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HOW TO DEVELOP ABILITIES TO INNOVATE IN LIFELONG LEARNING PROCESSES: CREATIVITY AND LATERAL THINKING
Learning Outcome: Creativity and Lateral Thinking
- involving the skilful and imaginative use of something to be produced. Creativity and originality are more important than technical skills. (Oxford Dictionary)

LEARNING UNIT 1

What indeed is a creativity and lateral thinking? Theoretical concepts and perspectives to use it within vocational education

The Learning Unit 1 is dedicated for discussing and clarifying the conceptions of Creativity and Lateral Thinking. The Unit winds up with presentation of several techniques of developing Creativity and Lateral Thinking into education processes.

1.1. DIDACTIC UNIT: CONCEPTION OF CREATIVITY AND LATERAL THINKING

One of the challenging tasks for teachers nowadays is to "teach creativity", by somehow inspiring their students be more creative in their learning and daily solutions. The important questions we raise ourselves are: what is creativity? Creativity for what purpose? What are the best ways / methods for training creativity? As Dr. E. de Bono states – *the purpose of creativity is to arrive at an effective new idea, not to offer some bizarre gimmick.*

Starting the discussion on creativity in education, we may think on who is our target group. Who are creative persons? How can we recognize creative ones? In this point, a quote of Frank Barron could be referred *"The creative person in more primitive and more cultivated, more destructive, a lot madder and a lot saner, than the average person."* Bill Hewlett says that *"Creative people have an abiding curiosity and an insatiable desire to learn how and why things work. They take nothing for granted. They are interested in things around them and tend to stow away bits and pieces of information in their minds for the future use. And, they have a great ability to mobilize their thinking and experiences for use in solving a new problem."* At the same time Theodore Levitt notices that *"A consistently highly creative person is generally irresponsible."*

> ***Assignment for the group – refer to the Learning Activity 1.1.1.***

If you had to provide a working definition of creativity, how would you define it? Quite a few descriptions of creativity can be found:

- Creativity can be described as involving the skilful and imaginative use of something to be produced. Creativity and originality are more important than technical skills. (Oxford Dictionary)
- Creativity is marked by the ability or power to create to bring into existence, to invest with a new form, to produce through imaginative skill, to make or bring into existence something new. (Webster's Dictionary)
- a mental and social process involving the discovery of new ideas or concepts, or new associations of the creative mind between existing ideas or concepts. (Wikipedia)
- the process of developing new, uncommon, or unique ideas. (National Association for Gifted Children)
- using imagination rather than imitating something else. (Oregon department of education)
- Creativity is the process of bringing something new into being... (Rollo May in Kettering, Ch.)
- Creative thinking involves imagining familiar things in a new light, digging below the

surface to find previously undetected patterns, and finding connections among unrelated phenomena. (Roger von Oech in Kettering, Ch.)

- Whatever creativity is, it is in part a solution to a problem. (Brian Aldiss)
- Creativity is allowing yourself to make mistakes. Art of knowing which ones to keep. (Scott Adams)
- Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty because they didn't really do it, they just saw something. It seemed obvious to them after a while. That's because they were able to connect experiences they've had and synthesize new things. And the reason they were able to do that was that they've had more experiences than other people. (Steve Jobs)
- Creativity is thinking up new things. Innovation is doing new things. (Theodore Levitt)

Practical assignment
Reflection:
The understanding of what creativity is, is the matter of personal experiences and goals. Try to define in your own words what creativity means form you.

Some of the following motivational quotes may help us to create the *recipe* of creativity:

"Take the obvious, add a cupful of brains, a generous pinch of imagination, a bucketful of courage and daring, stir well and bring to a boil." (Bernard Mannes Baruch)

"I must create a system or be enslaved by another man's. I will not reason and compare; my business is to create." (William Blake)

The three elements can be distinguished in the definition of creativity:

1. Being creative involves using the imagination in certain ways.
2. Being creative implies the use of imagination leads to new, original ideas.
3. These new ideas can be used for design or redesign.

As Master Trainer in de Bono Thinking, Graeme Allan states, these are the main principles of creativity:

- Creativity cannot be taught! Creative thinking can!
- Creative thinking is the foundation for lateral thinking.
- Creativity is innate (inborn).
- Creativity is a characteristic of talented people.
- Creativity is a characteristic of certain sorts of people.
- There is no possibility of creativity unless basic needs are met first.
- The relationship between creativity and psychological health is becoming closer.
- If various factors are in place including cultural and motivational factors, creative thinking and lateral thinking can generate creative ideas.
- The best context for training in creative thinking is in a practical context, where students use their thinking tools for a purpose.

Sternberg, O'Hara and Lubart (1997) states that development of creativity needs certain distinct but interrelated resources, all of which must be present to get a positive result when they

are combined:

- Knowledge – knowing what is new, not just reinvented;
- Intellectual abilities – generating, evaluating, and executing ideas;
- Thinking styles – a preference for thinking in novel ways of one's own choosing;
- Motivation – making a move, having fun. Goleman and colleagues emphasize that the internal motivation is of a great importance for the creativity of a person, and that the main main factor, helping to develop creativity is not limited time: "person needs time to freely research, go deep and enjoy a certain activity and to "domesticate" it. The big crime against the person's creativity is "kidnapping" their time. (Goleman, Kaufman ir Ray, 1992)
- Personality – determination and persistence in overcoming obstacles
- Environment – one that supports the investment game and spreads the risk.

Lateral Thinking is de Bono's alternative to 'teaching creativity'. Lateral thinking is based on three things, creative challenge, alternatives and positive provocation.

LEARNING ACTIVITY 1.1.1.	Who is a creative person?
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participants will be able to: • Name the list of characteristics of a creative person • Generate ideas how to encourage these characteristics in their students
Summary of the Activity	This activity is devoted for opening up the topic of creativity and lateral thinking in education, by sharing ideas of who the creative person is and how to enourage creativity in our students.
Duration of the Activity	Discussions in group: 15 minutes General presentation to the rest of the group: 10 minutes Total: 25 minutes
Aims of the Activity	The activity aims to: • serve as an ice-break, before deeper discussions on creativity and lateral thinking in education, • get to know personal opinions and experiences of the group participants
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Paper, pens.
Methodology to Implement and Develop the Activity	Split into small groups of 3-5 persons, brainstorm and prepare the group answers to the following questions: • How would you describe who the creative person is? • What are his/her characteristics? • Do you agree with the thoughts, presented in the above quotes? Try to imagine the idealistic picture of the creative student you would want to educate. Brainstorm.
Guidance once the activity is over	It is important that the participants reflect not only about their experiences, but also some projections to the future. After carrying out this task, the participants should have one common list of the characteristics, describing the creative person.

Assessment of the Activity	Active participation of participants Directing questions of the lecturer
Improvement Proposal of the Activity	

LEARNING ACTIVITY 1.1.2.	Creativity in education: own experiences
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participants will be able to: • Construct the individual approach towards the concept of creativity. • Recognize and identify the features of education for creative thinking. • List the general suggestions on how to include the creative thinking into own subject curriculum.
Summary of the Activity	This activity is devoted for opening up the topic of creativity and lateral thinking in education, basing on the personal experiences of the participants.
Duration of the Activity	Discussions in group: 15 minutes General presentation to the rest of the group: 10 minutes Total: 25 minutes
Aims of the Activity	The activity aims to: • serve as an ice-break, before deeper discussions on creativity and lateral thinking in education, • get to know personal experiences of the group participants • make the introduction to the topic.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Paper, pens.
Methodology to Implement and Develop the Activity	Split into small groups of 3-5 persons, and: • Describe what is the situation with creativity in education in your institution? Is there any? If so, provide best examples. If it is not the case, try to find what the obstacles are. • What could be improved; what and how should education of creative thinking included into the curriculum? • Brainstorm how the education of creative thinking could be included in your own subject curriculum. All participants should, basing on the presented information of what creativity and lateral thinking is, present their personal experiences from their work / learning process, if there are any appraisals of creative thinking education.
Guidance once the activity is over	It is important that the participants reflect not only about their experiences, but also some projections to the future. As this is only an opening activity, the discussions can be quite general, the group should not go into details. However, best examples should be recorded for further reference.
Assessment of the Activity	Active participation of participants Directing questions of the lecturer

1.2. DIDACTIC UNIT: WHAT CHARACTERIZES CREATIVE PERSON?

Once we are talking about creativity, we should also answer ourselves a question about who is a creative person – Creative teacher? Creative student? This didactic unit will help us to make the picture of a creative person, and to reflect on ourselves, trying to understand how creative we are, and can we educate other to be creative.

