Rasa Braslauskienė
Reda Jacynė
Aida Norvilienė
Sada Ramanauskienė
Gražina Šmitienė

Klaipėdos universitetas

21TS 21st Teach skills

Innovation-Based and Student-Centred Teaching in Higher Education Institution

Capacity-Building Course Material

Innovation-Based and Student-Centred Teaching in Higher Education Institution

Authors:

Prof. Dr. Rasa Braslauskienė

Assoc. Prof. Dr. Reda Jacynė

Assoc. Prof. Dr. Aida Norvilienė

Assoc. Prof. Dr. Sada Ramanauskienė

Assoc. Prof. Dr. Gražina Šmitienė

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Recenzentės:
doc. dr. Inga Bartusevičienė, Pasaulio jūrų universitetas (WMU, Švedija),
doc. dr. Ilona Zubrickienė, Klaipėdos universitetas (KU).

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PREFACE

The methodological handbook ***Innovation-Based and Student-Centred Teaching in Higher Education Institution*** is dedicated to the relevant issues of training teachers of the 21st century and developing their competencies.

In the first part *Student-Centred Learning in Higher Education*, Assoc. Prof. Dr. Aida Norvilienė defines the concept of student-centred education, discussing the aspects of active learning, cooperative learning, experiential learning, reflection, and deep learning. In this part, the author discusses the dualism and interaction of teacher- and student-centred education; analyses the problems related to the practice of student-centred education in higher education institutions, the cultural aspects of this education; discusses the importance of an effective learning and educational environment; talks about the importance of choosing educational methods, with the goal that learning is perceived not as the accumulation and possession of knowledge, but as a personally experienced and lived awareness of the surrounding world and the relationships in it, which matures and transforms learners. The author examines the difficulties of student evaluation and the importance of self-evaluation; discusses the role of a teacher in higher education as this role changes from being the only source of knowledge to being a guide, creator, and facilitator of learning.

In the second part *Innovative Teaching Methods. Digital Tools and Their Application Possibilities*, the author Prof. Dr. Rasa Braslauskienė reviews the possibilities, diversity, value, and challenges of using digital technologies in the higher education process for teachers and students. The author points out that when organising the study process, the fact that teachers must maintain a high level of media literacy (digital pedagogical competences) in order to organise and share educational materials with participants of the study process becomes apparent. Then there is the problem of choosing the most appropriate digital technologies. Despite the mentioned problem, digital technologies open up new opportunities to easily record the study process, copy the educational material presented in the lecture, distribute it on information platforms accessible to students, receive feedback, etc. The author presents the classification of educational goals using digital technologies, based on Bloom's taxonomy; discusses innovative study methods applicable in higher education; presents a series of digital tools, applications, programs, and other.

In the third part *The Assessment of Achievements in Higher Education*, the author Assoc. Prof. Dr. Sada Ramanauskienė presents the evaluation of higher education achievements, which is perceived at several levels: at the level of the institution, at the level of the study programme, at the level of the study subject (course), at the level of student achievements and progress. The author discusses the compatibility of study results and student learning achievements; analyses the compatibility of the intended study

results and evaluation methods; indicates that the evaluation of achievements must start from educational values, which must determine that the evaluation is effective, purposeful, goal-oriented, connected with students' experiences, cumulative, seeking progress, helping a student to improve, and promoting changes. The author distinguishes the most important requirements for the evaluation; discusses the main types of assessment, assessment methods and their combinations.

In the fourth part *Development of Critical and Reflective Thinking Skills and Designing the Study Subject*, the author Assoc. Prof. Dr. Gražina Šmitienė presents critical and reflective thinking, their connections with human cognitive and metacognitive, social and emotional, practical and physical skills and their importance in developing the ability to learn, information literacy, information technology management, responsible decision-making, and creativity. The author presents and analyses the general principles of constructing the content of the study subject, based on the theories of famous scientists, paying special attention to the importance of Bloom's and Marzano's and SOLO (Structure of Observed Learning Outcomes) taxonomies in the preparation of the study subject. The author pays special attention to the development of critical and reflective thinking in higher education institutions, analysing the aspects of student evaluation, self-evaluation, and independent learning as well as didactics in higher education, i.e. study methods, tools, and assessment.

In the fifth part *Creativity in Higher Education: Environment, Teaching and Learning*, the author Assoc. Prof. Dr. Reda Jacynė discusses the diversity of the concept of creativity and the problem of definitions, distinguishing cultural aspects, the dichotomy of Western and Eastern traditions in the matter of creativity. The author indicates the spectrum of creativity and its development opportunities in higher education institutions, the connections between this education and educational innovations; discusses Kaufman and Beghetto's categories of creativity; presents recommendations to European higher education institutions related to opportunities for creativity education, including the environment of higher education institutions, the activities of teachers, etc.; presents various methods that researchers point to as valuable in developing students' creativity; analyses creativity assessment issues, individual and group creative activities, etc.

The methodological handbook ***Innovation-Based and Student-Oriented Teaching in Higher Education Institution*** is intended for teachers, and students of higher education, and for teachers in schools. This methodological handbook contains theoretical material, summary in Lithuanian, practical tasks and questions for reflection at the end of each part. In this way, the aim is not only to present the latest statements of modern education science about the didactics of higher education, but also to encourage readers to actively engage in practical activities and self-reflection.

The collective of authors

Subtopic: STUDENT-CENTRED LEARNING IN HIGHER EDUCATION

Expected results:

- to be able to define the essence of student-centred learning;
- to be able to list and explain the principles of student-centred and teacher-centred learning;
- to be able to identify and describe the conditions of student-centred learning: transmission and facilitation;
- to be able to apply or recognise the principles of student-centred learning;
- to be able to define the concept of deep learning;
- to be able to specify the examples of student-centred learning/teaching methods;
- to be able to analyse and explain the examples of student-centred assessment in the subject they teach;
- to be able to assess and compare the differences between teacher-centred and student-centred paradigms.

Keywords: student-centred learning, educational environment, deep learning, higher education.

Theoretical part

Definition of student-centred learning

The development of higher education is one of the conditions for the development of the society. The link between the higher education system and the labour market is ensured through knowledge, skills, and competences acquired by students. "With the rise of cognitive and learning sciences in recent years, there has been increasing interest in determining how best to teach students and promote their learning" (Sawyer, 2005). As information becomes more readily available, competition more prominent and technology more pervasive, learning itself becomes more important if one wants to participate in the present knowledge economy. But the economy also becomes more complex since it is no longer just about the accumulation of knowledge and information. Many education theorists and researchers have tried to explore the best ways students learn, retain ideas, improve skills, and create innovative projects, with

the goal of improving engagement and instruction (Slavich & Zimbardo, 2012). Student-centred learning (SCL) offers an umbrella term to describe efforts for students to become actively engaged in their learning and for teachers to design and facilitate the learning process (cited in Trinidad, 2020). SCL began to be explored in the early twentieth century.

According to Trinidad (2020), there have been many variations, definitions and terms that relate to SCL, and these have at times led to confusion. For example, *active learning* involves students reading, writing, discussing, analysing, evaluating, and creating to exercise higher-order thinking skills (Ott et al., 2018). On the other hand, *collaborative learning* involves students working with their peers: students do not only participate in content and knowledge-building but also learn skills in cooperation and communication (Ralston, Tretter, & Kendall-Brown, 2017). *Experiential learning* involves students engaging in or reflecting on their personal experiences in order to abstract knowledge and gain skills. This model usually involves four phases of concrete experience, reflection, abstract conceptualisation, and active experimentation. *Problem-based learning* involves instructors posing complex issues and problems on groups of students, and helping them brainstorm, formulate, and structure their ideas. In the process, students learn concepts and principles that are much broader than the specific problems posed. These different terms are closely related to student-centred learning, which emphasises the centrality of the students' role in terms of practice, curriculum, and content. Given these different terms, different people may also have different ideas about what truly constitutes SCL.

Kember describes two broad orientations in teaching: the teacher-centred/content-oriented conception and the student-centred/learning-oriented conception. In a very useful breakdown of these orientations, the author supports many other authors' views in relation to student-centred view including that knowledge is constructed by students and that the lecturer is a facilitator of learning rather than a presenter of information (O'Neill & McMahon, 2005). This definition emphasises the concept of the student "doing". Other authors articulate broader, more comprehensive definitions. Summarising some of the literature on SCL, the following tenets can be identified:

1. "the reliance on active rather than passive learning;
2. an emphasis on deep learning and understanding;
3. increased responsibility and accountability on the part of the student;
4. an increased sense of autonomy in the learner;
5. an interdependence between teacher and learner;
6. mutual respect within the learner teacher relationship;
7. a reflexive approach to the teaching and learning process on the part of both teacher and learner" (O'Neill, McMahon, 2005).

Learning is often presented in this dualism of either student-centred learning (SCL) or teacher-centred learning (TCL). In the reality of practice, the situation is less black and white. A more useful presentation of SCL is to see these terms as an end of a continuum, when the three concepts are regularly used to describe SCL (Figure 1).

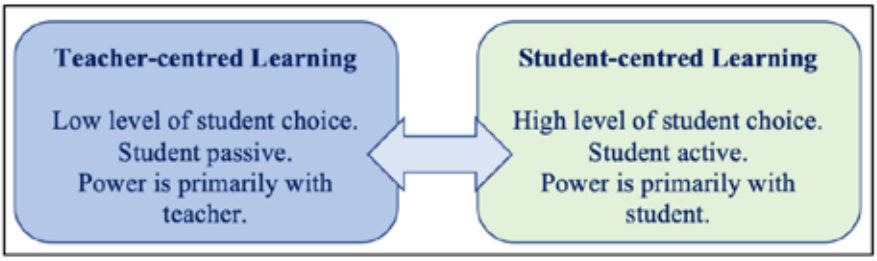


Figure 1. Student-centred and teacher-centred continuum (O'Neill, McMahon, 2005)

Although there are varying ways of understanding SCL, it is often contrasted with teacher- centred learning (TCL) since the former is a constructivist approach which assumes that construction of knowledge is shared with students actively involved. In contrast, the latter is an approach where teachers share knowledge to their students who are thought of as passive receivers of information (Kain, 2003). Some simplistically think of it as SCL involving active learning techniques and collaborative pedagogical activities, and TCL including unidirectional lectures and tests. However, SCL is not so much just about classroom practices since what it provides is a perspective for the teacher-student-content relationship and environment. Seen in this way, being student-centred does not mean forgoing lectures since different learning outcomes will need their own appropriate pedagogical modes – at times necessarily inclusive of lectures and didactic forms of teaching (Mascolo, 2009). Nonetheless, at the core of SCL there is a perspective of the teachers' design of active and deep learning, and the students' autonomy and responsibility for learning (Arman, 2018; O'Neill & McMahon, 2005).

In higher education, the concept of SCL is more thoroughly problematized because of SCL's misconceptions and assumptions, teachers' pedagogical preferences, and the practical feasibility of transitioning to a SCL environment. First, some faculty question whether this pedagogical practice truly enhances students' sense of involvement given that it also assumes that learners are motivated and engaged. Relatedly, there are difficulties implementing SCL in 'high power distance' societies where hierarchical relationships are more salient, like in Asia. Second, lecturing is still the most employed means of transmission of knowledge in higher education despite critiques like student absenteeism and lack of engagement. Most professors still prefer this mode

of instruction for a variety of reasons, including the necessity of covering content, having large classes, introducing new information, and helping students with difficult readings. Lastly, both students and teachers talk about the positive benefits of SCL but want the balance between teacher-directed and student-centred approaches since students are anxious of pedagogical approaches that lack structures and supports, and resources may not be present for SCL's effective implementation (Trinidad, 2020).

