is an expert in the thought field of science. Students' role is to memorize the new knowledge. Fortunately, this approach has been rethought and contradicted. Active learning encourages the students' autonomy and participation in their learning process, giving them a leading role and placing the teacher not as a mere transmitter of knowledge but as a facilitator or guide of that learning (Bonwell and Eison, 1991).

The crucial condition for successful active learning are critical thinking skills, which enable students and teachers understand the significance of metacognition to assess their own learning. Metacognition skills are related to planning, mental scripting, positive self-talk, self-questioning, self-monitoring and a range of other learning and study strategies. Active learning requires critical thinking that involves the careful acquisition and interpretation of information and use of it to reach a well-justified conclusion.

In this way the teacher adopts the role of the facilitator of the teaching-learning process, encouraging students to be autonomous and to assume a central role.

Active learning has a lot of profits such as:

- it is the first step to future higher education and helps to develop skills towards self-organizing and building own competencies (the individual studies, self-development),
- it increases the autonomy of the students under the supervision of consultors, teachers or experts within the studied discipline,
- it prepares future employers for long life learning which is the required to adapt to new environments of evolving professions.

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Active Learning to be high–effective should be complex, requiring reflection and metacognition, as well as continuous assessment and feedback. It involves thinking tasks such as analysis, synthesis, and evaluation. The teachers' role is important and should focus on the following actions:

- assist in understanding what the learning objectives, plan and tasks are, and what is the correlation between them, ensure transparency,
- organize the learning environment: classrooms or laboratories as well as the course, programme or instructions to make students save and comfortable to focus on the main learning activities,
- develop measuring and motivating systems, based on the alignment between learning and assessment,
- give continuous, personalized feedback,
- build a pathway to technological literacy,
- encourage collaborative and co-operative learning opportunities for productive group work,
- develop conscious awareness of the sources of messages, their quality and consequences of attending to them,
- combine the learning environment with real-world relevance to enable students understand and solve temporary real problems.

The role of student in active learning is to:

- develop metacognition skills to understand the learning processes and the patterns behind it. This means that students are aware of the self learning, can reflect on past learning, are conscious of the lack of knowledge or can define learning goals,
- design the details of the learning process based on the defined objectives and general plan such as tools, research methods (observation, analysis), information sources, detailed plan,
- use critical thinking in the all steps to select the appropriate information and to create the new one,
- monitor the progress and critically assess the own learning results,
- collaborate with other students.

3.1 Activities to learn

The activities to encourage learning can be chosen depending on the type of knowledge or skills we are to teach / learn, the size of the group of students whether it is a large group, a small one or we work with individual student. The learning is the most effective when it is connected with emotions. What deliver emotions are experience, observation, analysis or solution implementation.

How to learn by doing things?

Around 350 BC, Aristotle wrote in the Nicomachean Ethics (Aristotle et al., 1911) "for the things we have to learn before we can do them, we learn by doing them".

Experience is the first step to learning. It may be an accidental experience, e.g. a dropped glass ball does not break on a hard surface. Such an experience stimulates our curiosity, because the observed phenomenon is not in line with our conviction and the question arises WHY? In turn, the planned experience – when we implement it according to a specific scenario. There is also an experience based on a conscious search, for example when we learn to skate.

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Experience is generally trial and error. The conclusions drawn make us improve our activities to achieve our goals. This is a good method for people who are not afraid to take up a challenge, are open to failure and willing to build their own paths based on an experimental approach to the issue. Learning methods used for experiments can differ from virtual reality, simulation games to basic experiments. The result should be discussed and the following questions can be asked: Did you notice? Why did that happen? Does that happen in life? Why does that happen? How can you use that?

EXPERIENCE IS GENERALLY
TRIAL AND ERROR

Is observation the right method?

Observational learning occurs through observing the behaviour of others. It is a form of social learning which takes various forms, based on various processes. The observation entails the analysis of mechanisms and asking further questions about the rules and principles that emerge during observation. Observation is a fairly safe study, without major emotions, but it works well for students who like stability and certainty of the environment. It does not require interference and great commitment. It is important to note here that the insights of one experience cannot be a specific rule.

Preferred learning methods for observers are: analysis of own and others' experiences, conclusions from observation (discussion of the situation and real events, observation of another person in action), case study of implementations.

Is analysis of learning method?

Analysis is the stage of drawing conclusions from observations and experiences. It is about describing phenomena, showing what can be learned and what has been learned. The analysis may be multidirectional, e.g. SWOT analysis, which identifies opportunities, threats, strengths and weaknesses for a given research area. The conclusions from the analysis can be used in the creation of strategies or plans for further practical activities.

Preferred learning methods are: presentation and building of logical models, structures, processes, analytical and problematic tasks: case studies, research results with translation into theories.

Planning for learning

The stage of applying the knowledge is the stage of organizing and analyzing the conclusions so that they can be related to similar situations in the future and then used. Very often it is connected with implementation of a new solutions, testing and correcting them in order to optimize in subsequent implementations. Preferred learning methods for pragmatic approach are: scenarios, procedures, instructions.

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3.2 Active didactic method

There are a lot of active learning **didactic methods** that can be used and to develop interest, attitudes, opinions, find conceptual relations between different issues. For large groups and classes, the most popular are:

Problem – based learning method uses a specific problem as the initial stage both for acquiring new knowledge and integration process, while expanding and acquiring new knowledge. Students use the previously learned knowledge to discuss and analyse the real contextually rich dilemma or situation and learn new one, which helps them to solve the dilemma. This method allows individual approach of the student to the analysed the issue. The steps are as following:

- creating or learning a problem situation or getting acquainted with the problem,
- gathering information and learned knowledge,
- identification of the new knowledge, sources, tools,
- defining scientific goals,
- formulating problems, criteria of the solutions and work on ideas for solving them relation learned and new knowledge,
- work on problem solutions,
- verifying ideas according to the criteria and choosing the best solution,
- arranging and applying new solutions or presenting them,
- evaluation and feedback from the tutor.

The method assumes independent exploration of the issue, knowledge by students, searching for information necessary for solving the problem.

Project – Based Learning is a method of teaching through projects embedded in the realities of the social life of students, solving important issues for a given community, hence often interdisciplinary. It involves the realization of a larger batch of material over a longer period of time. The goals are set and the process is structured. It is highly recommended for teamwork. It is aimed at shaping the skills of independent work and work planning, searching for information sources, defining problems, searching for solutions, making decisions, cooperation and assessing the effects of work.

Inquiry-based Learning is derived from research practice. It is focused on the active exploration, research, experimentation and creation of the structure of knowledge by the student. The skills of asking questions, formulating problems, analysis and reasoning play an important role. The method implements the assumptions of modern education: critical thinking, creative thinking, cooperation and communication.

Design thinking is an approach to creating new products and services based on a deep understanding of the problems and needs of users. According to the Stanford Design Thinking.
Model it is based on the following assumptions (Figure 3):

- empathize and define – focusing on the user and learning his / her conscious and unconscious needs, what they desire and will use,
- ideate – usually based on creative collaboration to look at the problem from many perspectives, looking for new solutions, going beyond the usual patterns, looking for the innovation,

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- prototype and test – experimenting and testing hypotheses, building prototypes which are technologically feasible and economically profitable and collecting feedback from users frequently.
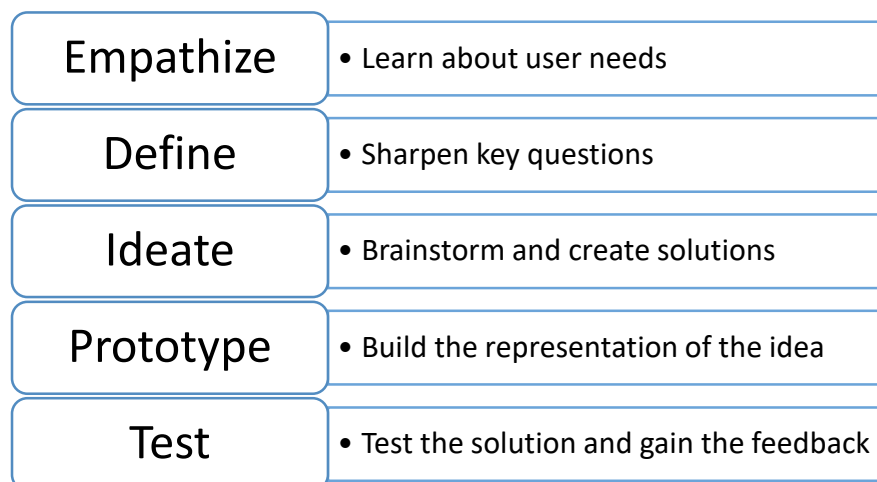
Empathize	• Learn about user needs
Define	• Sharpen key questions
Ideate	• Brainstorm and create solutions
Prototype	• Build the representation of the idea
Test	• Test the solution and gain the feedback

Figure 3. Stanford design Thinking Model.

Critical thinking – is the ability to objectively analyze information coming from available facts, evidence, observations and draw a rational conclusion. It develops skills such as analysis, communication, asking thoughtful questions, ability to solve problems (Figure 4).

