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THE FLIPPED CLASSROOM METHOD



FLipped CREative Awareness Teaching

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Content

Module 1 – THE FLIPPED CLASSROOM METHOD	6
<i>Description of the module 1</i>	6
<i>Learning objectives.....</i>	8
1. <i>Introduction - How it all began.....</i>	9
2. <i>A little bit of „official” history... ..</i>	11
3. <i>Flipped Classroom – key features</i>	12
4. <i>Theoretical background, other</i>	14
5. <i>Benefits of flipping the classroom</i>	17
6. <i>Challenges you have to be aware of.....</i>	20
7. <i>Why FC is especially important for VET in the EU?.....</i>	21
8. <i>Are there evidences of effectiveness? - Case studies.....</i>	23
8.1. <i>Case study 1 - Czech Republic</i>	24
8.2. <i>Case study 2 - Hungary.....</i>	27
<i>Assignment 1 – My 1st idea on Flipped Classroom</i>	30
<i>Assignment 1 - template</i>	31
Module 2 - ACTIVE TEACHING METHODS	32
<i>Description of the module</i>	32
To learn more about the concept watch the video:	33
<i>Learning objectives.....</i>	34
Module 2 – CREATIVITY-BASED EDUCATION	35
1. <i>Introduction -Technology of Creativity</i>	35
2. <i>The Project Method.....</i>	35
2.1 <i>The Origins of the Project Method</i>	35
2.2 <i>Applying Creative Project Method</i>	38
2.3 <i>Phases and Steps of Project Management</i>	39

2.4 Creative Project Method - Support and Training for Educators	48
2.5 What are the Benefits of Creative Project Method	49
3. <i>An introduction to Simulation Method</i>	51
3.1 Applying Simulation Method	52
<i>Assignment 2 - The Creative Project Method</i>	57
<i>Attachments</i>	58
Schedule (agreed with the project group on the first meeting)	60
Activities	60
Module 3 – THE CONCEPT OF CREATIVITY	66
<i>Description of the module</i>	66
<i>Learning objectives</i>	67
Area 1 - The perception and analysis of the teacher	67
Area 2 - The production of ideas phase	67
Area 3 - The selection phase	67
Area 4 - The application phase	67
<i>The Context</i>	69
<i>Creativity - the Concept</i>	71
1. Creativity (in school) Serves, Among Other Things[1]:	72
2. Creativity’s Impacts	72
3. Creativity (in educational activities):	74
4. Myths to dispel:	75
<i>Unit 1 - The Concept of Creativity and its Role in Implementing Cognitive Teaching Styles</i>	76
1. Introduction to Creativity[1]	76
2. When can I Use Creativity?	77
3. What is Creativity?[2]	79
<i>Unit 2 - The Importance of Improving the Creative Spirit</i>	80



1. The Stages of the Creative Spirit	80
2. The “Ingredients” of the Creative Person	82
2.1. The Creative Person[8]	83
2.2. The Personality[9]	85
<i>Unit 3 - The Pros and Cons of Creativity</i>	87
1. The Main Barriers to Innovation through Creativity	87
1.1. Mental Models	87
2. What hinders creativity?	87
2.1. Barriers to Creativity[1]	88
<i>Unit 4 - Understand the Mindset of Divergent or Lateral Thinking</i>	89
1. Lateral Thinking[1]	89
1.1. “Vertical Thinking (VT) vs Lateral Thinking (LT) [1]	89
1.2. The Nature of Lateral Thinking[1]	90
1.3. Lateral Thinking Phases[2]	91
2. The Creative Problem Solving[3]	92
<i>Unit 5 - Elements that Characterize Creativity</i>	94
1. TALENT	94
Fluency[2]	95
Flexibility[2]	96
Originality[2]	97
Elaboration[2]	98
2. METHOD - Problem Solving	99
2.1. The Process[2]	99
2.2. The CPS (Creative Problem Solving) Approach[2]	100
2.3. The "PAPSA" Method[1]	102
3. ENERGY	102



The Environment[2]	103
<i>Assignment 3</i>	<i>106</i>
Submission	106
Evaluation.....	106
Max.....	106
<i>Assignment 3 - template</i>	<i>106</i>
Course evaluation questionnaire	108
Evaluation of professional work.....	108
Teaching methods	108
Conditions, technical equipment	108



Module 1 – THE FLIPPED CLASSROOM METHOD

Description of the module 1

Experiments are being run all over the world about how best to introduce **new, innovative teaching, learning methods** that meet the requirements of the 21st century. One of these methods is the ‘**Flipped Classroom**’ coming out of the US, though increasingly known in Europe too.

The ‘Flipped Classroom’ (sometimes referred to as ‘Flipped Learning’) is a shift away from the traditional pedagogical approach to one where direct instruction (e.g. classroom lectures) moves from the group learning space to the individual learning space. This change allows the group space to be transformed into a dynamic, interactive learning environment with the teacher now guiding students in the application of the concepts learned in their own space and time. This allows the group space and time to be used more creatively. Basically, students are introduced to the learning material before a class (e.g. through hand-outs, presentations, videos as homework), with classroom time then being used to deepen understanding through discussion with peers and problem-solving activities facilitated by teachers.

The method is not strictly new: it was being used as early as the beginning of the 19th century, but its worldwide spread is connected to the development of new educational technology over the last ten years or so. Though most likely to be supported by technology (e.g. video), a flipped classroom model does not have an absolute reliance on technology.

Experiences have been favourable, showing **increasing student successes** with the use of flipped classroom methods. There are a number of possible reasons, for example this may be because it signifies a significant **shift** from a traditional teacher-centred teaching model **towards learner-centred**, tailor-made teaching and **active learning**. Though generally coupled to intensive use of new technology, the **focus is** not on the technology but rather **on the pedagogy**.

This video offers a useful summary and introduction to the Flipped Learning model:
(<https://youtu.be/OOSQFjzsnGY>)



This section gives an introduction to the theoretical background of the flipped classroom (FC) method. It helps you to identify its pedagogical concept and to evaluate its value against the traditional, frontal teaching methods.

Learning outcomes:

After completing this section / module, you will be able:

- to analyse the possibility of applying flipped classroom method in your own teaching context;
- to select the field, topic of the subject relevant for teaching with FC and aligning with the needs and learning attitudes of your students, and
- to describe the technical and pedagogical learning environment of an FC lesson and develop a draft idea of your 1st flipped classroom lesson.



The **topics** dealt within this module cover the:

- brief history of the Flipped Classroom model
- main features of the method
- theoretical background, and other applicable methods within the framework of the FC
- benefits and possible challenges associated with FC
- special relevance of FC to vocational education
- related case studies.

Learning objectives

Key knowledge

- Describe the pedagogical and methodological fundamentals of the FC method.
- Summarize conclusions based on the history of the FC.
- Recognise the results and experiences from other European countries
- Identify other methods (e.g. group work, project methods) usable with FC.

Core competencies

The teachers will be able to:

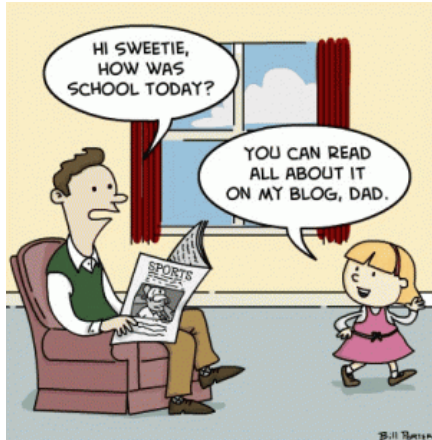
- fit their pedagogical methods to the needs of the age group, learning style of the students.
- build on learners' strengths, potentials and preferences (by taking into account their backgrounds, cultures, interests, goals, skills and prior knowledge) as crucial resources and drivers for motivation for creative learning.
- transfer the pedagogical theories into the daily classroom work.
- teach for creativity and teaching creatively.
- redesign his/her lesson management strategy.
- cooperate with other teachers to share knowledge for testing new methods, for developing.
- recognize and meet the needs of changing groups containing learners of various abilities.

Aptitudes

Teachers who can successfully apply the FC method are:

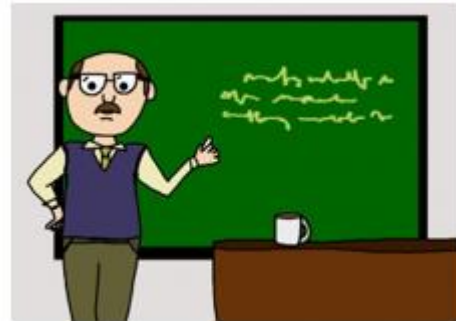
- Open to technical novelties and informs about the latest ICT tools and methods.
- Open to new teaching methods relevant to develop 21st century skills of the students.

1. Introduction - How it all began...



Students today are different from students of our times (assuming you are over 50!). The experiences of this **net generation** require changes to be made to our teaching methods.

Quite naturally, it often happens that some **students do not understand** topics explained by the teacher during a lesson.



And what if a **student is ill** and stays at home for days?

How can the teacher help her/him to catch up?

Geographic distance can also cause problems in the teaching / learning process.

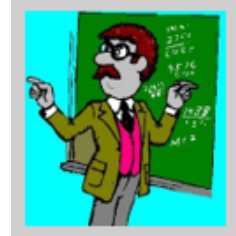


All teachers have faced these issues over time, and have been looking for possible solutions and improvements within their teaching practice. Some innovative teachers started trying out, and implementing, novel ways of adapting their teaching - and as an „unexpected” result the **Flipped Classroom method** was formulated, and spread. Read the following tale of the origins of the FC.

The Tale of the FLIP

Once upon a time there were literature teachers all over the world who gave out texts to their students to read before the classroom lesson. This was a bit different from the traditional teaching methods, though nobody attached a great importance to it. Years went by until....

...one day a professor at a big university discovered that his students were only memorizing information, instead of actually understanding the topics. So, he started looking for ways to improve his teaching practice. He asked his students to read the material before class, and then he dedicated the classroom lesson to interaction, debate and meaningful thinking. Instead of always „telling”, he started „questioning”. This way he completely turned the traditional lecturing method upside down. But he was not alone...



In another part of the world there were three university teachers who „inverted the classroom” – they took the activities that had previously happened within the classroom, outside of the classroom. And similarly, activities previously undertaken outside of the classroom now happened within the classroom. The lecture was delivered at home, and homework was done in the classroom. What a flip!

However, there was no real change to teaching methods in general – many students still struggled with their studies, and could only proceed with help of private tutors. At this time, S.K. happened to be tutoring one of his relatives, who then moved to a distant place but was reluctant to give up the helpful private lessons. To overcome this problem caused by the geographic distance, S. K. recorded his teaching materials so, with the help of technology, he managed to continue this tutoring at a distance. Soon he started giving out his recorded lectures to other students, and asked them to watch. When they actually met personally, the time was now dedicated to an interactive discussion of the topic. S.K. eventually established a successful Academy based on this model - which is still very popular to this day.

The real ‘flip’ happened in the US after 2000. Two chemistry teachers were continually discussing the challenges they faced day after day in their school. One of their recurring problems was that students were often absent due to their participation at sports events.

-It is not good if they always miss the classes. What can we do? I do not want to deliver the same lesson again and again individually to those who were missing...

- Look, I have found some software that is good for recording presentations and for attaching notes to them. Why don't we record our lessons?

Believe it or not, the students who missed out on the lectures actually mastered the materials more effectively than the ones who were sat in the classroom, listening to the „live lecture”.

- Amazing! Why don't we try it with more classes?

So step-by-step they stopped all live lectures, as they agreed that students only need them if they got stuck. They gave out the recordings for pre-class homework, and turned the classroom lessons into interactive learning environments where time was dedicated to help explore deeper a understanding of the topics. Soon the videos they published were discovered and used by other teachers and schools, so their approach - now named the Flipped Classroom - started to spread internationally.

Of course, it presented teachers with an extra workload at the beginning of this change, but their dedication and motivation helped them overcome these initial difficulties.

The Flipped Classroom made teachers and students happy all around the world.

If you don't believe this story, discover it for yourself! 😊

As it is often the case with innovation (and tales 😊), it is difficult to be precise about its origins. Most probably such changes in teaching methods – which leading to the examples such as the flipped classroom approach - appear in parallel in different parts of the world.

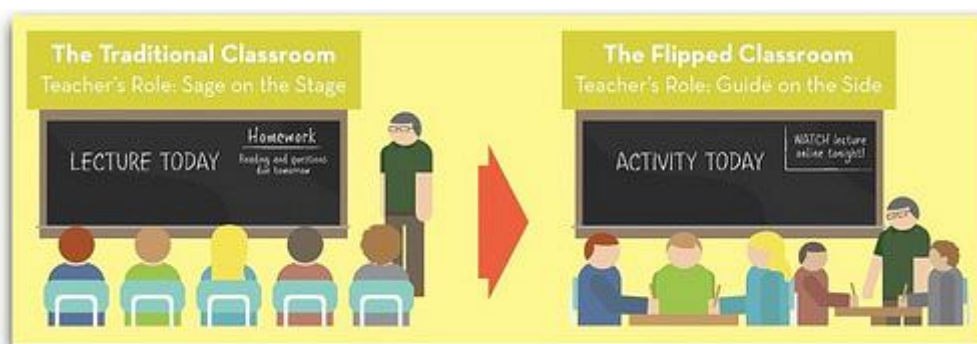


It is important to note, however, that the FC method in itself might not have developed so extensively without the support of **technology**. The FC approach is generally thought of as a **new pedagogic approach** paired up with technology.

2. A little bit of „official” history...

Flipped Classroom approach initially appeared **early in the 19th century**. The United States Military Academy at West Point created a set of teaching methods in which students utilized **sources provided** by their teachers to learn **before class**, while **classroom time was used** for group cooperation **to jointly solve problems**. This teaching method perfectly reflects the basic concept that underlie the Flipped Classroom.

In 2000, Glenn Platt and Maureen Lage introduced a ‘new’ teaching method while teaching at the University of Miami. In their lessons multimedia and the World-Wide-Web were fully utilized to encourage **students to watch teaching videos at home**, followed by cooperative group work in the classroom. This teaching method was basically a rudimentary version of the Flipped Classroom, but that specific term had not been coined for such a teaching format at that time. In 2001, Massachusetts Institute of Technology developed ‘open courseware projects’ focused on open educational resources (OER) which laid the foundations for the application of a Flipped Classroom model. In **2004, Salman Khan** made **videos** of coaching materials and **uploaded** them to a website - which soon became hugely popular among learners. Later, he founded the Khan Research Institution and uploaded even more learning materials to the network, driving rapid development of the Flipped Classroom.



The first real practical application of the flipped classroom is said to have begun with two American science teachers, Jonathan Bergmann and Aaron Sams. However, the concept of the flipped classroom was influenced by various strategies over the previous twenty years, including King’s concept of the ‘*sage on the stage*’, and Eric Mazur’s peer instruction strategy which switched the **transfer of information to outside of the classroom** to allow the lecturer to coach students through the assimilation of information within the classroom.

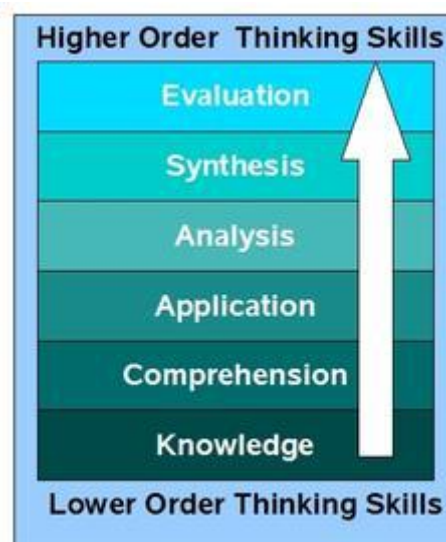
Research by Lage et al. (2000) sought to meet the needs of students with different learning styles by ‘inverting the classroom’ and offering lecture material to economics students via digital means. A few years later, Salman Khan, founder of the popular Khan Academy, saw the value in providing videos of lectures and exercises to allow students to learn on demand and at their own pace. Indeed, it was around the time that Khan launched the Khan Academy online platform that Bergmann and Sams began practicing the flipped classroom technique with their own classes by offering their lectures on YouTube to students to study before meeting in class.

3. Flipped Classroom – key features

According to the definition of *Flipped Learning Network*:

„Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.” (formal definition by the Flipped Learning Network)

Although definitions vary slightly, largely depending on the exact nature of the activities undertaken by students, the flipped classroom is ultimately a more **student-centred approach** to learning whereby **students receive lecture materials before class** - generally in some digital format - and spend the actual class time undertaking more active, collaborative activities. This approach allows students to learn about the topics outside of class, at their **own pace**, and come to class informed and more prepared to engage in discussions on the topic and apply their knowledge through **active learning** (Musallam, 2011; Hamdan & McKnight, 2013). This active learning within the classroom seeks to focus on higher level skills, such as creating, analysing, evaluating.



Bloom's taxonomy (Bloom et al., 1956) serves as the backbone to move the teaching process towards **developing skills rather than delivering content**. The emphasis on higher-order thinking is based on the topmost levels of the taxonomy, including analysis, evaluation, 12

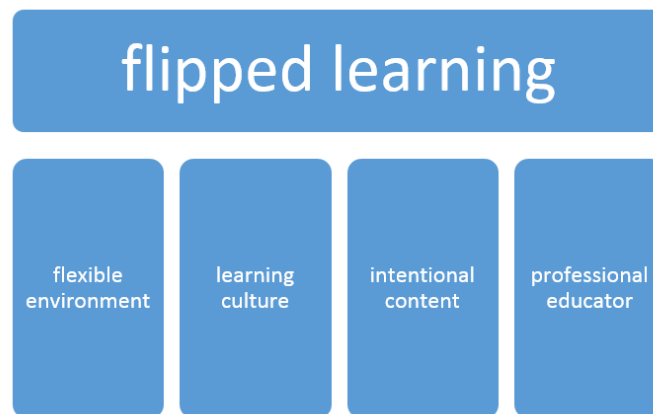
synthesis and creation. Bloom's taxonomy can therefore be used as a teaching tool to help balance assessment, and to evaluative questions in class, in assignments and in texts to ensure all orders of thinking are exercised in the students' learning. This should also include aspects of information searching.