SCL is based on several principles: students' learning styles, needs and expectations differ; there is no single correct teaching/learning method – each higher education institution decides for itself; students are given a choice, which encourages their responsibility and interest; the work of a teacher becomes focused not on instruction but on empowerment; active learning replaces passive learning; superficial absorption of information is replaced by a thorough understanding; mutual respect between the student and the teacher develops; more active cooperation between students and teachers is formed – dialogue is the essence of studies; the teaching/learning process must be monitored and regularly evaluated by all stakeholders (Čiburienė, Guščinskienė, 2017).

Different authors (Cox, 2010; Wright, 2011; Weimer, 2013; Čiburienė & Guščinskienė, 2017; Trinidad, 2020; etc.) have written about key aspects of SCL in higher education, and they outline five crucial aspects:

- First, there must be a balance of power with it being shared by both professor and student in terms of activities, decision-making, and assigned roles.
- Second, the function of content is to contribute to the learning process and acquisition of skills rather than just memorisation of concepts.
- Third, the role of the teacher shifts from being the sole knowledge source to being a guide, designer, and facilitator of learning.
- Fourth, there is the assumption that the responsibility for learning rests on independent and self-motivated students.
- Lastly, the purpose of the evaluation is not only to generate grades but also to be a means for students to learn, practice skills, and be given feedback.

To sum up, we can provide the following definition of student-centred learning: SCL is about helping students to discover their own learning styles, to understand their motivation and to acquire effective study skills that will be valuable throughout their lives. To put this approach into practice, teachers need to help students to set achievable goals; encourage students to assess themselves and their peers; help them to work co-operatively in groups; and ensure that they know how to exploit all the available resources for learning. Learning is thus more a form of personal development than a linear progression that the teacher achieves by rewards and sanctions.

Student-centred learning: transmission and facilitation

When we talk about student-centred learning, transmission and facilitation, it is very important to talk about the focus not just on **what is taught** but on **how** effective learning should be promoted.

In this context, an enabling educational environment is important. Empowerment is understood as enabling students to participate in the learning process, to shape it, to participate in decision-making. Educational environment is a dynamic information space of learning activities, created and influenced by the educator (teacher) and conditioned by the educational goal, the content corresponding to it and the educational forms, tools, methods, and infrastructure facilitating its assimilation. According to Jucevičienė, Gudaitytė, Karenauskaitė et al. (2010), the educational environment is:

- dynamic, i.e., constantly changing, adapting to changes and needs;
- designed and influenced by the educator: it is the expertise of the teacher, lecturer or other educator that determines the impact on the individual and the educational value created;
- conditioned by the educational objective, the content, the forms, methods, and means of education: these aspects of the educational environment also have a major impact on the learner and the competence he/she develops;
- infrastructure, i.e., the physical environment, material resources.

Having clarified the key concepts of the topic, it can be argued *that an enabling learning environment is the entire learning environment that enables a student studying in higher education to acquire knowledge, meanings and skills needed to build his/her personal and professional life.*

There are two aspects to study empowerment:

1. When empowerment is related to the individual, that is, to his or her inner strengths, knowledge, experience, motivation. Students' motivation plays an important role in the study process. In the analysis of the phenomenon of motivation, Gage and Berliner (1994) characterise motivation as a phenomenon fraught with extremes, which can lead to liminal states, such as endless boredom or an insatiable thirst for and pursuit of knowledge. There are various reasons for wanting to learn, e.g., Petty (2008) identifies the following reasons:

- I learn because I find it useful.
- The specialty I am studying will be useful to me.
- I realise that I am doing well in my studies and that it raises my self-esteem.
- If I learn well, I will please my teacher(s) and/or my peers.
- If I do not study, I will immediately get in trouble.
- What I am learning is interesting and meets my expectations.
- I enjoy learning.

2. When empowerment is linked to the external environment, it is the physical environment (what technology is used, what learning materials are available, the size of the classroom, the furniture, the tools, etc.) and the social environment (the mood of the learners, the mood of the group, the role of the teacher, the relationships between the learners, the attitude towards learning).

An empowering educational environment is of great importance for the success of a students' studies, as it empowers a student to learn, enables them to control their own learning process, fosters creativity, innovation, reflection, improves the student's self-confidence and motivation for quality activities and learning, and promotes a deep attitude towards learning. An empowering environment also promotes self-directed learning by giving the student an autonomy and the opportunity to take responsibility for their learning and its outcomes.

Student learning becomes the main preoccupation of the teacher (not their performance as a teacher or a raw number of facts to be transmitted to the students). In this way, the student is supported in making sense of their "journey" through knowledge construction. Students must take responsibility for their own learning and oversee their own learning (Figure 2).

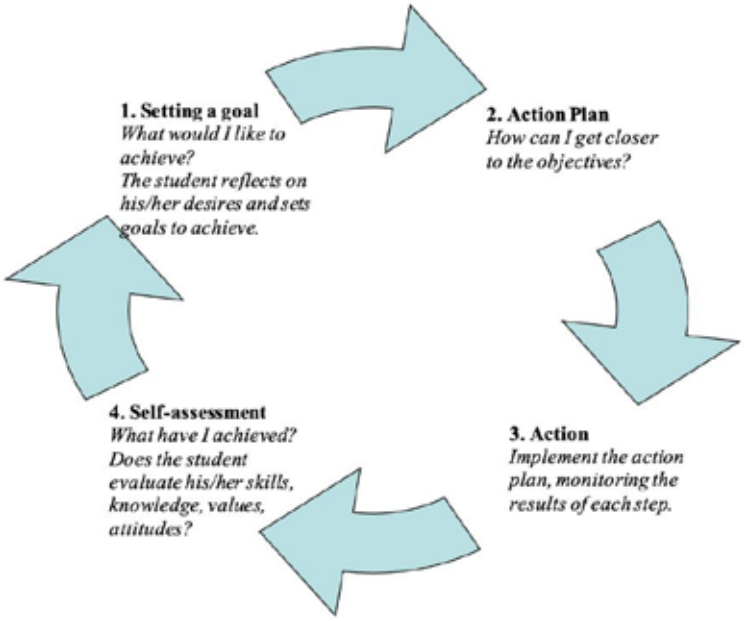


Figure 2. Student-led learning cycle (Petty, 2006 p. 28)

In a student-led cycle, it is important to be involved, to set goals, to create a plan of action according to one's own learning style. Self-assessment is an important skill that allows one to have confidence and to guide oneself in the right direction. It encourages taking responsibility for one's own development.

According to O'Neill and McMahon (2005), SCL have implications for: *curriculum design, teaching/learning methods, and assessment practices.*

Implication for curriculum design. In relation to curriculum design, SCL includes the idea that students have a choice in what to study and how to study. However, to what extent can this be carried out in the structures of today's universities? Modularisation provides a structure that allows students an element of choice in what modules they study. Students can choose the subjects and in this way they can decide what they want to study. One student-centred approach to curriculum design, problem-based learning, allows for some choice within a programme of areas that students may study. It allows students to set some of their own learning objectives/outcomes, dependent on prior knowledge. Problem-based learning, by using problems/issues/triggers, encourages the students to develop their own learning goals, thereby filling in the gaps in their knowledge or understanding (O'Neill & McMahon, 2005).

Student-centred learning: consequences for competences and learning outcomes. Student-centred learning encourages:
- the prioritising of higher order thinking and information skills;
- problem-solving, accessing, organising, interpreting, and communicating knowledge;
- students to work with teachers to select learning goals and objectives based on their prior knowledge, interests, and experience.

Based on a student-centred approach to higher education:
- syllabi and curricula, too, are organised not just around the facts the learner is supposed to acquire but around the processes through which learning is to be developed;
- where possible, curricula also take account of students' prior knowledge, interests, and experience as well as the gaps in these.

This strengthens the desirability of providing choice within the curriculum:
- It promotes structures incorporating electives.
- It therefore places demands upon logistical planning and resource provision.
- As a result, it creates a drive towards fully-modular structures with standardised module sizes.

Student–centred Learning Outcomes: Some examples	**Traditional Learning Outcomes/Objectives**
*By the end of this modules: **you** (the student) will be able to:*	*The course will cover:*
Recognise the structures of the heart	The anatomy of the heart
Critique one of Yeats' poems	A selection of Yeats poems

Figure 3. Learning Outcomes and Student-Centred Learning (O'Neill & McMahon, 2005)

Implication for teaching/learning methods. The phenomenon of learning is a multifaceted one, which we can look at from different angles. Learning is not seen as the accumulation and possession of knowledge, but as a personally experienced and lived awareness of the lived world and the relationships within it, which matures and transforms learners. In terms of learning and SCL, deep learning can be distinguished. Deep learning is learning in which students' study, analyse and try to understand and comprehend the material presented to them, rather than just memorising the details.

In addition to deep learning, there is also surface learning. These learning attitudes differ in motives and learning strategies (Table 1).

Table 1. Motives and learning strategies in relation to learning preferences (Warburton, 2003)

Learning preferences	Motives	Learning strategy
Surface learning	The main goal is to meet the minimum requirements, balancing hard learning with the goal of staying in school.	Reproduction: limited intention to understand the essence and reproduction of information based on mechanical memorisation.
Deep learning	Deep intrinsic motivations: learning based on a deliberate interest and the holistic development of competences by learning each specific subject.	Meaningfulness: interest and reflection, linking existing knowledge with new knowledge.

It is very important that students' retention rates differ based on different types of activity (Figure 5).

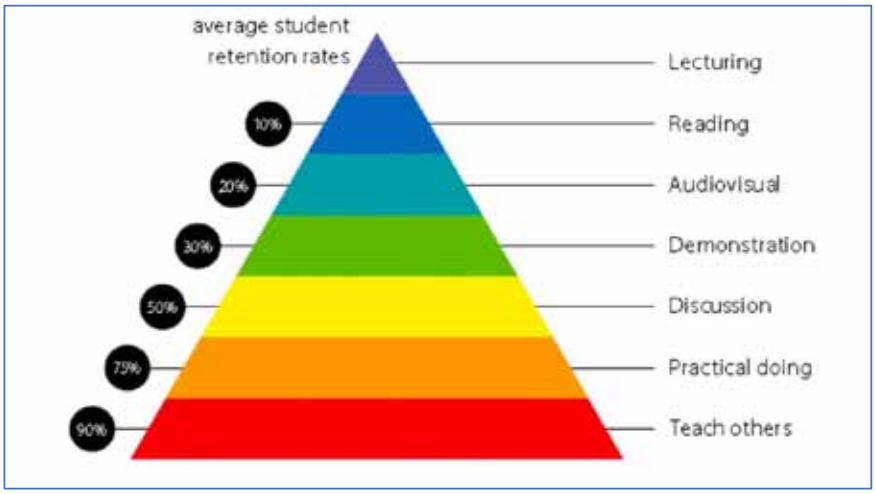


Figure 5. Students' retention rates based on different types of activity (Cox, 2010)

Various factors are thought to influence attitudes towards deep learning (Figure 4).