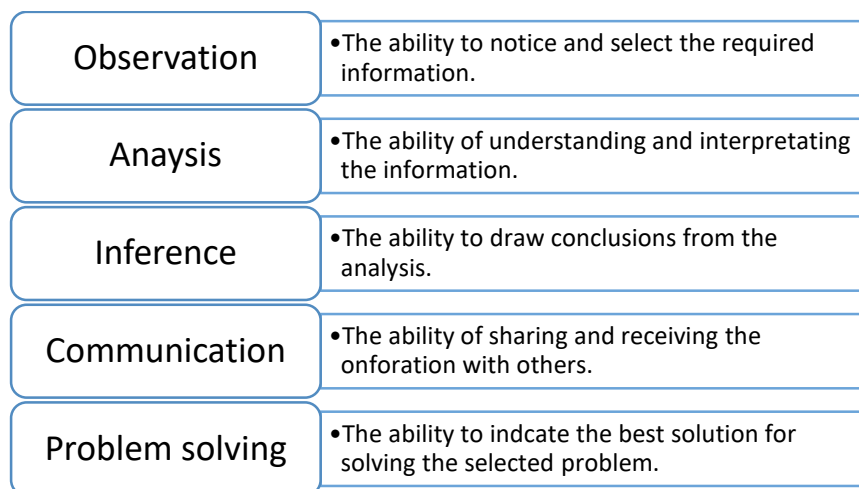| Observation	•The ability to notice and select the required information.
Anaysis	•The ability of understanding and interpretating the information.
Inference	•The ability to draw conclusions from the analysis.
Communication	•The ability of sharing and receiving the onforation with others.
Problem solving	•The ability to indcate the best solution for solving the selected problem.

Figure 4. Skills required for Critical Thinking.

All these active methods require both old and new knowledge. On one hand the more complex problem requiring holistic approach the better results in learning students may achieve. The complex problems show the relations and links between the pieces of the knowledge, develop the analysis skills and make the learning process more interesting. On the other hand, the teacher's role is to choose the case / problem, which is not too complex, what finally may end in students lack of motivation.

These methods are dedicated to groupwork. So that within the group, students' roles can change. This is the opportunity to be at one time the student and at the other the teacher, who transfer the acquired knowledge to someone else.

All active methods contribute to the development of creativity, critical analysis and autonomy in the search for knowledge and provide the acquisition of global and articulated knowledge.

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4   Motivating and activating

I view this year's failure as next year's opportunity to try it again. Failures are not something to be avoided. You want to have them happen as quickly as you can so you can make progress rapidly.
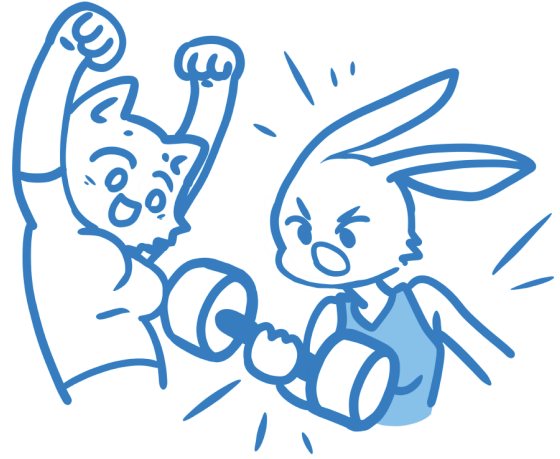
Gordon Moore, Engineer and
Co-Founder of Intel Corporation
'An Interview with Gordon Moore',
Ingenuity 5 (2),
Laura Schmitt (May 2000)

4.1 Motivation

The teaching goal is to teach students:

- new skills, new knowledge and use both in future actions,
- learn efficiently new things by students themselves.

To achieve those goals teachers use different methods of teaching. Some of them are more and some are less effective and efficient. But the most successful are teachers who know how to motivate and engage students in learning, how to combine emotions with good relations, challenges, usability and associations.

There are two ways to motivate students – one is **objective** – for example points or grades for their assignments and the second one **subjective** – related to the **emotions** of students they feel while learning, but also teachers emotions and **relations** between teachers and students.

The correlation between the grades and motivation is obvious – the better grades the higher satisfaction and better motivation for further learning. This is also connected to some effort student has to put into achieving the high grade. If there is no work included and the grades are too easy to be got, then the motivation of the students turns into other topics, as students calculate the time and the effort they put into learning.

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Figure 5. Sources of motivation.

There are two possible directions to motivate students: motivation towards reward and towards punishment.

Reward is something valuable or desired (events or stimuli) increase the likelihood of a preceding reaction occurring again. Continuous amplification is the most effective because it strengthens after each correct operation, but even the use of partial amplification gives resistance to extinction of the enhanced reaction. The reward can be a passed exam, collecting ECTS credits or even the inclusion in the learning schedule. The motivation for the reward defines the goal: what do I want? And how will be achieved (award), e.g. I want to do a good project.

Punishment is the opposite of reinforcement. Punishment is associated with a number of problems, e.g. it can prevent us from changing our behaviour but avoid the punishing person, or learn to manipulate the punishing person (lying). Punishment also causes fear and anxiety, which makes learning uncomfortable. It can also cause aggression. To be effective, it must meet three conditions, i.e. be immediately after action, consistent and associated with positive reinforcement. The motivation towards punishment defines the goal by asking: what do I want to avoid? So we think about the current state, although the target we want to change it, e.g. I don't want to fail the exam.

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4.2 Active learning and motivation

The more students are active while learning, the more emotions are involved and learning is more efficient. Students should be engaged in activities that involve reading, writing, discussing, or problem solving. Active learning can involve individual students in doing things and reflecting on what they have done, or it can involve students working cooperatively in pairs or groups. It requires students to engage in meaningful activities and think deeply about the concepts they're learning. When students engage in active learning—such as working together to apply a new practice – they are more likely to retain what they've learned. A wide number of exercises are considered active learning strategies such as solving case studies, complex problems, or interpreting text. Students can pair, with one individual designated as the explainer and the other as the questioner. As students in active learning monitor the progress and critically assess the own learning results, they need strong personal motivation.

But also teacher's role is to motivate students, which is challenging and sometimes frustrating as a lot of effort can be put with no effects. To do it effectively teacher may use several small methods to differentiate the ways of learning and in this way asking them interesting, bringing fun and positive emotions, and finally use rewards.

Students like interaction with their teachers so try not to be mono-talking person, use questions, reward students, just talk to your students. If the theme of the conversation goes too far from the main topic, but still brings positive emotions, let it be and treat is as an activating method also. Teachers who are elastic have better effects.

Monotony kills learning, do not talk about obvious things or the old ones, be specific on the most important information you want to send to your students and give lots of examples, case studies and interesting knowledge students will not find on the TikTok.

Mind the time as it is precious and valuable. When students see or feel that you are vasting their tome they lose the interest in learning and being active. The level of frustration rises and ruins the whole process of teaching.

To make students feel free to ask questions they must be sure that the teacher treats all questions seriously and there are no "stupid questions". All will be answered either by the teacher or with the help of the teacher which is even better.

MAKE STUDENTS FEEL FREE TO ASK QUESTIONS

Teacher should organize the classes and activities in order to make sure that students are activated each 15 – 20 minutes. Ask questions during classes if students do understand what to do or what they learn.

Make sure that students understand and feel free to ask questions to the teacher and they know the will be given the answer. This confidence is based on good the relation between teacher and the student.

Putting "Are there any questions?" or "yes???" at the end of the sentence kills asking questions, thus try not to use this sentences to ask questions to check if students do understand what you have said or talk about. Instead of this use any of activation methods. For example, ask students to put down Top – ten issues or join students in pairs and ask them to ask two questions prepared by themselves. The make a summing up on the questions which were too difficult to be answered.

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If you have little or no experience with activating teaching methods, it would be advisable to start with small teaching methods that are easy to use during lectures. For example, you may ask students to:

- Repeat the content of the previous lectures or exercises recall the information or skills and prepare students for next steps. (Actively self-monitoring),
- Make quick notes and put down the most important information from the lecture what will help them focus them on the main topic,
- Initiate the discussion or debate on the topic to check what students already know, new knowledge try to linked with the one students already have. Show them the links and connections. (buzz groups),
- Put down questions at the beginning of the lecture and at the end of it ask them to give the answer,
- Say the questions which still do not have the answers after the lecture. This shows what students are curious about the topic and what extend of the knowledge or skills they expect,
- Find the relations between new knowledge and skill with their everyday life or something which is beyond the university and their studies (context),
- Write their thoughts, lesson learnt (assign- in writing),
- Develop a position on a given topic (peer review),
- Find the information on a new topic in the internet, verify it and present to the others (webquest),
- Create exams for example multiple choice questions or open questions (getting ready for the exam).

The more challenging activities to build the motivation based on relations and emotions are:

- **Ice breaker,**
- Three-Step Interviewing, one student interviews another within specified time limits,
- **Mind mapping,**
- **Iconographic,**
- Oxford debate,
- Podcast,
- **Video,**
- Escape room,
- **Game.**

When emotions enter the learning, teachers' role is to monitor students progress. Make sure that the instructions are clear, so that students will know exactly what they are expected to do. Monitor the time as the assignment is completed and provide supervision during the assignment as well. Remain in the classroom as the students are working to answer their questions and give the feedback or tips to improve their work and the output, and to try to activate everyone during their activities. You can also use activating methods such as "peer-to-peer learning", that is, students teaching each other.

Be positive not negative what means that you do not use the word NO while teaching. Replace it with WHY, TRY.

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4.3 Ideas for icebreakers

Icebreaker is a short time activity which integrates and breaks barriers between students. It should be designed to be fun, interesting and proven to accelerate team development, questions or tasks are the perfect way to get your team shivering with excitement. You can use them just as a welcome break form regular activities, to make competition or before regular classes or lecture as a start-up. They can be based on for example on drawing, talking or writing.