It is said that the creative person is the one, who thinks freely and just doesn't kill the creative ideas, but below there is a more detailed list of characteristics, possibly belonging to a creative person. Let's discus about them:

1. *Curiosity*. Creative people are curious. Curious people always raise questions – what is that? Why is that? How does it work? What are the other possibilities / alternatives? What if…?

2. *Seeing problems as new challenges*. Creative people are not afraid of innovations. They believe that problems are not obstacles, but rather a stimulus for them to learn something new. They seek problems, find them interesting and see them as opportunities. They like to be challenged, and they see problems as natural part of life. Usually the best ideas are born in times of challenges and crises!

3. *Constructive Discontent* (in Rowse, 2007). Creative people often have an acute awareness of what's wrong with the world around them – however they are constructive about this awareness and won't allow themselves to get bogged down in grumbling about it – they take their discontent and let it be a motivation to doing something constructive.

4. *Optimism*. Creative people believe that most of the problems have at least several solutions.

5. *Wild imagination*. Creative people usually never have one idea. They have many alternatives.

6. *Not being afraid to sound or look crazy*. Creative people have many alternative ideas and are not afraid to share them. Even though some of the ideas may look crazy, but often a crazy thought gives birth of a new and great idea.

7. *Having collection of Good ideas*. Creative people look for stimulation and inspiration in everyday situations, so they collect and record all that they think is a good idea: aphorisms, pictures, interiors, photos, hand-crafts, their own thoughts, etc. in their computers they often have a folder called something like "Good ideas", have a special notebook, write blogs, and so on.

8. *Criticizing in time and in place*. New and creative ideas are very vulnerable to the attack of critique (read more in the next didactic unit), but the constructive critique by itself is the engine for creativity. Creative people are able to suspend their judgment.

9. …… what are your suggestions? What else characterize creative people?

LEARNING ACTIVITY 1.2.1.	How creative are we?
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participants will be able to: • Reflect on how creative persons they are • Identify areas where they need to pay more attention in order to become more creative
Summary of the Activity	This is the self-anaysis tool, allowing participants to reflect on how creative they are. They will evaluate themselves in each of the statements from 5 (totally agreeing) to 1 (totally disagreeing).
Duration of the Activity	For individual work: 15 minutes For discussing the results of the test with the group: 20 minutes Total: 35 minutes
Aims of the Activity	The activity aims to mirror the participants about their creativity, basing on some general statements that characterize a creative teacher.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Printed sheets with the questionnaire for each participant Pens
Methodology to Implement and Develop the Activity	How much are we the creative thinkers? Read the simple statements and think about yourself. Evaluate how you feel about each of the statements: 5 – deeply "yes" and 1 – absolutely "not".

1.	I spend much of my time looking for something new to learn.			
5	4	3	2	1

2.	I am so happy when I receive a new task in my work even if I don't know how to do it, as I never done it before.			
5	4	3	2	1

3.	I collect the good ideas that I find accidentally. I use my collection when I prepare for my lectures.			
5	4	3	2	1

4.	I like to share and discuss my ideas with others.			
5	4	3	2	1

5.	I am not afraid to give many alternatives, even if some of them may sound totally crazy.			
5	4	3	2	1

6.	In my work and at home I always notice some details that can be improved.			
5	4	3	2	1

7.	When I notice that something needs some change (innovation of improvement), I quickly think of some alternatives how to do it.			
5	4	3	2	1

8.	I believe that my students have dozens of good ideas and I encourage them to share and implement these ideas.			
5	4	3	2	1

9.	I try to keep myself updates of all the new things that are happening in my subject: I search on Internet, follow blogs on the topic, read books and journals, meet my peers for discussion, etc.			
5	4	3	2	1

10.	After each year of teaching I renew my subject curriculum with new teaching methods, revise my slides, etc.			
5	4	3	2	1

11.	I am eager to get the feedback about my work (may it be good or bad) from my colleagues and my students.			
5	4	3	2	1

12.	I have "discovered" some perfect teaching methods that works in the classes of my teaching subject.			
5	4	3	2	1

How many fives do you have? What, do you think, are the ways to become even more creative? Generate them with the rest of the group.

Guidance once the activity is over	After participants finish to fulfill the questionnaire, it is important that they discuss the results with the rest of the group, and generate / brainstorm several ideas how to become more creative.
Assessment of the Activity	Active participation, dialogue, ideas how to educate creativity in ourselves.
Improvement Proposal of the Activity	

1.3. DIDACTIC UNIT: LIMITING CREATIVITY

Beside the discussion about what is creativity and how to prompt it, it is worth to describe the limitations that may block the development of creativity.

According to Stenberg and Williams, there are three types of thinking: analytical, creative and practical. More about it, including the active verbs, describing the certain type of thinking, see the table below:

Analytical	Creative	Practical

Analyze	Create	Apply
Critique	Invent	Use
Judge	Discover	Put into practice
Compare / contrast	Imagine if..	Implement
Assess	Suppose that..	Employ
Evaluate	Predict	Render practical

Many agree that in nowadays curriculum, the dominating types are analytical and practical, whereas the creative if often treated taking lots of time therefore often minimized or excluded.

Hanks and Perry (1991) have listed twenty two barriers, which may block the development of creative ideas: traditions, control, over-specialisation, negativity, myths, fair of failure, impatience, monotone, fair of being jeered, lordliness, lack of financing, mess, insecurity, envy, group thinking, laziness, apathy, lack of liability, lack of support, intolerance, strain and fair of change. It is of a great importance to be able to recognize these barriers, blocking creativity, so that they can be dealt with. In case of a teacher, the complex role is to help learners to recognize the barriers, blocking their creativity.

Hensy and Amabile raise the idea that the most important in teacher's work is not to "kill" people's creativity, and define seven creativity killers (in Goleman, Kaufman and Ray, 1992).

1. **Surveillance** – Hovering over people, making them feel that they're constantly being watched while they are learning / working, under constant observation, the risk-taking, creative urge goes underground and hides.
2. **Evaluation** – When we constantly make people worry about how they are doing, they ignore satisfaction with their accomplishments.
3. **Rewards** – The excessive use of prizes deprives a person of the intrinsic pleasure of creative activity.
4. **Competition** – Putting people in a win-lose situation, where only one person can come out on top, negates the process of people progress at their own rates.
5. **Over-control** – Constantly telling a person how to do things, often leaves people feeling like their originality is a mistake and any exploration a waste of time.
6. **Restricting choice** – Telling people which activities they should engage in instead of letting them follow where their curiosity and passion lead, again restricts active exploration and experimentation that might lead to creative discovery and production.
7. **Pressure** – Establishing grandiose expectations for a people performance, often ends up instilling aversion for a subject or activity. Unreasonably high expectations often pressure people to perform and conform within strictly prescribed guidelines, and, again, deter experimentation, exploration, and innovation. Grandiose expectations are often beyond personal developmental capabilities.

Dr. Edward de Bono coined the phrase "lateral thinking" which involves approaching problems from diverse, unexpected angles and from different perspectives.

Dr. de Bono has created several techniques to help to apply lateral thinking to problem solving and idea generation. Some of these are the following: think of as many different alternatives for solving a problem as you possibly can; challenge any assumptions you may have

about your problem; and insert random elements which will encourage you to look at the problem from a different and unexpected perspective.