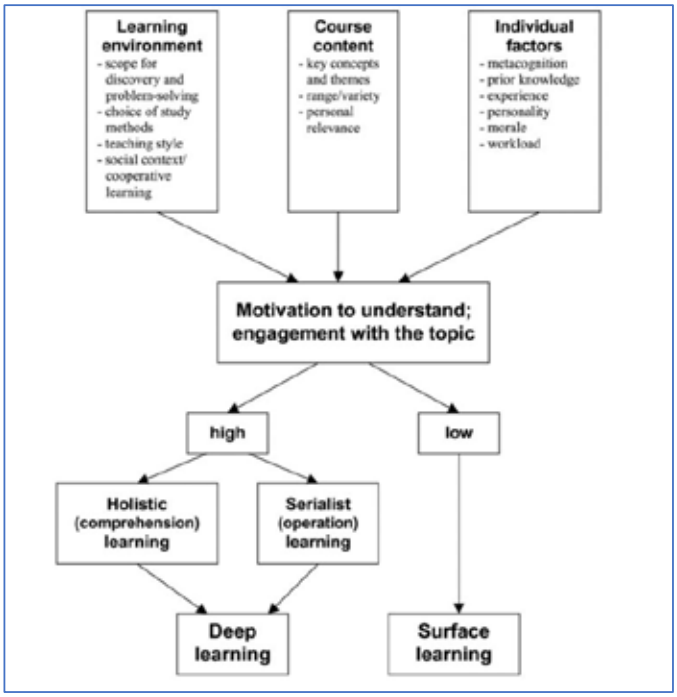


Figure 4. Some factors influencing deep learning (Warburton, 2003)

Table 2 highlights a sample of student-centred learning/teaching methods and includes some ideas for lecturers both within (more teacher-centred) and outside of the lecture format.

Table 2. Examples of student-centred learning/teaching methods (O'Neill, McMahon, 2005)

Outside of the lecture format	In the Lecture
Independent projects	Buzz groups (short discussion in twos)
Group discussion	Pyramids/snowballing (Buzz groups continuing the discussion into larger groups)
Peer mentoring of other students	Cross-overs (mixing students into groups by letter/number allocations)
Debates	Rounds (giving turns to individual students to talk)
Field-trips	Quizes
Practicals	Writing reflections on learning (3/4 minutes)
Reflective diaries, learning journals	Student class presentations
Computer assisted learning	Role play
Choice in subjects for study/projects	Poster presentations
Writing newspaper article	Students producing mind maps in class
Portfolio development	

Implementation for assessment practices. O'Neill and McMahon (2005) summarised some of the difficulties highlighted in the literature on assessment, for example: a) that the giving of marks and grades are over emphasised, while the giving of advice and the learning function are under emphasised; b) pupils are compared with one another which highlights competition rather than personal improvement. They also explain the concept of self-assessment as essential activity to help students "take responsibility for their own learning", an important aspect of SCL. Foucault argued that the examination is a technique of power, where a student is "controlled through a system 'micro-penalties', the constant giving of marks which constitutes a whole field of surveillance".

In Figure 6, practical examples of student-centred assessments are presented.

• Diaries, logs and journals • Portfolios • Peer/self assessment • Learning contracts and negotiated assessment	• Projects • Group work • Profiles • Skills and competencies

Figure 6. Practical examples of student-centred assessments (O'Neill & McMahon, 2005)

The use of the written examination is still a strong practice in today's universities and is primarily a summative assessment, i.e., an assessment for judgement or accreditation.

Evaluation involves many aspects: *gathering, interpreting, summarising, and giving feedback.* Assessment in teaching and learning can have very different aims and purposes. The most important purpose of assessment is to support student learning. For deep learning, assessment that supports learning is essential, where the teacher continuously monitors students' learning by providing timely and specific feedback on their progress and achievements, pointing out successes and gaps, helping them to achieve more (Žibėnienė & Indrašienė, 2017).

Feedback is also important as a means of motivating students to study. Feedback is a prerequisite for successful learning for the student and a tool for the lecturer to improve his/her performance and communication with students. For the improvement of learning, students need to have information about their level of knowledge, which must be obtained from the lecturer through feedback. Nicol and Macfarlane-Dick (2006) have identified seven main functions that are inherent in good feedback:

- helps to clarify the criteria for completing the task (in line with the set objectives, criteria, standards);
- facilitates self-assessment (reflection) in the learning process;
- provides quality information to students about their learning;
- promotes dialogue between students and lecturers about their learning;
- encourages action and confidence;
- provides an opportunity to bridge the gap between the actual performance of the task and the ideal performance of the task;
- provides lecturers with information that can be used to improve the learning process.

Student-centred learning: the role and responsibility of the lecturer

As we have already identified one of the key aspects of SCL in higher education, the role of the teacher is shifted from being the sole knowledge source to being a guide, designer, and facilitator of learning.

The university lecturer moves from being a transmitter of information and knowledge to a learner and collaborator with students and colleagues, learning and deepening existing knowledge and concepts (Crisol, 2011). This paradigmatic shift can be illustrated by the teacher-centred and student-centred paradigms (Table 3). The paradigm shift also particularly changes the roles of lecturers in the university, which promote collaboration and collaborative learning. It is important to note that lecturers, by becoming student facilitators, primarily share leadership roles that encourage students to engage in the educational process and share their knowledge and insights (ALRowais, 2015). Such a process enables peer exchanges between university lecturers and students, and these manoeuvres open opportunities for university lecturers not only to be formal knowledge providers, but also to learn and contribute to student growth and change.

Table 3. Paradigm shift (Sawant & Rizvi, 2015, Daugėla & Žydžiūnaitė, 2021)

Teacher-centred paradigm	Student-centred paradigm
Knowledge generated by a university lecturer and transmitted to students.	Students construct knowledge by collecting, synthesising, and integrating it. Collaboration, critical thinking, and problem-solving skills are developed.
Students passively accept the information.	Students are actively involved in the educational process.
The focus is on the acquisition of knowledge but not on the contexts in which knowledge will be used.	Emphasis is placed on the application of acquired knowledge and on collaboration, which can be used to solve real-life problems effectively.
The primary role of the university lecturer is through transfer of information to students and their assessment.	The role of the university lecturer is manifested through teaching and supporting students. The lecturer and the students evaluate the learning process together.
Teaching and assessment are separated.	Teaching and assessment are interrelated.
Assessment is only used to monitor teaching.	Assessment is used as an aid to learning.
Emphasis is placed on correct answers.	The focus is on question formulation and learning from mistakes.

Teacher-centred paradigm	Student-centred paradigm
Learning is assessed by tests.	Learning is assessed through student's work, projects, portfolios, etc.
Focus is on one subject.	Interdisciplinary links are sought.
Teaching culture is based on competition and individualism.	The teaching/learning culture is based on support and cooperation.
Only students are seen as learners.	University lecturer and students learn together.

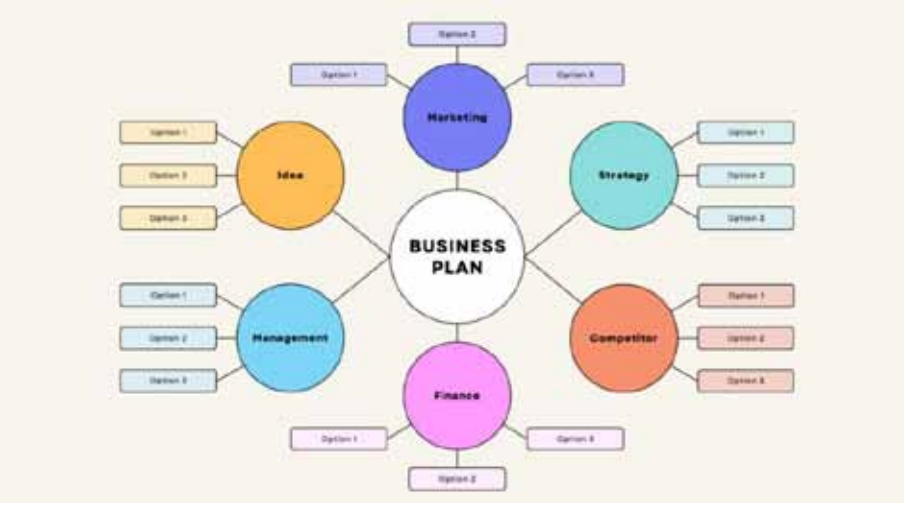
It has been observed that there is a correlation between the teaching methods that university lecturers use in their lectures and the goals they pursue in the educational process:

1. *A teacher-centred strategy to convey information.* In this transmission, the most important element is the transmission of facts and knowledge, in which a student is a passive listener.
2. *A teacher-centred strategy to gain an understanding of the subject.* In this process, university lecturers desire to uncover the concepts and show the links between them.
3. *A strategy of interaction between lecturers and students to develop an understanding of the discipline being taught.* In this process, through interactions between university lecturers and students, the aim is to reveal the concepts of the taught discipline and help to find the links between them.
4. *A student-centred strategy to enable students themselves to shape their perception.* In this process, university lecturers aim to help students to connect the already existing knowledge and skills with new knowledge, thus building their own personal perceptions.
5. *A student-centred strategy to get students to change their existing perceptions.* Through this process, university lecturers aim to help students construct new and reconstruct existing perceptions, critically evaluating them, and forming their own authentic viewpoints.

When the aim is only to transfer information to students, the most common approach, teacher-centred strategy, is used, while the student-centred learning strategy is used to develop students' critical thinking or to help students to develop personal, authentic conceptions (constructing and reconstructing the existing and new perceptions) (Daugėla & Žydžiūnaitė, 2021).

Practical part and reflection questions

1. Based on the theoretical material, draw up a concept map, which should include the principles and key concepts of student-centred learning.
   For example: you can use Canva https://www.canva.com.



2. Please explain the differences between the principles of student-centred and teacher-centred learning.
3. Analyse your institution's educational environment by using a SWOT (Strengths, Weaknesses, Threats, and Opportunities) analysis.

For example: *Analysis of the educational environment of the institution using the SWOT method.*

Strengths	**Weaknesses**
Strengths reflect those areas that show the advantages of the educational environment. What are the strengths of the educational environment? What are the strengths? What are the positive features? What resources do we have? What knowledge, skills and experience do we have in creating an educational environment?	Weaknesses reflect areas where neither you nor the institution achieves what should be valued in an educational environment. What are the weaknesses? How are we worse than others? What do we not know, what knowledge, skills and experience do we lack?
Opportunities	**Threats**
Opportunities: let's consider what could give new impetus to the creation and renewal of the educational environment in the institution. What are the latest trends? What are the needs of our students? What are the opportunities in the environment that we can seize? What are the changes in our sphere of activity?	Threats are obstacles that could hinder the realisation of the ideas behind the renovation of the educational environment in the institution. What challenges might we face? What risks can we identify?

3. Provide a description of one of student-centred subjects you teach, including the aim, the expected learning outcomes, the teaching methods, the self-assessment tasks, and the assessment criteria for the tasks.
4. Identify the factors that are necessary for deep learning? How can technology contribute to deep learning? Give examples of deep learning.
5. Give examples of the links between the teaching methods used by university lecturers in their lectures and the aims of the educational process.

Summary

Į STUDENTĄ ORIENTUOTOS STUDIJOS

Šiame poskyryje pristatomi į studentą orientuotų studijų paradigminiai pokyčiai. Dažnai mokymasis pristatomas dualizmo principu: mokymasis, orientuotas į studentą (angl. student-centred learning, SCL) arba į dėstytoją (angl. teacher-centred learning, TCL). Dažniausiai mes vartojame tris sąvokas, kai kalbame apie į studentą orientuotas studijas: studento pasirinkimo lygis, studento įsitraukimas ir studento įgalinimas. Įstudentą orientuotos studijos remiasi keliais principais: studentų mokymosi stiliai,

poreikiai ir lūkesčiai skiriasi; nėra vieno teisingo mokymo / mokymosi metodo - kiekviena aukštoji mokykla sprendžia pati; studentams suteikiama galimybė rinktis, o tai skatina jų atsakomybę ir susidomėjimą; dėstytojas yra labiau orientuotas į įgalinimą; aktyvus mokymasis pakeičia pasyvų mokymąsi; paviršutinišką informacijos įsisavinimą keičia nuodugnus supratimas; ugdoma abipusė pagarba tarp studento ir dėstytojo; formuojasi aktyvesnis studentų ir dėstytojų bendradarbiavimas - dialogas yra studijų esmė; mokymo / mokymosi procesas turi būti stebimas ir reguliariai vertinamas visų suinteresuotųjų šalių (Čiburienė, Guščinskienė, 2017).