Building – ask students to build a paper plane or a tower from the funny blocks,

Asking questions – is a great way to get to know your colleagues, a chance to ask them bizarre questions. Encourage students to write on the paper one question using "would you rather", give it to the person who is next to. Then listen to the answers. Here are some ideas:

- Would you rather eat meat or become a vegetarian?
- Would you rather fly on Mars or Moon?

Drawing – to picture a group hero consisting of students' superpowers or a draw a funny picture without looking at it (one person is to describe the picture),

Creating meme – not as difficult as one may think. Students love it and do it individually or in the group. The mem should present your attitude to climate changes and its effects on you. You can create and share your own viral memes in minutes using for example canvas what is free and easy to be used (see https://www.canva.com/create/memes/).

Discussion – on specific problems can reveal the knowledge, increase communication skills and deliver a lot of emotion when you pick up the controversial topic or picture. "A picture is worth a thousand words" is an English language adage. Pic up the picture presenting the idea and ask students to decide what idea is presented on the picture and describe it in three or five sentences (Figure 6).

Figure 6. Picture of the idea (pixabay.com).

True or lie – students prepare three sentences: two truths or one lie. The others try to guess which ones are lies. The Author of the lie should explain why. Try to focus on pollution, climate changes, water management, city development.

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Strategy development – increase communication skills and group work. **For ex. ask students to** pick up three the most important elements from the set below, which create friendly city and rank them in order of their relevance.

- Access to greenery,
- Friendly neighbours,
- Possibility of public participation,
- Running smoothly government,
- Public transport well developed,
- Education on different levels,
- City monitoring systems,
- Friendly for disabled people.

You can also ask students to develop the strategy for solving pointed problem. For example, students in the limited time should establish a strategy for surviving in the city, which meets the following problems: we do not have a flood in the city, we have a very high air temperature, there has been no electricity in the city for 30 days, the water becomes contaminated with plastic, drinking water is biologically contaminated, drinking water is being drying.

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5   Verification and assessment

> **The secret to success is the willingness to serve without aspiring for rewards.**
>
> Cham Joof, Gambian Historian
> *Gambia, Land of our heritage,*
> p IV

The whole process of education includes the assessment, what helps both teachers and students to verify the learning progress towards achieving the goals and finally reveals whether students have achieved. But do not teach how to pass the tests and do not use tests as teaching method. Use tests only for various types of the assessment.

DO NOT USE TESTS AS TEACHING METHOD

There are two paths of the assessing (https://poorvucenter.yale.edu/Formative-Summative-Assessments) that can be followed:

1) **Formative** – used as a feedback mechanism to identify learning gaps for both the teachers and the students. It helps to improve the teaching methodology and identify the gaps that students have considering knowledge or skill. These assessments help to adjust the instructions and monitor the educational progress. The formative tests can be proceeded throughout the whole process supporting small steps,

2) **Summative** – used to final verification and it is used to collect the evidence of learning knowledge, proficiency or success of the students when finishing the whole course. It is an element of motivation as it assesses their performance.
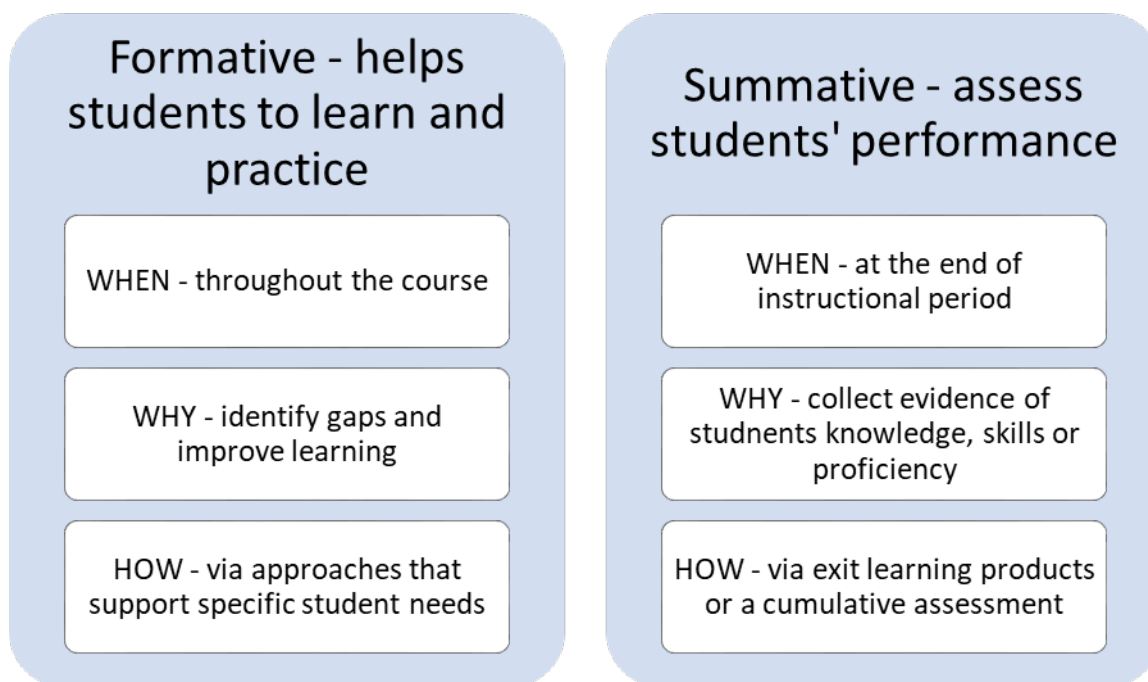
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Figure 7. Formative helps student to learn and practice (left), and summative assesses student performance (right) (https://www.celt.iastate.edu/teaching/assessment-and-evaluation/assessment-overview/).

5.1 Test

One of the methods that can be used to verify the results is a test. This is a quick method strongly correlated with learning objectives, but to be valuable and trustable, needs time to be prepared well. The creation of the tests is not an easy task and it is a real challenge. The questions must be aligned with learning objectives and reflect issues according to given criteria.

Tests can monitor the knowledge based on facts and skills on the analysis, synthesis, application or understanding. To build a test, several different questions (Table 4 and Table 5) can be used:

- **subjective** – permit the student to organize and present an original answer. They are used to explore rather student's attitudes than in measuring his / her achievement,
- **objective** – require students to select the correct response from several alternatives or to supply a word or short phrase to answer a question or complete a statement. The test check ability to think critically, to solve problems and may be reused.

Before the test is created it is worth to ask these questions:

- Will it monitor the progress of the students learning?
- Will it motivate or demotivate students?
- Will it provide any grades?
- What skills will be tested?

The tests can focus on the separate, single issue such as knowledge or represent the holistic approach. For each element, test questions should have different frames:

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Knowledge – the facts and recognition, recalling the information such as dates, names, values, definitions etc.

- Who was the inventor of...?
- Where can you find...?
- What color is...?

Comprehension – understanding the meaning of the information, presenting the interpretations or explanations.

- Describe in your own words...?
- List three reasons for...?

Application – applying general rules, methods, or principles to a new situation to solve a problem.

- How would you apply this approach to...?

Analysis – identifying the organization, relations or patterns within a system and its components.

- Classify ...according to...
- Draw the flow chart presenting the process of...

Synthesis – creating new quality or connections, making generalization of the known patterns.

- What ideas can you use to develop...?

Evaluation – assessing and augmenting, judging.

- How would you decide about...?
- What priority would you give...?

To create the test you may find the tips below helpful:

- **Define the test purpose** – what will be verified knowledge or skills? Is it **formative** or **summative?**
- **Define teaching objectives** – ensure that proper emphasis is given according to the importance of each of the objectives, show the relation between what was and learnt and now is tested.
- **Define assessment rubrics / criteria** – very important for subjective questions such as essay.
- **Choose the testing method** – it should be practical and efficient. Preferably possible to be implemented as digital with automatic summing up the scores etc.
- Calculate needed the time.
- Questions should cover the **topics from the lectures and classes.**
- Give the **precise instructions** for the each type of questions.
- Make the test **possible to be past** select items that at least 50 to 70% of the students can correctly answer, or are of average difficulty.
- Encourage students to **design their own test.**
- Test should give students the **detailed feedback on their knowledge or skills income.**
- Discuss the results with students – **but the discussion is also the element of learning. You may understand why some questions were difficult for students, helps also to evaluate the test and indicated the points to be improved.**

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Table 4. Types of subjective questions used for test.

Type of question	**Short Answer essay**
example	The floods are caused by …..
comments	Moderately easy and efficient to score. Short answer questions provide an opportunity to layer several levels of cognition into student assessments. The answers should be about few sentences but more than three to be beneficial.
required time	120 – 180 seconds per short answer item
Type of question	**Essay**
example	Describe the relation between climate changes and water management.
comments	Easy to do but difficult to identify reliable criteria for scoring. A question, where the candidate can provide an open-ended answer with text require extensive time to grade.
Required time	Fifteen minutes for a limited essay question, and a half-hour to an hour for a broader question requiring more than a page or two to answer.

Table 5. Types of objective questions used for test.