It is said that encouraging creativity is about not killing the new born ideas. Especially in education, when the students are new to a certain subject. So, finally there are some "good ideas" how to kill the new born ideas (basing on the www.creatingminds.org):

- Ignore the new idea. Say nothing. Pretend that it was not said. Let it die in silence.
- Criticize it. Say how bad the idea is. Show yourself to be an expert in such things and that the person offering the idea is not expert and hence unable to offer any idea of any use.
- Laugh at it. Smirk, giggle, laugh, and chortle. Say how funny the idea is. This will be very effective at preventing anyone else taking it seriously.
- Compete with it. Come up with a better idea that shows the idea to be not that good.
- Change it. Take up the idea enthusiastically and adjust it so that it is no longer recognizable.
- Shoot the messenger. Instead of attacking the idea, have a go at the person bringing it. Tell them that they are no good at creating ideas. That they should not be offering such thoughts here.

LEARNING ACTIVITY 1.3.1.	Evaluating factors limiting creativity
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participant will be able to: • Identify and evaluate the factors, limiting creativity • Come up with ideas how to overcome these factors
Summary of the Activity	This activity suggests identifying and analyzing the main barriers of creativity, aiming to overcome them while implementing training of creative thinking.
Duration of the Activity	Personal work: 15 min. Group reflection and discussion: 35 min. Total: 50 min.
Aims of the Activity	The activity aims to: • Identify and analyze the main factors, limiting creativity. • Present the personal and group ideas, how it is possible to overcome these barriers in the teaching / learning process. • Record the best ideas.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Table of the task printed and delivered for each participant Pens Flipchart
Methodology to Implement and Develop the Activity	The task will consist of two parts: Firstly, basing on your everyday work experience, think and diagnose what are the main factors, limiting the creativity (1 – does not describe my situation, and 5 – reflects my situation a lot). Brainstorm how you could personally, improve the situation. Discuss the main findings with the group. It is important that the ideas must be linked to the

curriculum of the subject you teach.

Factors, limiting creativity	How much does it characterize my working atmosphere	What can I do about it?
Surveillance	1 2 3 4 5	
Evaluation	1 2 3 4 5	
Salary	1 2 3 4 5	
Competition	1 2 3 4 5	
Over-control	1 2 3 4 5	
Restricting choice	1 2 3 4 5	
Pressure	1 2 3 4 5	

© A.Valiuškevičiūtė, 2007, according to Goleman, Kaufman and Ray

Secondly, again, basing on your own teaching experience, try to identify three more factors, that, in your opinion, are the killers of creativity in education. Present your ideas to the rest of the group.

Guidance once the activity is over	When the participants do the activity which regards the personal opinion, all the opinions are right. All the participants should be encouraged to exchange their experiences and thoughts. The participants should also be reminded that all the ideas should be linked to their teaching subject curriculum.
Assessment of the Activity	Active participation, dialogue, connecting the ideas to the actual situation – the curriculum of a certain subject.
Improvement Proposal of the Activity	

1.4. DIDACTIC UNIT: SOME TECHNIQUES FOR DEVELOPMENT OF CREATIVITY

There are three techniques for creativity development, presented in this didactic unit. These are: *Techniques for lateral thinking, Six thinking hats, Plus Minus Interesting*

Six thinking hats

Six Thinking Hats is one of the techniques, offered by E. de Bono, which helps to improve thinking and developing creativity - with its practical and uniquely positive approach to making decisions and exploring new ideas. The technique opens up the opportunity for creativity within Decision Making. It is used to look at decisions from a number of important perspectives. This forces person to move outside their habitual thinking style, and helps to get a more rounded view of a situation. The technique has the benefit of blocking the confrontations that happen when people with different thinking styles discuss the same problem. As S. Labelle (2005) states, the technique promotes fuller input from more people. In de Bono's words it "separates ego from performance". Everyone is able to contribute to the exploration without denting egos as they are just using the yellow hat or whatever hat. The six hats system encourages performance rather

than ego defense. People can contribute under any hat even though they initially support the opposite view. Therefore the technique of Six Thinking Hats is worth of trial. The technique can be used in groups or individually.
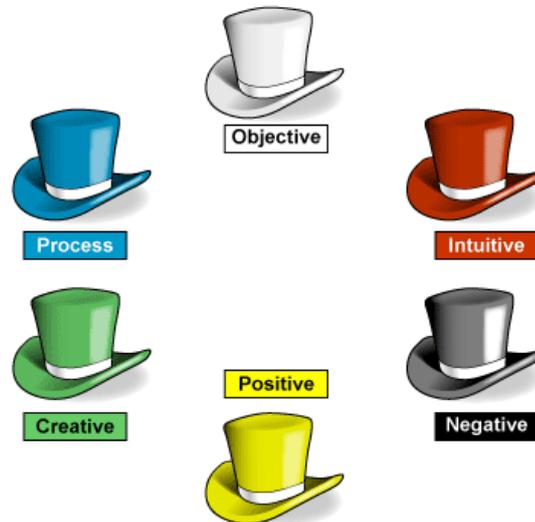
Figure: Six Thinking Hats

Each Thinking Hat is a different style of thinking. These are explained below:

- **White Hat** (knowledge, facts and data, requiring an objective look at data and information). With this thinking hat one focuses on the data available. One has to look at the information they have, and see what they can learn from it. One also has to look for gaps in their knowledge, and either try to fill them or take account of them. This is where the past trends are analysed.

> Facilitation for the ones having the role of the white hat owner (in Allan, 2010):
> - Think of paper, data, information…
> - What information do we have?
> - What information is missing?
> - What information would we like to have?
> - How are we going to get the information?

- **Red Hat** (emotions and feelings, hunches and intuition). 'Wearing' the red hat, one looks at problems using intuition, gut reaction, and emotion. One has to try to think how other people will react emotionally. It is needed to try to understand the responses of people who do not fully know the reasoning.

> Facilitation for the ones having the role of the red hat owner (in Allan, 2010):
> - Think of red and fire and warmth
> - Think of feelings, intuition…
> - Take care: emotions can be disguised as logic
> - An opportunity to introduce feelings at any time
> - Permission to raise our feelings without explanation

- **Black Hat** (caution, negatives, judgement, and looking logically at the negative aspects of a problem, often described as "devil's advocate). Using black hat thinking, one has to look at all the bad points of the decision. One has to look at it cautiously and defensively and try to see why it might not work. This is important because it highlights the weak points in a suggested idea or plan. It allows to eliminate them, alter them, or prepare contingency plans to counter them. Black Hat thinking helps to make one's ideas or plans 'tougher' and more resilient. It can also help to spot fatal flaws and risks before embarking on a course of action. Black Hat thinking is one of the real benefits of this technique, as many successful people get so used to thinking positively that often they cannot see problems in advance. This leaves them under-prepared for difficulties.

> Facilitation for the ones having the role of the white hat owner (in Allan, 2010):
> - Think of a stern judge wearing black robes…
> - The caution and risk hat
> - The preventative hat; reduces mistakes, errors
> - The hat for critical judgment
> - Points out why something cannot be done
> - A "natural" hat

- **Yellow Hat** (positives, examining the feasibility and benefits of a given situation and looking logically at the positive aspects). The yellow hat helps to think positively. It is the optimistic viewpoint that helps to see all the benefits of the decision and the value in it. Yellow Hat thinking helps to keep going when everything looks gloomy and difficult.

> Facilitation for the ones having the role of the yellow hat owner (in Allan, 2010):
> - Think of sunshine
> - Feasibility, possibilities…
> - Logical benefits of proposed action
> - An "unnatural" hat; we are not naturally optimistic
> - Always requires a deliberate effort
> - The basis of every creative idea

- **Green Hat** (creativity, lateral thinking, generating new ideas). The Green Hat stands for creativity. This is where one can develop creative solutions to a problem. It is a freewheeling way of thinking, in which there is little criticism of ideas.

> Facilitation for the ones having the role of the green hat owner (in Allan, 2010):
> - Think of vegetation and growth
> - For creative thinking
> - For new ideas
> - For additional alternatives
> - For provocation and movement foward

- **Blue Hat** (thinking about thinking, managing thinking, associated with the overall control and organization of the thinking process). The Blue Hat stands for process control. This is the hat worn by people chairing meetings. When running into difficulties because ideas are running dry, they may direct activity into Green Hat thinking. When contingency plans

are needed, they will ask for Black Hat thinking, etc.