Įvairūs autoriai (Cox, 2010; Wright 2011; Weimer 2013, Čiburienė, Guščinskienė, 2017; Trinidad 2020 ir kt.) analizuodami į studentą orientuotų studijų principus išskyrė penkis esminius aspektus:

- Pirma, turi būti galios pusiausvyra, kai ją dalijasi ir dėstytojas, ir studentas, kalbant apie veiklą, sprendimų priėmimą ir paskirtus vaidmenis.
- Antra, įgalinantis studijų turinys, kuris orientuotas į giluminį mokymąsi, o ne tik į sąvokų įsiminimą.
- Trečia, dėstytojo vaidmuo keičiasi ir jis tampa ne vieninteliu žinių šaltiniu, bet ir mokymosi vadovu, kūrėju ir pagalbininku organizuojant studentų savarankišką mokymąsi.
- Ketvirta, daroma prielaida, kad atsakomybė už mokymąsi tenka pačiam studentui.
- Galiausiai studentai vertinami ne tik tam, kad gautų įvertinimą, bet, kad vertinimas padėtų nusimatyti studentui tolimesnį savo mokymąsi, todėl tokio pobūdžio vertinime yra labai svarbus grįžtamasis ryšys.

Toks savarankiškas mokymasis priskiriamas ne tik prie bendrųjų gebėjimų, kurios labai svarbios bet kuriame kontekste, bet tai yra labai svarbu ir mokytojo profesijos kontekste. Jeigu būsimasis mokytojas bus išmokęs pats vertinti, analizuoti savo mokymąsi, reflektuoti apie jį, jam bus žymiai lengviau tai atlikti ir savo profesinėje veikloje. Galime išskirti šiuos savarankiškai besimokančio studento lygmenis: priklausomas besimokantysis, įsitraukęs besimokantysis, susidomėjęs besimokantysis ir savarankiškas, atsakingas už savo mokymąsi studentas.

Taigi analizuojant į studentą orientuotą paradigminį požiūrį, remiantis (Cox, 2010; Sawant, Rizvi, 2015; Daugėla, Žydžiūnaite, 2021) galima išskirti šiuos aspektus:

- Studentai dalyvauja kaip kolegos mokymosi procese, kartu su dėstytoju konstruoja žinias jas rinkdami, sistemindami ir analizuodami, perkeldami į įvairius kontekstus. Šiame vaidmenyje labai svarbūs tampa bendradarbiavimo, kritinio mąstymo, problemų sprendimo įgūdžiai.
- Studentai turi aktyviai įsitraukti į ugdymo procesą. Pagrindinis dėmesys skiriamas įgytų žinių panaudojimui įvairiuose kontekstuose ir gebėjimui bendradarbiaujant, mokytis efektyviai spręsti kylančias realaus gyvenimo problemas.

- Universiteto dėstytojas – pagalbininkas, kuris įtraukia studentą į mokymosi procesą ir kviečia dalyvauti mokymosi proceso vertinime.
- Mokymas ir vertinimas yra tarpusavyje susiję.
- Vertinimas naudojamas kaip pagalba mokymuisi. Pagrindinis dėmesys yra skiriamas klausimų formulavimui ir mokymuisi iš klaidų.
- Mokymasis vertinamas per studento parengtus darbus, projektus, aplankus (portfolio) ir pan.
- Ieškoma tarpdisciplininių jungčių.
- Mokymo(si) kultūra paremta palaikymu ir bendradarbiavimu.
- Universiteto dėstytojas ir studentai mokosi kartu.

Į studentą orientuotos studijos yra ypatingai svarbios ugdant XXI a. reikalingus gebėjimus, nes tai suteikia galimybę ugdyti studentų kritinį mąstymą arba padėti jiems susikurti asmeninį, autentišką studijų procesą, sampratas (įgytas kompetencijas perkelti į skirtingus kontekstus, konstruoti ir rekonstruoti esamą ir naują suvokimą), įsitraukti į žinių kūrimą ir pritaikyti įgytus gebėjimus čia ir dabar.

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Subtopic: INNOVATIVE TEACHING METHODS. DIGITAL TOOLS AND THEIR APPLICATION POSSIBILITIES

Expected results:

- To acquire knowledge about digital technologies in the study process and be able to apply this knowledge with reference to the taxonomy of cognitive goals and critical thinking development (Bloom, 1956).
- To be able to plan the technology-based teaching/learning process, selecting innovative teaching/learning methods, predicting digital tools.
- To be able to think analytically, creatively and critically, to solve problems and use digital technology in the context of lifelong learning.

Keywords: digital technologies, innovative teaching methods, digital tools, study process.

Theoretical part

Digital technologies in the study process

Digital technologies (DT), which have become an integral part of our life, both facilitate the study process and open opportunities that we would not have if we did not use them. The implementation of the pedagogical process is unimaginable without digital tools for communication, sharing of educational content, evaluation, analysis, implementation of creative tasks, personalisation of material. Without video streaming tools such as ZOOM, Microsoft Teams or Skype, we would not be able to connect with people who are remote or unable to communicate live. The emergence of new DT provides the prerequisites for transferring part of the educational process to the virtual space. This becomes a valuable support tool for teachers but poses challenges for their professional preparation.

When organising the study process, the fact that teachers must maintain a high level of media literacy (digital pedagogical competences) becomes obvious in order to organise and share educational materials with participants of the study process. Then there is a problem of choosing the most appropriate digital technologies. Despite the

mentioned problem, digital technologies open up new opportunities to easily record the study process, copy the educational material presented in the lecture, distribute it on the information platforms available to students, and receive feedback by using digital tools. When using DT, it is the duty of teachers to teach their students to manage the received information, to share it on appropriate digital spaces, to develop media literacy.

Dissemination of the pedagogical process in the study process expands and creates new opportunities for interaction between teachers and students. For this purpose educational process systems are being developed. One of the most popular and comprehensive is the American educator and psychologist Bloom's (Bloom et al., 2001) taxonomy of cognitive goals and critical thinking education. The 6-level learning process system established by Bloom substantiates the achievement, consistency and implementation of educational goals in the study process. When analysing the possibilities of the application of digital technologies and the dissemination of educational content in the pedagogical process, the aforementioned taxonomy, created in 1956, is referred to (Bloom, 1956).

This taxonomy is continuously revised and updated (Krathwohl, 2002; Ekren & Keskin, 2017). The goals of the study process are analysed based on one of the most famous systems of the pedagogical process, which analyses the constituent parts of the process. Referring to Bloom's taxonomy, a classification pyramid of the educational goals is constructed.

Bloom's taxonomy is a powerful tool because it explains the learning process based on the set goals (Shabatura, 2013):

1. To understand a concept, you need to memorise it.
2. To apply a concept, you need to understand it.
3. To evaluate a process, you need to analyse it.
4. To create an accurate conclusion, you need to do a thorough assessment.

According to Bloom's taxonomy levels:

1. Memorisation: recalling information and demonstrating knowledge of previously acquired material (may include facts, terms, key concepts, or answers to questions).
2. Comprehension: demonstrate understanding of facts and ideas by organising, comparing, translating, interpreting, describing, and indicating main ideas.
3. Application: use information in new or familiar situations, use the acquired knowledge, facts, rules, and methods to solve problems.
4. Analysis: examine and divide information into parts, understanding reasons or motives; draw conclusions and find evidence to support generalisations.

5. Evaluation: express and defend opinions, making decisions about information, authenticity of ideas or quality of work according to certain criteria.
6. Creation: organise, integrate, and use concepts into a new plan, product or proposal; collect information differently.

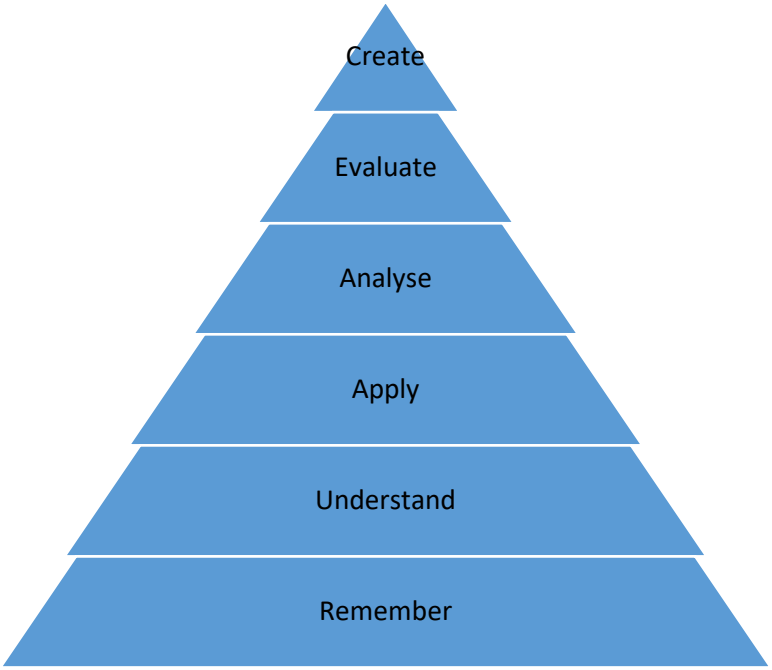

Figure 1. The classification of the educational goals

The possibilities of applying the mentioned taxonomy are revealed in the development of the learning of a specific topic, as well as in the evaluations of the quality of students' work (Ugdymas(is) paradigmų kaitoje, 2017). Therefore, self-assessment becomes very important in the study process.

Self-assessment

The ability to self-evaluate the completed task gives students the opportunity to be honest in the process of improving their competences (Kazlauskienė & Gaučaitė, 2018). A student can follow the level of change by self-assessment in order to achieve higher learning results. The teacher, recording the results of students' self-assessment, has the opportunity to model the educational content taking into account the topics and subject areas in which the students need help.

Digital technologies can be an opportunity for all participants of the study process, especially teachers, to try and apply various digital learning solutions. The possibilities of using and applying digital technologies cover all educational subjects, but due to their abundance, it becomes a challenge for the teacher to choose the most necessary and suitable quality tools. The abundance of developed tools does not always meet expectations for quality in the study process. Therefore, the teacher must devote time to self-assessment and self-evaluation of tools or to participate in the professional development programs.

In the scientific literature, learning that is based on digital technologies is associated with the quality principles of innovative and modern learning: the implementation of the idea of open learning, its availability in all digital forms. Digital forms must be supported by technological means:

- the opportunity for the learner to decide which technological solutions, quality content resources, content or means of communication to choose;
- promoting independent learning;
- selection of interaction options;
- availability of open resources, recognition of open learning, ensuring quality use of resources;
- ensuring the diversity of participants, opinions, forms, and learning outcomes.

The application of digital technologies provides an opportunity to engage students:
- includes them in interactive training(s);
- increases the effectiveness of training;
- develops their independence;
- encourages them to search, discover, and experience the sense of familiarity.

These tools open up opportunities to apply the methods that encourage cooperative learning, help to allocate lecture time more rationally, etc.

Taking into account the possibilities of digital technology tools to implement innovative learning methods, it is appropriate to find out innovative educational methods, digital tools and the need and possibilities of their application in the study process.

Innovative learning methods. Digital tools and their applications.

When dealing with applied digital technologies, the concept of innovativeness is increasingly discussed. In the scientific literature, **innovative** learning is described as a teaching method that the teacher chooses for the implementation of a specific goal and achieves the desired results, taking into account the individual characteristics of the student. Innovative learning is inseparable from the application of digital tech-

nologies and targeted innovative methods. In modern pedagogy, methods that use digital technologies and active learning methods are called innovative.