Type of question	**True-False**
example	A flash flood is a rapid flooding of low-lying areas. T / F
comments	Students have a 50-50 chance of getting the right answer by guessing. Considered not to be unreliable form of assessment.
Required time	30 seconds per true-false item
Type of question	**Multiple Choice**
example	Nature based solutions are the solutions use to: A. Produce food B. Protect from floods C. Increase retency D. Increase biodiversity
comments	Difficult and time consuming to create, quick to verify the knowledge even on the advanced level.
Required time	60 seconds per multiple choice item
Type of question	**Matching**
example	Match the causes and the effects of the climate changes A. Increase of the temperature B. Rapid industrialization C. Deforestation D. Pollution E. Energy use 1) Rise of the sea level 2) Human health lost 3) Green gas effect 4) Lost of biodiversity 5) Food security
comments	Matching questions are similar in nature to multiple choice in that they are focused on recall and recognition.
Required time	60 – 80 second
Type of question	**Fill-in-the-Blank**
example	One of the results of climate changes is …..
comments	The correct input can be one or many. This is important while building digital tests for ex. on moodle.
Required time	60 sec.
Type of question	**Problem based questions**
example	If this amount of plastic pollution continues to generate of the next twenty years, what kind of impact would this have on our cities?
comments	These require the student to complete or solve an equation or prompt.
Required time	Assessed individually for the question and expected length of the answer.

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The **pre-test** and **post-test** is the method of the quantitative research / assessment. We use pre-test and post-test studies to observe whether a given factor influenced the change of a variable over time. Studies of this kind of forms are most often in the same group of people. The essence here is to set the measurement of a given variable / feature twice in the assumed time interval, first time at the beginning of the course / module / lecture and the second at the end of it. This method is not used to assess and grade students but to get knowledge how effective learning is and how high is the income of the knowledge. It helps to improve the course or module. To make pre-test and post-test method valuable, the questions should refer to the pack of knowledge which will be introduced / learnt.

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6 Interpersonal communication

> **The single biggest problem in communication is the illusion that it has taken place.**
>
> George Bernard Shaw
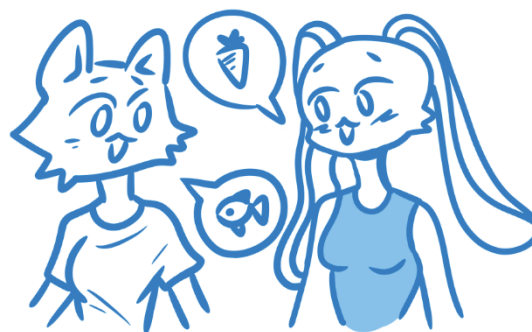
Interpersonal communication refers to the entire process and practice of exchanging ideas, information, and even emotional experiences that can be shared between people.

> THERE ARE AS MANY REALITIES AS EACH
> PERSON DESCRIBES HER/HIS OWN REALITY

The meaning of the message and communication is not just asking questions and providing information, but getting answers to our questions and getting the feedback that we need. Thus, if I do not get the expected information one, it means that not necessary that the other person does not know the answer but probably wrong questions were asked.

For gaining or forwarding the information we use **interpersonal communication**. It consists of spoken or written language, i.e. words, but also non-verbal communication, i.e. body position, gestures, facial expressions, eye movements, physical distance, paralinguistic sounds, eye contact and touch.

The quality of communication is not only determined by the use of a code that is understandable to both the sender (original source) and the receiver (responder / decoder) of the message. It also depends on the channel (medium) that is used to send the message (content). Sometimes communication barriers based on participants' experience and knowledge appear and make it difficult to communicate with each other. This can be verified by the received feedback (receiver to sender and vice versa as the loop).

To use interpersonal communication in teaching and learning, it is not enough for one to be an expert in chosen subject matter. If you want students to learn the material, you must go beyond mere lecturing and apply a broad range of communication techniques. High quality communication enriches teaching and makes it more effective. Thus the rules of communication effectiveness and quality is the key to the success.

6.1 The communication process

Interpersonal communication refers to the entire process (Figure 8) and practice of exchanging ideas, information, and even emotional experiences that can be shared between people. It is based on speaking, listening, written communication and no – verbal communication.

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The sender may have different intensions such as to share with the information or to gain the information. The success depends on the coding of the message. The more precise, simple and clear is the message, the more probable is to get the appropriate feedback from the receiver. The message or question can be also supported with examples or stories.

The transmission can operated be via different channels such as online with audio and video or personal in the direct contact. During the transfer the non-verbal communication plays also the crucial role as if it is consistent with the words it influences receiver emotions and trust, and enables to decode the message appropriately.
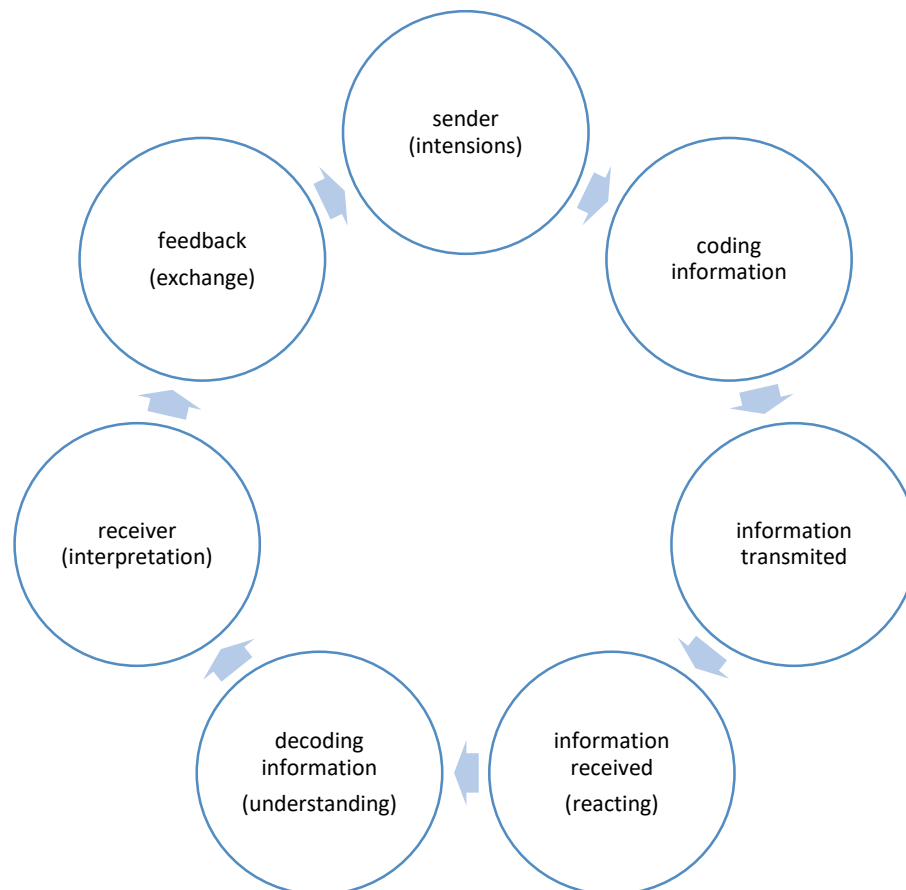
Figure 8. Interpersonal communication process.

6.2 Communication between generation

When people from the same generation communicate, mutual understanding is much better, but when people from different generations are concerned, communication is often difficult. This is due to different vocabulary and different perceptions. Today's students are referred to as generation Z (digitarians), which easily adapts procedures to their needs, is characterized by pragmatism, ambition and goals focused on development. It is a generation prepared for changes and adapting quickly to them. People born after 2000 quickly learn new tools and technologies, **use short messages** and search for information on the Internet. They rather learn using the **keyword search technique** than reading long texts. Teachers are mainly generations X and Y. X are independent and in education they are focused on the role of a coach and mentor using ready-made solutions, generation Y is already playing the role of a partner looking for new solutions

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Considering who our interlocutor is, it is worth preparing didactic materials in a way adapted to proper generation and if we consider temporary students – to Z generation. Instead of long descriptions, the content should be bulleted with links to longer information expanding the topic, drawings, diagrams, tables increase the absorption of knowledge.

6.3 Communication effectiveness

If communication is about getting answers to questions, who is responsible for understanding the message? The answer is simple – the sender. He or she has to prepare a message in a way that depends on the age group, culture, language used by the recipient and the subject matter and purpose.

Understanding the message increases the enrichment of the message with opinions and inspiring examples, allowing the recipient to interact by showing their ideas, brainstorming, focusing on the relationship and showing emotions.

The effectiveness of communication is also related to the interpretation of the message. Interpretation is highly dependent on the speaker's intentions being read, and it connects us to our and speaker's emotions.

In order to communicate effectively, you also need to listen skilfully and show patience. The bridge between the sender and the recipient is the stronger the level of mutual trust and openness to support and team work. The sender's self-confidence and commitment may also be the key. Thus if we want to be understood we must adopt the information to the listeners' level of logic, analytical skills and experience. Talking the same thing we will use different words while talking to the kid, an expert or a student.

Still it is also important to differentiate our expectations towards our recipients. At the university, we treat our students equally. We have the same expectations for everyone, but among them there are people who may struggle with various time or permanent constraints, although they are not formally disabled. That is why it is important to identify these listeners and be ready to act spontaneously.

If we listen to a person who is genuinely interested in the subject, which is talking about, we hear dynamics, joy, commitment and passion. This translates into greater effectiveness of the message because it makes it credible. The speaker's intentions are positive and are perceived as such. As a result, they cause the listener's interest, focus and often infect with enthusiasm. We also get empowerment through making eye contact and gesturing. This results in better assimilation of knowledge, increased interest and searching for information on a given topic also outside of school hours.