Moving from a teacher-led, traditional lecture structure to a student-centred, more active pedagogical approach can help students to analyse and reflect on learning and facilitates the development of **higher order skills** (Mazur 2009; Westermann 2014; Hutchings & Quinney, 2015). Strayer (2012) suggests the **regular and structured use of technology** in this more student-centred approach is what differentiates a flipped classroom from a regular classroom where additional, supplementary resources are used.

In *A Review of Flipped Learning* (Hamdan & McKnight, 2013) the authors acknowledge that flipped classrooms can differ in methods and strategies, largely due to the fact that “*learning focuses on meeting individual student learning needs as opposed to a set methodology with a clear set of rules*”. As such, the authors suggest the following are the key features that foster learning:

- Flipped Learning requires **flexible environments**. As in-class activities in a flipped classroom can vary from collaborative group work to independent study to research, educators often rearrange the physical space in a classroom to accommodate these variants.
- Flipped Learning requires a shift in learning culture. Flipped classrooms shift the focus from teacher-led to **student-centred** learning in order for learners to experience topics in greater depth through active, more meaningful approaches to learning.
- Flipped Learning requires **intentional content**. Educators evaluate which materials should be presented to students in advance and which content should be taught directly to help students “*gain conceptual understanding as well as procedural fluency*” through constructivist approaches.
- Flipped Learning requires dedicated, **professional educators**. The use of the flipped classroom approach, particularly with the presentation of materials through digital media and technologies, is not intended as a replacement for educators. Class time is crucial for the educator to determine if students have, inter alia, gained understanding of a topic.

A Flipped Classroom is when you give out materials before class. However Flipped Learning only happens if the above mentioned **pillars** are also in place.



There *is no single way* of applying the FC method as such.
There are as many ways of applying it there are teachers. Discover your own way!

4. Theoretical background, other

Hannafin & Land (1997) explain that “*student-centred learning environments emphasise concrete experiences that serve as catalysts for constructing individual meaning. This premise is central to the design of many contemporary learning systems*”. Although Cook (2003) has found that some students “*make most progress in highly structured environments*”, if this approach is considered in the context of a meta-theory such as Bloom’s Taxonomy (Bloom et al., 1956), it has as one of its disadvantages the fact that the learner does not necessarily display understanding but rather the ability to recall and memorise, and certainly does not attain the pinnacle of learning - ‘creating’.

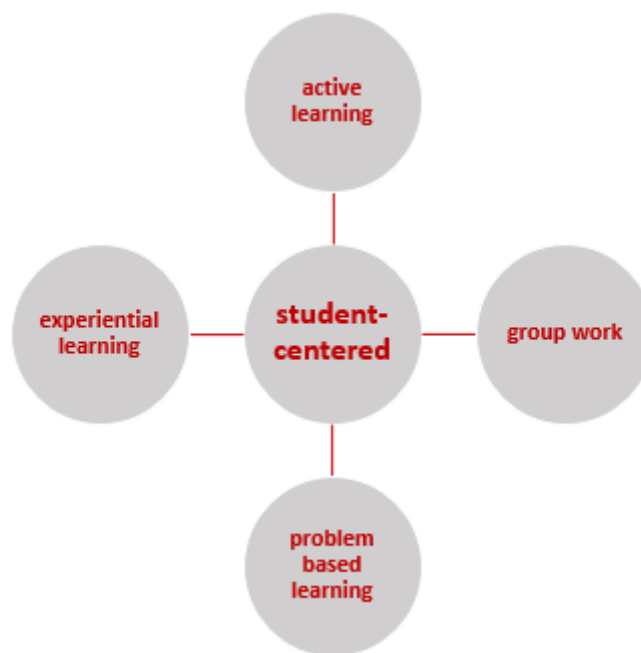
This shift in focus to the provision of student-centred learning, coupled with the pervasiveness of **technology**, has suggested a change in the role of the teacher from a ‘knowledge provider’ to a ‘knowledge resource’ due to “*self-access to information*”, a key feature of technology (Trebbs, 2011). This shift in focus is nothing new, however, as a move from an instructional to a learner paradigm was suggested by Alison King over twenty years ago in her article on education reform, *From Sage on the Stage to Guide on the Side* (King, 1993).

So, are these the beginnings of how to move to a flipped class? It’s not quite as clear cut as this, as we need:

- a strategy;
- the proper supports in place;
- to consider the learner, their abilities and learning preferences.

Student-centred teaching and learning is based on the **constructivist learning theory** which takes the position that learners are active in how they interpret information and build meaning **14**

and knowledge through prior experiences using observation, problem-solving and processing (Cooper, 1993; Wilson, 1997; Ertmer & Newby, 1993). Constructivism takes into consideration the influence of content and context in learning to be a truly individual process. It moved away from the more direct, teacher-centred **Behaviourist** theory which critics felt lacked a focus for fostering meaningful learning, and placed too little significance on the positive effects of group work.



Jean Piaget, a key figure in the development of the constructivist theory, believed that teaching should **match the needs of the children**, and outlined the four stages of intellectual development:

1. Sensorimotor, Preoperational
2. concrete operational
3. formal operational

which he felt were necessary to construct meaning in one’s environment from infancy to adulthood. While Piaget believed in the individualised, social and active learning process for children, the psychologist, Seymour Papert - who built on the constructivist theories of Piaget through his own theory of constructionism - saw the traditional educational system to be too structured to foster this active and inquisitive learning process (Papert, 1993). Papert believed that the **learner**, as an **active participant, can be aided by technology** in structuring their own learning experiences. Donald Tapscott (1998) acknowledged that the increasing availability of digital media and technologies has made Papert’s beliefs more relevant than ever and that they represent the continuing shift to more interactive learning (fig. 1).

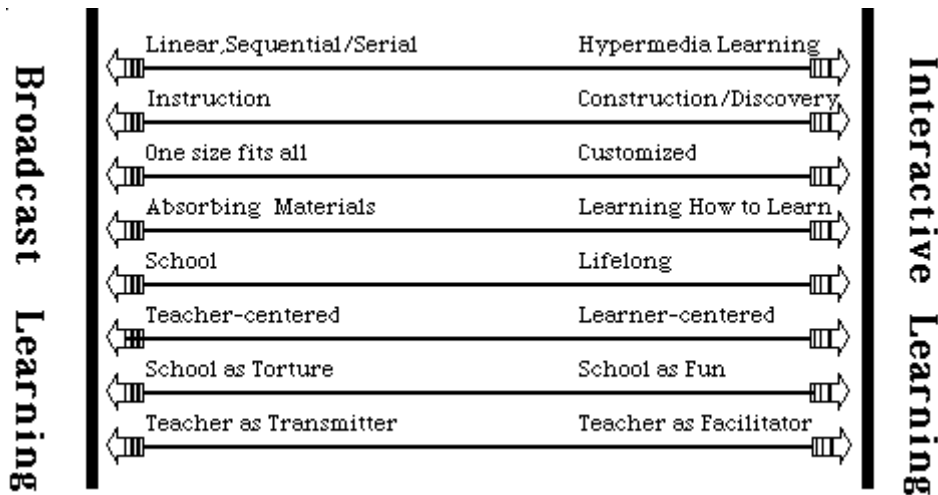
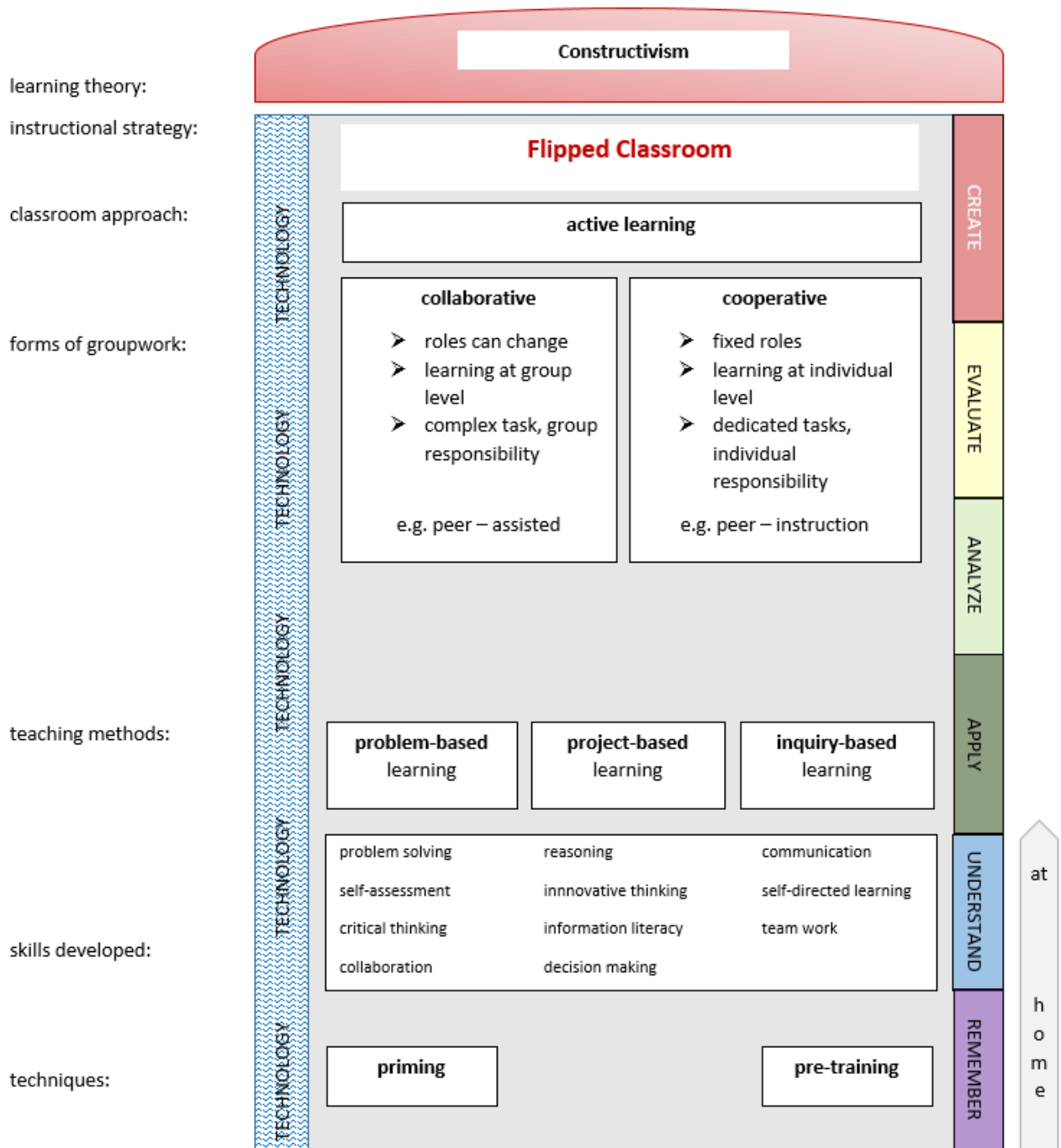


Figure 1 shows Tapscott's continuum in learning technologies from broadcast to interactive learning (Tapscott, 1998)

The theoretical foundations for the justification of flipped classrooms largely focus on research into student-centred learning as a result of the strategic shift towards **actively involving students in the learning process**. Much of this research cites inter-linked theories and approaches related to active learning, problem-based learning and peer-based strategies. A frequent caveat in these student-centred strategies is the importance of the educator in guiding the students in these self-directed and **collaborative activities**.

Studies into current workforce skill requirements give weight to the constructivist approaches of peer-based or cooperative learning with an increasing need to prepare students for a workforce that requires higher order thinking and collaborative skills to solve novel problems, often through digital collaboration environments (Bentley, 2016).

The following figure shows how the Flipped Classroom fits into constructivist learning theory, and how it is compatible with different approaches and techniques in



5. Benefits of flipping the classroom

The flipped classroom is a **student-centred** model aimed at increasing student engagement, understanding and retention by reversing the traditional classroom teaching approach. Cole (2009) argues that this model is a **more efficient use of class time**, by focusing on the **practical application of knowledge** during class. Educators with large classes can particularly benefit from the technique, as Schullery et al. (2011) suggest, whereby a move from a passive, lecture model for 300 business students was flipped to active learning with groups of 24 students to result in a more engaging experience. As a result, student efficiency was increased by providing **17**

them with the opportunity to **come to class more prepared**, having been primed for the learning with pre-class instructional material (Bodie et al., 2006).

Gannod et al. (2008) point to the increased **opportunities for active learning** during class time, and this approach in itself offers key benefits for students. As Prince (2004) and Bonwell & Eison (1991) note, “*active learning requires students to do meaningful learning activities and think about what they are doing*”. The literature frequently discusses active learning with respect to collaborative learning, cooperative learning and problem-based learning, all of which promote meaningful learning and foster student engagement in the learning process allowing students to increase their **learning autonomy** (Overmyer, 2012).

The potential to increase **student engagement and motivation** is a significant driving force in the provision of flipped classrooms. Innovations and advances in technology have allowed educators to create resources to foster meaningful engagement (Schullery et al., 2011) and many platforms and services provide a means of collating useful **resources for re-use by educators and students**. This increased or adapted use of technology coupled with a more student-centred approach can help to facilitate learning for students with **varying learning preferences** or styles (Gallagher, 2009; Gannod, et al., 2008).

The flipped classroom model provides **more** opportunities to offer **one-to-one interaction** with students (Lage et al., 2000) to increase the **development of higher-order skills** through analysis, evaluation and creation (Bloom et al., 1956), critical thinking and problem solving. This interaction is often peer-to-peer, providing educators with more opportunities to ensure knowledge acquisition and understanding, particularly in large groups. By focusing on the quality of the interaction rather than the quantity **student performance can be improved** (Pierce & Fox, 2012).

The flipped classroom model has the potential of **benefitting diverse learners** due to the student-centred approach that is the focus of the model. By providing students with foundational information asynchronously, which they can access on demand and review as many times as they need, they have more opportunities to “*understand and improve their recall before they come to class*” (Hamdan & McKnight, 2013). Arnold-Garza (2014), referencing Overmyer (2012) suggests that students can benefit from reflecting on the material and specific concepts “*through questions and discussion with their teacher, by working with their peers to solve problems based on lecture content, by demonstrating or arguing their own solutions to classmates and the teacher, by checking their understandings through in class experimentation and lab work, and by peer tutoring or creation of learning objects*”.

According to the *Flipped Learning Network*, the majority of teachers who have flipped their class noticed improvement in the grades as well as the attitudes of their students. Almost every teacher who tried this model wants to flip classes again. Let us summarize the key benefits that are behind this success:

Before class:

students learn at own pace:

- ✓ watch video at any time of the day 🕒
- ✓ as many times as needed ⏮ ⏭
- ✓ note down questions or key concepts 📝
- ✓ no more frustration with homework 😊
- ✓ if absent, can catch up fast



teachers create content:

- ✓ supported by technology
- ✓ good tool for motivating students
- ✓ can be re-used
- ✓ if absent, can still deliver the lesson



In the classroom:

Active learning



students

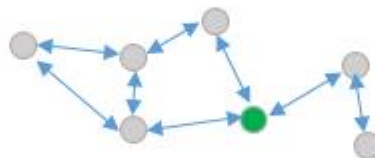
- ✓ apply new knowledge
- ✓ ask questions and get immediate answers
- ✓ better understanding



the teacher

- ✓ can really differentiate
- ✓ decides how much time to spend with each student
- ✓ better classroom management

- ✓ increased interaction (student-teacher, student-student)





- ✓ students have more control over their own learning process
- ✓ higher order skills are developed
- ✓ better results
- ✓ transparency for parents.

Of course, besides pros there are always cons as well, so in the next section we are going to look at the possible challenges you might face when flipping your class.

6. Challenges you have to be aware of...

Despite the increasing popularity of the flipped classroom model, particularly at tertiary (Higher Education) level, a number of challenges have been identified.



One of these challenges, the notion that the educator may be relegated to a ‘guide on the side’, has been greeted with arguable criticism (Kirschner et al, 2006). While this criticism is not solely directed at the flipped classroom model (it began as a criticism of constructivist, student-centred learning) it has deterred some from adopting this approach in their own teaching and prompted proponents of student-centred models to highlight the importance of the educator in any of these approaches.

Organisational challenges have also been experienced from management and support staff who do not understand or have a desire for this cultural shift towards a more student-centred pedagogy. Some of this can be identified as a concern for student performance, particularly for student groups that comprise diverse learners. And students themselves may be slow to support a more active role in their learning, with a fear that it means adding to their workload.

Many point to **logistical issues** when they discuss the challenges of implementing the flipped model. These issues relate to classroom space, design and resources as obstacles to achieving a more active learning approach. In addition, technical issues in schools and in homes can be found to impede the provision of pre-training materials and resources in areas where there is **20**

inadequate connectivity or hardware. A related issue points to the possible need for educators to upskill in technology or the pedagogy and the time required to change a teaching strategy or the learning materials themselves.

Last but not least, while technology may be considered a deeply-embedded element within the flipped classroom approach, an important consideration is that **pedagogy should lead requirements**, rather than technology. To include technology in the flipped classroom without first **considering its pedagogical purpose** will not lead to effective teaching or learning.

Watch this video about *Overcoming Common Hurdles* for further practical recommendations from Jon Bergman, a pioneer of the FC movement:

(<https://youtu.be/bwvXFILQCIU>)



7. Why FC is especially important for VET in the EU?

The potential of the flipped classroom approach to ensure quality of provision and quality of graduates in the European Vocational Education and Training (VET) sector is considerable.

At a general level, the adoption of the flipped classroom provides an opportunity for renewal of the educational approach being utilised in EU VET education, away from the traditional ‘Sage on the Stage’ identified by Alison King over twenty years ago. This is important on two levels, as it ensures against any stagnancy in the VET pedagogical approaches being implemented and provides a new and flexible means of delivery for “new types” of learners, such as **adult learners, independent learners**, etc. These elements are evident in the Bruges Communiqué on enhanced European Cooperation in Vocational Education and Training for the period 2011-2020 (2010) where it is noted that there is a strong requirement “...to respond to the changing **requirements of the labour market**. Integrating changing labour market needs into VET provision in the long term...we must regularly review occupational and education/training standards which define what is to be expected from the holder of a certificate or diploma.” The Bruges Communiqué also notes that “adults – and in particular, older workers – will increasingly be called upon to update and broaden their skills and competences through continuing VET. This increased need for lifelong learning means we should have **more flexible modes of delivery, tailored training offers and well-established systems of validation**”.