These learning methods allow students to actively participate in discussions and projects, perform creative tasks, learn collaboratively, create mind maps, use virtual laboratories, audio-visual tools, etc. Innovative learning methods are based on the application of digital technologies, which open up new possibilities for presenting learning materials. A properly designed activity can develop cooperation, independence, creativity, critical thinking, information culture, etc.

Innovative educational methods are based on 4 rules:
- TELL ME - AND I WILL FORGET
- SHOW ME - AND I WILL REMEMBER
- LET ME TRY - AND I WILL RECALL
- LET ME TEACH ANOTHER - AND I WILL MEMORISE.

Different methods, different skills, abilities:
- **With tests** we train reading and encourage not to miss small details.
- **Projects** are for creativity.
- **Teaching** will teach listening skills.
- **Group work** develops discussion, persuasion, and working with others skills.
- **The method of questions** stimulates curiosity, shows the logic of the subject, and allows knowledge to be transferred to another situation.
- **DT teaching methods** promote communication and cooperation, develop creativity.

The teacher needs to test the methods three times: *learning - applying - improving*.

Researchers distinguish one of the directions of DT application in education as a virtual learning method. Virtual learning is "learning that takes place in virtual space, using virtual space tools as well as synchronous and asynchronous virtual communication" (Targamadzė, 2011, p. 14). Virtual learning is described as one of the most convenient ways of learning. It emphasises flexibility and mobility. Targamadzė (2011) describes flexibility and mobility of learning as the ability to access learning material at a convenient time, learn at an acceptable pace, allocating as much time as needed to understand the topic. Flexibility includes not only flexible study schedules, but also self-paced learning. The aforementioned features expand the circle of learners. Such learning is attractive to various groups of learners: 1) persons who have left the country where they are studying; 2) working students who do not have the opportunity to attend the educational institution; 3) students with special needs; 4) students who are temporarily unable to attend the educational institution.

The application of virtual learning opens up new possibilities to present learning materials. The material is easily updated, its accessibility is facilitated, and complex learning content can be presented by using various methodological tools. Virtual learning uses virtual learning environments. A virtual learning environment is "a system with tools that can be used to provide electronic learning materials" (Alcattan, 2014, p. 58). A properly designed virtual learning environment can foster cooperation, independence, creativity, critical thinking and information culture. Kaklauskas and Kaklauskienė (2013) distinguish 7 main tools of the virtual learning environment (VLE):

1. Means of communication and cooperation that promote group activities, communication between students and the teacher. These facilities include messages, chat rooms, forum, etc.
2. Student and teacher presentation areas: this is information for participants connected to the environment.
3. Means of student registration by which participants are registered or connected to VLE.
4. Educational content and its management tools are designed to create and present educational content, learning objects, information.
5. Task preparation and survey organisation tools are designed to check students' knowledge, to present them with tasks and surveys.
6. Student learning and progress monitoring tools are designed to monitor the achievements and activity of course participants.
7. Tools for changing the environment interface are tools for changing the layout, appearance and design of the components of the virtual course.

VLE provides the teacher and students with all the necessary tools using which they can carry out educational activities. In virtual learning, these activities are performed only in a virtual space where only virtual communication is used.

Digital tools

The teacher, modelling the content of the taught subject, constantly plans, analyses, and evaluates the educational material, sets goals, predicts results, and creates new educational content.

Based on Bloom's taxonomy, an analysis of digital technology tools that a teacher can use in teaching is presented below (see Table 1).

Table 1. DT tools that dominate in memorisation and information dissemination (Žalytė-Linkuvienė, 2020)

DT tools for memorisation	Zoom, Skype	Communication; video streaming; sharing of visual, graphic, video, audio material; arranging virtual meetings; conducting discussions. Depending on the version, a large number of participants may participate.
	Microsoft Teams	Synchronisation of application network user account data; real-time communication; live video conferencing; material sharing. Depending on the version, a large number of participants may participate.
	Flip grid	Video calls, face-to-face communication, topic discussion, discussions, audio-visual sharing, educational resources tool
	Explain everything	Real-time virtual communication, whiteboard function, possibility to include audio-visual and textual material in communication, possibility of virtual meetings
	Kialo edu	Descriptive management of discussions on preferred topics
	Edu creations	An interactive whiteboard and screen display tool that can provide visual material on the topic under analysis, its interpretation; create and share short instructional videos; use already created content
DT tools for understanding	LearningAppsOrg	Presentation and delivery of educational content in the form of interactive tasks
	Kahoot	Consolidation of knowledge and understanding of teaching materials through interactive tasks
	Interact	Modelling of online quizzes, interactive tests
	Quizizz	Modelling of quiz game form, preparation of topic presentations, development of visual communication tools
	Breakout Edu, Classcraft	Learning, understanding, and mastering of teaching materials while playing games online

DT tools for application	This mode organises the process with gadgets and digital hardware: iMO cubes, Photon robots with Photon EDU, Blue-bot robots, Lego constructors with WeDo2, interactive maps with DT tool Clever Books Geography, interactive T-shirts with DT tool Virtual-tee	
DT tools for analysis	Coggle	Creating mind maps, initiating discussions
	Mentimeter	Real/current communication with the audience, sharing of thoughts, dissemination of feedback
	Goggleforms	Conducting surveys, compiling questionnaires, analysing results
	GoSoapBox	Analysis of knowledge, assimilated material
	iBrainstorm	Ideas, elements of thought maps, materials are shared in the individual and group educational process
	Crowdsignal	Execution of surveys, voting
DT tools for evaluation	Quizalize, Zzish, Quizlet	Differentiation of tasks, knowledge testing
	ClassDojo	Tracking and recording person's behaviour, activities and achievements
	Nearpod	A tool for interactive lessons, videos, formative assessment
	Yacapaca	A tool for resources that complement the content of formative assessment and education
DT tools, creative	Edpuzzle, H5P	Interactive video lecture creation
	Doink	Animation creation
	Flipsnack	Creating a virtual magazine with translated sheets
	Visme	Creation of presentations, illustrations, infographics
	Canva	Illustration, photo management
	Pixton	Comic book creation
	Storybird	Creating virtual books
DT tools for self-assessment	Digital graphic symbols of self-assessment: smiles, traffic light, number scale, thumbs, cobweb, star, cake, coloured steps	
	Multi-DT plugins for evaluating results or capturing feedback - self-evaluating	

Churches and Schrock (2009) present the classification of DT tools according to Bloom's taxonomy, indicating the activities that can be performed with these tools (see Table 2).

Table 2. Classification of DT measures according to Bloom's taxonomy (Churches & Schrock, 2009)

Level of thinking (according to Bloom's taxonomy)	**Learning activities**	**Tools**
Creating	Video casting, collaboration, filming, programming, storytelling, creation, simulation, wiki creation, writing.	"Prezi", "Sreener", "Wevideo", "Google Sites", "DimDim", "Google Hangout", "ScreenCast- O-Matic", "Google Docs", "MS Office 365", "Twiki", "Wikispaces", "Animoto", "Audacity", "YouTube", "SlideRocket", "WeVideo", "Open Drive", "PowToon", "Revisu", "Google Drive".
Assessing	Testing, moderation, experimentation, discussion, ranking, recommendation, support.	"Docebo", "Google +", "KidBlog", "Google Groups", "Diigo", "Form+".
Analysing	Surveys, calculation, integration, differentiation, concept mapping, planning.	"Docebo", "Survey Monkey", "Google Forms", "TexploraTree", "Create a Graph", "Mindmeister", "Mindmodo", "Lucidchart", "Cacoo", "MindMup".
Applying	Demonstrating, sharing, presenting, illustrating.	"Docebo", "Slideshare", "YouTube", "Pod-o-Matic", "PcMonkey", "Voki".
Understanding	Commenting, grouping, searching, filtering, annotation.	"Docebo", "Twiki", "Wikispaces", "Penzu", "Google Search", "Bing".
Knowledge	Explanation, question, watching, reading, telling.	"Docebo", "Google+", "Diigo", "Youtube", "Google Drive".

Khalid, Rongbutsri and Buus (2012) provide the classification of DT tools according to pedagogical activities. In the classification of tools according to learning methods and activities intended for these methods, the tools used in higher education are distinguished (Table 3).

Table 3. Classification of DT tools according to learning activities and methods (Khalid, Rongbutsri & Buus, 2012)

Type (what)	Activities/methodology (how)	Tools
Acquisition: reading; demonstration; hearing.	Reading, demonstration, listening.	"Mahara", "Moodle", "Quickr", "Adobe Connect"
Information analysis: processing; collection; handling; classification; choice; analysing; manipulation.	Concept maps, brainstorming, crosswords, search, definition.	"Mahara", "Moodle", "Quickr", "Adobe Connect"
Adaptation: modelling; simulation.	Simulations, modelling.	"SecondLife"
Communication: discussion; demonstration; debate; criticising.	Argumentation, briefing, debate, fishbone, discussion, icebreaker, interview, dialogue, questions-answers, short answer, snowball.	"Mahara", "Moodle", "Adobe Connect", "Quickr"
Creation: writing; drawing; drawing up.	Artefacts, assignments, book analysis, essays, exercises, demonstrations, portfolios, tests, voting/survey.	"Mahara", "Moodle", "Adobe Connect", "Quickr"
Experimenting: practicing; application; exploration; acquaintance.	Experiments, game, role playing, simulation, case study.	"SecondLife"

The classification of DT tools presented by the authors (Churches & Schrock, 2009) shows that various DT tools are assigned to active learning activities and presentation of learning materials. They are classified according to the performed functions, level of thinking, pedagogical activities and methods. Therefore, DT tools can be used for learning. By using these tools in the study process, the student is provided with an interactive learning environment based on modern learning methods. Students can access learning content online, take tests, attend courses, receive feedback from teachers, complete projects, create mind maps, complete assignments, collaborate and share resources in a virtual learning environment. Students can access the learning environment 24 hours a day. 24/7, the resources are easily updated; they have all learning tools and a flexible learning environment (Alcattan, 2014).

Viswanath, Kusuma and Gupta (2011) distinguish the following advantages of DT for the teacher: the teacher can create more diverse and attractive learning materials, apply project activities, communicate and send feedback to students. Therefore, it is

appropriate to model a learning environment based on innovative learning methods and DT tools. The functions of the analysed DT tools provide an opportunity to enrich the study process and correspond to Bloom's taxonomy pyramid.

DT is developing rapidly not only in the fields of computer software and hardware. The latest plug-ins for smartphones and tablets are delivered every day, various consoles and virtual interactive products are being developed.

Therefore, the most relevant question today is not whether to use technologies, but which DTs are most suitable for one or another stage of the study process. Thus, the need arises for the teacher to constantly read and be interested in all available information about the possibilities of the latest digital tools. The use of DT creates great opportunities for learning, as it opens up new ways of collaboration, content creation for different subjects, distance learning, assessment, and dissemination of results. In the virtual teaching/learning environment, the learner is encouraged to search for the necessary material, work, and reflect. The training(s) material is available anytime, anywhere, as long as there is an internet connection.

Globalisation, explosion of information, rapid change impose new demands on the individual, society and education (Barkauskaitė et al., 2005), so the ability to learn, lifelong learning becomes a necessity. In order a person could be able to learn successfully throughout one's life, one must develop the abilities and skills of independent learning, i.e., learn to independently define learning goals, plan appropriate learning steps, find information for learning in various sources, solve emerging problems, self-critically reflect, and evaluate the achieved progress. In other words, independence can be described (Jovaiša, 2007) as a personal personality trait that enables one to correctly choose activity and communication goals, means, and methods in order to be able to act actively and productively. Petty (2007), emphasising the perception of self-directed learning as deep rather than superficial learning, claims that the freedom of learning given to learners increases their responsibility, motivation, and learning performance. The researcher emphasises that self-directed learning is the best teaching method when digital technologies can be applied in the context of lifelong learning.