However, when we lose interest because the information is incomplete, partial or, conversely, too long and too detailed – which probably required a lot of teacher's work, we spend ineffective teaching time.

Also, the multicultural environment requires special competences of teachers in order to avoid stereotypes and eliminate prejudices. The projection resulting from our own experiences on which we build the assumptions of reality is also a big limitation. The university should be a place where objective, not subjective, knowledge is transferred. This difficulty is basically impossible to eliminate completely – we are human, but at least we should not build rules based on individual experiences as far as possible.

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THE SENDER IS RESPONSIBLE FOR THE TRANSMISSION AND UNDERSTANDING OF THE MESSAGE BY THE RECIPIENT

Mostly we communicate with others making certain assumptions based on our knowledge and experience. Communication based on such an approach may disappoint us when we communicate with a person with different background.

There are as many realities as there are people describing this reality.

The set of possible barriers may be the reason of being not understood. These may be:

- language or culture differences,
- emotional reactions,
- information overload,
- filtering information,
- perceptual errors in non-verbal communication,
- interpersonal relations.

6.4 Public speaking

For most of us public speaking is stressful. Even though we are well prepared, the stress appears and can impact us as a motivation or destroy the show. This also depends on our previous experiences and on the audience – if we know it or not.

Being a good speaker needs a bit of training. It is not only the matter what you say but also how you say. Thus it is valuable to give your students tips on how to make a speech, what are the meanings of the gestures, physical contact, posture or tone, pace, rhythm of speaking or engagement.

YOUR SPEECH SHOULD CHAIN THREE ELEMENTS: EMOTIONS, CONTENT AND EXPERIENCE
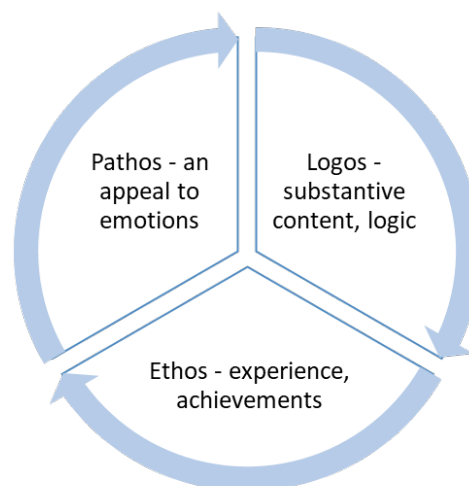

Pathos - an appeal to emotions

Logos - substantive content, logic

Ethos - experience, achievements

Figure 9. Speech elements.

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To strengthen the communication beyond the words you need five drivers:

Do your best – good speaker is an expert and knows the subject, is credible. Prepare for the speech, make notes and use them if necessary.

Make pleasure – use your own energy, gesture and your emotions. Interact with the audience, listen to it, ask questions about their opinion, use storytelling and pictures, jokes. Refer to culture with quotes. Act according to the politeness theory, proposed by Penelope Brown and Stephen C. Levinson. This approach centers on how to take feelings and desires into consideration when speaking and acting. Being nice and polite means acting as to:

- Attend the receivers interest, wants and needs and minimize the imposition
- Put your listener first and maximize the generosity on him.
- Express your approval and solidarity to others and avoid disagreements
- Minimize the expression of praise of self
- Put stress on expression of agreement between self and others.
- Show sympathy and empathy.

Be on time – do not prolong the speech or presentation, make it consistent and pick up the most important issues, Show the logical outline for your understanding the topic. Not long with all parts introduces: introduction, …conclusions… summing up.

Be excellent – do not be afraid, speak as a leader, make people listen to your voice, use modulation, strengthen the posture. When you talk and represent an attitude of trust and dignity, express the self-confidence the communication is more effective. While speaking keep an eye contact with the listener. Your voice should be confident, firm, and full of energy. Strengthen the presentation with an appropriate clothing and gesture. Verbal and nonverbal channels of communication should be consistent. Otherwise the speaker is not found by the receiver as a reliable, honest and trustable.

Control the situation – if the interlocutor is a very specific person and the whole conversation is difficult try to focus on things that you have in common, be cultural and ethical, feel his or her emotions and reflect them. You may also control the communication process when you speak quieter when the interlocutor is loud, talk about the behaviour not about the person, or finally limit the information and focus on benefits from the information.

Use emotions – communication is a process and so that both rational and emotional aspects appear with different pressure at the exact moment. The welcome stage, building contact should be based on emotions, then the receiver is ready for listening and interaction. So the rational meanings are now more important in the communication till the end of the process so that the stage of ending is balanced.

6.5 Oxford debate

"Of all the talents bestowed upon men, none is so precious as the gift of oratory. He who enjoys it wields a power more durable than that of a great king. He is an independent force in the world." – Winston Churchill

For some time now, there have been ideas that everyone of us can do something to help stop climate change or to have significant impact on its effects.

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This idea encourage local governments to increase the awareness about climate change and its effects. It is assumed that citizens are able to monitor and observe their living environment for changes and be active in mitigation and adaption of their surroundings.

A lot of programs such as public projects are developed by the cities to encourage local communities to involve in different actions adapting to climate changes their neighbourhood, but the question is if local communities have the real impact on this global problem and are able to protect themselves from flooding, urban heat islands, disasters and other climate change effects such as social and business threats.

Oxford-style debating is a competitive debate format featuring a resolution (provocative statement) that is supported by one side and opposed by the other. There is an audience vote before and after the debate and the winner of the debate is the team that changes their numbers the most from one vote to the next, rather gains the bigger amount of votes. The audience's vote, plus the judges' scores determine the winner.

Oxford debate enables the acquisition of knowledge and the exchange of views. It involves speakers and the audience in the important process of joint discussion, co-decision making and working out solutions. By debating, you:

- practice the culture of conversation, respect of people different views,
- learn to listen to and respect the arguments of others,
- learn to think critically and analytically,
- formulate and defend your opinion and formulate rational arguments,
- work as a team member,
- prepare for public speeches and appearances.

6.6 The roles

The Chairman conducts discussions and cares for the order and culture of discussions.

Secretary takes care of the order of speeches and that the participants' statements do not exceed the set time. May possibly record discussions.

Speaker 1. Starts the debate, presents the way of understanding the thesis, outlines the lines of argumentation. If there is time, it starts presenting the arguments.

Speaker 2. Presents and develops arguments. If he has enough time, he can start a counterargumentation.

Speaker 3. Conducts counter-argumentation to the other side's statements.

Speaker 4. Summarizes. Reminds the most important arguments. It shows why, in his opinion, it was their team who won the debate.

The Proposal team task is to prove the truth of the thesis. Speakers must demonstrate with their arguments that the postulates or statements contained in the thesis are right or true. The natural advantage of the Pro team is that it initiates the debate, which gives it more influence over the area in which the discussion takes place.

The Opposition team must prove that the postulates indicated by the Pro team in the thesis are incorrect or untrue. The team argues against the thesis, at the same time trying to show errors in the

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opponent's arguments. It is primarily the Opposition that bears the burden of counter-argumentation in the debate. The Opposition's advantage is that its fourth speaker is the last to speak in the debate.

The audience votes and ask questions.

Jury selects the team that, in his opinion, won the discussion. The task of the Juror is to assess the debate from the perspective of an experienced, "trained" and prepared audience.

Assistants of speakers Search for information for debaters.

How the debate is proceeded?

54 minutes

1 min: the Chairman who should always be addressed as Mr / Madam Chairman, opens the debate, introduces the goal and rules of the debate. Then calls on the first speaker to begin the debate.

1 min: It is the duty of the first speaker for the proposition to introduce the other guest speakers. Each speaker should then be introduced by name and with a short one or two line introduction, which can be either humorous or serious.

6 min: Pro Speaker 1 opening statement.

6 min: Con Speaker 1 opening statement.

5 min: Pro Speaker 2 develop arguments.

5 min: Con Speaker 2 develop arguments.

30 min: Q&A session facilitated by moderator, including questions from audience This is the opportunity for the audience to join in the debate. A certain amount of time will be allocated to this and each speech will be limited to an agreed maximum length of time. Speakers must answer questions as asked. One speaker at a time. The Chairman will end the floor debate and call upon the next speaker.

5 min: Pro Speaker 3 conducts counter-argumentation to the other side's statements.

5 min: Con Speaker 3 conducts counter-argumentation to the other side's statements.

4 min: Pro Speaker 4 summation – no new arguments.

4 min: Con Speaker 4 summation – no new arguments.

1 min: the Chairman after the final speeches the Chairman calls an end to the debate and calls for the voting to begin.

1 min: the Chairman polls audience on pro or con position – voting.

General Tips:

Audience have also votes so that make the best logical arguments, add jokes. To make them interested and tackle emotions use communication technics based on anecdotes, examples, stories, jokes.

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Table 6. Jury template.