The utilisation of the flipped classroom provides a dynamic and alternative pedagogical approach and a highly flexible mode of delivery with established systems of validation.

With regard to empowering graduates, the Bruges Communiqué notes that: *“This means enabling people to acquire knowledge, skills and competences that are not purely occupational... VET has to give learners a chance to catch up, complement and build on key competences without neglecting occupational skills.”* The flipped classroom approach can facilitate multiple aspects of this through the **movement away from** repetition, rote learning and **traditional ‘chalk and talk’ classrooms** to an engaged classroom experience which builds additional competences around communication, teamwork, critical thinking, design thinking, etc. through **in-class activities** such as experimentation, self-directed learning, peer-learning, discussion, etc. and **pedagogical approaches** such as problem-based learning, work-based learning, cooperative learning, etc. Additionally, using the flipped classroom approach, **ICT skills** are naturally enhanced through application and use of digital tools such as screencasts, podcasts, videos, OERs, etc. to access pre-classroom training.

This element of the flipped classroom approach in VET - the provision of an approach involving multiple pedagogical methods and activities - provides the opportunity to address another key aspect of VET outlined in the Bruges Communiqué, to *“Encourage practical activities and the provision of high-quality information and guidance which enable young pupils in compulsory education, and their parents, to become acquainted with different vocational trades and career possibilities.”* Furthermore, the flipped classroom approach offers the opportunity to move away from singular theory-based summative assessment methods to more **practical activities and assessments** based around developing graduates with **real world skills** - and element of note in the Bruges Communiqué (*“VET curricula should be outcome-oriented and more responsive to labour market needs. Cooperation models with companies or professional branch organisations should address this issue and provide VET institutions with feedback...”*).

As students learn by doing, particularly in Vocational Training for trades (e.g. in fields such as Construction or Hospitality, etc.) which demand the mastery of a wide range of practical skills, a flipped classroom approach allows an educator **more time in a face-to-face setting** to concentrate on elements such as the context of the learning and the application of the learning that is extremely important for the student. That is class time can be given over to how to apply the learning to a practical (e.g. work-orientated) scenario. Flipping the class familiarizes students with crucial content and ‘how-to’ knowledge before a class, so they have more time to immerse themselves in **real-life, hands-on learning during the class**. In this way, students get much more of practical tuition, as many of the **theoretical concepts** have already been reviewed behind the scenes by the student **outside of the classroom**.

The flipped classroom also provides an opportunity for the implementation of work-oriented activities, which can provide students with the ability to develop workplace relevant skills and knowledge. The flipped classroom model naturally lends itself to methodologies based around work placement, work-based learning, ‘learning by doing’, etc., as well as many similar elements for cognitive apprenticeships. Educators applying this model have the opportunity to develop work-ready graduates, conforming to the suggestions of the Bruges Communiqué which notes that “Work-based learning carried out in partnership with businesses and non-profit organisations should become a feature of all initial VET courses” and that “Participating countries should support the development of apprenticeship-type training and raise awareness of this”.

Watch the following video about *Laying the table for four* (created by VET students of the Hansági Ferenc Vocational School, Hungary). It will hopefully increase your appetite to try and apply the FC method with your own students:

(https://youtu.be/4JGg8lO__pc)



Another example worth watching is the video about *Making a bouquet of flowers*, created by a Hungarian VET teacher:



8. Are there evidences of effectiveness? - Case studies

Research about the effectiveness of the application of the Flipped Classroom model is not extensive, however data provided by Clintondale High School (in Michigan) demonstrate a considerable impact on learning effectiveness.

<http://www.flippedhighschool.com/ourstory.php>

There are summary studies that report favourably: “*in one survey of 453 teachers who flipped their classrooms, 67 percent reported increased test scores, with particular benefits for students in advanced placement classes and students with special needs; 80 percent reported improved student attitudes; and 99 percent said they would flip their classrooms again next year* (Flipped Learning Network, 2012).” (Goodwin-Miller 2013)

Hopefully this very course will produce additional cases about its mastery by teachers from various schools in the participating five countries. Until then, this section presents two European case studies of note.

8.1. Case study 1 - Czech Republic

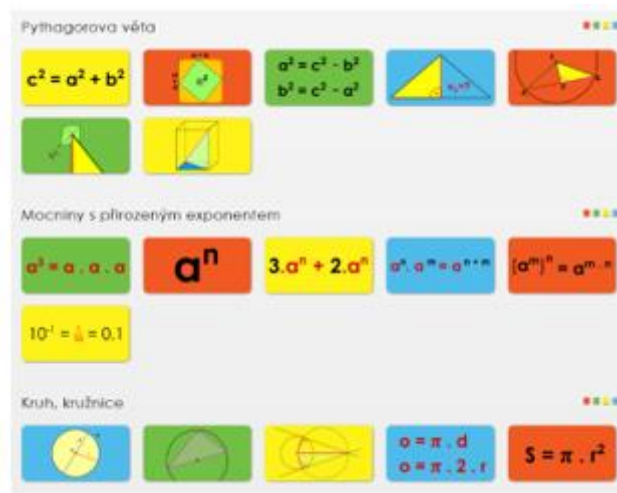
A pedagogical experiment was conducted from September 2013 to January 2014 in the Czech Republic, with the main focus being the Flipped Classroom model in the teaching of **mathematics at upper primary school level**.

Methodology

The project focused on the application of a flipped teaching method, with students learning basic chapters of **mathematics** through **animated video**.

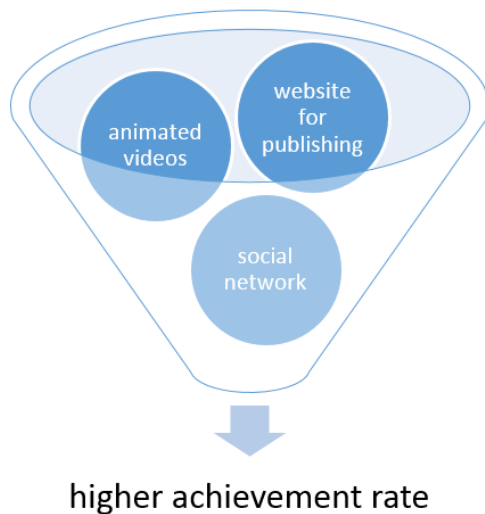
The aim of the research project was to implement training through using of the flipped classroom model and to find out whether the animated video used can help to increase students' academic performance.

The research involved 54 pupils - 27 of them in a control group and 27 in an experimental group. The average age of students was 13.5 years.



A long term, classical pedagogical experiment was used to verify the effectiveness of the animated video created for the experiment. The **control group** of pupils (one class) progressed through **traditional teaching methods** - presenting new topics during school lessons. The **experimental group** (one class of the same school year) had an animated video at their disposal, specifically created for the purpose of the experiment. **Websites** (prevracenatrida.cz) were created for the **distribution of the educational videos**. Pupils were informed about the nature and intent of the flipped classroom teaching model, then studied the animated videos during their home preparation. Each student was assigned a login name and password, and given the opportunity to comment on each video and to discuss problematic parts of the subject matter on the **social networks**. Brief summaries of the topics and explanations of the problematic parts were given in classes. The emphasis was placed on independent work and on

the enlarging and deepening of the students’ knowledge.



At the start of the experiment both the control and the experimental group undertook a didactic test (**pre-test**). At the halfway point of the experiment the students undertook a **mid-test**, and at the end of the experiment both the groups then undertook a final didactical test (**post-test**). The researcher (a math teacher for the experimental group) created twenty-five educational videos that covered the first half of the eighth-grade mathematics curriculum. At the end of the pedagogical experiment, students of the experimental group filled out a simple questionnaire, consisting of three closed questions. The questionnaire was chosen to give rapid feedback from pupils about the new method.

Results

The final conclusion of the pedagogical experiment was that the **performance of students in mathematics was significantly higher** in the student group where Flipped Classroom methods were introduced.

*“After evaluating the long-term pedagogical experiment, we can conclude, that there was **significant difference in achievement** (evaluated based on post-test) between pupils of experimental and control groups in the selected thematic unit of mathematics. Flipped classroom method, when students are studying a new educational material using educational animated videos, did significantly affect academic performance of students. Creative videos were evaluated positively. We assumed that the new method of teaching pupils interested, especially because the use of modern technology. Which was confirmed.” (Špilka R., Maněnová M., 2014).*

Reference

ŠPILKA, Radim a Martina MANĚNOVÁ. Flipped classroom, web-based teaching method analysis focused on academic performance. In: *Proceedings of the International Conference on Education Technologies II*. Praha, 2014, s. 95-100. ISBN 978-1-61804-234-7.

8.2. Case study 2 - Hungary

This experiment took place in a secondary vocational school (Central Hungarian Regional Agricultural **Vocational Training Center** - FM KASZK - Táncsics Mihály Agricultural Technical School, Vác) in January 2016. Participants were aged 17-18 were in the 4th grade at school, and covered the topic of **Globalization**, as part of their **Social Studies** curriculum.

Methodology

Globalisation as a topic is generally familiar to most students, as they can come across it in films and news reports. A specific and distinct course book for Social Studies did not exist, but this **topic is covered** in the relevant chapters of the **History course book** that students use. The text, however, is not particularly motivating for the students, partly because it is poorly supported with captivating images and graphic illustrations, so many students subsequently lack an interest in the subject. Though the underlying topic is important, the text for this course does not enthuse students.

Fortunately, many **good videos are available** on the internet to alleviate this problem. This experiment focused on studying the results and effectiveness of **two different teaching methods** for this topic – the FC model and a traditional one.

Practical implementation

The two groups were separated into two different physical classrooms, with the students being instructed by two different teaching methods. For both, the topic for the next day was revealed on the day before and the students told that their knowledge would be tested by a set of questions.

The students of the **FC Group** met in the IT classroom – not the normal venue for their Social Studies class. However, on the previous day these students were asked to find and **watch a video** on the internet, focus on its keywords, and be prepared to take a test on the topic. At the beginning of the lesson the aim of the video was emphasized again, and students given 20 minutes to make further inquiries on an individual basis on the net. When tested, the group was given a limited time - of 20 minutes – to answer all questions.

The other group had a 30-minute lesson using a **traditional frontal teaching** model and learning environment. They were given less time for the test (15 minutes), but consequently they had fewer questions to answer. In addition to the teacher's classroom explanation, they could make use of their history course book to analyse and interpret its pictures and illustrations. Due to the lack of time given they could not take notes or make an outline of the lesson.

With the FC Group a slightly modified version of the flipped classroom was applied: voluntary students were to watch an eighteen-minute **video** about globalisation **at home** before the lesson. This modification was deemed to be reasonable as not all Secondary VET students necessarily have access to ICT tools or the internet outside of the school. Another reason for changing the method slightly was down the very low level of student motivation.

The lessons took place as follows: The FC Group students were seated in the IT classroom, each at a desk with a PC. After distributing the test sheets, the students had 20 minutes to do individual research on the internet. Some students elected to finding the relevant information by only reading, others took notes in their exercise books. After switching off the computers they had 25 minutes to answer 10 questions in the test.

The control Group was taught by traditional teaching methods. Students were asked to write down the title of the topic (Globalisation) then, with the help of the teacher's explanations and through discussion, they started to familiarise themselves with this topic in the curriculum. The students were asked to take notes individually and pay particular attention to the keywords. Specific attempts were made to break the monotony of the lesson – to maintain student attention - by detailed explanation of the pictures and graphic illustrations. At the end of the 30-minute lesson the students took a 15-minute test. Since they had less time than the other group, they were given only eight questions.

Results

The two tables below show a **significant difference** in the results of the students instructed by traditional, frontal teaching and of the ones instructed by a flipped classroom method. The latter were more successful in tasks which required previous knowledge (Task 2: local problems, Task3: multinational companies, Task 4: drawbacks of globalisation).

Individually, without the help of the course book or pre-studying, the former was unable to figure out important keywords and phrases.

In the case of IT-supported learning there was not a huge difference among the tasks. If a concept or phenomenon was unknown, the students could easily check its meaning on the internet and remember it more efficiently from **their research** than from the teacher's explanation.

Thus, **visualisation** seems to help with memorising information. Students could remember the drawbacks of globalisation more successfully, since they were discussed in detail by the lecturer in the video and emphasized with relevant **images**.

Group 2 (traditional frontal teaching method)

Number of task	1.	2.	3.	4	5.	6.	7.	8.	Total score
Total available scores per task	2	2	2	5	4	2	2	2	21 points
Total score of all students per task	20	20	20	50	40	20	20	20	210 points
Student 1	0	0	0	0	0	0	0	0	0 points
Student 2	0	1	0	3	0	0	0	0	4 points
Student 3	0	1	0	4	0	0	0	0	5 points
Student 4	0	1	0	4	0	0	0	0	5 points
Student 5	0	1	0	4	0	0	0	0	5 points
Student 6	1	0	2	1	0	2	0	0	6 points
Student 7	1	2	2	3	0	1	0	0	9 points
Student 8	1	2	2	2	2	1	2	0	12 points
Student 9	1	2	2	3	2	1	2	0	13 points
Student 10	1	2	2	3	2	1	2	1	14 points
Total	5	12	10	27	6	6	6	1	73 points
Percentage	25%	60%	50%	54%	15%	30%	30%	5%	34 %

Group 1 (flipped classroom method)

Number of task	1.	2.	3.	4	5.	6.	7.	8.	9.	10.	Total score
Total available scores per task	4	4	2	3	2	5	4	2	2	2	30 points
Total score of all students per task	56	56	28	42	28	70	56	28	28	28	420 points
Student 1	1	1	1	0	0	1	0	1	0	0	5 points
Student 2	1	1	1	0	2	4	2	0	0	0	11 points
Student 3	1	1	1	0	0	4	1	1	2	2	13 points
Student 4	0	0	2	2	0	4	0	1	2	2	13 points
Student 5	1	2	2	0	2	5	0	1	1	0	14 points
Student 6	1	3	2	1	0	4	2	1	1	0	15 points
Student 7	2	1	2	1	1	5	1	1	1	0	15 points
Student 8	2	1	2	1	2	5	1	0	1	0	15 points
Student 9	2	1	1	2	2	5	1	1	1	0	16 points
Student 10	1	0	2	1	0	5	2	1	2	2	16points
Student 11	2	1	2	2	2	4	2	0	2	0	17 points
Student 12	2	1	2	2	1	5	3	1	0	0	17 points
Student 13	1	1	2	1	2	4	2	1	2	2	18 points
Student 14	1	1	2	0	2	5	4	2	1	2	20 points
Total	18	15	24	13	16	60	21	12	16	10	205 points
Percentage	32	26	85	30	57	85	37	42	57	35	48 %

Assignment 1 – My 1st idea on Flipped Classroom

Description of the task

After reading the content of this first module, share your first ideas and impressions about applying flipped classroom (FC) method in your classroom.

Before answering the following questions, give a short introduction about your teaching environment (your school, your subject/s, the grades of your students)!

1. What are your first impression about the FC model? Have you heard about it before? If you had earlier experiences with it, please share them!
2. How essential do you think the role of technology is with the FC model? Could you imagine applying FC without ICT?
3. How might you use the FC in your specific field of teaching? What age group and which topic would you choose for a first experiment, and why?
4. What would be the special pedagogical (didactic) goals that could be reached more effectively by FC than with the traditional method?
5. What would be the most difficult task for you if starting this method in your classroom?

Submission

- Use the attached Word template, including answering the questions.
- Size: 1-2 A4 pages
- Use this name for your file: YourName_Module_1.docx
- Upload it and click the "Add submission" button below the text to submit it.

Evaluation

- Reflects the relationship of the FC method and technology. **3 points**
- Subject, age group and chosen subject is defined and reasons for choice are included **3 points**
- At least 2 pedagogic objectives are mentioned, where applying the FC method can be more effective than traditional approaches. **4 points**
- **Max. points achievable: 10 points**

Assignment 1 - template

Your name:

Your school:

Your subject(s):

Age group you are teaching:

1. What are your first impression about the FC model? Have you heard about it before? If you had earlier experiences with it, please share them.
2. How essential do you think the role of technology is with the FC model? Could you imagine applying FC without ICT?
3. How might you use the FC in your specific field of teaching? What age group and which topic would you choose for a first experiment, and why?
4. What would be the special pedagogical (didactic) goals that could be reached more effectively by FC than with the traditional method?
5. What would be the most difficult task for you if starting this method in your classroom?

Module 2 - ACTIVE TEACHING METHODS

Description of the module

Rationale

The active methods in education can be looked at as an alternative to the class/lessons system. We present here the steps and phases of the methods and give examples of how to use the elements in planning an educational activity. The traditional methods of teaching on all levels of education cannot properly provide the essential potential of intellectual progress in the ability of students to incorporate new ideas, knowledge and technologies. The creative project method, like no other method gives an opportunity to wisely combining the theory and practical use of knowledge in real life. Besides that, the creative project method allows to deepen self-confidence of students, their self-realization, helps them understand the importance of group work. The project method marks a serious role in cooperation in the process of completing creative exercises, forms research skills. This method not only holds educational function but also teaches how to self-educate. In addition, we present a simulation method that could be applied with success along with the creative project.

The module aims to

- present active teaching methods suitable for all subjects and fields of education
- emphasize the role of creativity in the development of the individual potential of the student

The module aims to contribute to the innovation of flipped classroom teaching practice. We present the methods that activate, motivate, inspire students and help them to develop skills required in the labour market. We hope to deliver methodological material regarding student-centred teaching methods for the development of „21st Century Skills”.

After completing the module each educator will be able to set a scenario based on active methods that could be collaboratively developed with the educational institution community to ensure high quality teaching practices focused on the success of the students.

Active Methods in Education. The Concept.