Practical part and reflection questions

Based on the theoretical material and Bloom's taxonomy, model the content of one of your taught subjects with innovative learning methods and DT tools, choosing DT tools, creating more diverse, more attractive learning materials for students.

1. How to choose the most appropriate DT when organising the study process?
2. Explain the learning process based on Bloom's taxonomy and name the levels of Bloom's taxonomy.
3. Based on Bloom's taxonomy, indicate the DT tools that dominate memorisation and information dissemination. Give some examples.
4. How are DT classified? What DT tools do you use in the study process, in the virtual learning environment, in communication, etc.? Give examples of the application of DT tools according to the performed functions, level of thinking, pedagogical activities, methods, etc.

Summary

INOVATYVŪS MOKYMO METODAI. SKAITMENINIAI ĮRANKIAI, JŲ TAIKYMO GALIMYBĖS

Skaitmeninės technologijos (ST), tapusios neatsiejama gyvenimo dalimi, kartu palengvina ir studijų procesą bei atveria galimybes, kurių neturėtume, jei jų nenaudotume. Pedagoginio proceso vykdymas nebeįsivaizduojamas be skaitmeninių įrankių bendravimui, ugdymo turinio dalijimuisi, vertinimui, analizei, kūrybinių užduočių įgyvendinimui, medžiagos individualizavimui. Be vaizdo transliacijų įrankių, tokių kaip ZOOM, Microsoft Teams ar Skype negalėtume susisiekti su asmenimis, kurie yra nutolę ar neturintys galimybių bendrauti gyvai. Naujų ST atsiradimas sudaro prielaidas dalį ugdymo proceso perkelti į virtualią erdvę.

Tai tampa vertinga pagalbine priemone dėstytojams, tačiau kelia iššūkių jų profesiniam pasirengimui.

Organizuojant studijų procesą akivaizdus tampa faktas, kad dėstytojai privalo išlaikyti aukštą kompiuterinio raštingumo lygį (skaitmenines pedagogines kompetencijas), siekiant kokybiškai organizuoti ir dalintis mokomąja medžiaga su studijų proceso dalyviais. Tuomet susiduriama su problema, kaip pasirinkti tinkamiausias skaitmenines technologijas. Nepaisant minėtos problemos skaitmeninės technologijos atveria naujas galimybes nesunkiai fiksuoti studijų procesą, kopijuoti paskaitoje demonstruojamą mokomąją medžiagą ir platinti studentams prieinamose informacinėse platformose bei, naudojantis skaitmeniniais įrankiais, gauti grįžtamąjį ryšį. Naudojant ST, dėstytojų pareiga savo studentus išmokyti valdyti gautą informaciją, dalytis tinkamose skaitmeninėse erdvėse, ugdyti medijų raštingumą.

Pedagoginio proceso sklaida studijų procese praplečia ir sukuria naujas galimybes dėstytojų ir studentų tarpusavio sąveikai. Šiam tikslui yra kuriamos ugdymo proceso sistemos. Viena populiariausių ir išsamiausių yra amerikiečių edukologo ir psichologo Bloom'o (Bloom ir kt., 2001) pažinimo tikslų ir kritinio mąstymo ugdymo taksonomija. Jo sudaryta 6

lygių mokymosi proceso sistema pagrindžia ugdymo(si) tikslų siekimą, nuoseklumą ir įgyvendinimą studijų procese. Analizuojant skaitmeninių technologijų taikymo ir ugdymo turinio sklaidos galimybes pedagoginiame procese, remiamasi minėta taksonomija, sukurta 1956 m. (Bloom, 1956). Ši taksonomija nuolatos peržiūrima ir papildoma (Krathwohl, 2002; ir Keskin, 2017). Bloom'o taksonomija yra galinga priemonė, nes paaiškina mokymosi procesą remiantis išsikeltais tikslais (Shabatura, 2013): a) norėdami suprasti sąvoką, turite ją įsiminti; norėdami pritaikyti sąvoką, turite ją suprasti; c) norėdami įvertinti procesą, turite jį išanalizuoti; norėdami sukurti tikslią išvadą, turite atlikti išsamų vertinimą. Minėtos taksonomijos taikymo galimybės atsiskleidžia konkrečios temos mokymosi raidoje bei studentų darbo kokybės vertinimuose (Ugdymas(is) paradigmų kaitoje, 2017).

Šiuolaikinėje pedagogikoje, metodai, kuriuos taikant naudojamos skaitmeninės technologijos ir aktyvieji mokymosi metodai, vadinami inovatyviais. Šie mokymosi metodai studentams suteikia aktyvaus dalyvavimo diskusijose, projektuose, atlikti kūrybines užduotis, mokytis bendradarbiaujant, kurti minčių žemėlapius, naudoti virtualias laboratorijas, audiovizualines priemones ir kt. galimybes. Inovatyvūs mokymosi metodai yra paremti skaitmeninių technologijų taikymu, kurie atveria naujas mokymosi medžiagos pateikimo galimybes. Tinkamai suprojektuotas užsiėmimas gali ugdyti bendradarbiavimą, savarankiškumą, kūrybiškumą, kritinį mąstymą, informacinę kultūrą ir kt. Inovatyvūs ugdymo metodai paremti 4 P taisykle: „pasakyk" - ir aš užmiršiu; „parodyk" - ir aš prisiminsiu; leisk „pabandyti" - ir aš išmoksiu; leisk „perduoti kitam" - ir aš įsisavinsiu. Naudojant ST priemones studijų procese, studentui suteikiama interaktyvi ir šiuolaikiniais mokymosi metodais paremta mokymosi aplinka.

D. K. Viswanathas, S. Kusuma ir S. K. Gupta (2011) išskiria šiuos ST privalumus dėstytojui: dėstytojas gali sukurti įvairesnę ir patrauklesnę mokymosi medžiagą, taikyti projektinę veiklą, komunikuoti ir siųsti atsiliepimus studentams. Todėl tikslinga yra modeliuoti inovatyviais mokymosi metodais ir ST priemonėmis grįstą mokymosi aplinką. Taigi dėstytojui iškyla būtinybė nuolatos skaityti ir domėtis visa galima informacija apie naujausių skaitmeninių priemonių galimybes. ST naudojimas sukuria puikias galimybes mokytis, nes atveria naujų būdų bendradarbiavimui, turinio kūrimui skirtingiems dalykams, nuotoliniam mokymuisi, vertinimui, rezultatų sklaidai. Virtualioje mokymo(si) aplinkoje besimokantysis yra skatinamas ieškoti reikalingos medžiagos, dirbti ir reflektuoti. Antra, mokymo(si) medžiaga yra prieinama bet kada, bet kur, kur tik yra interneto ryšys.

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Subtopic: THE ASSESSMENT OF ACHIEVEMENTS IN HIGHER EDUCATION

Expected results:

- acquisition of a systematic approach to the assessment of achievements;
- knowledge of assessment types and their application in higher education;
- knowledge of the principles of student achievement assessment and the ability to implement them;
- knowledge of the variety of student achievement assessment methods and the ability to choose and apply them purposefully by implementing study programs in higher education qualitatively.

Keywords: assessment of achievements; higher education.

Theoretical part

Systematic approach to the assessment of study achievements

In higher education, the assessment of achievements is perceived at several levels: institutional level, study program level, study subject (course) level, student achievement and progress level. All these levels determine the results to be achieved. The results must reveal the competence (knowledge, abilities, skills and values) of the future specialist, i.e., the complexity of the activities a person will be able to perform.

Determination of study results is associated with Bloom's taxonomy (1956, 2001), SOLO taxonomy, Marzano's taxonomy (2005) and others. In the field of assessment of achievements, 6 levels of knowledge, presented in Bloom's (1956, 2001) taxonomy, are identified by using the appropriate verbs (you can additionally view the following sources: https://www.flickr.com/photos/vandycft/29428436431/in/photostream/ or https://www.utica.edu/academic/Assessment/new/Blooms%20Taxonomy%20-%20Best.pdf, etc.).

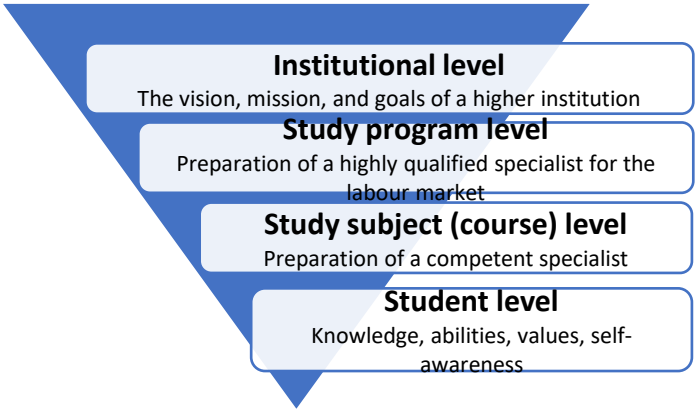

Figure 1. Achievement assessment levels in higher education

When evaluating achievements at the level of a high school student, we can use Bloom's taxonomy, revised by the authors in 2001 (more about this: https://ies.ed.gov/ncee/edlabs/regions/northeast/onlinetraining/ResourcesTools/Bloom%27s%20Taxonomy.pdf).

From the 6 main levels, the authors have formulated 4 types/categories of cognition:

- Factual Knowledge: knowledge of terminology; knowledge of specific details and elements.
- Conceptual Knowledge: knowledge of classifications and categories; knowledge of principles and generalisations; knowledge of theories, models, and structures.
- Procedural Knowledge: knowledge of subject-specific skills and algorithms; knowledge of subject-specific techniques and methods; knowledge of criteria for determining when to use appropriate procedures.
- Metacognitive Knowledge: strategic knowledge; knowledge about cognitive tasks, including appropriate contextual and conditional knowledge; self-knowledge.

Compatibility between study results and student's learning achievements. The achievement of study results at the institutional level shows the quality of studies of a higher education institution, the implementation of its mission, vision, and goals. Referring to the level of a study program, study results are associated with the competence of trained specialists, i.e., the training of specialists with the highest professional qualifications. At the level of a study subject, the expected study results are related to the results of the entire program and are compatible with each other. At the level of a study subject, outcomes must be clear, reasonable, and measurable. We

are presenting an example (see Table 1) of how the result of a study subject and the corresponding student's learning achievements could be formulated in respect of 4 types of cognition.

Table 1. The relationship between the study result and student's learning achievements (example)

Result *referring to the content of the subject/course, one of the possible study outcomes is provided*	**Type of achievement** *the expected type/category of the study achievement*	**Achievement** *student's learning/study achievement*
Knowledge of basic concepts, ability to use them purposefully in professional discourse and creatively apply them in practical activities.	Student's learning/study achievement corresponding to factual knowledge.	Knowledge of the key concepts related to the course material and ability to explain them.
	Student's learning/study achievement corresponding to conceptual knowledge.	Analysis of the concepts related to the course material, comparison of concepts and their conceptions.
	Student's learning/study achievement corresponding to procedural knowledge.	An ability to apply concepts in practice in individual and group tasks and to demonstrate them by analysing situations, participating in discussions and debates.
	Student's learning/study achievement corresponding to metacognitive cognition.	Awareness of changes in conceptualisations of concepts, awareness of paradigms related to the concept and development of concepts, identification of regularities, demonstration of new insights, and creative application of concepts.

Referring to the formulated results of a subject/course of the study, the achievements, i.e. knowledge, abilities, skills, attitudes, etc., are determined, and appropriate methods for assessing students' achievements are selected and applied.

The assessment of students' achievements and progress is understood as criteria-based monitoring and feedback of education and learning, the collection and accumulation of information about the learning processes and results, the interpretation and implementation in order to ensure the quality of teaching and learning (The Order No. V-1309 of the Minister of Education and Science of the Republic of Lithuania of 21 December 2015 "On the Approval of the Description of Primary, Basic and Secondary Education Curricula" (***Summary version from 1 September 2016***) Vilnius). Figure 2 provides an example of what methods could be used taking into account the expected achievements according to cognitive types.