Jury template					
Date:					
Speaker assessment					
		Speaker 1	Speaker 2	Speaker 3	Speaker 4
Structure of the public speech , clarity of thoughts and structure	0-3				
Verbal communication – language, rhetoric	0-3				
Nonverbal communication – posture, gestures	0-2				
Questions – the quality of the answers	0-2				
Role of the speaker	0-3				
Result					
Team assessment					
Clarity of the team opinion	0-5				
Consistency of the team	0-5				
Argumentation – quality and strength	0-5				
Counterarguments – ability of discussion	0-5				
Individual assessment	0-10				
Result					
Final result					

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7   Results presentation

> **Somewhere, something incredible is waiting to be known.**
>
> Carl Sagan, Astronomer and Popular Science Writer From:
> *That's Weird!: Awesome Science Mysteries,*
> Kendall F. Haven (2001)
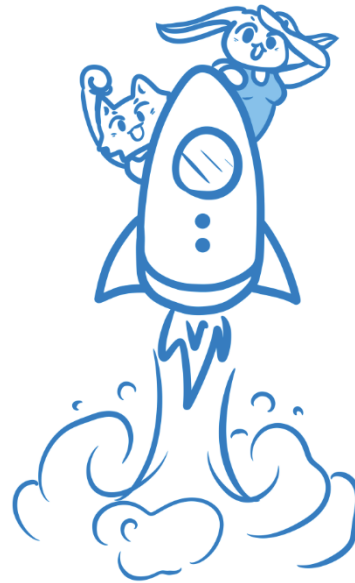
7.1 Presentation

The most popular method for assessment the students output is the project presentation based on slides and speech. The length of time can vary depending on the type of the project, if it is presented by one person or more, if it is an open presentation or only for the teacher, if it is single or few are planned to be done at the same sessions. The appropriate time should be between 5 minutes up to 20 minutes. Short speeches makes students focus on the crucial information that make their project special and exclusive. 10 minutes can be used for presentations were more than one person is engaged, 15 minutes gives plenty of time to the speakers but also often makes the listeners distractive and focus on other things rather than listening to colleagues, 20 minutes should not be used.

The quality of the message is influenced by the way we pronounce words, the dynamics and melody of sentences, the appropriate selection of vocabulary that is popular and used by people to whom we address, and the form of the message.

> *THE CONTENT OF THE MESSAGE IS NOT AS IMPORTANT AS BODY LANGUAGE AND THE FORM OF PRESENTATION*

Table 7. The coherence between speech and presentation.

	Speech	**Presentation**
Clarity	expert language coherence with slides knowledge on key issues	there are all slides and information on slides guiding the listeners introduction (goal, scope) transition (number of the slide, titles, headlines) conclusions bibliography
Style	combination of speech and posture, right tempo, fluent delivery attend the receivers interest, fits time requirement, using emotions	fluent in the deliver nice for the eye and readable nicely polished

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7.2 Pitch

A pitch, also called an elevator speech or an elevator pitch is a brief and concise speech that tells about who you are, what you do, and what you want to achieve. It is named as such since it should be short and compelling enough that you can introduce yourself during an elevator ride. The elevator pitch is a way to share your credentials and expertise quickly with individuals who don't know anything about you[1].

A pitch, no longer than 3 minutes is also a useful method to present a solution to a certain problem. A pitch forces the presenter to focus on the main message and leave not relevant aspects out of the presentation. A pitch is usually done without IT tools. Therefor a good pitch requires practice. A pitch can be also used in a competition. A pitch is another way of communication and it is usually the start of a discussion or interaction. With a pitch you want to impress the audience with your idea or solution that is often new to them. A good pitch generally ends with a call for action.

A good pitch contains two important elements as described in this 2 minutes youtube video[2]. Firstly, what is the 'pain' or 'the problem' that you want to solve. At the start of the pitch the pain should be clear. Secondly you have to present to value proposition, your solution. Your solution should be convincing and irrefutable, so that the investor or the audience is eager to work with you and the solution that you presented.

Important elements of a pitch are: 1) time bound (not more than 3 minutes), 2) it should be easy to understand for the audience, who is often not an expert in your field. 3) In your pitch you should show the added value of your solution, idea. 4) your idea should be irrefutable.

If you want to pitch your idea to a bigger audience or when you pitch on stage, you can follow this structure:

Start of the pitch

- Start with an anecdote or (personal) story to catch the attention of the audience,
- Surprise the audience with a shocking or funny fact,
- 'imagine'…,
- Ask a question to the audience (to get their attention).

Middle of the pitch

- Pain and solution,
- Make the pain real. What is the pain / problem?,
- First the pain / problem, then the solution.

End of the pitch

- Call to action,
- Catch the attention / energizer,
- Not: are there any questions or 'thank you'.

---

[1] https://corporatefinanceinstitute.com/resources/career/elevator-pitch/
[2] https://www.youtube.com/watch?v=Tq0tan49rmc

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Jury, memo and assessment criteria

If an external Jury will judge the pitches, the organizer should prepare a handout with clear instructions to the jury members, that contains the following paragraphs:

1. Introduction

Introduction and explanation of the event with names of the teams or individuals that will present.

2. Name of jury members and their organization / company
3. Program of the day

Table 8. Pitch assessment criteria & points.

Team / name	1 (low)	2	3	4	5	6 (high)
1. Innovativeness / out of the box						
2. Feasibility (technical)						
3. Economic attractiveness						
4. Social and environmental context						
5. Quality Pitch						
6. Quality Poster						
Final ranking						

7.3 Infographic poster

An infographic poster is a visual representation of data that can be used to explain complex information. Infographic posters are often used to tell stories or to show a development now and in the future. An infographic can be used as an assignment for students to attractively visualise the main problems and causes of a certain problem and present the facts and problems attractively with the use of icons. This will serve as communication to the general public.

The concept behind the infographic poster is simple: take your data, organize it into categories, and then display it in a large format (usually poster size). Data can be presented in different ways, using charts, diagrams, maps, and photos. Arrange the information in such a way that it is visually connected. For example, using a quadrant with different colours so that all information flows together visually. It is important to create a cohesive piece of art for viewers to digest at their leisure, whether they're looking at an individual section or taking in the entire image.

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Why use an infographic poster?

Infographics are a great way to share information in an attractive, engaging, and memorable way. They're great for communicating complex topics you want people to remember and understand in a simple format. And because infographics don't need words or lots of text, they also work well on social media. Often it is a challenge for the makers of an infographic to reduce the amount of text.

Why do we create infographics?

The purpose of an infographic is usually to promote an idea, a brand or a certain development over time. It can tell stories about a certain situation or development or make statements about things that matter to the audience, such as environmental issues or sustainability. The use of pictograms helps you to show progress of decline, like population growth or impacts of climate change.

How to make an infographic poster?

Follow these steps to make an impressive infographic poster:

- What is your concept. Your project should be both exciting and valuable for your audience. You will also need to know what data is related to this topic and how much time you can dedicate to the design process. Collecting data can sometimes take days.
- Use an infographic template. Many websites offer free templates, but they're not always easy enough for beginners or don't include all the formatting needed for print projects like posters. If these work well for you and don't require modifications, great! But if not, some other options might be more suitable for your needs—like designing one from scratch using software like Adobe Illustrator or Inkscape (both free!). You can also make use of PowerPoint.
- Create the content itself: What do YOU want to say? How best way possible? Consider ways you might use visuals and words to differentiate between various points made throughout the text; think about how much space each point will take up so as not to crowd everything together too much on screen ("content density"). Then start writing out bullet points based on this plan before moving on next step below…

Where to get inspiration?

- Google Images Search,
- Google Search Results,
- Other Websites: Drawtify infographic maker has many free high-quality editable infographic poster templates and a series of powerful and effective design tools. In addition, it also has a wealth of built-in design plug-ins, such as intelligent charts, maps, QRcode, and barcode generators. Therefore, Drawtify online infographic creator can help designers create infographics more professionally and faster. It gives users the best solutions to create eye-catching infographics quickly.
- Other infographic tools can be found here: 12 Best FREE Tools to Create Infographics (2022 Comparison) (websiteplanet.com).

Steps of the infographic poster assignment

Step 1

Provide learners with their assigned topics. Learners can work individually or in groups. If they work in groups, assign specific roles to each member (e.g., researcher, writer, editor, designer).

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Step 2

Review the learning outcome learners will need to achieve. **Note:** This activity will require that learners find, synthesize, and integrate a range of information and then arrange and design the content in a way that effectively communicates to a specific audience.

Next, review the assignment rubric. This will depend on the learning outcome learners need to achieve, however, common components to an infographic assignment rubric include:

- **Content** – accurate, detailed and well-researched information is presented and supports the topic / purpose or argument.
- **Focus** – all content (visuals & text) are intentional and complementary to the purpose of the infographic.
- **Visual Appeal** – colours, fonts, graphics and data visualization effectively contribute to the topic and message being conveyed.
- **Argument** – the infographic effectively informs the audience of its intended purpose.
- **Organization / Layout** – information is systematically organized and effectively aligns with the main message.
- **Citation** – full bibliographic citations are included for all sources of information referenced.
- **Mechanics** – the infographic is free of spelling and grammatical errors.

Note: It's helpful to show learners examples of infographics used for different purposes. A simple Google image search will bring up hundreds of options to choose from. Ask learners to walk through the rubric criteria and rate the different components of the examples shown.

Step 3

Learners can use software applications such as PowerPoint or Photoshop to create their infographics. They can also explore other free or inexpensive online options. Here are a few of our favourites.

- **Piktochart** – a simple tool to create infographics, presentations, posters, flyers and other visual resources. Watch demo: https://youtu.be/LdRMqJWyvik.
- **Venngage** – another tool for data visualization, explaining processes and communicating information. Visit webpage: https://venngage.com/.
- **Canva** – is similar to Piktochart and Vennage. Canva users can work from templates or create from scratch. Visit webpage: https://www.canva.com/.
- **Socrative** – quizzes, surveys, team activities, and content from educators around the world – all in one easy-to-use assessment tool.
  Visit webpage: https://www.socrative.com/higher-ed/.
- **Genially** – thousands of professional templates, images, and quality content to choose from to create visual content. Visit webpages: https://www.canva.cn/en/, https://genial.ly/.