To learn more about the concept watch the video:



Teaching Methods for Inspiring the Students of the Future | Joe Ruhl | TEDxLafayette

<https://www.youtube.com/watch?v=UCFg9bcW7Bk> Last access April 24, 2020

Learning objectives

Knowledge outcomes

At the end of the module participants will:

- be familiar with the project method and simulation method
- have an insight into the main characteristics of the creative project and simulation method
- have an overview about the possible practical application of the creative project method and simulation method in the flipped classroom formula

Skills outcomes

At the end of the module participants will be able to:

1. better understand students' needs and characteristics;
2. define learning outcomes for the curriculum;
3. define the learning and teaching context;
4. develop or revise a curriculum based on the creative project method while setting the learning goals and outcomes for the course;
5. evaluate and improve curricula;
6. conduct the course based on active teaching methods

Competences

Area 1 - Professional engagement

Organisational communication, Professional collaboration, Reflective practice

Area 2 -Digital resources,

Selecting, Managing, protecting and sharing

Area 3 - Teaching and Learning

Teaching, Guidance, Collaborative learning, Self-regulated learning

Area 4 - Assessment

Feedback & planning

Area 5 - Empowering learners

Differentiation & personalisation, actively engaging learners

Area 6 - Facilitating learners' digital competence

Communication, Problem solving

Module 2 – CREATIVITY-BASED EDUCATION

1. Introduction -Technology of Creativity

According to the methodology defined as the Technology of Creativity and applied in the educational process during the study course, the creative project as an element of that methodology is meant for the Subject – not for the whole world. The project is subject-centred, always addressing someone. To talk about the project, we have to specify a problem or social issue affecting a person or the group of people – also treated as the Subject. The aim of the project is enhancing, improving the Subject or his/her reality.

This approach requires a high level of engagement on the part of students as well as their willingness to learn independently. It also requires a considerable level of passion and involvement on the part of the teaching staff. The projects may be suggested by the teacher, but they are planned and executed as far as possible by the students themselves, individually or in groups.

Students, as well as the teacher, have to define WHAT and for WHOM it will be developed as a final result. The project's outcome should be the answer for the real social or economic need and solve the problem. This method holds not only educational function, teaches how to self-educate, but also develops entrepreneurial and social (citizenship) skills which are fundamental for preparing young people for today's job market.

2. The Project Method

2.1 The Origins of the Project Method

Recently, the project method has become the most used education tool for conducting classes from different areas of knowledge. Despite some claims it is not a novelty, it is not meant to replace or discard traditional learning models. After all, the project-based learning has been used by the architecture student from 16th century Rome in the first modern Academy of Fine Arts. Even then it was considered a complementary form of education to lectures. Since then, the definition of the project has been subject to many changes, but its core parts remained unchanged. The project method was “re-discovered” and defined as democratic par excellence by John Dewey and further approved by American philosophers and educators who followed him from the early twentieth century. What’s interesting, it was highly regarded by the Bolsheviks – Dewey’s concept was zealously implemented by the first peoples' commissar for

35

education RFSSR Anatoly Lunacharsky. Ultimately the Soviet power considered it as dangerous – they realized that the truth this method teaches is freedom and not obedience. The meaning of this method was discovered once again at the end of the 19th century in the United States, which, as a result of extended access to practical further education, had experienced a real technical revolution, and the names of famous inventors (Alexander G. Bell, Thomas A. Edison, Nikola Tesla) was outshined by the eminent representatives of exact science. What's more, the project was a perfect fit for American democracy – it was Alexis de Tocqueville, who in his fundamental work *Democracy in America* debated as to why do Americans value the practical use of science over theoretical one, and considered applied science as highly democratic. Because of that, it was Stillman H. Robinson who announced that project method can be used for raising someone “in democracy” – by relating to the experience of industry and production focused classes, it introduces students with self-reliance and cooperation, and also for those best among students it creates a chance to move up in the social hierarchy, and by that fulfilling the idea of a self-made man.

It is most often assumed that the first person to introduce the term ‘project method’ as a pedagogical one was Charles R. Richards in 1900, however, it was only used in reliance on the American teachers conducting workshops on practical further education. A broader definition and understanding of the project method was proposed much later by the American pragmatist philosophers: John Dewey, William James. They stated that every form of intellectual activity should be directed towards solving problems, that are created as a result of our struggles to handling what we experience. Hence the standing that relative value of human ideas is determined by the number of ways that can be used.

As defined in the experimental Laboratory School of Chicago, led personally by John Dewey, the way of student development (personal growth) leads through experience, that is the process of gaining experience about the surrounding world and oneself. The leading principle of this didactic system was the “learning by doing” achieved by participating in different practices. According to Dewey, the process of education cannot be limited to simple information sharing –it should rather include the organization of the social process of experience though learning to think and act morally.[1]

The project method was later re-defined by Dewey's disciple, academical math teacher, William H. Kilpatrick. In a broadly discussed work *The Project Method* from 1918 he stated that the project is defined as “An intended action performed whole-heartedly in a social surrounding”. [2] From such perspective, students should not start from acquiring general

knowledge, which is later organised into broader knowledge, but rather another way around – they should first be introduced to theory (news) and the abilities in specific social circumstances, related with their everyday lives.

In this case, an important factor was not a practical aspect, or solving real-life problems, but rather an intent followed by motivation. After the First World War, the project method started to gain approval outside of the United States.

Methodology of the Creative Project Method at the University of Humanities and Economics Lodz, Poland (AHE w Łodzi)

In the traditional methods of teaching on all levels of education the initiative, preparation and content come mainly from the teacher. The project method is an educational, collaborative approach in which students acquire knowledge and skills while solving a practical problem. Like no other method, the project enables combining the theory and practical use of knowledge in real life. It allows students to develop self-confidence, self-realization, helps them understand the importance of group work. They are involved in the activity and the evaluation of the results and have control over their learning. The aim of the project method carried out at the University of Humanities and Economics in Lodz (AHE) is to increase the quality of teamwork and students' ability to carry out a real-life project.

Definition of the Structure of the Creative Project

In the assignment, the maker defines what is the material (a starting point) and what is the result. It allows for different solutions and interpretations, helps to define what conditions the new state of reality the resulting work needs to fulfil. The subject's (maker's) area of activity is the way to complete the work. The maker can use different theories and concepts of activity, different experiences, and tools to complete the assignment, it is important to choose a solution that goes beyond standard ones. The abovementioned work can be created for the use of a third party, the client. In this case, it is the client that decides what requirements this work fulfils. The project should include the means for acquiring information on the client's needs and expectations.

Evaluation:

Objective effect - What is the result? Does it match the requirements of the end-user? In what aspects does it match the requirements and where it does not?

Subjective effect - What did the maker learn? Which aspects did he/she develop and what did he/she realize?

[1] See Dewey, John (1897) 'My pedagogic creed', The School Journal, Volume LIV, Number 3 (January 16, 1897), pages 77-80.

[2] See Kilpatrick, W. H. The Project Method, "Teachers College Record" 1918, vol. XIX, no. 4.

2.2 Applying Creative Project Method

The **learning objectives** you can target when applying the creative project method are:

- Enhanced ability to carry out project work,
- Ability to collaborate and function in teams,
- Enhanced skills in communication, decision making,
- Increased sense of personal and social responsibility and citizenship at a local and global level

Students design an activity which solves the problem outlined during the class. They are supposed to implement the outcome of their work. An example of the final product:

- an article to be published in newspapers and magazines
- setting up a dedicated website with research outcomes: ranking list of eco-friendly cars
- formulating bids and drafts for citizens budget in the city
- providing free training for companies

- providing activities for children
- producing a leaflet
- producing a theatre performance

One of the most valuable aspects of this approach is that it is based on real-life challenges or problems. Students are expected to think of creative solutions to the problem. It is also important to find some subjective outcomes – what we have achieved by this project for other people and ourselves.

2.3 Phases and Steps of Project Management

We present here the phases of the creative project method and give an example of how to use these elements in planning the activity. The model is flexible, it can be used both on a long and short term, and it can be easily suited to creative problem-solving – it is particularly useful during the development and accomplishment of environmental projects. **The method has been developed as the Creative Project Method at the University of Humanities and Economics in Lodz, Poland.**

The process

Begin a project with a clear understanding of why you want to start the project in the first place and what are your goals and the expected learning outcomes. Everybody in your team needs to be focused. Write down and describe why you started the project, what is expected and how this could be achieved. This document is essential to keep the development of the project on the right tracks. A well-framed challenge will help you to focus on your goals.

Make the first attempt to formulate the reason why you started the project and what you want to do in a single unambiguous sentence. Consider questions such as: What is the problem? - Who

has the problem? - What is the context? - What is the goal? Reflect on the expected outcome and discuss how this can best be achieved. The outcome will be a structured description of the

problem and the outcome, together with a clear understanding of the project goals and how you plan to achieve results most effectively.

After framing your challenge, you can start to research new information for further inspiration.

The steps:

In the preparation phase, the teaching staff member provides topics and issues to be solved in specific subject areas. Required resources and equipment for carrying out the project method are based on research and knowledge of current issues in the specific field, and online work.

1. The teacher begins by giving a talk about a specific problem or challenge, for example, in the area of work/labour/job – finding a job, job migration, mobbing or burnout.
2. Students then team up, decide on the specific problem or challenge they want to tackle and make a work plan defining what they will do agreeing on deadlines for themselves.
3. Students then try to find creative solutions to the problem, searching for solutions that are new, non-standard and which are of beneficial to those affected by the problem/issue.
4. Students carry out their plan in practice.
5. Students share the results of the project with all the group.
6. Students evaluate the project.

During the process, as a task leader, the teacher acts as a mentor in the first phase, providing a framework, topics and issues to be solved in the specific area. During the second phase, the educator's role changes to one of a coach, stimulating students to make questions, to be creative in their solutions, helping them to make connections and overcome any possible obstacles.

It can be challenging for students to share work and be responsible for their part.

Step 1 - Preparation

The phase gives space for formulating the project problem – an idea for a creative project.

In a preparation phase the teacher provides topics and issues to be solved in specific subject areas. Required resources and equipment for carrying out the project method are based on research and knowledge of current issues in the specific field, and online work.

40

The Challenge

The teacher provides topics and issues that can be solved in specific areas. In this step, the teacher does not precede the project but is integrated into it. The students choose the project, they discuss what they need to know for solving the problem and learn the required techniques and concepts. They can talk about a specific problem or challenge in, for example – about finding a job, job migration, mobbing or burnout. This part aims to plan the change that the project will bring into reality. Students then team up, decide on the specific problem or challenge they want to tackle and make a work plan defining what they will do and agree on deadlines for themselves. Then they try to find creative, new, non-standard solutions to the problem that is beneficial to those affected by the problem/issue.

The project group

Forming a group of people who communicate and cooperate should include the part when they agree on a mutual contract. They define a schedule, so everybody knows his/her activities and responsibilities in the project and all the tasks are clear. A good choice for online collaboration would be using Trello. (Trello is a management and collaboration tool that helps to organize projects into boards. Trello tells you who is working on what, allows you to keep all the resources in one place and easily change the order of things to do on the list. It's simple, free and easy to use).

To know how the project will be evaluated, the participants should set the criteria – how they assess each other and what aspects will be considered by the teacher.

Elaborating the details of the project

Once the topic is agreed upon within the group, the students present the title of the project, the objectives, the form of implementation, the expected results – regarding the change in the reality or the Subject. After analysing the proposal, the teacher approves it – or not. He/she strongly encourages the students to discuss the project elements in groups, to develop plans and strategies to solve the problem. Participants can make a list (individually or in the group) of the

most interesting ideas, and then choose those which are worthy to work on in order to carry out the project.

Step 2 - Implementation

The project is carried out according to the students' initiative and concept – they choose the tools for solving the project problem independently. Although the teacher is monitoring and evaluating the project constantly, he/she does not interfere, giving the students the space for their creativity and self-development. During the process, the teacher acts as a mentor, providing a framework, topics, and issues to be solved. Gradually the role changes to one of a coach, stimulating the students to be creative in their out-of-the-box way of thinking. As the process proceeds, the teacher has to shift more and more responsibility to the students. It can be challenging for students to share work and be responsible for their part but they should choose the most innovative, creative solution. Required resources and equipment for carrying out the project method are based on research and knowledge of current issues in the specific field. The teacher can assign group leaders, but students should decide who is responsible for the equipment, and distribute tasks to their colleagues. Time for reflection should be provided during all phases of the project, allowing students to evaluate their progress.

Phase of searching for creative solutions

The crucial part for the teacher is to present the task as an open-ended problem giving the space for many possible interpretations and assuming various solutions.

Creative project examples

The students of Pedagogy Faculty conducted a workshop for kids at the community daycare centre during which participants created a story “Friends of the hedgehog” which was eventually published as a radio play and a booklet and given as a gift to the children at the local hospital.



1. Workshop for kids at the community daycare

The outcomes of the project:

Engaging the local society, finding sponsors, building the atmosphere supporting creativity and cooperation, gaining funds for the project, building bonds.



2. A group of students decided to renovate two rooms in the local orphanage.

The outcomes of the project: Finding sponsors, building the atmosphere supporting creativity and cooperation, gaining funds for the project, building bonds. One of the students started to work at the orphanage.



3. Easter meeting with the patients of the Red Blood Cell Foundation

The outcomes of the project: Engaging the local society, building the atmosphere supporting creativity and cooperation, gaining funds for the project, building bonds.

Step 3 - Evaluation

In this phase, all participants gather and analyse information about expected or achieved outcomes, draw conclusions and make decisions regarding improvements. The most important issue should be discussed by the participants assessing the work/personal gains.

The questions that should be asked: What are the values and profits for the project group and each participant? What skills did you develop? What competencies were developed - personal and social?

Improvement and changes in the project

In this part an important question should be asked: If you had the chance to repeat the activity what would you do differently?

Case study

Every year students of the Philology Faculty at the University of Humanities and Economics (AHE w Łodzi) conclude the semester with the issue of *The Curtain* (Kurtyna), writing articles, reviews, doing editorial and printing part of it. In cooperation and under the supervision of The Youth Culture Centre in Lodz, they watch spectacles during the Festival of Theatres, gather materials and work hard to finish their task before the event ends, to comment the plays for the audience.



4. The issues of *Kurtyna*, and students of Journalism faculty at work



Last access April 24, 2020 <https://www.ahe.lodz.pl/media/5771/kurtyna>

45

Students of Journalism and Social Media Faculty run AHE TV news channel and present video bulletin every week – they make interviews, edit material and publish it. They make decisions, act independently, and take responsibility for the results.

Watch the video-bulletin:



5. The video bulletin <https://www.facebook.com/dziksahe/videos/220074732767999>

Last access April 24, 2020

Students of Graphics Faculty compete to show their posters at the end of the year in the gallery outside of the University.

The exhibition was held in the creative industries hub Art Inkubator in Lodz.

Watch the video of the opening:



6. The opening of the students' poster exhibition project. Last access April 24, 2020

<https://www.youtube.com/watch?v=pIgC57tT6Jk&t=27s>

Step 4 - Archiving - Competition

Archiving the project on the platform <https://metodaprojektow.ahe.lodz.pl> provided by the University of Humanities and Economics in Lodz (AHE) enables the access to the competition – a yearly event that aims to promote students in the following categories:

- Best Prosocial Project
- Best Prosocial Art Project
- Best Entrepreneurship Project
- Best Project Promoting AHE (the University of Humanities and Economics in Lodz)

The University provides a dedicated website for archiving students' projects and submission of the documentation is an obligatory procedure before obtaining the grade. Each member of the team responsible for the project gets the same mark.



<https://metodaprojektow.ahe.lodz.pl/> last access April 24, 2020

2.4 Creative Project Method - Support and Training for Educators

Every year the University (AHE) provides the training for educators to help them apply the creative project method. They can learn online in addition to the meetings at the University.

One of our primary educational aims is to make our students able to think independently so that they will face problems well prepared out of the school as well, they will use their knowledge and abilities for the sake of the environment and the society, to make them think creatively. For this, they need positive experiences gained in the course of the learning process, which are sources of energy and enthusiasm for them.

Watch this amusing video about the teacher at the University of Humanities and Economics giving a lesson on forms of lightsaver combat (a practical approach) while teaching English.

https://youtu.be/9M_mbkmlhhU



last access on April 24, 2020

The meaning of creativity in the project work and the added values of the creative project method are:

- Developing creativity in the project work
- Discovering participants' true potential (the makers and the receivers) thus the development of passions and interests (resources and capabilities)
- Increasing imagination and defining the vision of one's development
- Searching and generating more effective, innovative ways of solving problems
- Crossing one's limits, breaking schemes, responding to challenges enabling critical thinking
- The multiplicity of experiences enabling a participant to notice different perspectives of phenomena and problems.

2.5 What are the Benefits of Creative Project Method

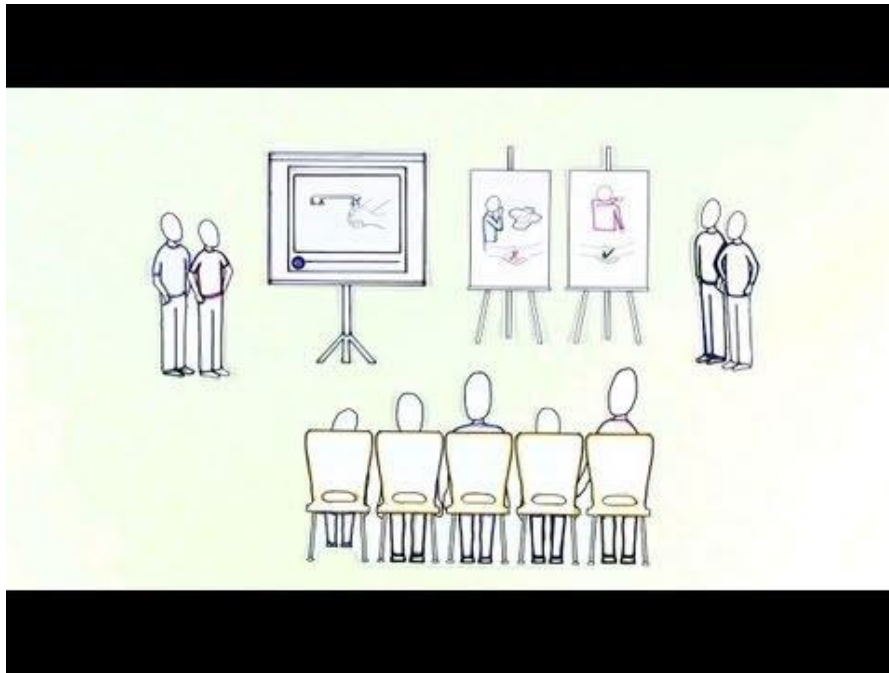
The advantages of this method in its educational, social and integrating potential are, especially:

- enabling the realisation of educational activities (with cognitive, educational and upbringing targets and also therapeutic ones in case of projects bringing the emotional satisfaction),

- developing the interrogative (way of) thinking, abilities of creative, concept, analytic character,
- forming the aesthetic sensitivity, achieving the emotional satisfaction,
- mastering one's intellect,
- mastering one's particular abilities,
- mastering the ability to group-work, co-operation and responsibility for one's own work,
- significance of a team-work adjusted to hobbies of particular team members,
- sharing the results of community work, - forming the democratic habits,
- upbringing the people respecting the rules of democracy and free elections,
- forming the moral attitudes, - developing the experimental mentality,
- developing the readiness to verify some traditions, values and belief transmitted from generation to generation, - facing the challenges and formulaic solutions,
- developing divergent thinking,
- going beyond one's possibilities, developing the transgressive thinking,
- enabling running the discussion and developing the ability of considering arguments 'for' and 'against',
- a human being lives in the society which is learning and the knowledge is not constant and stable but dynamic and inconstant,
- everybody can apply the research methods,
- there are no theological, metaphysical, political nor economic certainties which are considered as dogmas making a human being impossible to examine various aspects of existence,
- developing the critical thinking and 'borrowing' some ideas from other co-learners,
- making a decision with respect to the rights of majority and minority^[1],
- the possibility to express one's opinions, thoughts, ideas regardless of the opinions and beliefs of the adults (PDF) Project method in educational practice. Available from: https://www.researchgate.net/publication/321747866_Project_method_in_educational_practice [accessed Apr 22 2020].