> Facilitation for the ones having the role of the blue hat owner (in Allan, 2010):
> - Think of the sky; an overview
> - For process control
> - For thinking about thinking
> - Suggests the next step
> - Suggests another hat sequence
> - Asks for summaries, conclusions, decisions…
> - The hat used most by chairman

This technique can be used in various situations of learning, work, or any decision making process (from organizing a party, to preparing learning project, or to preparing a business plan). The timing of the technique depends on the situation or problem being sold. First, the problem, or the situation to be sold is presented to the group (of colleagues, or of learners). The group of six persons is formed, and each person is given a different color of the hat (or, in other words, is asked to look at the situation from the different angle), and is explained of the responsibilities and purpose of each color. The "owners" of the color hats are asked to present their position and given a time limit (that may be from 2 to 20 minutes). So, the general analysis of the problem, including arguments of all "hat owners" may last from 12 minutes to 1 hour.

Plus Minus Interesting (PMI)

When the new ideas are generated, one has to decide which are the best to carry forward. The PMI technique belongs to Dr. Edward de Bono. The PMI has a simple yet powerful goal:
1) To look first for the plus (P) points in any idea
2) To look next for the minus (M) points
3) Finally, and, most important, to look for the interesting possibilities in the idea.

The PMI technique recognizes that as well as good and bad points, some thinkgs cannot be categorized and are just "interesting".
It is natural in our thinking first to demonstrate negative reactions to new ideas, or to decide about them very subjectively, basing on our likes or dislikes. The universal preference is to look at the minus factors first, then the plus factors. It is also unnatural to pick out the aspects of the ideas which are either liked or disliked, but are considered as interesting. It is believed, that without this emotional reaction to an idea, the look at it may be narrowed. As Master Trainer in de Bono Thinking, Graeme Allan states, without exploration of the interesting possibilities, a new idea has only a 50/50 chance of survival. This technique allows us to reflect on the idea at least from three angles. The PMI is intended to ensure that decisions are made after the three sides of the issue. The versality of the technique lays in possibilities not to refuse any idea (because of our subjectivistic decisions) before analysing it:

- If we **like** the idea, we can choose to give the idea deliberate attention and to do a PMI on it.
- If we **dislike** the idea, we can still use the PMI on the idea in the hope we will find something that may change our mind.

Example

Consider this provocation and brainstorm the PMI:

All the seats could be taken out of the public transport, so all passangers would go standing.

Plus
- Equal rights for all!
- Busses could accommodate more passangers
- Tickets would be cheaper
- *Your suggestions???*

Minus
- Could be dangerous
- Could not drive fast
- On the long trips, passengers would get tired
- Not too god for old people, and small children
- *Your suggestions???*

Interesting
- Passengers would train their leg muscles
- Passengers would have more possibilities to talk to each other
- *Your suggestions???*

Other techniques for lateral thinking

Dr. De Bono recommends lateral thinking techniques as an alternative to creativity training. Dr. de Bono has created several techniques to help to apply lateral thinking to problem solving and idea generation. Some of these are the following: think of as many different alternatives for solving a problem as you possibly can; challenge any assumptions you may have about your problem; and insert random elements which will encourage you to look at the problem from a different and unexpected perspective. Essentially, lateral thinking is a combination of three thinking processes, thinking modes or thinking operations (in Allan, 2010):

1. The use of challenge (raising questions regarding the value of e.g. certain lesson)
2. The exploration for alternatives (being motivated and seeing value in exploring posible alternatives)
3. The use of provocation techniques (provocation is a highly productive form of creative thinking and a foundations of lateral thinking)

Random Input

is one of a lateral thinking tools (in Mind Tools. Essential skills for an excellent career). It is very useful when one needs fresh ideas or new perspectives during problem solving. For many types of problem solving, people tend to think by recognizing patterns. We react to these patterns based on past experience and extensions to that experience. Sometimes, though, we

get stuck inside them. Within a particular pattern there may be no good solution to a particular sort of problem.

Random input is a technique for linking other thinking patterns into the ones we are using. Along with this new pattern comes all of the experience you have connected to it.

To use Random Input, select a random noun from either a dictionary or a pre-prepared word list. It often helps if the noun is something that can be seen or touched (e.g. 'helicopter', 'dog') rather than a concept (e.g. 'fairness'). Use this noun as the starting point for brainstorming the defined problem. One may find that you get good insights if you select a word from a separate field in which you have some expertise. If one chooses a good word, one will add a range of new ideas and concepts to the brainstorming. While some will be useless, hopefully you will gain some good new insights into your problem.

Example

Imagine that you are thinking about the problem of reducing car pollution. So far in thinking through the problem you have considered all the conventional solutions of catalytic conversion and clean fuels. Selecting a random noun from the titles of the books in a bookcase you might see the word 'Plants'. Brainstorming from this you could generate a number of new ideas:

- Plant trees on the side of roads to convert CO_2 back into oxygen.
- Similarly, pass exhaust gases through a soup of algae to convert CO_2 back into oxygen. Perhaps this is how an 'air scrubber' in a space craft could work?
- Put sulfur-metabolizing bacteria into an exhaust gas processor to clean up exhaust gases. Would nitrogen compounds fertilize these bacteria?

These ideas are very raw. Some may be wrong or impractical. One of them might be original and the basis of some useful development (in Mind Tools. Essential skills for an excellent career).

Yes, No, PO is one more technique, devoted for triangular analysis of a problem or idea. When meeting a new suggestion or idea, we may react in three ways: agree, disagree with it, or be no judging, but creative about it.

Yes – it's true or right!
No – it's untrue or wrong!
PO – let me think about it, in my own creative way…

Not all of the ideas can be judged just Yes or No. Sometimes you may not want to judge an idea, but treat it creatively, as a fantasy or a suggestion, another way to look at things. PO is used for a creative pause, to demonstrate yourself and other people that you are not judging an idea but are treating it creatively, as new idea and as a new way to look at things.

Example

Try to answer just Yes or No to the following statements. Are there PO statements in the list?
- 5+5=13
- The Internet was invented in 2001

- Education should be online and schools closed.
- Girls are more clever than boys
- It is much better to travel by bus than by train
- Pizza is more healthy than a hamburger
- For an hour each day, shop prices should be discounted by ten percent.
- For some people shopping is a hobby – they enjoy it.
- People should stop using their cars in cities and use bicycles instead.
- Only the clever ones enter universities.
- It could be a day off on Wednesdays.
- One day Vilnius will be more popular touristic city then Paris.

PO can be associated with various words including *poetry, suppose* and *hypothesis.* PO can also be explained as "provocative operation" and is used as a prefix to a radical statement designed to provoke new ideas. It is important to note, that PO is not for rejecting ideas, but rather it is to be used as a stimulus for new ideas. The PO statements can be used by reversing situations, exaggerating, distorting or just being fanciful, e.g. if the question is how to clean the car, the PO statements could be: "the car gets so dirty you cannot see it"; "the dirt cleans the car"; "who needs a car?".