Step 4

Learners can present their infographic options through asynchronous online discussions, or synchronously by sharing their screens and facilitating a group / class discussion on applications such as Microsoft Teams, Zoom, Blackboard Collaborate, Adobe Connect or other conferencing tools available to them.

Table 9. Infographic assessment criteria.

| Criterium	4	3	2	1
Content	Covers topic in-depth with details and examples. Subject knowledge is excellent.	Includes essential knowledge about the topic. Subject knowledge appears to be good.	Includes essential information about the topic but there are 1-2 factual errors.	Content is minimal OR there are several factual errors.
Graphics	All graphics are related to the topic and make it easier to understand.	All graphics are related to the topic and most make it easier to understand.	All graphics relate to the topic.	Graphics do not relate to the topic.
Attractiveness	Makes excellent use of font, color, graphics, effects, etc. to enhance the presentation.	Makes good use of font, color, graphics, effects, etc. to enhance to presentation.	Makes use of font, color, graphics, effects, etc. but occasionally these detract from the presentation content.	Use of font, color, graphics, effects etc. but these often distract from the presentation content.
Grammar and spelling	No misspellings or grammatical errors.	Two or fewer misspellings and / or mechanical errors.	Three misspellings and / or grammatical errors.	Four or more spelling or grammar errors.
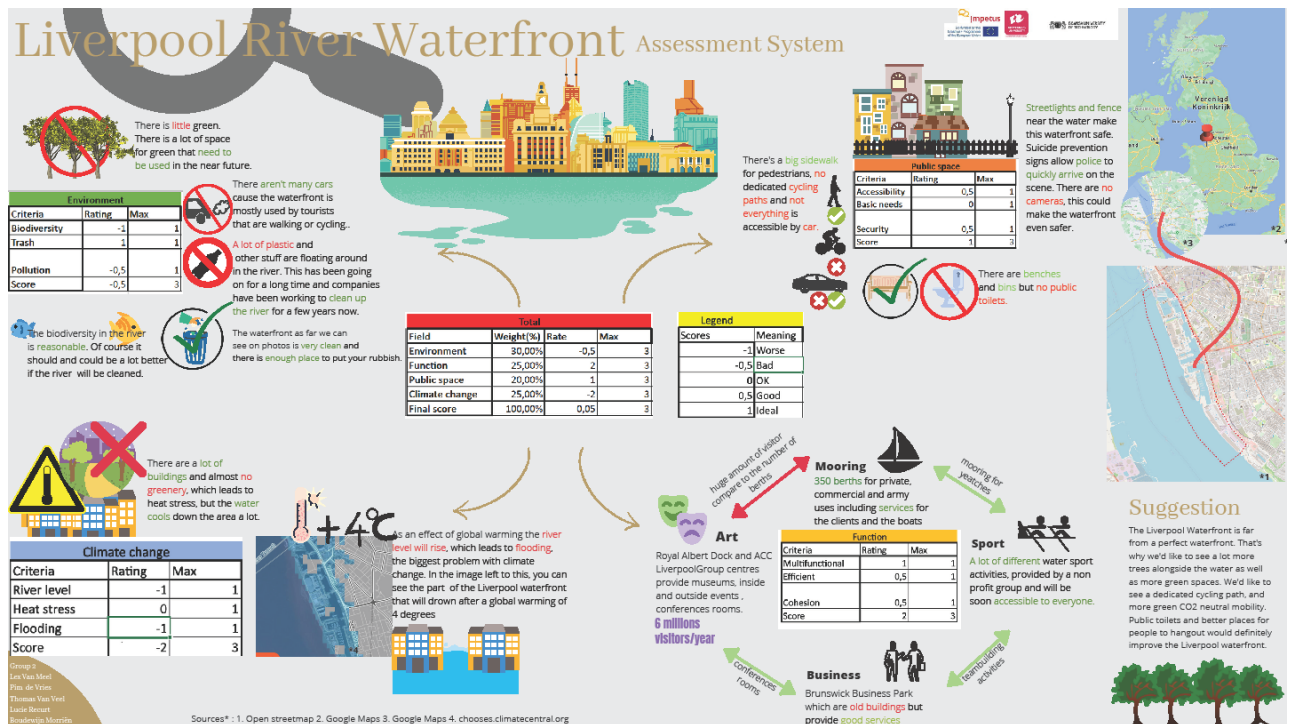
Figure 10. Fact sheet elaborated by students during Climate Cafe organized during Impetus teaching / learning activity.

See Fact sheet.pdf

Link to IMPETUS presentation Factsheet: **Place link to final presentation here**.

7.4 Fact sheet

The fact sheet is a printed document which in a simple form based on the graphics and text that presents the information on the specific topic. Because is preferably be a **single page long** document, the choice of the text and graphics is curtail. This method requires from a student a good selection of the information which mentioned in the fact sheet should be **brief and concise.** A fact sheet should be also **visually appealing** be easily **readable**.

Fulfilling all those requirements it becomes an easy tool to present the essence of the knowledge. It has following advantages as it is the way to:

1) educate non-professionals about difficult topics and make them interested by using the graphics,
2) point out the most important aspects of the selected issues,
3) promote the knowledge as is a comfortable piece of art to put on social media and disseminate via digital media.

To achieve the goals Fact sheet should be simplified and written in nonprofessional language but not in jargon. Comparisons and analogies are beneficial. The text should be short and focus on the most important facts. Change as many of the text into the charts and tables, no additional description of them is needed. The set of the presented information should be self-contained.

The page of facts should contain the title of the presentation and the word "Fact Sheet". Make simple charts, tables and graphics to visualise the facts. If possible refer to other materials, articles to enable readers looking for more information on presented facts. What is more shorten the text by using acronyms (explain them first). For more detailed information see: Fact Sheets – Center for Rural Health Communication Toolkit (und.edu).

Look at some examples: https://projects.au.dk/healthygrowth/case-study-and-fact-sheets.

7.5 Video

Social media have revolutionized the way humans communicate and socialize. Education is also changing; social media are transforming educational environments, and online or blended learning are increasingly used. The COVID-19 pandemic has further accelerated this change (Escamilla-Fajardo, Alguacil, & López-Carril, 2021). Social media is becoming more and more integrated in our daily lives. Facebook, Instagram, WhatsApp, Tiktok, and other platforms are used by people around the world to share information and short movie clips. These social media platforms can increase awareness about climate change and vulnerabilities and inform the public about issues in their local neighbourhood. The ability to make short movies and video clips is increasingly becoming an important communication skill for students in Higher Education Institutes. These skills match with the horizontal priority of the European Union of open education and innovative practices in a digital era and promotes excellence in student driven skills development. The competence that is addressed with the short movie clip making is the competences: innovation driven, demand driven, collaborative working and interactive learning.

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Data collection protocol & methodology

Before you start making the movie you should consider the following:

1. Which vulnerabilities do I want to communicate?
2. How can the video help me to involve the community?
3. Who is the audience?
4. How do I make the video interesting and entertaining (and not boring)?
5. What message do I want to communicate?
6. What is the expected impact of the video?
7. Do I wish to make 2 videos of 2 cities or do I wish to combine 2 cities in one video?

If you answered these questions you can proceed to the next phase:

1. Before you get started, make sure you read and study everything you can online about the filmmaking process.
2. Make videos and pictures in your neighbourhood or city.
3. Make a screenplay for about 5 scenes. Look for information on the internet.
   https://www.wikihow.com/Write-a-Screenplay
4. Select an app you want to use to make your movie. Find manuals online like:
   a) https://www.wikihow.com/Use-Windows-Movie-Maker
   b) https://animoto.com/resources/tutorials/how-to-create-a-video-in-animoto
   c) https://www.wikihow.com/Create-a-Short-Film-Only-Using-Android-Smartphone

You can download any video maker from Google Play Store, and search for good options online (check the reviews). When you find one that you like, use it to trim your video and merge your different scenes into one film.

If you have a computer rather than an Android phone, you can download any video application on your computer. If you need a better application, just search Google for reviews.

Link to example video's:

Videos from IMPETUS ClimateCafé Groningen: https://climatecafe.nl/2021/03/climatecafe-impetus-collect-climate-data-in-your-city-april-12-16/

Watch all videos on: https://climatecafe.nl/news/

1.7 Software

There are several tools which may help to activate students. Most of them are accessible by using mobile phones so they are very comfortable to be used both in classes or in the field. All are free but also have the additional features when paid.

- **Mentimeter** – to pose a question easily and within a minute or two, have aggregated responses from every participant (https://www.mentimeter.com/).
- **Google disc** applications – very efficient and intuitive to create questionnaires, websites, and other formulares.
- **Piktochart** – a simple tool to create infographics, presentations, posters, flyers and other visual resources. Watch demo: https://youtu.be/LdRMqJWyvik.
- **Venngage** – another tool for data visualization, explaining processes and communicating information. Visit webpage: https://venngage.com/.

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- **Canva** – is similar to Piktochart and Vennage. Canva users can work from templates or create from scratch. Visit webpage: https://www.canva.com/.
- **Socrative** – quizzes, surveys, team activities, and content from educators around the world – all in one easy-to-use assessment tool.
- **Genially** – thousands of professional templates, images, and quality content to choose from to create visual content. Visit webpages: https://www.canva.cn/en/, https://genial.ly/.
- **Vimeo** – easy online video maker with ready-made templates or possibility to create your own ones. Visit website: https://vimeo.com/create/templates.