Figure 2. Compatibility of study achievements and the assessment methods

Each provided assessment method must contain the described criteria. While introducing students to the assessment tasks, it is necessary to present them the evaluation criteria for each task. Table 2 presents indicative criteria for the assessment methods that each academic should prepare referring to the content of his subject and the expected study results.

Table 2. The evaluation methods and indicative criteria (prepared according to Žibėnienė, 2014; Bulajeva, 2007; etc.)

Evaluation methods	***Indicative criteria for the assessment methods***
Concept map	*Naming of essential, related concepts; relations of concepts and attributes (correct, incorrect); the relation of essential features to the concept.*
Essay	*Maintenance of the thematic outline; compatibility of scope and topic development; originality and individuality of thoughts; consistency of teaching; reasoning; generalisation; proper citation and references.*
Report	*With respect to the content of a report: compliance with the general technical recommendations for the preparation of reports; clarity of structure; completeness of topic analysis; consistency and integrity while presenting the topic; presentation ethics; applied scientific aspect (theoretical justification, scientific analysis, ability to distinguish and present essential points); originality (independence, speakers' contribution) are important.* *With respect to the presentation and visualisation: language style; language culture; speech pace, clarity, suggestiveness; speaker's posture; usage of visual material; communication and feedback with the audience; ability to answer questions clearly; ability to answer questions correctly are essential.*
Scientific paper	*Achieving the goal of the work; maintaining subject boundaries; paper structure; analyticity; consistency and logic of laying out; neatness and correctness (proper citation and putting references to literary sources); compatibility of the length of a paper and the development of the topic.*
Case study	*Achieving the objectives of a case study; consistency and logic of the analysis process; quality of analysis, application of knowledge; decision-making process during the case study; quality of judgment and comments.*
Problem analysis	*Achieving the set goal; quality of problem solving; consistency and logic of activity; quality of argumentation.*
Review	*Adherence to the review structure (if indicated); demonstration of knowledge of the reviewed object; depth of analysis and reasoning; consistency of analysis; validity and consistency of the assessments made; validity of the recommendations provided; ethical commenting.*
Debates	*Argumentation and persuasion; correctness, appropriateness and timeliness of the use of examples and sources; the success of cross-examination; adherence to debate methodology; oratorical abilities of participants.*
Oral presentation	*Clear presentation of ideas; quality of speech (clearness, loudness); quality of argumentation; quality of an introduction (part of the introductory presentation); quality of conclusions; eye contact with the audience; usage of demonstration tools and programs; quality of visually presented material; question management (quality of answering questions); time management (whether time allocated for delivery is properly used), using this oral presentation method for formative assessment.*

The assessment system of results in higher education studies is determined by legal documents regulating education in Lithuania. In Lithuania, a ten-point evaluation system is adopted. Table 3 summarises the descriptions. A student must have achieved at least 50% of the expected results of a study subject.

Table 3. The assessment system of study results of a student (the case of Lithuania) (prepared in accordance with the Order No. ISAK-2194 of the Minister of Education and Science of the Republic of Lithuania of 24 July 2008 "On the Approval of the Evaluation System of Study Results", Žibėnienė, 2014; etc.)

Evaluation	Description
10 (excellent) *All expected study results have been achieved*	Excellent, exceptional knowledge and skills. Comprehensive knowledge and its application in solving complex practical problems. Understands and uses concepts fluently, is able to analyse them in a wider context of the subject, has excellent analytical and evaluation skills. Excellent application of theoretical knowledge, high-quality performance of complex and non-standard tasks. Excellent expressiveness and presentation skills. Understanding of the purpose of actions.
9 (very good) *90 percent of the expected study results have been reached*	Extensive, profound knowledge and skills. Extensive, profound, comprehensive knowledge and its application in solving complex practical problems. Understands the studied material perfectly, uses concepts correctly. Thinks originally and independently. Has perfect analytical, evaluation, and synthesis skills. Applies theoretical knowledge splendidly. Performs complex typical tasks with ease and quality. Has very good expression and presentation skills. Understands what methods and techniques uses and why.
8 (good) *80 percent of the expected study results have been reached*	Better than average knowledge and skills. Better than average knowledge and its application in solving practical problems. Acquainted with the mandatory material. Able to work independently with additional material. Understands concepts and principles, and applies them appropriately. Provides arguments well and supports them with facts. Good application of knowledge. Performs tasks of medium complexity and those that are more difficult correctly and qualitatively. Good speech expression and presentation skills. Knows what methods and techniques to apply.

Evaluation	Description
7 (average) *70 percent of the expected study results have been reached*	Average knowledge and ability, minor errors occur. Average knowledge, there are minor errors. Applies knowledge to solve practical problems. Acquainted with the basic material, understands and uses concepts and principles. Several essential parts are linked into a whole. Provides reasons well enough, applies knowledge based on given examples. Good quality of performance. Performs moderate tasks correctly. Sufficient expression and presentation skills.
6 (satisfactory) *60 percent of the expected study results have been reached*	Knowledge and abilities (skills) are below average, errors occur. Applies knowledge to solve simple practical problems, acquainted with basic material, understands concepts satisfactorily, is able to describe the received information in one's own words, focuses on several aspects when analysing, but is unable to connect them, satisfactory preparation for further studies. Knowledge is applied following the examples provided, quality of performance is satisfactory, knows how to act by analogy, performs easy tasks correctly, but does not understand more complex ones, satisfactory expression and presentation skills.
5 (weak) *50 percent of the expected study results have been reached*	Knowledge and abilities (skills) meet the minimum requirements. Applies knowledge to solve simple practical problems, simple naming of mastered concepts, retelling a text, answer is focused on one aspect, minimal preparation for further studies. A minimum of sufficient problem-solving ability by example, ability to work by analogy, satisfactory expression and presentation skills.
4 to 1 (unsatisfactory) *50% of study results have not been reached and the subject has not been mastered, it is evaluated negatively*	Minimum requirements are not met. Knowledge and skills do not meet minimum requirements.

Specific descriptions are prepared taking into account the topic of the subject. They indicate the specific knowledge, abilities, skills, attitudes, and understanding to be achieved by each score of assessment.

Inclusive management of evaluations of achievements

The study prepared as a part of the project "Development of Student-Centred Learning, Teaching and Assessment within Bologna Learning Network; LOAF" (2018) provides recommendations. The authors indicate that the evaluation of achievements must begin with educational **values**. Assessment is **effective** when learning is reflected as a complex process, where it is important not only what students know, but also how they can use what they have learnt. Assessment is a **purposeful**, goal-oriented process, designed to compare the achievement with learning outcomes. During the evaluation process, the **attention** is paid to both the results and students' experiences. Assessment helps to understand which **methods** students learn best and what is needed to make a progress. Assessment is **cumulative**, as it is a process that takes place throughout the whole study period. It aims at progress through continuous growth. Assessment is important at all levels (see Figure 1), which, based on the experience, can **adjust** study results and standards. Assessment helps to **develop**, thus it is important to have feedback. Assessment **promotes change**, thus an assessment-friendly and supportive educational environment is essential.

Getting feedback is important not only for students from lecturers, but also for lecturers (study program curators, administration, etc.) from students. Feedback received from students enables to improve the content of the subject, its implementation, procedures, as well as increases the quality of the entire program. Usually, student surveys on course assessment issues are carried out in the following semester after the course studies, and they are carried out by the members of the university student union by using the approved forms.

Requirements for the methods, tools and procedures of study achievement assessment

After summarising the EU directives (Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) (2009, 2015), Brussels, Belgium), experiences of Lithuania (Žibėnienė (2014); Bulajeva (2007); Pukelis et al. (2007), foreign countries (American Association for Higher Education (AAHE). Principles of Good Practice for Assessing Student Learning. [interactive], [accessed on 2022-08-18] http://assessment.uconn. edu/docs/resources/AAHE_Principles_of_Good_Practice.pdf); Nine Principles of Good Practice for Assessing Student Learning [interactive], https://www.ncat.edu/_files/pdfs/campus-life/nine-principles.pdf) and researchers (Csibi (2020) and others), the following main principles of the assessment of study achievements can be distinguished:

- **validity** (the assessment is related to the goals of the study program (study subject) and must measure the results of the studies intended to implement them);
- **reliability** (the assessment information received and results must be objective and not change when assessor changes);
- **clarity** (the evaluation system must be informative, understandable for both the assessors and students);
- **relevance** (the assessment carried out must be positively evaluated by students themselves and contribute to the implementation of the goals of a study program);
- **impartiality** (the assessment methods applied during the assessment must be equally suitable for all students).

When discussing the basic requirements **for the assessment procedures**, it is necessary to clarify the types of the assessment. Assessment can be: diagnostic, formative (incorporate self-assessment), and summative. According to the formalisation of the assessment of the acquired competences, it can also be formal and informal. The definitions of the concepts presented below are taken from The Order No. V-1309 of the Minister of Education and Science of the Republic of Lithuania of 21 December 2015 "On the Approval of the Description of Primary, Basic and Secondary Education Curricula" (Summary edition from 09/01/2016; https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/481fb7d0a82611e59010bea026bdb259/ejTyNDsnvQ?jfwid=-3u88yonh7).

Diagnostic assessment *is an assessment that clarifies student's achievements and progress made during a certain period of learning, predicts opportunities for further learning, and helps to overcome difficulties.* It is an assessment that determines student's achievements at the time of diagnosis. Therefore, diagnostic assessment methods, such as test, control, written survey, oral survey, etc. are used. This type of assessment is usually used at the end of a topic or after finishing part of the course. After the diagnostic evaluation, it is necessary to explain the errors, indicate which criteria of the intended results have not been achieved and/or explain which criteria with which score have been achieved.

Formative educational assessment *is a mutual response, feedback provided in an educational process, which helps a student to improve his/her learning, guides what still needs to be learnt, and allows a lecturer to adjust his/her teaching in order to achieve the best possible results.* This type of assessment focuses on the development of the progress and personal development of a student. The following evaluation methods, such as group discussion, case study, performance evaluation, report, presentation of independent work, reflection, etc. are used. Self-assessment should be classified as one of the essential assessment methods which aims for the development of students' self-awareness, personal development and learning to learn competencies. ***Self-assessment*** *is a self-monitoring, evaluation and reflection on student's own educational process,*

achievements and progress, predicting further learning steps. Evaluation methods such as SWOT, essay, self-reflection, self-assessment, etc. are used. When conducting a formative assessment, it is necessary to provide detailed feedback to students indicating areas for improvement and strong, promising directions.

Summative cumulative assessment *is formally approved results of student's education after completing the program, course, module or other stage of education.* This type of assessment is aimed at the assimilation of final assessment of subject/course. The following assessment methods are most often used: written or oral examination, presentation of independent work, etc. In university practice (Lithuania and elsewhere), the evaluation of the examination comprises at least 50% of the final assessment, while the remaining part is cumulative. During the subject/course, according to the predetermined calendar work plan, students perform independent, group or other tasks, the amount of which comprises 50% (or less) of the assessment of the final assessment score.

Each formal assessment in high school is concluded with a written assessment recorded in points or credit in the report card. An informal assessment takes place continuously, throughout the study period of a student, when a lecturer observes and analyses students' activities, notices initiative, activity, independence, assignment of responsibilities, contribution to group work, etc. Universities in the EU, the USA and other countries encourage informally acquired competences to be evaluated and recorded as student achievements.