LEARNING ACTIVITY 1.4.1.	The PO thinker (in Allan, 2010)
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participant will be able to: • Use the technique of Yes No Po in thinking
Summary of the Activity	In period of 15 minutes participants will be asked to become PO thinkers and to prepare the alternative, unusual perspective of given situation.
Duration of the Activity	15 minutes
Aims of the Activity	This activity aims to demonstrate the technique of Yes No Po.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Paper and pens
Methodology to Implement and Develop the Activity	Pairs of participants are introduced to a imaginary situation: *Some pressure groups suggest learner drivers should be tested for intelligence and social responsibility before qualifying for a license. This is, they believe, because dull and irresponsible people are main traffic offenders.* The pairs are asked to become the PO thinkers. They should design a humorous letter for the local newspaper giving their views about this suggestion. Let the pairs present their letters when they are ready.
Guidance once the activity is over	Participants can be asked to reflect on how the task went, and to summarize on the importance of the PO kind of thinking in everyday teaching and learning situations.

| Assessment of the Activity	Interesting and valuable ideas
Improvement Proposal of the Activity	

LEARNING ACTIVITY 1.4.2.	Using many perspectives for decision making
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participant will be able to: • Use the technique of random input in thinking
Summary of the Activity	In period of 20 minutes participants will be asked to think about one and only question – what could be the 50 different ways how to use the brick.
Duration of the Activity	Thinking of 50 ways to use the red brick: 20 minutes Coming up with the real educational problem and finding many solutions: 20 minutes Total: 40 minutes
Aims of the Activity	This activity aims to demonstrate the technique of random input in thinking.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Flipchart and pens
Methodology to Implement and Develop the Activity	Brainstorm in a big group – what could be the 50 ways to use the simple red brick. It is normal that after listing some 10 ways, the group will lack suggestions. Then, choose a random noun, associate it with the brick, and, go on with the suggestions. Let someone from the group formulate the real problem, which would be education oriented, possibly deriving from the real experience and repeat the technique, coming up with as many suggestions as possible. *Note!* All the ideas from the group, event the craziest ones are acceptable during the brainstorm. After gathering all the ideas, the best ones are selected.
Guidance once the activity is over	After the activity is over it is very important to make general statements and conclusion. Participants can be asked to conclude themselves, justifying the importance of being able to find as many answers to one single question, and emphasizing the ways how this technique could be used in their teaching. It is also important to emphasize that all the ideas, including the craziest ones are welcome, because they can lead to a great projects!
Assessment of the Activity	Number of ways, listed for possible use of a brick. Interesting and valuable ideas
Improvement Proposal of the Activity	

LEARNING UNIT 2

Process of building creativity and Lateral Thinking into education

The development of creative thinking in education settings is best when it is linked to a practical context, where students would be using their thinking tools for a certain purpose. Therefore Learning Unit 2 aims to reveal and recommend concrete steps for building creativity in education.

Learning Unit 2 is divided into 5 Didactical Units, which represent the steps of the process of building creativity in education. The steps are as follows:
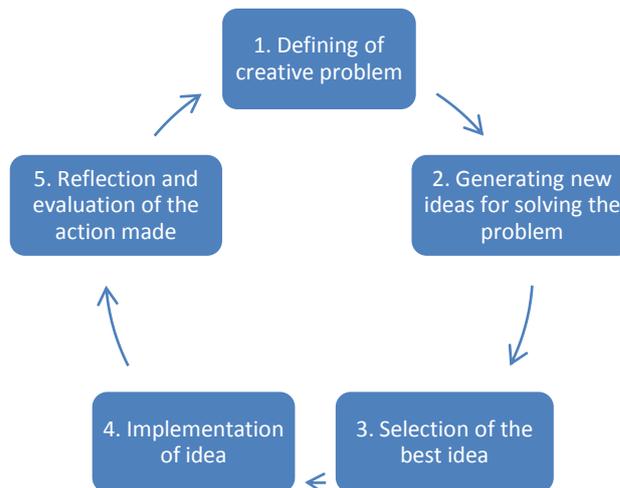
Note! All of the learning activities in this Learning Unit are connected between each other – going through 5 sections, participants will build an idea of the "project" in 5 step process. The techniques, presented in Learning Unit 1 and 2 will be employed in carrying out further Learning Activities. Participants will work in groups of 4-5 persons, forming two or four (or any other oddly even number) groups. Each group will start from their definition of a problem and will go on towards finding the solutions.

2.1. DIDACTIC UNIT: CREATIVE PROBLEM: HOW TO DEFINE IT?

Welcome to the first step of building creative solutions. However if we are looking for creative solution, we should start with identifying what is the problem that need a creative solution. What is unsatisfactory situation that needs some changes?

In major cases, defining the problem is a problem in itself.

The process of defining the creative problem, might be started from reflecting on the following motivating statements:

"A problem well-stated is a problem half-solved." (John Dewey)

"One should never impose one's views on a problem; one should rather study it, and in time a solution will reveal itself." (Albert Einstein)
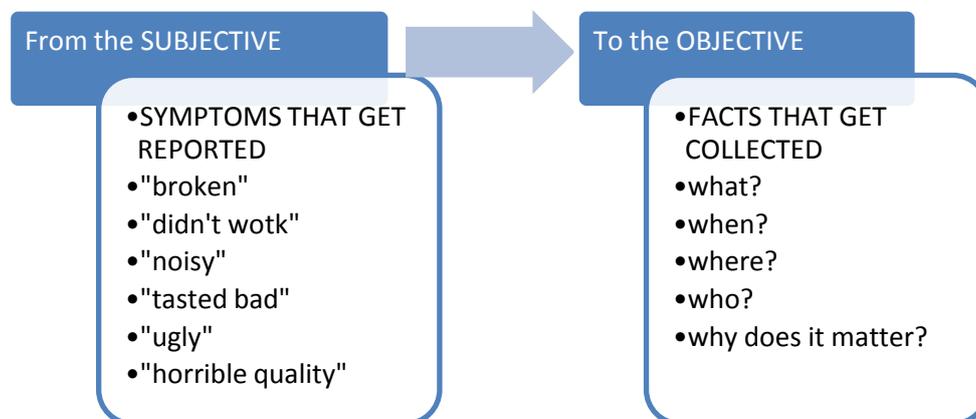
A creative solution can be also called a solution of a creative problem. In order to understand a problem, there must be clear understanding of what the problem is. Depending on different life experiences, traditions and backgrounds, people tend to understand problems differently.

Usually the process of defining the problem is structured as follows:

- What the problem is
- Where it occurs

- When it happens
- How often it happens
- Who experiences it
- Why the problem matters

Cochram (2008) states that it is important to transfer our subjective understanding of a problem into objective definition of it, calling this process *Evolution of a Problem Statement*. If crafting of a problem statement is done carelessly, the resulting problem solving is doomed. The action we take with symptoms of a problem can be much different than the action we take with a well-defined problem. In both cases, we are basically dealing with the same problem, we are just choosing a different starting point. In the first case (by taking symptoms of a problem statement) it leads to a drastically different solutions, to compare with the second example, when the problem statement goes beyond the symptom and gets specific. The process of developing a problem statement is an evolution in many respects, as illustrated below:

From the SUBJECTIVE	To the OBJECTIVE
•SYMPTOMS THAT GET REPORTED •"broken" •"didn't wotk" •"noisy" •"tasted bad" •"ugly" •"horrible quality"	•FACTS THAT GET COLLECTED •what? •when? •where? •who? •why does it matter?

The more detailed information we gather about the problem, the more resources we have for creative solution of the problem. The problem statement is being defined basing on the following questions (according to Cocharan, 2008):

- How was the problem first reported? Unfiltered problem statement? May be not very accurate, such as "no good" or "doesn't work".
- Who experiences the problem? Only a few problems are universal. Most only affect certain people, depending on variety of factors.
- What exactly is the problem? It is important to find out what is happening beyond the raw symptoms, not taking anything for granted and attempting to independently verify all facts.
- When does the problem occur? Most of the problems are localized to a specific place or set of places. What those places are, will often indicate the causes and dictate how the problem must be solved.
- How often does the problem occur? Frequency of occurrence helps clarify the scope and magnitude of a problem. Armed with information about frequency, ones has a much better idea of the resources that will be needed to attack the problem.
- Why does it matter? Problems never exist in a vacuum. For a problem to exist, a standard, a requirement, or expectation must be violated.