Learn more basic information from the video:

<https://www.youtube.com/watch?v=LMCZvGesRz8&t=7s>



last access April 24, 2020

[1] Maciej Kołodziejski et al. / University Review, Vol. 11, 2017, No. 4, p. 26-32

3. An introduction to Simulation Method

The use of role-plays and simulations within higher education is not a new development. Examples can be found stretching back over fifty years across a variety of disciplines including law, psychology, business and politics. Both methods fall into a larger body of teaching strategies often-labelled ‘active learning techniques. This form of teaching also includes group discussions, debates, collaborative projects and internships. In essence this can include any method that asks students to help develop and apply their own knowledge (Shaw 2010).

Experiential learning such as simulation has been promoted as a means to challenge students’ creativity. It has been used at different levels of instruction. Experiential learning encourages higher-order learning, which promotes critical thinking abilities and self-directed learning[1]. **51**

The teacher can use the method for practical and theoretical learning, and students can be trained in simulated situations before entering the labour market. Simulation is an educational activity in which students experience a real work situation with the teacher as a supervisor. The teacher defines a scenario and parameters of the procedure and ensures that students understand the tasks before beginning. Playing the role allows them to gain experience, learn specific job and function, better choose a career path in the future.

The overall aim of this active teaching method is gaining knowledge and skills by interacting with a „real world” situation and environment.

[1] Kreber, 2001

3.1 Applying Simulation Method

When applying the simulation method, the following **learning objectives** can be targeted:

- Ability to collaborate and function in teams,
- Enhanced skills in communication, decision making,
- Increased sense of personal and social responsibility and citizenship at a local and global level
- Increased experience in the field of study and future work.

Specific **learning outcomes** you can expect are:

- providing an experience as close to the "real work" as possible
- gaining knowledge and skills through experiential practice
- promoting the use of critical and evaluative thinking
- developing students' appreciation of community and culture

Phases and steps of Simulation method

At the beginning of the course the teacher provides a scenario of the situation and tasks to be simulated in a real work environment. (It is on the teacher's part to find the working space). Students decide if they want to take part and which role they take. In the AHE case, it was a court trial in the space of the real court with students of the Law Faculty in the role of a prosecutor, defender, accused and witnesses. (The judge was a real one). At the same time, it was a great opportunity for students' work assessment as they had to convince the judge with their arguments. High school students of the law class made an audience - which was agreed in advance. The case was documented (filmed).

Preparation phase

In the preparation phase the teacher is expected to develop a scenario for a learning experience and plan an assessment form of student learning through simulation - it is often more complex than with other methods. The students' task at the beginning is to do research on the background of the situation to be simulated. During the course teacher provides a framework of the situation and the case scenario while supervising the research, assigning materials to study.

Students prepare in advance as much as possible, rehearsing the parts of the simulation that are predictable, gaining the necessary knowledge. During the simulation the teacher and the students discuss the development of the case, reflecting on their work and experiences.

Resources required for the simulation method are Internet-based materials during the course and consultations with the teacher. Students' engagement will ensure the success of the simulation.

Case study

In the University of Humanities and Economics in Lodz (AHE) the simulation method was applied at the Law Faculty in the course on Law proceedings.

At the first meeting in the university, the teacher proposed the situation and tasks to be simulated in a real work environment. Students decided that they want to take part and which role they take. In this case, the teacher, being a solicitor, invited students to see how the real court works. He had arranged the educational situation, asking for permission to run the class at the court. (The topic of the simulation depends on the professional background of the teacher and his/her connections).

Together they developed a scenario for a learning experience. At the same time, students were gaining knowledge about the rules of the lawsuit proceedings in the courtroom, about the facts or issues in the case that was in dispute.

Students described possible roles and decided who was taking responsibility for which part. They tried their roles during the classes at the university. They succeeded in the court playing the simulation.

After the event, at the university, they evaluated the simulation, reflecting on what they learned.

Illustration 1. Two students in the role of parties directly involved in a lawsuit: a prosecutor and a defendant playing their parts in front of the real judge who kindly supports the educational situation. Both students were enjoying the simulation, especially the girl, insisting on wearing real handcuffs during the scene. Behind the camera stands a fellow academic recording the proceedings and making a documentary of the simulation. Full documentation is available on Illustration 1.

<https://www.ahe.lodz.pl/news/13275/symulacja-rozprawy-sadowej-w-wykonaniu-studentow-ahe-w-lodzi>



Illustration 1.

<https://www.ahe.lodz.pl/news/13275/symulacja-rozprawy-sadowej-w-wykonaniu-studentow-ahe-w-lodzi>

Last access April 24

Watch the video documenting the simulation:

<https://www.youtube.com/watch?v=Yfq2qSwJmu8&feature=youtu.be>



Last access April 24, 2020

Through role plays and teaching, you can get a better understanding of how some theoretical concepts work. Learning this way is much more fun than just listening to a lecture.

Watch the video:

<https://www.youtube.com/watch?v=Ua57yXxJscE>



Last access April 24, 2020

3.2 What are the Benefits of Simulation Method

Simulation can improve students’ skills and allow them to learn in a real or staged environment.

Students are able to gain a greater understanding of the procedures and problems relevant to the subject and learn from experience.

Simulation offers student participation. Rather than sitting through a lecture, students can practice what they have learnt and quickly learn from any mistakes. Students develop hands-on and thinking skills, including knowledge-in-action, procedures, decision-making, critical thinking, and effective communication. Simulated learning can be set up at appropriate locations, and repeated as often as necessary. Feedback can be given to students immediately and allows them to understand exactly what they can improve.[1]

[1] (Moorthy, Vincent, & Darzi, 2005), (Brooks, Moriarty, & Welyczko, 2010) Retrieved from <https://simulatedtraining.wordpress.com/advantages-disadvantages-of-using-simulation-training/>

Assignment 2 - The Creative Project Method

After reading the content of this module, answer the questions related to the contents of self-learning on Creative Project Method and Simulation Method.

The questions on Creative Project Method:

1. Describe the creative project method concept
2. Complete the statement: The project starts with...
3. What is meant by student-centred teaching?
4. What are the phases of the creative project?
5. Which of the following statements is correct? In Creative Project Method you probably:
 - won't see teachers lecturing
 - won't see multiple choice quizzes.
 - won't see homework
 - might see any of the above
6. What are the factors of success in Creative Project Method?
7. What are the steps of Creative Project Method?
8. What is meant by evaluation of the project?
9. Write at least three characteristics of a creative project?

The questions on Simulation Method:

1. Describe the Simulation Method concept
2. Complete the statement: The simulation starts with...
3. What are the phases of simulation?
4. What are the factors of success in Simulation Method?

Submission

- Use the attached Word template (answer the questions). Size: 1-2 A4 pages
- Name the file (YourName_Module_2) and upload it.

Evaluation

- Creative Project Method 6 points
- Simulation Method 4 points
- Max. points achievable: 10 points

Attachments

1) Creative Project Template for students (example)

Year of studies:	Form of study:	Semester:	Group:
Faculty			
Course			
Teacher			
Title of the project			
The aim of the project			
Objectives:	<ul style="list-style-type: none"> • knowledge • skills • personal and social competencies 		
The result of the project	<ul style="list-style-type: none"> • material • subjective / personal gain 		
Why the project was realized in a specific way: explain your choice			
Innovative aspect of the project			
Description of the project's content			
Project group	First name and surname	Index No.	The role in the project

	1.			
	2.			
	3.			
	4.			
	5.			
	6.			
Tasks and Deadlines	Task	Deadline	Cost	Person responsible
	1.			
	2.			
	3.			
	4			
	n			
Presentation of the final result / product	<ul style="list-style-type: none"> • Presentation method • Duration • Place 			
Evaluation of the project				

Project documentation		Documentation method	Person responsible
	1.		
	n		
Resources			

Sample schedule

<i>Schedule (agreed with the project group on the first meeting)</i>		
Date		Activities
	I meeting – organizational meeting General description of the project, task assignment	Consulting by e-mail, f2f, by phone
	II meeting – presentation of the project, SWOT analysis Improving project, implementing project Project implementation	Consulting by e-mail, f2f, by phone
	III meeting – defending and evaluating project with the group and the teacher (10 min – the project should be presented in the most interesting way)	
	IV meeting – defending and evaluating the project with other groups (15 min each, the project should be presented in the most interesting way) Final grades	
Assessment criteria		

2) Evaluation and assessment of the project

Name and Surname:

Part I: Self-evaluation

Tasks that I completed independently:

.....
.....
.....
.....
.....
.....
.....
.....

The percentage value of my contribution to projects:

What I've learnt during the project:

.....
.....
.....
.....
.....
.....
.....

My final score is... (1 – 6) because:

.....
.....
.....
.....

Part II. Evaluation of work in a project group



Who is in the project group:

Name/Surname	Completed tasks	Percentage of work contribution to the project	Score (1–6)
1.			
2.			
3.			
4.			
5.			

Self-evaluation (1 -6)

based on:

- a) importance of the subject
- b) preparation of the scenario
- c) research development
- d) forming of conclusions
- e) general score:

The score for participation in the project: cooperation, communication, helping each other (1 – 6):



Part III. Evaluation of other projects:

Project I

Title:

Presentation (attractiveness, readability, accurateness)

Project's value (–6):

Project's preparation (1-6):

Add remarks:

3) Evaluation and project's score – formative and summative assessment

Evaluation and project's score

While conducting the project, it is advised to use two types of assessment: formative and summative

Formative assessment is used as part of conducting the project. It is used as a tool to support the student's engagement by allowing them to express their needs in the area of curriculum, but also methods and tools used. This kind of assessment should help teacher and student alike to define the component marks of the student and identify the areas of knowledge and abilities for the student, that may be lacking. A teacher who uses the score from this assessment effectively should fit educational tools to the needs and expectation of a group, that he is currently working with. This assessment does not need to have an effect on the student's final score. Depending on the timetable and the complexity of the project the formative assessment can be used more than once, it can be used after the duration of one third and two-thirds of the time intended for the project.

Use of formative assessment in undergraduate education

The assessment may be conducted in a form interview or questionnaire for the student to fill, and then discuss it with a teacher. In the case of a group, it is recommended to do a group discussion with the teacher. The formative assessment may include:

1. Were there any difficulties with the preparation of the project?
2. How does a student handle researching and using sources of information?
3. Does student participate in every topic brought as part of the module, also can he combine knowledge from different areas (topics, classes, different subjects)?
4. Does student possess the ability to deduce and formulate conclusions?
5. Can students use their knowledge in the real world?
6. Does the student possess the abilities of communication and teamwork?
7. Does the student know where he/she is headed (defined goals, effects)?

8. Does the student know what he/she wants to learn?
9. What is the level of motivation and student's engagement in the project?
10. Do students need help with conducting the project? What help would it be?

Students should prepare a detailed plan for the project and its schedule. It should be used as a base for making a formative assessment.

Summative assessment is made at the end of the project and should be used to verify, what learning outcomes were achieved and to what degree. The summative assessment does not need to check every defined outcome, only their representatives.

An example of a summative assessment in undergraduate education.

The assessment should have a written and oral part (entry form + discussion with the whole group participating). It should include the student's assessment, as well as an assessment of group and teacher. In the case of a group project, it is best to propose an assessment inside of the group.

The summative assessment may include:

I. Knowledge and understanding

1. What sources did the student use? (quantity, quality, thoroughness)
2. How did the student use the knowledge? (quality evaluation)
3. Did student choose the theory independently from the pool of available resources that described the task?
4. To what degree did the student show the ability to deduce and formulate conclusions

Module 3 – THE CONCEPT OF CREATIVITY

Description of the module

Rationale

The knowledge constructed by students is not only dependent on the learning content, but on their previous knowledge, interest and learning styles as well. For this reason, it is of key importance for teachers to adequately choose a strategy to create the ideal learning environment for students. Modern classroom management approaches provide complex opportunities for active learning, developing competences that are essential on the 21st century labour market.

The aim of the module is to

- present innovative classroom management methods, alternative teaching practices;
- emphasize the essential role of student-centred, active learning.

Topics

Creativity Concept - Units

1. A clear knowledge of the concept of creativity, its role with respect to cognitive and teaching styles;
2. Awareness of the importance of cultivating a creative spirit and why;
3. Be aware of what the brakes and blocks of creativity are
4. Understand the mindset (frame) of divergent or lateral thinking
5. Analyse the elements that characterize creativity (activation, method and energy) into the teaching process;

Creativity Method in the School - Units

1. Creativity Method (Introduction)
2. The Perception phase (techniques and exercises and case studies)
3. The Analysis phase (techniques and exercises and case studies)
4. The Ideas Production phase (techniques and exercises and case studies)
5. The Selection phase (techniques and exercises and case studies)
6. The Implementation phase (techniques and exercises and case studies)

Implementation of Creativity Method - Units

1. Pilot project on some classes – Pre-testing the method
2. Analysis of the results of pre-testing the method

Learning objectives

Competences

The module contributes to the development of the following Creativity competences:

Area 1 - The perception and analysis of the teacher

- (C1) to find and set problems related to students' learning
- (C2) to formulate new problems about the learning process/activities
- (C3) to fully understand the student (learning styles, character, personality traits, etc.)
- (C4) to evaluate and analyse the emerging information from the classroom.

Area 2 - The production of ideas phase

- (C5) to produce a wide range of solutions (learning units, learning objects, digital learning resources, teaching method used, etc) for each problem analysed (in a short time)
- (C6) to find amazing learning resources to raise the attention.
- (C7) To engage the students in learning processes aligning the learning activities with the learning styles/attitudes of the students
- (C8) to cogenerate the learning or teaching unit/event developing the infinite solutions with involvement of the students and colleagues
- (C9) to develop infinite, different new learning unit/event.

Area 3 - The selection phase

- (C10) To find (to select) always the best (right) solution to develop new teaching formats (in terms of training resources, teaching materials, tools, environments etc.).

Area 4 - The application phase

- (C11) The ability to effectively implement emerged and selected solutions.

Knowledge Outcomes

At the end of the Module the participants will:

- be familiar with challenges educators face in the 21st century;
- have an insight into the main characteristics of innovative teaching methods;
- see the difference between traditional and student-centred classroom management;
- have an overview about the possible practical application of the Flipped Classroom model.

Skills Outcomes

At the end of the Module the participants will be able to:

1. perceive, define, set, analyse the characteristics of the students, problems related to learning in the context of design and implementation of teaching activities in the flipped classroom
2. quickly generate a variety of alternative and suitable solutions (learning units, learning objects, digital learning resources etc) for solving specific problems/needs related to learning, individually and in groups, in the flipped classroom teaching paths
3. select and choose the best teaching solutions and resources (digital and traditional) based on criteria related to specific learning outcomes
4. design, test and implement a learning units/learning events/activities/experiences in a flipped classroom environment
5. face an unexpected problem during the teaching (inside or outside the classroom) and to find the right pedagogical solution.

The Context

Below you can find some information from newspaper articles and other sources that demonstrate the importance of learning creativity.

The World Economic Forum presented the skills which, from now until 2020, will become indispensable. In the first three places we find:

- **complex problem solving;**
- **critical thinking**
- **creativity.**

These are elements connected, in one way or another, to technological evolution. (...) And it is in this context that man will be called to make a difference through his ability to deal with complex problems, in increasingly interconnected areas and with transversal subjects. (...) "[1]

“It is important to equip current and future generations – regardless of social and cultural background – **with the characteristics of successful innovators** – including curiosity (or inquisitiveness), use of *imagination, critical thinking, problem-solving, and perseverance* (resilience or persistence) which includes positive risk-taking.

These characteristics are associated with 'creativity', which is a process typically of imagining possibilities, creating something new, and reflecting upon and modifying what is being created. In a broader sense it is a way of interpreting and acting upon the world.

'Innovation' means to create something new within a particular context or strive towards a goal in a new way.