8   Literature

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9   Attachment (The questionnaire)

Future skills and teaching methods (Higher Education)

This questionnaire is directed to academic teachers in higher education (HE). The word "teacher" refers to faculty, researchers, professionals, and other non-academic staff who teach.

The aim of this study is to learn about universities educational standards. We would like to know what student's skills are taught and which teaching methods are used to achieve educational results.

It is divided into 4 sections:
- teaching methods and forms,
- group work features,
- future students' skills,
- future teachers' skills.

The questionnaire is anonymous and takes about 15-20 minutes to finish. Participation in this survey is voluntary and any individual may withdraw at any time.

When in doubt about any aspect of the questionnaire, or if you would like more information about it or the study, you can reach us by mailing at:
dominika.wroblewska@pg.edu.pl

The results of this research will be published on https://impetus.aau.at

Thank you very much for your time and cooperation!

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Background information

The questions are about you, your education institute and position, the time you have spent in teaching.

Higher school

Please give a name of your Institution in English for ex. Gdańsk University of Technology.

_____

Country

_____

What is your field of teaching according to OECD Research Areas?

O Natural sciences
O Engineering and technology
O Medical and health sciences
O Agricultural sciences
O Social sciences
O Humanities

What is your academic position?

O research
O research and didactic
O didactic

How long have you been working as a teacher?

O < 4
O 5 – 10
O 11 – 15
O 16 – 20
O 21 – 25
O > 25

Teaching methods and forms

In this section we would like to learn about teaching methods and forms, which you use in your teaching process.

How often did you use following approaches to education BEFORE COVID-time.

	never	seldom	often	always
Full-time in contact (teachers' and students' contact hours)	O	O	O	O
Blended-learning (hours in contact supported with online activities and materials)	O	O	O	O
E-learning (combined use of computer hardware, software, and educational theory and practice to facilitate learning)	O	O	O	O

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How often are you going to use following approaches AFTER COVID-time?

	never	seldom	often	always
Full-time in contact (teachers' and students' contact hours)	○	○	○	○
Blended-learning (hours in contact supported with online activities and materials)	○	○	○	○
E-learning (combined use of computer hardware, software, and educational theory and practice to facilitate learning)	○	○	○	○

How often do you use the following teacher-centered methods?

	never	seldom	often	always
Traditional lectures – students listen and take notes	○	○	○	○
Training based on steps, procedures and instructions	○	○	○	○
Observational learning – students observe experiments done by the teacher	○	○	○	○
Presenting material using multimedia and presentations	○	○	○	○
Telling students to read a textbook on a topic	○	○	○	○
Summative tests and exams	○	○	○	○

How often do you use the following student-centered methods?

	never	seldom	often	always
Group discussions (different kinds)	○	○	○	○
Case-study learning (training by analysis of specific cases)	○	○	○	○
Storytelling (based on myths and stories from professional life)	○	○	○	○
Game-based learning (knowledge or skills are gained by playing or designing educational games)	○	○	○	○
Project-based learning (training by designing the solution for a specific problem)	○	○	○	○
Role-playing games and simulations (games played according to a previously prepared scenario)	○	○	○	○
Brain storming (forming and presenting as many radically different ideas and opinions ona given topic as possible)	○	○	○	○
Problem-based learning (traning by solving problems and finding the optimal solution)	○	○	○	○
The metaphor game (find a new way solving a problem within the given metaphor)	○	○	○	○
Self assessment (student asses themselves)	○	○	○	○
Peer assessment (students asses other students)	○	○	○	○

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Please indicate usage of following approaches:

	I do not use and I will not use in future	I do not use but I intend to use in future	I use and I will continue
Interdisciplinary approach	◯	◯	◯
Cooperation with external partners (private or public sector)	◯	◯	◯
Correlation with scientific projects	◯	◯	◯
Joined education (with other HE)	◯	◯	◯

Please share your comments on teaching methods.

_____

Group work features

This section is to find your role when you work with student groups.

What is your role when you use group work?

- ☐ define the learning objectives for the activity
- ☐ prepare instructions, milestones
- ☐ assign students to groups with regard to particular skills or abilities relevant to group tasks
- ☐ wait for group work results without interfering
- ☐ monitor group interactions and progress
- ☐ help students move forward on the task
- ☐ provide feedback on group and individual performance
- ☐ assess the group work results
- ☐ use self-assessment (students assess themselves)
- ☐ use peer-assessment (students assess one another)
- ☐ encourage to reflect on what worked well and wrong in groups
- ☐ other...

How well are you prepared to build a student team?

	1	2	3	4	5	
not at all	◯	◯	◯	◯	◯	very well

How well are you prepared to moderate a student team?

	1	2	3	4	5	
not at all	○	○	○	○	○	very well

Future students' skills

This section is devoted to the future relevant student's skills and goals, which reflect the local / global economical, political and social changes and may be important for future professional work in different environments [Ulf-Daniel Ehlers "Future Skills – Future Learning, Future Higher Education", Karlsruhe, Germany, 2020]

The explanation of skills

1. Critical thinking refers to logically assesing information to make up decisions.
2. Creativity involves seeing concepts in a different light and to innovative thinking and problem solving.
3. Collaboration involves group work to achieve a common goal.
4. Communication is the practice of conveying ideas.
5. Information literacy gives the tools needed to distinguish fact from fiction.
6. Media literacy helps analyze media and digital tools.
7. Technology literacy involves understanding different applications.
8. Flexibility is an ability to adapt to changes.
9. Leadership involves abilities to influence and guide others.
10. Initiative relates to employees starting projects, creating plans, and executing strategies on their own.
11. Productivity measures how well someone is able to prioritize, plan, and manage their work.
12. Social skills refer to the skills needed to interact effectively with others.

What future skills that do you teach students and why?

	I teach	I do not teach but I am going to	I do not teach as I do not have possibilities	I think there is no need to teach it.
1. Critical thinking	○	○	○	○
2. Creativity	○	○	○	○
3. Collaboration	○	○	○	○
4. Communication	○	○	○	○
5. Information literacy	○	○	○	○
6. Media literacy	○	○	○	○
7. Technology literacy	○	○	○	○
8. Flexibility	○	○	○	○
9. Leadership	○	○	○	○
10. Initiative	○	○	○	○
11. Productivity	○	○	○	○
12. Social skills	○	○	○	○

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Future teachers' skills

Please indicate skill you would like to develop including approaches, strategies, techniques, tools, and examples of innovative relevance for the following methods:

How well are you prepared to build a student team?

- [ ] Universal Design for Learning (engagment, represantion, action and expresion)
- [ ] Digital Competence Framework (apps, moodle, free software, social media...)
- [ ] Game-Based Learning and Gamification, Escape rooms
- [ ] Project-based Learning
- [ ] Creativity
- [ ] Collaboration and teamwork
- [ ] Critical Thinking
- [ ] Agile education
- [ ] Motivation and student activation methods
- [ ] Design Thinking
- [ ] Active learning
- [ ] other...

Thank you very much for your cooperation!

This is the end of the questionnaire.

If you have any questions, please write to dominika.wroblewska@pg.edu.pl

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Team building template

Team identification	
Name 1	*Write your skills / knowledge which are valuable* *For the project / activity*
Name 2	
Name of the group	*Find the best name of the group reflecting the members or the main ideas the group would like to follow*
Logo of the group	*Logo should be as simple as possible reflecting somehow your team*
Motto of the group	*Find the statement which will be motivating you*
Our goal	*Define the most important goal apart from learning new things*
Our reward	*What will you do when you finish the activity successfully?*
Contract rules	
Rule 1	*For example: decisions are made by voting*
Rule 2	
Project Management	
Name 1	*Assigned roles*
Name 2	*Assigned roles*
Server	*Virtual disc to upload and share files on tasks*
Communication channel	*MS Teams / zoom / FB / other*

Task assignment			
Date	Name of the team member	Activity she / he will conduct	What is needed?
Make as many rows as you need			

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Self assessment group work template

	Skills	Points
Communication Skills	I can lead a discussion regarding a presentation presented	
	I can draw conclusions and formulate fully justify opinions	
	I Can be Effective in resolving problems	
General Team Skills	I can obtain information from literature, databases and other sources	
	I can work efficiently	
	I can integrate socially	
	I can critically evaluate my work	
	I can integrate the obtained information, interpret and critically evaluate it	
	I can motivate and support team members	
Technical Skills	I can document the results of an analysis	
	I can prepare project documentation	
	I can prepare and make a presentation on the implementation of a project or research task	

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Jury template

Jury template					
Date:					
Speaker assessment					
		Speaker 1	Speaker 2	Speaker 3	Speaker 4
Structure of the public speech , clarity of thoughts and structure	0-3				
Verbal communication – language, rhetoric	0-3				
Nonverbal communication – posture, gestures	0-2				
Questions – the quality of the answers	0-2				
Role of the speaker	0-3				
				Result	
Team assessment					
Clarity of the team opinion	0-5				
Consistency of the team	0-5				
Argumentation – quality and strength	0-5				
Counterarguments – ability of discussion	0-5				
Individual assessment	0-10				
				Result	
				Final result	

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Pitch assessment criteria & points template

Team / name	1 (low)	2	3	4	5	6 (high)
1. Innovativeness / out of the box						
2. Feasibility (technical)						
3. Economic attractiveness						
4. Social and environmental context						
5. Quality Pitch						
6. Quality Poster						
Final ranking						