LEARNING ACTIVITY 2.1.1.   **Mind-mapping the problem**

Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity the participants will be able to: • Define actual problem • Name different aspects of that problem
Summary of the Activity	A mind map is a whole-brain method (as it uses words, colors, images and associations) for generating and organizing ideas which is largely inspired by Leonardo da Vinci's approach to note-taking. Participants will mind-map actual problem, regarding the lack of creativity in nowadays schools. During the next learning activities they will be generating ideas and looking how can they solve this problem in their own surrounding.
Duration of the Activity	Mapping the problem: 15 min.
Aims of the Activity	Mind maps are used for the following: • Problem solving • Generating ideas • Setting personal goals • Preparing a business plan • Studying new materials This activity aims to demonstrate the method of mind-mapping for the process of identifying a problem.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Paper Pens
Methodology to Implement and Develop the Activity	Ask the participants what problems they see in nowadays education. You can start with the problem regarding the creativity in educational processes in the schools of today. At the beginning you place an image at the center of a piece of paper which represents the subject matter of the mind map. Then you write down a key word that describes the chosen topic. Next, you proceed to draw branches leading out from the central issue which represent the main associations that come from thinking of a chosen issue. From each main association you then branch out into sub-associations (but just one word per branch). It is important to use colors and images when creating mind maps to further stimulate memory and imagination. Note that mind maps should use minimum of words, and they rely on key pictures and key words that act as triggers.
Guidance once the activity is over	The group work results will be the basis for the next learning activities.
Assessment of the Activity	Active participation, the realness of the problem defined and ideas offered.
Improvement Proposal of the Activity	

2.2. DIDACTIC UNIT: GENERATING NEW IDEAS

Welcome to the second step of building creative solutions. After the problem is named, it is the time to generate quite a long list of ideas how to solve this problem. This step is characterized by a high level of fantasy, craziness and openness. New ideas are born here!

The process of generating new ideas, might be started from reflecting on the following opening and motivating statements:

"If we want to solve a problem that we have never solved before, we must leave the door to the unknown ajar." (Richard P. Feynman)

"We are continually faced with a series of great opportunities brilliantly disguised as insoluble problems." (John W. Gardner)

"Nothing is more dangerous than an idea when it is the only one you have." (Emile Chartier)

"A new idea is delicate. It can be killed by a sneer or a yawn; it can be stabbed to death by a quip and worried to death by a frown on the right man's brow." (Charles Brower)

"An idea must not be condemned for being a little shy and incoherent; all new ideas are shy when introduced first among our old ones." (Samuel Butler)

"A good idea is like a lighted match, easily blown out by the cold winds of rigid management." (Richard Kinder)

As it is seen from the above quotes, new ideas are often shy and fragile. Below there are some methods for more productive generation of new ideas (basing on Rowse, 2007).

Evolution – when new ideas come as a result of building upon previous ones. This is a step by step process and the progression is quite small at each step, but it becomes significant over time. A question, being raised at this evolutionary process is – how could I improve the things/processes that already exist.

Reapplication – when you look at something old in a new way. For example – taking a fork, looking at it and coming up with as many new uses for a fork as possible in 2 minutes. This kind of "breaking outside the box" can lead to some interesting discoveries. A question, being raised in this reapplication process is – how could I do something differently?

Synthesis – where two or more existing ideas are combined into a third idea. This is what happened that fateful day that someone wondered what would happen if they combined the idea of the theatre and a restaurant together – theatre restaurant. A questions to be asked when entering into synthesis – how could I take the benefits of xxx and combine them with the benefits of yyy.

Revolution – where a completely new idea that is that is difrerent from a previous one is developed. A question to be asked when developing revolutionary ideas – instead of asking – how can I make xxx better, one might ask – what could I do instead of xxx to achieve the same goals?

Changing direction – where there is a complete change of focus. A question to be asked in this case – if we could start over – how would we do things differently?

LEARNING ACTIVITY 2.2.1.	Daily exercises for developing creativity
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out his activity, the participants will be able to: • Name some of the daily techniques for developing creativity • Choose which are the best methods in certain situation
Summary of the Activity	During this activity the participants will be acquainted and will have a possibility to try out some simple daily exercises for developing their creativity.

Duration of the Activity	Trying two of techniques – 40 min.
Aims of the Activity	Before moving towards generating of creative ideas for solution of the identified problem, this learning activity is dedicated to demonstrate several techniques for generating new ideas.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Quite a big room, or a corridor Paper Pens
Methodology to Implement and Develop the Activity	Choose at least two daily exercises from the list below and try them with the participants. It is recommended to try the first exercise about 25 styles of walking. The second exercise can be chosen from the list. • Think about walking. Try to think and demonstrate at least 25 styles of walking. • Look at the picture. Think of 100 (or 50) words about the picture and write them down. Then create a crazy story about the picture using all of the words. • For 30 minutes a day think exclusively on one subject. At first it might be very hard to do. Write the new ideas you come up with on your chosen topic every day. • Combine ideas. Choose two random subjects and describe each one in detail – what does it look like? What is it used for? How is it made? Then substitute one object with the other objects description. How can you make object A feel like object B? • Play word association games. If you are doing it solo, write down your beginning word and spend 10 minutes just saying the next word that comes to mind. Compare the beginning word to the final word. They should be pretty diverse. This loosens up your mind to allow free association of ideas. • See how long you can talk (and make sense!) without using a common word, like "and", "but", "the" or "that".
Guidance once the activity is over	After the activity is over, it is important to make a conclusion that each situation (whether in professional or life context) has many possible solutions. The big job is to generate as many ideas as possible and then to choose the best. After the activity is over, the participants should be asked to share their own thoughts and experiences from their own teaching about the daily exercises for developing creativity. All the experiences should be recorded and added to the list.
Assessment of the Activity	Active participation, sharing ideas, discussing possible use of these techniques in the lessons of the participants.
Improvement Proposal of the Activity	

LEARNING ACTIVITY 2.2.2.	Generating ideas - Lotus
Learning Outcomes linked	Creativity and Lateral thinking

Unit of the Learning Outcome linked	After carrying out this activity, participants will be able to: • Create new ideas, basing on Lotus technique
Summary of the Activity	Lotus technique will demonstrate how one idea can inspire the development of new ideas. In Lotus Blossom, the petals around the core of the blossom are figuratively "peeled back" one at a time, revealing a key component or theme. The cluster of themes and surrounding ideas and applications, which are developed in one way or another, provide several different alternative possibilities.
Duration of the Activity	About 40 min.
Aims of the Activity	This activity is to be used when developing new ideas, or when having a problem to create more ideas. It also helps to create seeds of ideas that can inspire for further good ideas.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Post-it notes Pens
Methodology to Implement and Develop the Activity	The group should start with a description of the actual problem. The problem should be written down on a Post-it note and put in the middle of a large working area (wall, black board or flipchart). The group should come up with some simple, but very different from each other, ideas how to solve the named problem. Those ideas should be written on the Post-it cards and placed around problem description. Six or eight ideas are needed. Everyone in a group should be engaged.

Idea 6	Idea 1	Idea 4
Idea 3	Problem description	Idea 7
Idea 8	Idea 5	Idea 2

Unfolding the lotus blossom is the next step. Make a copy of the idea cards and place them further out from the cluster. The previous process should be repeated, but surrounding each of the idea cards with secondary ideas, using only the primary idea cards as stimuli. This should result in ideas which are further removed from the original problem. This can lead to many ideas as in the diagram below. If as idea seems to be leading somewhere, the whole process can be repeated to that particular idea.

Idea 6.6.	Idea 6.1.	Idea 6.4.	Idea 1.6.	Idea 1.1.	Idea 1.4	Idea 4.6.	Idea 4.1.	Idea 4.4.
Idea 6.3.	**Idea 6**	Idea 6.7.	Idea 1.3.	**Idea 1**	Idea 1.7.	Idea 4.3.	**Idea 4**	Idea 4.7.
Idea 6.8.	Idea 6.5.	Idea 6.2.	Idea 1.8.	Idea 1.5.	Idea 1.2.	Idea 4.8.	Idea 4.5.	Idea 4.2.
Idea 3.6.	Idea 3.1.	Idea 3.4.	**Idea 6**	Idea 1	Idea 4	Idea 7.6.	Idea 7.1.	Idea 7.4.
Idea 3.3.	**Idea 3**	Idea 3.7.	Idea 3	**Problem**	Idea 7	Idea 7.3.	**Idea 7**	Idea 7.7.
Idea 3.8.	Idea 3.5.	Idea 3.2.	Idea 8	Idea 5	Idea 2	Idea 7.8.	Idea 7.5.	Idea 7.2.
Idea 8.6.	Idea 8.1.	Idea 8.4.	Idea 5.6.	Idea 5.1.	Idea 5.4.	Idea 2.6.	Idea 2.1.	Idea 2.4.
Idea	**Idea**	Idea	Idea	**Idea**	Idea	Idea	**Idea**	Idea

8.3.	**8**	8.7.	5.3.	**5**	5.7.	2.3.	**2**	2.7.
Idea 8.8.	Idea 8.5.	Idea 8.2.	Idea 5.8.	Idea 5.5.	Idea 5.2.	Idea 2.8.	Idea 2.5.	Idea 2.2.