'Creativity and innovation' appear in the competences of: literacy; mathematical, science and technology; digital; entrepreneurship; and cultural awareness and expression."[2]

-

THE “4 CS ” OF LEARNING - Transversal skills

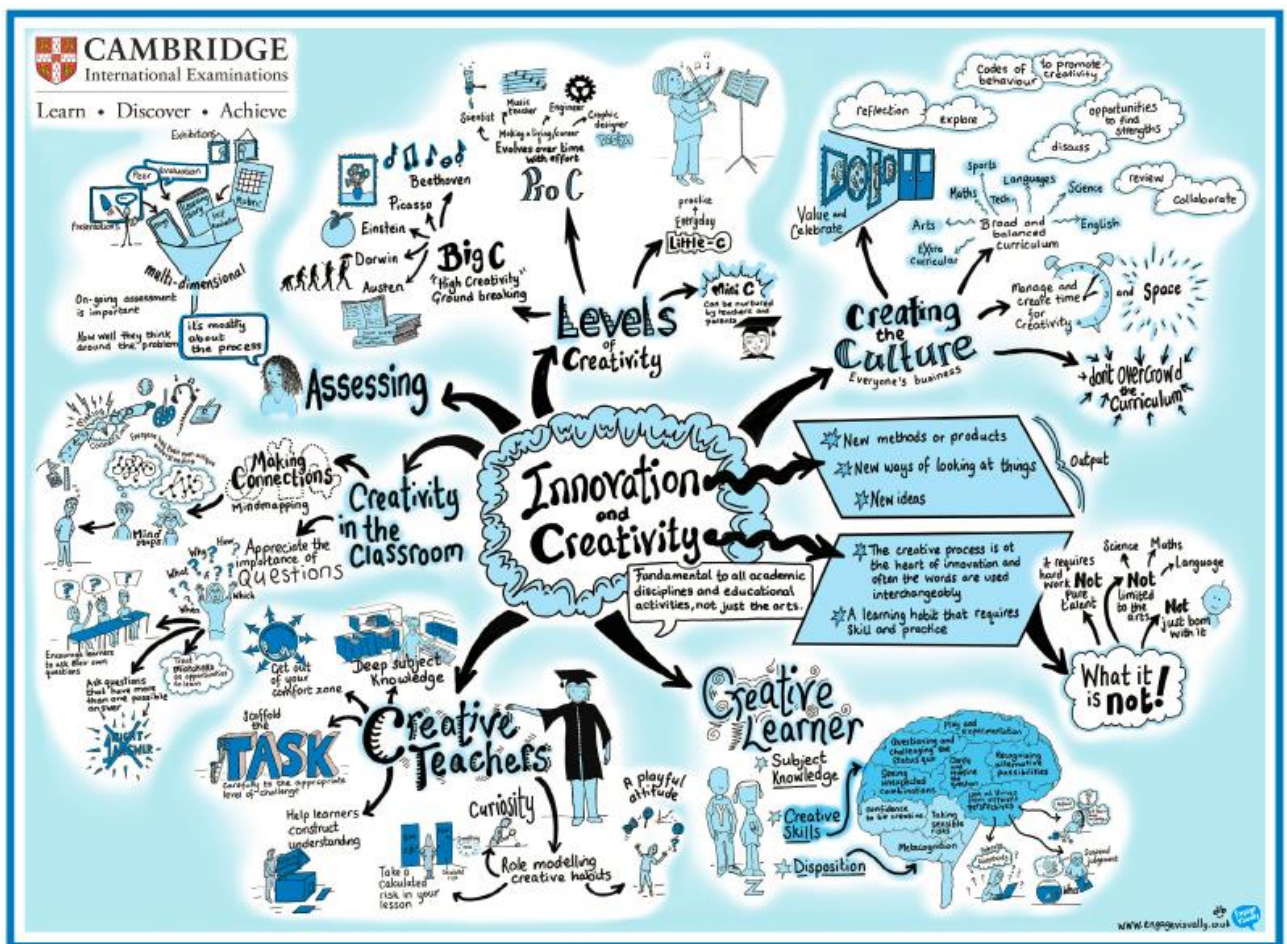
- **CRITICAL THINKING**
- **CREATIVITY**

- COMMUNICATION
- COOPERATION

Nowadays it is increasingly necessary to move to an approach that stimulates and enhances the *participation* of the whole class through *decision-making, sharing and problem-solving processes*.

Using methods that put “issues” in the centre, help the problems to be solved. Situations in which students can easily descend by making important assessments.[3]

Innovation and Creativity in the Classroom



[1] FONTE: Il Sole24Ore – “*Creatività, una competenza di cui non potremo più fare a meno*”
– di Francesca Cantardi 01.12.17

[2] FONTE: " Commission Staff Working Document "at the basis of the Recommendation of
the board on key competences for lifelong learning COM (2018) n.24 of 17.01.2018

[3] Prof. Irene Baldriga “*Le competenze del XXI secolo: idee e strategie per la scuola della
complessità.*»– Mondadori Education 18.01.18

Creativity - the Concept

Is this creativity?

Creativity (artistic) as a process
based on purely aesthetic
criteria.



Or this?



Creativity is the process that
gives life to something **new**
that satisfies a **real need**. An
original and **valuable** process.

The second one (Barbie) is the creativity concept we will work with.

Creativity (in school) is an **original** process that gives "**new**" **value** to teaching.

It allows you to rethink *programming*, the *structure* of teaching activities, the management of class *dynamics* and the *spaces* in which you teach.

1. Creativity (in school) Serves, Among Other Things[1]:

- Amaze, intrigue and excite pupils
- Involve the class by capturing their attention
- Maintaining interest in the topics covered
- Communicate better what you think is useful
- Make that topic useful at that time
- Clarify why it is important to study that particular topic.
- Incentivize emotions
- Making the diversity of pupils productive
- Share the didactic activity with the pupils
- Questioning yourself
- Always ask yourself many questions
- Develop critical thinking
- Develop the spirit of initiative
- Seeing things in a new way (spaces included)
- Remove ground from conformity
- It favours interdisciplinarity

2. Creativity's Impacts

Impact on multiple intelligences[2]:

- linguistics
- logical-mathematical
- space
- body-kinesthetics
- musical

- interpersonal
- intrapersonal
- naturalistic
- existential.

Let's try to deepen the concept reading this article: [The Role of Multiple Intelligences and Creativity in Students' learning style.](#)

On the one hand, creativity encourages "**personalization**" by allowing each student to work and develop their talents in an inclusive logic. On the other, it urges "**individualization**", ensuring that students achieve the fundamental skills[3].

It stimulates all the different learning styles[3]:

- Visual-Verbal
- Non-verbal
- Auditory
- Kinesthetics

Let's try to deepen the concept reading this article: [The Relationship between learning styles and creativity](#)

Impact on different cognitive styles[3]:

- **GLOBAL** (overview)
- **ANALYTICAL** (individual details)
- **SYSTEMATIC** (one variable at a time)
- **INTUITIVE** (hypothesis)
- **MINUTES** (summary, verbal associations)
- **VISUAL** (diagrams and graphic representations)
- **IMPULSIVE** (fast processing)
- **REFLECTIVE** (slow and reflective processing)
- **FIELD EMPLOYEE** (context dependent)
- **FIELD INDEPENDENT** (autonomous)
- **CONVERGENT** (proceeds according to logic)

- **DIVERGENT** (proceeds creatively)"

Let's try to deepen the concept reading this article: [The Role of cognitive style in creative thinking among college students.](#)

Impact on different teaching styles[3]:

- **SPOKEN** (use words and refer to written text)
- **VISUAL** (uses images, maps, diagrams, blackboard and refers to the iconic aspects of the text)
- **GLOBAL** (focuses on a general idea of the topic and defines macro-relationships)
- **ANALYTICAL** (starts from the details and declines one aspect at a time)
- **SYSTEMATIC** (follows the detailed list of topics)
- **INTUITIVE** (follows the outline of the topics in general, modifying it on the basis of the pupils' references)"

Let's try to deepen the concept reading these 2 articles:

- [Teachers' creativity different approaches and similar results](#)
- [A Study on the Relationship between Creativity and Innovation in Teaching and Learning Methods towards Students Academic Performance at Private Higher Education Institution Malaysia](#)

3. Creativity (in educational activities):

“It allows an **accurate analysis** of the **starting situation** and the **choice of the topics and objectives** that are considered important;

It helps **identify the reasons why I have to teach those topics.**

It **allows you to find solutions, operational strategies** that allow you to teach what you think is the most appropriate."

“Creativity is more than producing something different or unique. It has also to produce something that is meaningful, that is, of value to others. “[4]

"The CREATIVE IDEA[5] should “*work*”. It is the idea that proves to be:

- *Correct*
- *Useful;*
- *Valuable;*
- *Meaningful.”*

4. Myths to dispel:

- We are born creative (the prerogative of exceptional minds)
- Children are more creative (more spontaneous and free)
- Creativity is transgression and provocation
- Creativity is a spontaneous act, which comes by itself and which does not involve effort
- Creativity is a solitary process
- Once the creative flow has started, there is no need for rational control over the process itself
- Creativity is like fantasy (far from concrete)
- Artists are creative, scientists are rational

CREATIVITY is a **TRANSFORMATIVE** (voluntary) ACT that satisfies a need.

First Picture: Jump without considering the new context and its possibilities

Second Picture: Jump considering the new context and its possibilities



«Creativity is the ability to observe things well»

PABLO PICASSO

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- [1] FONTE: ISABELLA MILANI – “*L’arte di insegnare*” – VALLARDI 2013
- [2] FONTE: HOWARD GARDNER – “Multiple Intelligences: New Horizons in Theory and Practice” – BASIC BOOKS 2008
- [3] FONTE: F.CARTA: “*Stili di apprendimento, stili cognitivi e stili di insegnamento. Per una scuola inclusiva*” Liceo G.M. Dettori Cagliari
- [4] RALPH L. KLIEM „Creative, Efficient, and Effective Project Management” – CRC PRESS Taylor & Francis Group 2014
- [5] DANIEL GOLEMAN, MICHAEL RAY, PAUL KAUFMAN «*Lo Spirito Creativo, imparare a liberare le idee*» – BEST BUR 2001

Unit 1 - The Concept of Creativity and its Role in Implementing Cognitive Teaching Styles

1. Introduction to Creativity [1]

”To many of us, “creativity” is a mysterious quality that some lucky people are born with. But the truth is that everyone is, and can be, creative. Even if you think your mind works in an entirely logical way, there are techniques and approaches you can use to help you think more creatively. You could define creativity as the ability to meet needs or solve problems in new and inventive ways. When you look at it like this, many of us are actually being creative without even thinking about it.”

What are the benefits of creativity?

There are various ways that you and your organisation can benefit from improved levels of creativity. These include: **finding new solutions**.

Creativity helps you generate lots of new ideas which can help you and your organisation to deal with change, build strong teams, develop new products and services, improve customer service, and retain talented staff. The more ideas you generate, the more likely you are to find

76

new ways to meet challenges and overcome problems. The possibilities are as endless as your imagination.

Minimising frustration. Improving your creativity means you can drastically reduce the frustration caused by failing to meet challenges or to solve problems at work.

Increasing productivity. The right creativity tools and techniques can help you and your organisation to generate ideas and solve problems faster, making you more effective, productive and fulfilled.

2. When can I Use Creativity?

Creativity can be particularly useful for generating ideas and for problem-solving at work. When your usual response, or organisational guidelines, suggest a particular course of action, pause for just a moment and consider whether there might be an alternative way.

Generating ideas There are all sorts of techniques available, e.g. brainstorming and mind mapping, to help you think more creatively and innovatively.

By this we mean:

- setting aside assumptions about how particular challenges or problems should be approached, e.g. just because that's the way you're always done something, does that make it the best way?
- taking new perspectives and being open to new ways of doing things in your day-to-day work. Think back to the last time you did something, did anyone suggest another way, or did you receive any feedback?
- looking for new ways to create value for your organisation. Think about any competitors or rivals your organisation has. What do they do differently, what is it about them that you admire? Could you adapt this to your organisation?
- listening to, respecting, and incorporating other people's suggestions and ideas into your thinking.

Problem-solving: The secret of using creativity to solve problems is to avoid the temptation of looking at how you tackled similar challenges in the past. Instead, try to re-formulate your thoughts.

You can do this by:

Re-defining your problem. Before you start, make sure it's the problem and not the symptoms you're trying to solve. Ask yourself why the problem exists, and spend time getting to the bottom of it. It's also important to be clear about what you're trying to achieve, and any constraints that exist. If the problem is a particularly large one, break it down into smaller parts, and deal with each one at a time. When you have thought the problem through thoroughly, try summarising the problem in a couple of words if possible, to really focus your mind.

Open your mind. Once you're really clear about the problem, start generating possible solutions. Remember to try to think about ways of doing something out with the normal approach. You will find a variety of creativity techniques throughout this unit to help you do this. Avoid the temptation to immediately go with your first idea. It may or may not be your best idea, but by considering a number of alternative options first you may come up with something better. If you do go back to your original idea you can be sure that you've considered all the other options. Try not to pass judgment on any of your ideas until you have come up with as many as you can, and then revisit them all with an open mind.

Identify the best solution. Once you have a number of possible solutions, choose the best one by weighing up the pros and cons of each. There might be an obvious choice, but if not, you may wish to ask others for their input to help you decide.

Implement your solution. The final stage of creative problem-solving is to transform your solution into action. Without this final stage, your creative efforts will have been wasted. It is useful, therefore, to draw up an action plan to help you implement your chosen solution.

Where should I start?

Being creative doesn't have to mean having big original ideas. It can be something as simple as contributing to a suggestion scheme with your ideas on trying something new or doing something better in your department. What's more, brand new ideas are few and far between. Most of the time new ideas are created by putting together existing ones in new and original ways. Think about email. It's really just a combination of the letter, the word processor and a modem. But what has resulted is something that has changed the way that people around the world communicate with each other. Look around you for inspiration. What are other teams,

departments, or industries doing that you could 'steal' creatively? The interesting and original concept a rival has come up with could well be adapted and moulded for your purposes.

3. What is Creativity?[2]

”E. Paul Torrance (Millar, 1997) has been a pioneer in creativity research and education for more than 50 years. Torrance sees creativity as a process and has developed a battery of tests of creative thinking abilities. He believes that all individuals are creative and that creativity can be enhanced or blocked in many ways. He considers creativity developmentally, opposite to those who believe that a person’s creativity was established at an early age (two or three years old), however his research has shown that creativity does not develop linearly and that it is possible to use activities, teaching methods, motivation and procedures to produce growth, even in ageing. **Torrance asserts that creativity is an infinite phenomenon**; you can be creative in an endless manner.

You find creativity in many apparently different areas: humour (haha), science (aha) and art (ah). Koestler (1976) presents the theory that all creative activities - the conscious and unconscious processes underlying artistic originality, scientific discovery, and comic inspiration have a basic pattern in common.

He calls it "**bisociative thinking**" - a concept he coined to distinguish the various routines of associative thinking from the creative jump which connects previously unconnected frames of references and makes us experience reality on several planes at once. Koestler introduced the concept of a "matrix" to refer to any skill or ability, to any pattern of activity governed by a set of rules - its "code".

All ordered behaviour, from embryonic development to verbal thinking is controlled by the rules of the game, which lend it coherence and stability, but leave it sufficient degrees of freedom for flexible "strategies" adapted to environmental conditions. The term code is deliberately ambiguous, and reflects a characteristic property of the nervous system: to control all bodily activities by means of coded signals. The concept of matrices with fixed codes and adaptable strategies, is proposed as a unifying formula, and it appears to be equally applicable to perceptual, cognitive, and motor skills and to the psychological structures variously denominated frames of reference, associative contexts, universal discourse, mental sets, **79**

schemata, etc. These silent codes can be considered as condensation of learning into habit or associative thought. Bisociative thought is the challenge of habit by creativity.”

[1] An Introduction to Creativity -

<https://www.southampton.ac.uk/~assets/doc/hr/An%20introduction%20to%20creativity.pdf>

[2] Creativity for Operational Researchers – Paragraph 2 – What is Creativity? -

<https://orbit.dtu.dk/files/2770938/imm3343.pdf>

Unit 2 - The Importance of Improving the Creative Spirit

“For creativity to manifest itself, we need to take something that we have inside and give it life by expressing it outside of us.

The creative spirit is something that "animates a whole way of being" within us, whatever we do. The difficult. Of course, it's about releasing him.”[1]

1. The Stages of the Creative Spirit

“The stages of the CREATIVE SPIRIT

- **PREPARATION** (immersion in the problem)
- **INCUBATION** (let the problem ferment)
- **THE FANTASTIC** (open to the intuition of the unconscious)
- **LIGHTING** (the emergence of the solution)

The translation of **ILLUMINATION** into **REALITY**”[1]

The first stage is **PREPARATION**[1].

80

We dive into the maze of the problem in search of any useful information.

We do it in an open and welcoming way of the new, listening without prejudice.

Preparation barriers^[1]

“**Functional fixity**”. See the most obvious way to deal with a problem. Bind inextricably to the routine.

"**Self-censorship**". We no longer go beyond our "acceptable".

All this generates **despair** and **frustration**.

At this stage it is essential to have **perseverance**, without giving up prematurely.

The second stage is **INCUBATION**^[1].

It is the phase in which we let **the problem ferment** allowing the mind to search for the solution by itself. We use the unconscious.

Here is the kind of knowledge that we usually call **INTUITION**.

The third stage is **FANTASIZING**^[1].

Find space in times **when we don't think about the problem**. We are open to intuition.

When we are lost in the everyday life of things. E.g. while cleaning the house, cooking, playing sports, relaxing.

The fourth stage is **LIGHTING**^[1].

It is the moment when, fantasizing, **the solution emerges from nothing.**

The solution must then be translated into reality.

Let's try to deepen the concept reading these 2 articles:

- [The Unconscious Mind according to Henri Poincaré](#)
- [The Flow of Creativity](#)

2. The “Ingredients” of the Creative Person

- Sense of challenge (accept the conflict)
- Playful
- Cultivation of courage
- Sense of humour
- Be naive
- Having a childish freshness
- Systematic doubt
- Be prepared to take risks
- Positive dissatisfaction
- Be amazed
- Knowing how to see things in a new way
- The art of knowing how to listen
- Joy of discovery
- Willingness to be born every day
- Different perception of things
- Tolerance to ambiguities
- Make correlations
- Systematic perplexity
- Ask yourself questions
- Knowing how to learn from your mistakes
- Curiosity

- Open minded
- Critical thinking
- Desire to learn and act
- Propensity to experiment
- Passion

2.1. The Creative Person[8]

We can characterise at least three types of creative persons. First, the problem solver where the person (subject) is trying to solve a problem (object) in a creative way, this is the case of OR workers, engineers, scientists, advisers, etc.

Secondly, the artistic person (subject) who creates a new piece of art (object) usually it will be a close interaction between the subject and object, the “soul of the artist” will be in the object, this object can be a product (painting, music, film) or a process (dance, theatre, performance).

And thirdly, the persons that adopt creativity as a life-style being creative at work, at home and everywhere, both in an extrovert and introvert way (inventors, artists, mode designers, etc). Amabile (1983) has documented that creativity in each individual has three components: expertise, creative-thinking skills and motivation. Expertise is in a few words, knowledge in its many forms: technical, procedural and intellectual. Knowledge can be acquired both theoretically and practically. Learning to learn is an important tool for becoming an expert in modern Society. Creative-thinking skills determine how flexibly and imaginatively people approach problems and tasks. It demands courage to be creative because you will be changing the status quo. Individuals can learn to be more creative and can learn to use creative tools in problem solving. Motivation is the last component. An inner passion and desire to solve the problem at hand will lead to solutions far more creative than external rewards, such as money. This component, usually called intrinsic motivation, is the one that can most immediately be influenced by the work environment.

Amabile's research has identified six general categories that support creativity: challenge, freedom, resources, work-group features, supervisory encouragement, and organisational support. Teresa Amabile (1998) after many years of research focusing on creativity within organisations has also concluded that individual creativity gets killed much more often than it **83**

gets supported. Mostly, it is not because management has a vendetta against creativity, it is undermined unintentionally because of the optimisation of short business imperatives: co-ordination, productivity, efficiency and control. Her research has shown that it is possible to develop organisations where both profit and creativity flourish, but you need a conscious strategy. Torrance's research has also shown that children's creativity gets killed in the primary schools and it is possible to design schools and education systems where both rational and creative work flourish (Goff, 1998). Amabile (1998) has also drawn attention to the crucial importance of intrinsic motivation in creative endeavour.

Business has traditionally rewarded people extrinsically with pay and promotion but creative actions often arise out of a long-standing commitment to and interest in a particular area. She appreciates this is only one part of the equation, and that expertise in the domain concerned, and sufficient mental flexibility to question assumptions and play ideas, are also important. In addition, she points out the critical importance of challenge, for instance, matching people to tasks they are interested in and have expertise in, permitting people freedom as to how they achieve innovation, setting a sufficiently diverse team the task of innovation, along with sufficient resources, encouragement and support.

It is difficult to give a simple and general definition of creativity. It is easier if we focus to study creativity in relation to problem solving tasks. Herrmann (1996) gives a short definition that encapsulates many other definitions presented in the literature: "What is creativity? Among other things, it is the ability to challenge assumptions, recognize patterns, see in new ways, make connections, take risks, and seize upon chance." Let us elaborate a little more on this definition: challenge assumptions means questioning the basis of the problem formulation; recognise patterns because usually chaos and complexity are caused by simple patterns which, when recognised, lead us to the solution to the problem; see in new ways means looking for patterns from different perspectives: a rational or logical, an organisational or procedural, an interpersonal or emotional, and an experimental or holistic; make connections, or "bisociate", because many creative ideas are the result of synergy occurring between two thoughts or perceptions; take risks because there always exists the probability that your ideas will lead to failure due to many factors out of your control; and seize upon a chance means to take a calculated risk in order to take advantage of an opening that allows to move forward toward a creative solution. In addition, a response is creative if it is heuristic rather than algorithmic. A heuristic is an incomplete guideline or rule of thumb that can lead to learning or discovery. An algorithm is a complete mechanical rule for solving a problem or dealing with a situation. Thus, **84**

if a task is algorithmic it imposes its own tried-and-true solution. If a task is heuristic it offers no such clear path, you must create one.

2.2. The Personality[9]

Focusing on the characteristics of the individual who creates. Factors such as temperament, personal attitudes, and habits influence creativity. Creative thinking is largely a function of divergent thinking - the discovery and identification of many alternatives. Psychologists have performed considerable research on the characteristics of creative individuals that promote divergent thinking. These included: knowledge, imagination, evaluative skills, awareness and problem sensitivity, capability to redefine problems, memory, ideational fluency, flexibility, originality, penetration, self-discipline and persistence, adaptability, intellectual playfulness, humour, nonconformity, tolerance for ambiguity, risk taking, self-confidence, and scepticism. Recent research has shown that creativity is more than just divergent thinking.

The two complementary patterns of convergent and divergent thinking must run alongside one another. Gardner (1983) has identified seven kinds of intelligences or pathways to learning: linguistic (writers and speakers), logical-mathematical (scientists), musical (composers), spatial (visual artists), bodily kinaesthetic (dancers, athlete), interpersonal (educators), and intrapersonal (therapists). It could be possible to think of creativity in the same way. However, creativity scholars and practitioners have not made any move in this direction, but they have recognised that there are many ways of being creative. The intelligence testing (IQ) movement originated in attempts to predict academic competence. Using familiar situations with prior knowledge and reasoning (intelligence) may be sufficient to solve some problems or dilemmas. However, there are instances in everyday life in which new and different problems and dilemmas emerge, which require some cognitive bridging or creativity.

Results have been published showing that there is not a meaningful correlation between intelligence (essentially IQ) and creative problem solving (Goff, 1998) Maslow (1987) distinguishes between "special talent creativeness" and "self-actualising creativeness" and he found that creativity is a universal characteristic of self-actualising people. Self-actualisation may be described as the full use and exploitation of talents, capacities, potentialities and the like. Such people seem to be fulfilling themselves and doing the best that they are capable of doing. He identified the following characteristics of self-actualising creativeness: perception or **85**

fresh appreciation and wonder of the basic good of life; expression or ability to express ideas and impulses spontaneously and without fear of ridicule from others; childlike or innocence of perception and expressiveness, natural, spontaneous, simple, true, pure and uncritical; affinity for the unknown; resolution of dichotomies or the ability to synthesise, unify, integrate; and peak experiences or fearless, wonderful, ecstatic experiences which change the person and his/her perception of life. Their codes of ethics tend to be relatively autonomous and individual rather than conventional. They regard upon the world with wide, uncritical, undemanding, innocent eyes, simply noting and observing what is the case, without either arguing the matter or demanding that it be otherwise. Self-actualising creativeness is "emitted", like radioactivity, and it hits all of life, regardless of the problems. Maslow (1987) mischievously wrote: "Science could be defined as a technique whereby non-creative people can create".



[1] DANIEL GOLEMAN, MICHAEL RAY, PAUL KAUFMAN «*Lo Spirito Creativo, imparare a liberare le idee*» – BEST BUR 2001

[8] Creativity for Operational Researchers – Paragraph 2 – The creative person -
<https://orbit.dtu.dk/files/2770938/imm3343.pdf>

[9] Creativity for Operational Researchers – Paragraph 4 – The Personality -
<https://orbit.dtu.dk/files/2770938/imm3343.pdf>

Unit 3 - The Pros and Cons of Creativity

Do schools kill creativity? | Sir Ken Robinson

https://www.ted.com/talks/sir_ken_robinson_do_schools_kill_creativity

1. The Main Barriers to Innovation through Creativity

- Mental models
- Lack of knowledge
- Resistance to change
- Poor analysis of the problem
- Lack of method

1.1. Mental Models

"Our" mental models "determine not only how we make sense of the world, but also how we act." - *Peter Senge*

"Although people do not (always) behave consistently with the theories they marry (i.e. with what they say), they behave consistently with the theories they use (i.e., their mental models)" - *Chris Argyris*.

Let's focus on mental model concept: [Mental_models_A_robust_definition](#)

2. What hinders creativity?

- PERCEPTUAL (e.g. Limited points of view; Difficulty in distinguishing facts from emotions; Not having an overview; Inability to divide problems into "sub-problems")
- EMOTIONAL (e.g. Fear of going against the current; Stopping at the first solution; inability to relax; low esteem and self-confidence)
- CULTURAL (e.g. Excessive faith in logic, in statistics; excessive recourse to past experiences; refusal of doubt; believing that daydreaming is childish)

2.1. Barriers to Creativity^[1]

To be creative you have to be open to all alternatives. This open mindedness is not always possible to meet because all humans build up **blocks** or **mental locks** in the maturation and socialisation process. Some of those locks can have external causes, such as family environment, the educational system, and organisational bureaucracy. Other blocks are internally generated by our reactions to external factors or by physical factors. A key to improve your creativity is to become aware of your locks and do something about them. While everyone has blocks to creativity, blocks vary in quantity and intensity from person to person. Most of us are not aware of our conceptual blocks. Awareness not only permits us to know our strengths and weakness better but also gives the needed motivation and knowledge to break down these blocks.

Adams (1986) identifies the mental locks as perceptual, emotional, cultural, environmental, and intellectual. Perceptual locks are obstacles that restraint us from clearly perceiving either the problem itself or the information needed to register the problem. It is well known that our eyes can deceive us in observing some figures. Our perceptions are not always accurate. Emotional locks restrict our freedom to investigate and manipulate ideas. They prevent the communication of our ideas to others. These locks are also called psychological barriers and are the most significant and prevalent blocks that impede innovation. Fear of something new is a common characteristic of many individuals in the developed world. Cultural locks are adapted by exposure to a given set of cultural patterns. The culture of the industrialised countries trains mental playfulness, fantasy and reflectiveness out of people by placing stress on the value of efficiency, effectivity and moneymaking. Taboos and myths are predominant blocks to creative behaviour. Therefore, it needs courage to be creative in a culture that does not support creative changes. Our near social and physical environment imposes environmental locks. Creative persons have usually had a childhood where they were free to develop their own potentialities. We have seen that Amabile (1998) has documented that organisational climate can be a barrier or a stimulus to creative activities. Intellectual locks are caused by conservatism and lack of willingness to use new approaches. The same approaches, the same tools and the same persons are tackling the same problems for years. Persons with intellectual locks are usually very negative to changes and are fast to criticise new proposals.

[1] Creativity for Operational Researchers – Paragraph 2 – Barriers to creativity -
<https://orbit.dtu.dk/files/2770938/imm3343.pdf>

Unit 4 - Understand the Mindset of Divergent or Lateral Thinking

Several authors call creativity an "alternative thought":

- Ellis P. Torrance "*right thinking*";
- Max Wertheimer "*productive thinking*";
- Joy P. Guilford calls it "*divergent thinking*";
- Edward De Bono a "*lateral thought*".

We will deepen the “lateral thinking” by Edward De Bono.

1. Lateral Thinking[1]

- "Lateral thinking is an *intentional* process."
- "It is a way of using the mind as determined as logical thinking, but extremely different."
- "It differs completely from vertical thinking."
- "Both are necessary and complementary."
- "Lateral thinking is productive."
- "Vertical thinking is selective."

"The two fundamental aspects of the lateral thinking process:

The intentional generation of alternative ways of looking at things; (principle: any particular way of looking at things is only one among many other possible ways)

Questioning the assumptions."

1.1. “Vertical Thinking (VT) vs Lateral Thinking (LT) [1]

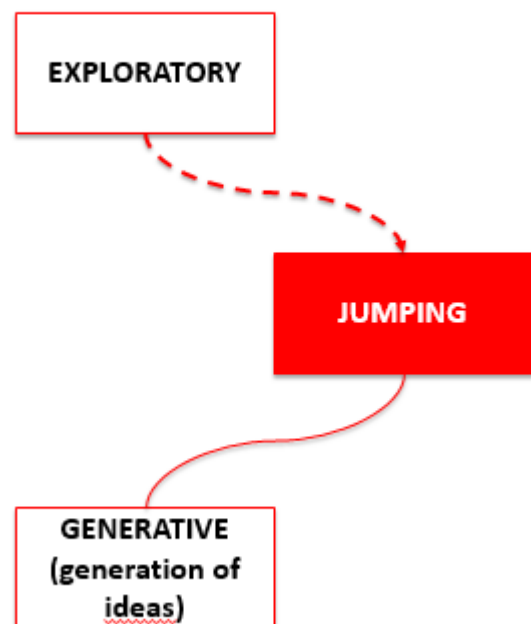
- VT is selective, LT is productive.
- The VT starts only if there is a direction in which to move, the LT starts moving in order to generate a direction.

- VT is analytical, LT is stimulator.
- The VT is sequential, the LT can jump.
- With the VT you have to be correct at every step, with the LT you cannot be correct.
- With the VT the negotiation is used in order to block some paths, with the LT there is no negotiation;
- With the VT we concentrate and exclude what is irrelevant, with the LT we welcome the intrusions of the case;
- With the categories of the VT classifications and definitions are fixed, with the LT no;
- The VT follows the most probable paths, the LT the least probable ones;
- VT is a finite process, LT is probabilistic.

VERTICAL THINKING



LATERAL THINKING



1.2. The Nature of Lateral Thinking[1]

"Lateral thinking deals with changing models."

"Instead of taking a model and then developing it as it does in vertical thinking, lateral thinking tries to restructure the model by putting the elements together in a different way."

1.3. Lateral Thinking Phases[2]

- Select a FOCUS (or centre of attention);
- Carry out a LATERAL DISPLACEMENT to generate a STIMULUS (the starting point of creativity);
- Establish an ASSOCIATION.

Let's focus on convergent and divergent thinking reading this article from page 1-25: [Toward a definition of creativity: construct validation of the cognitive components of creativity](#)

and this article: [Creative and Lateral Thinking Edward de Bono](#)

Let's focus on vision of the Split Brain reading this article: [Visions of the Split Brain](#)

Here are two explanatory videos on the mechanism of lateral thinking in a creative process:

Lateral Thinking I Edward de Bono

<https://youtu.be/Nb9Oe83ruUw>



Creative Thinking – How to get out of the box and generate ideas I Giovanni Corazza

<https://youtu.be/bEusrD8g-dM>



To better understand the mechanism of lateral thinking, which is the basis of a creative approach, we recommend reading the book by Edward de bono "Lateral Thinking".

2. The Creative Problem Solving[3]

Process Experience has shown that it is a good idea in a creative problem-solving process to start with divergent thinking to produce as many ideas or solutions as possible and thereafter to switch to convergent thinking to select the few most promising ideas. This is usually illustrated in the form of a diamond.

Some of the rules for **divergent thinking** are:

- Image, reframe and see issues from different perspectives
- Defer judgement (criticism or negativity kills the divergent process), be open to new experiences
- Quantity breeds quality, to have good ideas you need lots of ideas
- Hitchhiking is permitted, in this way a synergetic effect can be achieved
- Combine and modify ideas, in this way you can create many ideas
- Think in pictures, to create future scenarios you can even simulate potential solutions
- Stretch the ideas, imagine ideas beyond normal limits, and
- Do not be afraid to break paradigms, avoid destructive criticism, and to add value to the challenged concept.

Some of the rules of **convergent thinking** are:

92

- Be systematic, find structure and patterns in the set of produced ideas
- Develop ways to evaluate ideas, assess qualitative and quantitative measures of ideas
- Do not be afraid of using intuition, this is the way most important decisions are taken
- Avoid quickly ruling out an area of consideration, take your time or better sleep on it
- Avoid idea-killer views, try the impossible
- Satisfy, do not expend too much time in looking for the optimal solution of an ill-structured multi-criteria problem
- Use heuristics, use common sense and experience-based rules, and
- Do not avoid but assess risk, this does not mean being blind to risks, for serious consequences be sure to have a contingency plan.

As we will see below, creative problem-solving processes always contain phases of divergent and convergent thinking. Divergent thinking produces as many solutions as possible within the available time. The participants will vary in the way they prefer to produce ideas; some will do it by association, others by unrelated stimulus. Convergent thinking on the other hand requires the participants to use skills in reality testing, judgement and evaluation to choose the one or two best options from a number of possibilities. It is not unusual that in a group some members will very easily diverge, that is build a list of alternatives, while others will converge very fast by trying to select the best solution from the list and the rest will be passive not knowing what is required of them. Hence the need of a facilitator, he or she designs a clear and visible process to align the group.

[1] EDWARD DE BONO – “*Creatività e Pensiero Laterale, Manuale di pratica della fantasia*” – BUR R.C.S LIBRI 1998

[2] PHILIP KOTLER, FERNANDO TRIAS DE BES “*Marketing Laterale, tecniche nuove per trovare idee rivoluzionarie*” IL SOLE 24 Ore 2004

[3] Creativity for Operational Researchers – Paragraph 6 – The Creative Problem Solving - <https://orbit.dtu.dk/files/2770938/imm3343.pdf>

Unit 5 - Elements that Characterize Creativity

The **Three Ingredients of Creativity [1]** are:

1. **Talent** - Attitude to create. To invent.
2. **Method**
3. **Energy** - Positive and constructive attitude.

What prevents us from creating[1]?

"The anti-creative monster is called PIP:

- *Fear of failure. To be wrong.*
- *Do not know the method. Ignorance.*
- *Stop at your own conventions. Laziness."*

1. TALENT

We have seen a variety of abilities that characterises creative individuals or groups. Four of the key abilities will be discussed in this section as well as tools to enhance them in concrete problem solving situations.

The creative attitude - or talent - **can be measured through 4 factors [1]**:

- **Fluidity/Fluency** - quantity;
- **Flexibility** - change direction;
- **Originality** - uniqueness;
- **Elaboration** - choose and process.

In this section we will only present some few tools, those being the most popular and especially suitable for group work. Higgins (1994) presents many other tools and at the end of the list of references addresses of the best-known creativity home pages are presented.

Fluency[2]

Fluency is the **production of multiple problems, ideas, alternatives or solutions**. It has been shown that the more ideas we produce, the more likely we are to find a useful idea or solution. Fluency is a very important ability especially in the creative problem-solving process. To have too few alternatives is not a good thing in problem solving, especially if you have to be innovative. There are many tools for producing ideas, alternatives and solutions.

Several researchers have shown that training and practice with these tools cause a better fluency. One creative tool, which has been widely used with big success for generating many ideas, is **Brainstorming**. Osborn (1953) invented it for the sole purpose of producing checklists of ideas that can be used in developing a solution to a problem. The tool is directed to generating unconventional ideas by suppressing the common tendency to criticise or reject them summarily. He tried to separate idea-evaluation from idea generation because he believed that if evaluation comes early, it reduces the quantity and quality of the ideas produced. Therefore, in a brainstorming session no criticism is permitted, and freewheeling generation of a large number of ideas and their combination and development are encouraged.

Brainstorming is founded on the associative premise that the greater the number of associations, the less stereotyped and more creative the ideas of how to solve a problem will be. However, nothing in brainstorming is directed at changing the assumptions or paradigms that restrict the generation of new ideas. This is an excellent technique for strengthening fluency, fantasy, and communication skills. It is a good idea to have a facilitator to prepare and warm-up the brainstorming session, to lead and support the session, and to evaluate the whole process. This tool gives the possibility for the group to use more than one brain achieving a synergetic effect. Generate a multitude of ideas and some of them will be truly useful, innovative and workable. Asking individuals for inputs gives them an increased sense of importance and produces an atmosphere for truly creative and imaginative ideas to surface and be acknowledged.