When working with the group, the trainer can rotate people around the Lotus. Thus a person puts one secondary idea against the primary idea and then moves on the next primary idea. This created a "dance" around the ideas – moving and thinking.

Guidance once the activity is over	The group work results will be the basis for the next learning activities. During the activity it is important that even the crazy ideas are valuable.
Assessment of the Activity	Active participation, engagement, urgency and creativity of generated ideas.
Improvement Proposal of the Activity	

LEARNING ACTIVITY 2.2.3.	Building ideas for development of creativity in education. View of different stakeholders
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, participants will be able to: • Create new ideas, basing on techniques of creative thinking • Plan the activities, basing on the views of various stakeholders
Summary of the Activity	This learning activity will open the needs of main stakeholders of the identified problem, and further generation of ideas will be based on those needs.
Duration of the Activity	For identifying the needs and expectations of stakeholders: 20 min. For generating ideas: 30 min. Total: 50 min.
Aims of the Activity	This activity aims to encourage the participants to build several creative ideas by using the techniques, presented in earlier sections, and basing on the needs and points of view of different stakeholders of the solution to an identified problem.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Paper Pens
Methodology to Implement and Develop the Activity	Make groups of 4-5 people. Ask them to draft several ideas on how to develop creativity in education, aiming to solve the problem, formulated in Learning Activity 2.1.1. Before starting to generate creative ideas, the groups should identify who are the main stakeholders of their problem. Most probably at least there groups of stakeholders will be listed: students, teachers, employers. Then the big group is divided into as many groups, as there were stakeholders mentioned, so that each stakeholder is present in our group. So, there will be at least three groups – "students", "teachers", "employers", and they are asked to brainstorm the needs and expectations of these stakeholders towards the identified problem: "we, as students would be interested in….", "we, as teachers, would like to….", "we, as employers, would need to….". After discussing the stakeholders' expectations ask participants to come back to their

	previous team and to formulate the concrete steps towards finding the solution. For generating ideas, groups should use the techniques of creative thinking that were discussed in previous sections.
	In this activity, groups should not share their work results with other groups.
Guidance once the activity is over	The group work results will be the basis for the next learning activities. The results of the group works should not yet be discussed between groups in this phase.
Assessment of the Activity	Active participation, realness of advocacy of certain group of stakeholders, urgency and creativity of generated ideas.
Improvement Proposal of the Activity	

2.3. DIDACTIC UNIT: CREATIVE IDEAS. HOW TO SELECT THE BEST ONES?

Welcome to the third step of building creative solutions. This step is quite challenging, as we have to make a selection. We have to chose which of all good ideas is the best and worth of implementation. That requires some intuition, and, surely some methods ensuring objectivism of making the selection.

The process of selecting the best ideas might be started from reflecting on the following motivating statements:

"Only the wise possess ideas; the greater part of mankind is possessed by them." (Samuel Taylor Coleridge).

After quite several ideas are brainstormed, or generated in other ways, we have to select the best ones which are worth to be implemented. The first question is how to assess the value of ideas, what are the main criteria of assessment. It is obvious, that the general criterion is to assess how well the idea corresponds the requirements of the situation.

Practical assignment "Selecting best ideas" – refer to the Learning activity 2.3.1.

To help to evaluate the value of an idea, the SMART criteria can be employed. SMART stands for Specific (S), Measurable (M), Achievable (A), Relevant (R) and Time bound (T). The SMART criteria are summarized below:

Specific – the idea should state exactly what is to be achieved.

Measurable – idea should be capable of measurement – so that it is possible to determine whether (or how far) it has been achieved.

Relevant – ideas should be relevant to the people responsible for achieving them.

Time Bound – the plans of implementing ideas should be set with a time-frame in mind. These deadlines also need to be realistic.

The second question is selecting ideas is the method – *how* do assess. In this point at least to methods can be mentioned.

One of the methods, called PMI (Plus, Minus, Interesting) has already been presented in section 1.3.2.

Another method, quite popular in management is so called SWOT analysis, allowing to evaluate strengths (S) and weaknesses (W) being internal factors, as well as opportunities (O) and threads (T), being external factors of any phenomena, plan or idea.

	Positive	Negative
Internal factors	*Strengths* ✓ . ✓ . ✓ .	*Weaknesses* ✓ . ✓ . ✓ .
External factors	*Opportunities* ✓ . ✓ . ✓ .	*Threats* ✓ . ✓ . ✓ .

If the idea is regarding creation of a new business, the tool of a PEST analysis could be useful. The acronym stands for the political (P), economical (E), Social (S) and Technological (T) issues that could affect development and implementation of the idea. In all cases the PEST analysis must be followed up by consideration of how the idea / new business should respond to these influences.

Political / legal (various regulations)	Economic (facts and forecasts)	Social (education, wealthcare, employment, etc.)	Technological
✓ . ✓ . ✓ .	✓ . ✓ . ✓ .	✓ . ✓ . ✓ .	✓ . ✓ . ✓ .

It is easier to analyze and to make the decision on selecting ideas, when having some concrete criteria. The ones listed below might be helpful:

Criterion	Your comments about the ideas being selected
Is the idea easy understandable for its target users?	
Is the benefit clear?	
Is the implementation of idea possible to observe? Can it be observed in action?	
Will the implemented idea contribute to economic benefit?	
Will the implemented idea contribute to social benefit?	
Whose exactly needs the implemented idea will satisfy?	
What kind of social values will the implemented idea encourage?	
Is the idea easy to try out for its target users?	
Will it be easy to adapt this idea in more sectors?	

How is the idea better than previous in this topic?	
…your ideas on what are the other criteria?	

LEARNING ACTIVITY 2.3.1.	Selecting best ideas
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participants: • Prepare the list of selection criteria
Summary of the Activity	Take 10 minutes to brainstorm what would be the most important criteria in selecting the best ideas, worth of implementation. Prepare the list of criteria.
Duration of the Activity	Preparing list of criteria: 20 minutes Presenting and discussing them: 20 minutes Total: 40 minutes
Aims of the Activity	This activity aims to demonstrate how to make a selection of best ideas by using some techniques of creative thinking.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Paper Pens Paper hats of six colors (black, white, red, greed, blue and yellow)
Methodology to Implement and Develop the Activity	Form groups of 6 persons. Attribute each group member with a colour hats. There have to be all the six colours in the group. Repeat each person, wearing the hat of a certain colour, to evaluate the solution from a certain point of view. E.g. Black hat looks for negativities, risks and threads in the offered solution. For remembering of the roles of each hat, refer to 1.3. Didactic unit. The groups should take the ideas, generated in previous Learning Activity and analyze them by using the 6 hats method, as well as PMI or other technique, if needed.
Guidance once the activity is over	It is important that the "owners" of the different color hats are allowed to make comments / contributions only according the color of their hats. After the activity is over, it is important to finalize of how the triangular approach (e.g. by using Six hat training technique, or any other technique) could be best employed into teaching and learning processes.
Assessment of the Activity	Being able to play the exact role of each color hat, selection of best ideas.
Improvement Proposal of the Activity	

LEARNING ACTIVITY 2.3.2.	Employing many points of view into solution of a problem

Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participants: • Before making a decision, to analyze the problem or idea basing on six different aspects.
Summary of the Activity	Like in solving problems, like in selecting best ideas, the main thing is to use so called triangular approach, meaning, to discuss the problem / idea from all possible aspects. In this activity the participants will be able to try out a Six Hats thinking technique by e. de Bono. The ideas, generated by the participants earlier, will be analyzed in this Learning Activity.
Duration of the Activity	Explaining the task, dividing roles: 15 minutes Solving the problem in groups of 6 persons: 40 minutes Total: 55 minutes
Aims of the Activity	It is aimed that this activity will demonstrate how we should analyze problems or new ideas by employing as many approaches and points of view as possible. This thinking technique provides the symbolic structure of our thinking, by giving color to each thinking aspect. The ideas, which were generated in previous Learning Activity, will be analyzed, and best ones selected during this Learning Activity.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Paper Pens Paper hats of six colors (black, white, red, greed, blue and yellow)
Methodology to Implement and Develop the Activity	Form groups of 6 persons. Attribute each group member with a colour hats. There have to be all the six colours in the group. Repeat each person, wearing the hat of a certain colour, to evaluate the solution from a certain point of view. E.g. Black hat looks for negativities, risks and threads in the offered solution. For remembering of the roles of each hat, refer to 1.3. Didactic unit. The groups should take the ideas, generated in previous Learning Activity and analyze them by using the 6 hats method, as well as PMI or other technique, if needed.
Guidance once the activity is over	It is important that the "owners" of the different color hats are allowed to make comments / contributions only according the color of their hats. After the activity is over, it is important to finalize of how the triangular approach (e.g. by using Six hat training technique, or any other technique) could be best employed into teaching and learning processes.
Assessment of the Activity	Being able to play the exact role of each color hat, selection of best ideas.
Improvement Proposal of the Activity	

2.4. DIDACTIC UNIT: IMPLEMENTATION. FROM IDEA TO RESULT!	

Welcome to the fourth step of building creative solutions. This step requires lots of imagination, projections to the future and realism at the same time. A detailed plan of implementation has to be prepared here!

The process of implementation of the best ideas might be started from reflecting on the following motivating statements:

"The creative process does not end with an idea – it only starts with an idea." (John

Arnold)

"Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity." (George S. Patton)

"The future will not happen if one wishes hard enough. It requires decision, it imposes risk, it requires actions, it demands allocation of resources, above all human resources, it requires work." (Peter Drucker)

"These days, the problem isn't how to innovate; it's how to get society to adopt the good ideas that already exist." (Douglas Engelbart)

We can say that a good idea is a half of work done. But before it is done, it is still much work to do. As we have the best idea (-s) selected for implementation, we have to analyze them once again, this time, aiming to prepare detailed plan of how to implement it, and which aspects need to be emphasized in that plan.

There are quite a lot of tools for planning and implementation, but in this section we will concentrate on one, called:

Reverse planning (basing on creatingminds.org)**.** This technique is based on the idea, that the planning process should start not thinking about the aims, but imagining the final outcomes in the future. Reverse planning works first by legitimizing idealistic, "ridiculous" ideas, and then gradually working back towards the feasible. This prevents "silly" ideas being thrown away because you cannot see how they might be achieved. The advantage of reverse planning against forward planning is, that if you plan forwards, there might be many possible futures and it is easy to lose our way. If you start at what you want and work backwards towards now, then there are far fewer paths to get lost in. There are four basic steps of reverse kind of planning.

1. Envision a perfect future. In this phase we have to imagine the ideal view of our idea implemented. What could happen best? At this stage completely impossible and idealistic solutions may be created.
2. Step back into fiction. In this stage we have to take a step towards reality with another idea. It may still look impossible, but it will certainly make more sense.
3. Step back into possibility. Now we have to take a step back again into an idea that is actually feasible. It may not be clear yet how to implement the idea, but at least it looks feasible.
4. Walk back to now. Now create a plan by continuing to move back to current reality, by asking in each step – what happened before that? When you get back to now, turn and look towards the possibility and you will have your implementation plan.

It is important that each of the steps is realistic and possible to be implemented, and at the same time flexible enough, not shutting the door to extra creative additions.

LEARNING ACTIVITY 2.4.1.	Adoption checklist
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participants will be able to: • Make a plan by using the technique of Reverse planning
Summary of the Activity	During this activity the groups will prepare the implementation plans to their ideas, using the technique of Reverse planning.
Duration of the Activity	Preparation of the plan: 40 minutes

Aims of the Activity	This activity aims to get the participants acquainted with the technique of Reverse planning, and to prepare a plan to the idea, which has been generated in Learning activity 2.2.3.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Sheets of paper Pens
Methodology to Implement and Develop the Activity	During this activity the groups will further work with their ideas, formulated in the Learning activity 2.2.3. Employing the technique of Reverse planning, they should prepare the implementation plan of their ideas: • To describe each step of the plan • To describe the target group / users of the implemented idea • To identify the time frame for implementation • To demonstrate the benefits of this idea The plan should be idealistic, but at the same time realistic (measurable and observable)
Guidance once the activity is over	After the activity is over, it is important that the groups have some time to revise their plans and do some internal feed-backing. The implementation plan should be realistic enough.
Assessment of the Activity	Active participation, quality of the implementation plan.
Improvement Proposal of the Activity	

2.5. DIDACTIC UNIT: REFLECTION AND EVALUATION OF ACTION

Finally, welcome to the fifth step of the creative solutions building process. Even though it is the last one in this list, it is not final in reality. It is rather first one, giving information and inspiration for further creative ideas. It is important to see the benefits of evaluation and constructive critique, being the best resource of information for further development!

Since the creative thinking is about generating and implementing ideas, these ideas must be evaluated. The main purpose of reflection and evaluation is to communicate the information what went right and what could be improved for the next actions.

The process of reflection and evaluation might be started from reflecting on the following opening thoughts:

"It is impossible for ideas to compete in the marketplace if no forum for their presentation is provided or available." (Thomas Mann)

"The imagination imitates. It is the critical spirit that creates." (Oscar Wilde)

"I criticize by creation, not by finding fault." (Marcus Tulius Cicero)

We may formulate certain questions that would facilitate gathering of useful information for moving on. The questions may be addressed to the team or to the individual who has contributed to the implementation of idea.

1. Was the idea worth of implementation?
2. On the basis of evaluation, should we modify this idea?
3. On the basis of evaluation, should we come up with a new idea?
4. Did we select the right team to implement the idea?
5. Were the roles distributed well inside the team?

6. What can we learn from this experience?

It is also important to mention, that evaluation of action may go in two lines: *self-evaluation*, when the authors and implementers of creative ideas are deciding what went well and what could be improved in their point of view, and the *external evaluation*, when the authors or implementers of the creative ideas ask for the feedback information from possible users / clients, or other stakeholders of an implemented idea.

LEARNING ACTIVITY 2.5.1.	Expert review. Blessing or condemnation?
Learning Outcomes linked	Creativity and Lateral thinking
Unit of the Learning Outcome linked	After carrying out this activity, the participants will be able to: • Make a critical review to their work • Provide constructive critique
Summary of the Activity	During this activity, the groups of participants will change their role from the authors of the ideas, to the expert evaluators of these ideas.
Duration of the Activity	Getting to know the project of the other group: 15 minutes Providing constructive comments: 15 minutes Total: 30 minutes
Aims of the Activity	This activity aims at providing the participants possibility to be in shoes of evaluator, this way allowing to look at the creation of ideas and their implementation from a distance. It also aims to improve the participants' skills of giving the constructive feedback.
Guidance for a proper performance of the Activity	
Materials needed to perform the Activity	Work results of all the groups – papers with their identified problems and ideas for their solutions. Blank papers for evaluators' notes.
Methodology to implement and Develop the Activity	After being writers and authors, the participants are asked to change their roles and this time to become the expert evaluators, whose main role is to decide whether the ideas and plans of their implementation are realistic, creative, and worth to be implemented. The groups read each other's projects and prepare constructive feedback.
Guidance once the activity is over	In this learning activity it is of great importance to emphasize the principles of constructive critique.
Assessment of the Activity	Active participation, constructive critique.
Improvement Proposal of the Activity	

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