Brainstorming combined with other methods has been used for a wide diversity of problems, including not only marketing and product issues but also strategy development, planning, policy, organisation, leadership, staffing, motivation, control, and communication. However, this tool is not appropriated for broad and complex problems demanding high-qualified expertise and know-how. Some of the ideas produced may be of low quality or obvious generalities. Brainstorming is not a good idea for situations that require trial and error as opposed to judgement.

Flexibility[2]

Flexibility is the ability to **process ideas or objects in many different ways** given the same stimulus. It is the ability to delete old ways of thinking and begin in different directions. It is adaptive when aimed at a solution to a specific problem, challenge or dilemma. Flexibility is especially important when logical methods fail to give satisfactory results. Looking at modern paintings requires flexibility, they demand looking from different perspectives in order to see different objects, images and symbols. Seeing persons or objects in the clouds requires the flexibility of seeing concrete shapes in cloud formations. Flexible thinking provides for changes in ideas, detours in thinking to include contradictions, differing viewpoints, alternative plans, differing approaches and various perspectives of a situation.

A family of creative tools, known as **verbal checklists**, has been created to enhance flexibility in the creative process. Usually this is a checklist of questions about an existing product, service, process, or other item to yield new points of view and thereby lead to innovation. Osborn (1953) has developed a very extensive verbal checklist while he was a partner of a major US advertising firm. The idea behind the verbal checklist is that an existing product or service can be improved if one applies a series of questions to it and pursues the answers to see where they may lead. The main questions take the form of verbs such as Modify? or Combine? These verbs indicate possible ways to improve an existing product or service by making changes to it. Then you add definitional words to the verb, for instance combine ideas, combine appeals, combine purposes, combine units, etc. Elberle (1971) developed a short verbal checklist known as the **SCAMPER technique** to assist people in improving their flexible thinking.

When using such a checklist, you will usually follow the following steps:

- Identify the product or service to be modified
- Apply each of the verbs on the checklist to suggest changes in the product or service
- Make sure you use many definitional words for the listed verbs, and
- Review your changes to determine which one meets your solution criteria.

Another important tool for encouraging flexibility is the use of **provocative questions**. These questions will open up a situation to a broader and deeper direction of thinking which otherwise might not be produced or considered. They encourage people to think about ideas or concepts they have not thought about previously. Some provocative questions can be: What would happen if: water tasted like whisky? Cats could bark? Women could fly? How is: A PC like a ⁹⁶

ship? A flower like a cat? A sunset like a lake? A car like a fork? What might happen if: It never was Sunday? It was against the law to be perfectionist? People were not creative? Image what might happen if: By law it was forbidden to have children? Cars could fly? Men could have children?

Originality[2]

Originality means getting away from the obvious and commonplace or **breaking away from routine bound thinking**. Original ideas are statistically infrequent. Originality is a creative strength, which is a mental jump from the obvious. Original ideas are usually described as unique, surprising, wild, unusual, unconventional, novel, weird, remarkable or revolutionary. You need courage to be creative, because as soon as you propose a new idea, you are a minority of one. Belonging to a minority is unpleasant. In addition to it the original thinker must be able to withstand the ridicule and scepticism, which will be directed toward his/her ideas and himself/herself. To enhance creativity, we have to be respectful of unusual or crazy ideas or alternatives.

Picture Stimulation is a very popular technique used to provide ideas beyond those that might be obtained using brainstorming. The members of the group will look at a set of selected pictures and relate the information gained from the picture to the problem, otherwise the rules of brainstorming should be followed.

Photo Excursion uses the same principles of picture stimulation but instead of using prepared pictures for stimulation, participants are required to leave the building walk around the area with a (polaroid or digital) camera, and take pictures of possible solutions or visual ideas for the problem; when the group reconvenes, ideas are shared.

Another related technique is the **Object Stimulation** tool where instead of pictures a variety of different objects (e.g. a hammer, a pencil, a board game, etc.) will be used.

Sometimes you can use words instead of pictures or objects, and associate them to your problem. Originality can also be enhanced by analogies and metaphors. An **analogy** is a comparison of two things that are essentially dissimilar but are shown through the analogy to have some similarity. A **metaphor** is a figure of speech in which two different universes of thought are linked by some point of similarity. In the broadest sense of the term, all metaphors are simple analogies, but not all analogies are metaphors. Nature is a good source to provide **97**

analogies. Poetry is a good source of metaphors. Similes are specific types of metaphors that use the words "like" and "as" - for instance, the wind cut like a knife; his hand was as quick as a frog's tongue, he sees like a condor and digs as fast as a mole. **Similes** can be used to suggest comparisons that offer solutions.

Elaboration[2]

Mind Mapping is a visual and verbal tool usually used to structure complex situations in a radial and expanding way during the creative problem-solving process. A mind map is by definition a creative pattern of related ideas, thoughts, processes, objects, etc. It is difficult to identify the origin and the creator of this technique. It is probable that this tool has been inspired by research on the interplay between the left and the right hemisphere of the brain. It can also be dated back to experiments with the brain and accelerated learning.

It has been, among others, Buzan (1983) who has made **Mind Mapping** a well-known technique with many applications. The principles to construct mind maps are few and easy to understand. The best way to learn it is by practice. After short time you will do it automatically. If it is difficult for adults it is because they think linearly and take notes in a linear way (using the left hemisphere of the brain). To make mind maps you have to draw ideas from the centre of the paper and move in a radial and parallel way, to do that you have to use both your creative and your logical brain. With some experience you develop your own style, your own pallet of colours, your own symbols, your own icons, etc.

A Mind Map contains usually the following elements:

- The subject or the problem that has to be studied or analysed will be placed in the centre of the paper
- Keywords (names or verbs) are used to represent ideas, as far as possible only one word is used in a line
- The keywords are connected to the centrum through a main branch and sub-branches
- Colours and symbols are used to emphasise ideas or to stimulate the brain to identify new relations
- Ideas and thoughts are permitted to arise free; too much evaluation is avoided during the period of elaboration of the map.

When constructing a mind map, it is a good idea to start from left to right building main branches in a circular way. Then, to continue drawing sub-branches moving in a circular way

until the whole sheet of paper is fill up with ideas. That is, you have been moving following an expanding spiral pattern. Then, move in the reverse way following a contracting spiral pattern supplementing the map with new ideas and connections. These spiral movements provoke the interplay between the creative and the logical parts of the brain, combining holistic thinking with particular details of the subject or the problem in question.

2. METHOD - Problem Solving

Ability to find solutions in every area, allows you to shift the focus, to change the point of view.

- **Problem Finding** - be aware of the problem;
- **Problem Setting** - define the problem in detail;
- **Problem Analysis** - break the problem down into secondary problems;
- **Problem Solving** - eliminate the causes and answer the questions posed by the problem
- **Decision Making** - choose how to act based on the answers obtained;
- **Decision Taking** - take action.

2.1. The Process[2]

Focusing in the way that creative solutions and products were developed, Wallas' four-stage model has given inspiration to the development of approaches to be used by individuals or groups in the creative solving process. In the next two sections we will see some of these methods. Some definitions of creativity are closely related to the process of sensing problems, forming ideas or hypotheses, testing and modifying these assumptions and communicating the results.

In this respect creativity is the ability to see a situation in many ways (divergent thinking) and continue to question until satisfaction is reached (convergent thinking). The creative process can involve tiny creative leaps or giant breakthroughs. Both require that an individual or a group go beyond where they have gone before, embracing the unknown, the mysterious, the change, and the puzzling without fear.

The creative process may be considered as a new way of seeing, a different point of view, an original idea or a new relationship between ideas. It is the way or manner in which a problem is solved. It is the process of bringing something new into being. It is the process of combining previously unrelated ideas or perceiving a new relationship from previously unrelated ideas. Whether solving problems alone or in a group, you really **must have a guided process** i.e. a plan or a map of the steps to be followed. This is especially so in a group due to the need to align the capabilities of the members in a positive way. This map is usually called the creative problem solving process and under this denotation there exists a huge number of methods, tools and techniques to support the creative process. It is also a good idea to facilitate the group creative process. The facilitator will support the process, will elaborate a plan of the steps to be followed and will manage the whole process to secure that an action plan will be elaborated and implemented.

2.2. The CPS (Creative Problem Solving) Approach^[2]

Osborn (1953) described several basic steps to support groups and individuals to be more successful in creative problem solving. Later, based on these proposals, several researchers have formalised and extended these ideas into a systematic approach to creative problem solving known as the CPS approach or process. 4-step, 5-step and 6- step models have been proposed. Here we present the most general version. It is called the 6-diamond model (Courger, 1995), where the upper part of each diamond represents the divergent sub-processes and the lower part corresponds to the convergent subprocesses.

The **6 steps** are:

- **Mess finding:** Identify areas of concern. Generate ideas about possible problematic situations from a holistic viewpoint. Identify the three most critical and general problems. Select one for further work.
- **Fact finding:** Observe carefully, like a video camera, while collecting information and data about the problem situation. Both objective facts and subjective experiences should be collected, explored and identified.
- **Problem finding:** Fly over the challenge or the problem by considering different ways of regarding it. Think about those possibilities.
- **Idea Finding:** Search for a variety of ideas, options, alternatives, paths, approaches, manners, methods and tools. Select potential solutions or ideas.

- **Solution finding:** Dig about the ideas in new and different ways, from other viewpoints and criteria. Assess the consequences, implications, and reactions to the selected ideas. Select ideas and solutions to develop an action plan.
- **Acceptance finding:** Develop ideas about how to implement the action plan. Search for ways of making the ideas or solutions more attractive, acceptable, stronger, more effective, and/or more beneficial. Develop a working plan for implementation.

Considerable research into the CPS process shows that a willingness to consider alternatives, to take some risks, to venture into insecure land, and to tolerate some uncertainty and ambiguity are important; see Parnes for further (1997).

Let us now focus on the different types of creative sub-processes that are needed at each step of the 6-diamond model:

Steps:	Sub-processes:
Mess finding	fluency, flexibility, originality, deferred judgement, and evaluation
Fact finding	analysis and evaluation
Problem finding	synthesis
Idea finding	fluency, flexibility, analysis, originality, and deferred judgement
Solution finding	synthesis, elaboration and evaluation
Acceptance finding	synthesis, evaluation, originality, and flexibility

As we can see at all these stages creativity tools can be used, but depending on the problem or the situation under study, both "hard" and "soft" methods can also be applied especially in the convergent phase of each step in the CPS process. Depending on the size and complexity of the problem the whole CPS process might take a long time. During this process the work group at some stages will need a facilitator, an expert, or a supervisor to support the different types of decisions to be taken. These are some of the roles that the advisor or mentor of a group of students at the university working on theses or projects can take. On the other hand, a very important aspect in this respect is learning. Every person that has a “proactive” stance to life can easily learn the use of creativity tools and the CPS process. Because of their simplicity many of these tools can be used in everyday life.

Children at school and elderly people can creatively empower their life by being proactive instead of reactive. Moreover, being creative in a group is usually fun; creative teams at work usually laugh a lot, see further Goff (1998). Depending on the actual problematic situation some more specialised approaches could be used combined with creative tools, for instance: Synectics (Gordon, 1961), Future Workshops (Jungk and Müller, 1987), TKJ (Kobayashi, 1971), SWOT (Sørensen and Vidal, 1999), The Search Conference (Emery and Purser, 1996), Idealized Design (Ackoff, 1978) and TRIZ (Kaplan, 1992)

2.3. The "PAPSA" Method^[1]

- **PERCEPTION.** "Collect all possible data and information trying to explore the" problem "from every point of view;"
- **ANALYSIS.** "Deconstructing the problem and determining the directions of research;"
- **IDEAS PRODUCTION.** "Find as many original ideas;"
- **SELECTION.** "Choose the best ideas based on criteria;"
- **APPLICATION.** "Proceed with the practical realization of the chosen ideas."

3. ENERGY

How to mobilize creative energy^[1]?

"Energy spontaneously tends to flow in a positive sense. We want to create, to communicate, to be happy. "

It can encounter two types of obstacles:

"Objective processing. Laws, standards, physical, moral or economic constraints.

Imaginary. These are negative beliefs. But there are also positive beliefs and ambivalent beliefs. "

It develops in an **INDIVIDUAL**, **GROUP** (collective) and at **COMPANY** level (values).

"The Three Pillars of Creative Energy^[1]

- *The multiplicity of options*

- *Constructive listening*
- *The ability to turn problems into opportunities. "*

The Environmental Variables of Creativity

- **Attention** (empathic and generative)
- **Collegiality** (collaboration)
- **Dialogue**
- **Sincerity**
- **Analysis and summary, priorities**
- **Curiosity and wonder**
- **Optimism and sense of humor**
- **Trust**

"A common context in which knowledge is SHARED, CREATED and USED through Interaction."

The Environment[2]

Focusing on the organisational culture or climate that encourages or kills creativity there will be things that happen either formally or informally and either of these may in turn help or hinder; there may also be things that the organisation does not do that affect the quality of problem solving.

Environmental factors conducive to creative thinking include: the freedom to do things differently, an environment that encourages risk taking and self-initiated projects, and provides help and time for developing ideas and individual efforts; an optimal amount of work pressure, a no punitive environment, a low level of supervision, resources and realistic work goals; shared responsibilities, timely feedback, confidence in and respect for co-workers, and shared decision-making (participation); interaction with others outside the work group; and open expression of ideas, particularly of-the-wall ideas.

All these factors will increase individual motivation and the happiness of enjoying your work, being essential elements for creative and innovative work. Many organisations do not foster these conditions. Cultural change, education, and training are necessary within a global strategy to develop an action plan to make an organisation more creative. Managers at all levels, especially engineers and scientists, educators, and graduate students have much to gain from understanding how to foster a creative climate.

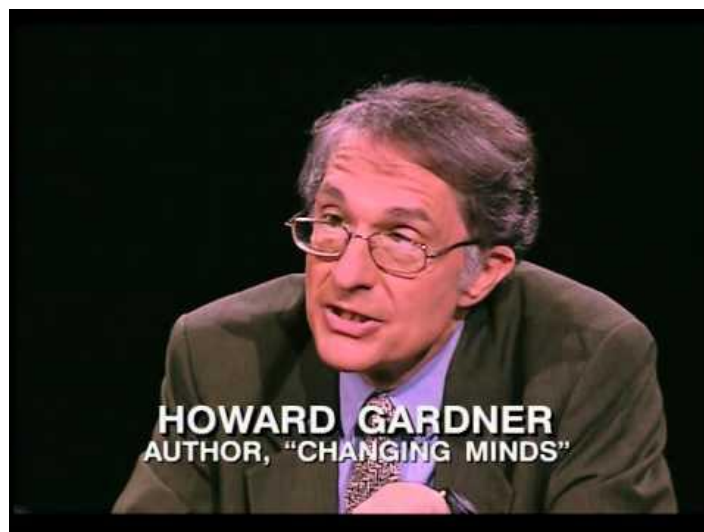
Barriers to creativity include habits and routines, judgmental thinking, oppression and hierarchy, and various perceptual, emotional and cultural blocks seen in the last section, see further Amabile (1983, 1998).

For an exhaustive and comprehensive understanding of the creative approach, also in relation to its connection with design thinking, **we recommend other readings**, some of which are specifically related to the didactic context.

- [Nature of creativity](#)
- [Design thinking educators](#)
- [Innovation Creativity design](#)
- [The Creative Process as Creators Practive It](#)

Finally, please, watch a last interesting video: The Open Mind: The Art and Science of Changing Minds

https://youtu.be/EOm_YtHK8M



[1] HUBERT JAQUI, ISABELLA DELL'AQUILA “66 tecniche creative per formatori e animatori” – Franco Angeli 2013

[2] Creativity for Operational Researchers <https://orbit.dtu.dk/files/2770938/imm3343.pdf>



Assignment 3

Description of the task

After reading the content of this module, answer the 10 questions in the attached Word template, related to the module content.

Submission

Use the attached Word template (answer the questions). Size: 1-2 A4 pages

Name the file (YourName_Module_3) and upload it.

Evaluation

Insufficient - Less than 5 correct answers

Sufficient - between 5-6 correct answers

Good - between 7-8 correct answers

Excellent - 9 correct answers

Excellent - 10 correct answers

Max. points achievable: 10 points

Assignment 3 - template

Your name:

1. Describe the creativity concept.

2. What should a creative idea be like?

- Correct; Useful; Valuable; Meaningful
- Correct; Fluid; Valuable; Meaningful
- Correct; Useful; Original; Meaningful
- Fluid; Original; Flexible; Valuable

106

3. What is meant by functional fixity?
4. What types of creativity blocks do you know (*answer through bulleted list*)?
5. What are the phases of lateral thinking (*answer through bulleted list*)?
6. Which of the following statements are correct (Vertical Thinking VT vs Lateral Thinking LT)? (multiple choice)
 - VT is productive, LT is selective.
 - VT is analytical, LT is stimulator.
 - The LT is sequential, the VT can jump.
 - VT is a finite process, LT is probabilistic.
 - The LT follows the most probable paths, the VT the least probable ones.
7. What are the ingredients of creativity? (multiple choice)
 - Method
 - Talent
 - Perseverance
 - Energy
 - Attention
8. What are the steps of the creative method - PAPSA - (*answer through bulleted list*)?
9. What is meant by the ingredient - energy?
10. Write at least three characteristics of a creative environment (*answer through bulleted list*).

Course evaluation questionnaire

1 2 3 4 5

1 Please evaluate the online course as a whole on a 1 to 5 scale:

Evaluation of professional work

1 2 3 4 5

2 Were the objectives of the course reached, did the course meet expectations?

1 2 3 4 5

3 To what extent was the information provided in the course new?

1 2 3 4 5

4 Was the course practically useful?

Teaching methods

1 2 3 4 5

5 How would you evaluate the teaching methods applied?

1 2 3 4 5

6 In case of online courses it is important that participants learn not only from the content and the mentor, but from each other as well. How did this work in this course?

1 2 3 4 5

7 Could the requirements of the course be met?

1 2 3 4 5

8 Rate the assessment methods. Were the assignments appropriate to assess if the learning content was mastered?

1 2 3 4 5

9 How do you rate the work and preparedness of the tutor(s)?

Conditions, technical equipment



1 2 3 4 5

10 How do you evaluate technical conditions (access, speed)?

1 2 3 4 5

11 Rate the organisation of the course.

1 2 3 4 5

12 Rate the customer service activities of the training institution.

1 2 3 4 5

13 Other comments, suggestions: ...