Higher education institutions should monitor and assess students' non-formal learning activities. Students, who actively participate in scientific research, volunteering, mentoring, art, sports activities, etc., should have an opportunity for their above mentioned activities to be recognised as achieved learning outcomes. Higher education institutions are recommended to confirm the procedure of recognition of these activities for ensuring the transparency and objectivity of this process (The Compatibility of Student-Centered Learning, Teaching and Assessment of Achievements. Compendium of Recommendations, 2018).

Achievement assessment methodologies, methods and their combinations

Depending on the expected results of the studies, individual methods, combinations of methods or methodologies can be used to evaluate achievements.

Let's begin with the more complex evaluation methodologies. Achievements corresponding to the metacognitive cognition will require complex, mutually compatible assessment methods. For example, during professional practice, a student has to perform not one, but several tasks, the assessment of which may require different assessment methods (see table 4). Some tasks can be more complex, others - simpler. Therefore, grading different assignments may have different effects on the final grade.

Table 4. Contents of the practice folder *(*example from description of the *2nd Practice*)

Type of the task according to the program of the subject (study module)	Task	Total hours	Influence to grade, %
Practice report	Practice portfolio and mentor evaluation	5	10
Individual work	Reflection of lessons observed during practice	8	15
Independent performance of laboratory work and description of laboratory work (report)	Lesson protocols of all the subjects observed during practice	106	50 (30 and 20)
Activity reflection	Writing an activity reflection according to the attached form	10	15
Self-evaluation	Self-evaluation of one's practical activities in educational institutions according to the provided form	2	5
Verbal illustrated report	Presentation of practice by using *Power Point* in practice discussion	2	5
Total:		133	1100

Each task named in the table has its own performance description and performance instructions; a corresponding protocol or a filling form are provided. All this is prepared and attached in the appendices. Also, a student is informed exactly how he/she needs to submit the assignment for the assessment, how to staple it, what clerical requirements to follow, etc. During the practice briefing, each student receives a complete description of the practice, verbally discusses how the practice will take place, how to fill out the portfolio; all the questions that arise during the briefing are answered. A pedagogue (mentor) and a lecturer (practice supervisor), who will guide and advise a student during the entire practice, are assigned.

The evaluation can be carried out by means of a collegial evaluation, when not one, but several lecturers, specialists or students of this field participate in the evaluation (see Table 5).

Table 5. Example of collegial evaluation of the subject/course *Practice 2*

No.	Assessor	Task	Impact, final assessment, %	Impact, final assessment, %
1.	Practice supervisor	Independent performance of laboratory work	30	85
		Description of laboratory work (report)	20	
		Individual work	15	
		Activity reflection	15	
		Verbal illustrated report	5	
2.	Mentor teacher	Practice report	10	10
3.	Student	Self-evaluation	5	5
			100	100
The university organises practice discussion in which students, practice supervisors and mentors participate. During the discussion, students present the summarised results of the practice. **Students evaluate the procedure of practice organisation, express their suggestions for its improvement.**				

At the end of the table we can see that students are asked to evaluate and submit their suggestions regarding the organisation of practice and its improvement. In this way, additional feedback on practice implementation issues is collected.

Each assessment method can have various modifications of its application: oral or written examination, oral presentation, report, performance reflection, individual work, etc. can take place by allowing the usage of available resources, literature or notes; they can take place remotely, synchronously or asynchronously, etc. In this case the evaluation method must also be modified. For example, if a written survey (test) takes place in a remote asynchronous way (i.e., students can answer the test questions via, for example, Moodle system at their convenience before the set date), then the questionnaire must be modified in such a way that it is possible to assess not the abilities of factual knowledge, but critical thinking, reasoning, problem solving, etc.

In Table 6, we are presenting the examples of the assessment methods referring to the cognitive types.

Table 6. The methods of achievement assessment (prepared according to Žibėnienė, 2014; Bulajeva et al., 2011; Csibi, 2020; and others)

Cognitive type	Evaluation methods
Factual knowledge	Test, interview, oral survey, written survey, incomplete sentences, concept map, question words, "thick" and "thin" sentences, concept and definition scheme, 6W (questions and answers), Bloom's question book
Conceptual knowledge	Interview, problem interview, heuristic interview, 3K method, press conference simulation, report, debate arguments for and against, mind map
Knowledge of procedures	Debates, heuristic conversation, problem conversation, critical reading, T-diagram, angles, M-diagram, Venn diagram, nine-sided diamond, Frayer model, essay, blogs, publication review, peer review, role-playing didactic game, laboratory work, term paper
Metacognitive cognition	Problem talk, case study, debates, project, fishbone diagram, M diagram, Venn diagram, nine-sided diamond, simulation, problem solving scenario, activity reflection, self-reflection, thesis

The classification of the assessment methods presented in Table 6 is conditional. When assessing students' achievements, an educator must be creative, professional in one's own field and have the vocation of a teacher to work with students. Cooperation, mutual communication and mutual understanding between a lecturer and a student guarantee a high-quality process of the assessment of achievements and the constantly improving training of highly qualified specialists.

Practical part and reflection questions

1. Look at Fig. 2, and based on your practice in higher educational institution, add the assessment methods you use in your practice to the picture.
2. Using the examples given in Table 2, create the criteria for other assessment methods (test, final test, activity reflection, etc.), extend the table.
3. Provide your insights on how different assessment methods could be combined to assess students' conceptual, procedural and metacognitive knowledge.

*

1. What interested you the most, left an impression, was memorable when analysing the topic on the assessment of achievements?
2. What have you learnt about the assessment of achievements, the assessment process, and the assessment methods?
3. What will you use in your practical work with students?
4. Share your insights on the material presented.
5. Share your experience about the process of study evaluation at your higher education institution.

Summary

PASIEKIMŲ VERTINIMAS AUKŠTOJOJE MOKYKLOJE

Pasiekimų vertinimas aukštojoje mokykloje suprantamas keliais lygmenimis: institucinis lygmuo, studijų programos lygmuo, studijų dalyko (kurso) lygmuo, studento pasiekimų ir pažangos lygmuo. Visais šiais lygmenimis nustatomi rezultatai, kurių siekiama. Studijų rezultatai turi atskleisti būsimo specialisto kompetentingumą (žinias, gebėjimus, įgūdžius ir vertybines nuostatas), tai yra, kokio sudėtingumo veiklas asmuo galės atlikti. Pasiekimų vertinimo srityje dažniausiai naudojami B. Bloomo (1956, 2001) taksonomijoje pateikti 6 žinojimo lygmenys, kurie identifikuojami naudojant atitinkamus veiksmažodžius. Vertinant pasiekimus aukštosios mokyklos studento lygmenyje galime pasitelkti 2001 m. autorių patikslintą B. Bloomo taksonomiją, kurioje iš 6 pagrindinių lygmenų autoriai sudarė 4 pažinimo tipus/kategorijas:

- Faktinės žinios: terminų žinojimas, konkrečių detalių ir elementų išmanymas.
- Konceptualios žinios: klasifikacijų ir kategorijų žinojimas, principų ir apibendrinimų išmanymas, teorijų, modelių ir struktūrų išmanymas.
- Procedūrų žinojimas: su studijų dalyku susijusių dėsningumų ir algoritmų išmanymas, veiklos būdų ir metodų žinojimas, kriterijų, pagal kuriuos nustatoma, kada naudoti atitinkamas procedūras, išmanymas.
- Metakognityvinis pažinimas: gebėjimas strategiškai mąstyti, gebėjimas kūrybingai spręsti užduotis (teorines ir praktines), savireflekcijos gebėjimai, savęs pažinimas.

Studijų rezultatų pasiekimas instituciniu lygmeniu parodo aukštosios mokyklos studijų kokybę, jos misijos, vizijos ir siekinių įgyvendinimą. Studijų programos lygmenyje, studijų rezultatai siejami su parengiamų specialistų kompetencija, t.y. aukščiausios profesinės kvalifikacijos specialistų parengimu. Studijų dalyko/kurso lygmenyje numatomi studijų rezultatai sietini su visos programos rezultatais ir tarpusavyje suderinami. Dalyko/kurso lygmenyje studijų rezultatai turi būti aiškūs, pagrįsti ir pama-

tuojami. Pagal suformuluotus studijų dalyko/kurso rezultatus, nustatomi pasiekimai, t.y. žinios, gebėjimai, įgūdžiai, nuostatos, ect., ir parenkami bei pritaikomi atitinkami studentų pasiekimų vertinimo metodai.

Besimokančiųjų pasiekimų ir pažangos vertinimas suprantamas kaip kriterijais grįstas ugdymosi ir mokymosi stebėjimas ir grįžtamasis ryšys, informacijos apie mokymosi procesus ir rezultatus rinkimas ir kaupimas, interpretavimas ir naudojimas mokymo ir mokymosi kokybei užtikrinti. Kiekvienas numatytas vertinimo metodas turi turėti aprašytus kriterijus. Studentus supažindinant su atsiskaitomosiomis užduotimis, būtina juos supažindinti su kiekvienos užduoties vertinimo kriterijais.

Priklausomai nuo numatytų studijų rezultatų, pasiekimams įvertinti gali būti naudojami atskiri metodai, metodų deriniai ar metodikos. Metakognityvinį pažinimą atitinkantys pasiekimai reikalaus sudėtinių, tarpusavyje derančių vertinimo metodų. Pavyzdžiui, profesinės praktikos metu studentas turi atlikti ne vieną, o keletą užduočių, kurių įvertinimas gali pareikalauti skirtingų vertinimo metodų. Užduotys gali būti vienos sudėtingesnės, kitos – paprastesnė. Todėl skirtingų užduočių įvertinimas gali turėti skirtingą įtaką galutiniam įvertinimui.

Kiekviena atsiskaitomoji užduotis turi savo atlikimo aprašymą, vykdymo instrukcijas arba pateikiamas atitinkamas protokolas ar pildymo formą. Visa tai parengiama ir pridedama prieduose. Taip pat studentas tiksliai informuojamas, kaip jam reikia pateikti užduotį vertinimui, kaip ją susegti, kokių raštvedybos reikalavimų laikytis ir pan.

Studento pasiekimų vertinimas gali būti vykdomas pasitelkiant kolegialų vertinimą, kai vertinime dalyvauja ne vienas, o keli šios srities dėstytojai, specialistai, grupės studentai, pats studijuojantysis.

Kiekvienas vertinimo metodas gali turėti įvairių jo pritaikymo modifikacijų, pvz., egzaminas žodžiu ar raštu, žodinis pristatymas, pranešimas, veiklos refleksija, individualus darbas ar kt., gali vykti leidžiant naudotis turimais ištekliais, literatūra ar užrašais, gali vykti nuotoliniu sinchroniniu ar nesinchroniniu būdu ir pan. Tokiu atveju, vertinimo metodas taip pat turi būti modifikuojamas. Pavyzdžiui, jei apklausa raštu (testas) vyksta nuotoliniu nesinchroniniu būdu (t. y., studentai gali į kontrolinio/testo klausimus atsakyti per, pvz., moodle sistemą jiems patogiu laiku iki nustatytos datos), tai klausimynas turi būti parengtas taip, kad galima būtų įvertinti ne faktines žinias, bet kritinio mąstymo, argumentavimo, problemų sprendimo, situacijų analizės ir pan. gebėjimus.

Dalyko/kurso pabaigoje, studentai prašomi įvertinti ir pateikti savo siūlymus mokymo(si) organizavimo ir tobulinimo klausimais. Tokiu būdu surenkama papildoma grįžtamoji informacija studijų dalykui tobulinti.

Dėstytojas, vertindamas studentų pasiekimus, turi pats būti kūrybiškas, savo srities profesionalas ir turėti pedagogo pašaukimą dirbti su studentais. Bendradarbiavimas,

abipusis ryšys ir savitarpio supratimas tarp dėstytojo ir studento laiduoja kokybišką pasiekimų vertinimo procesą ir nuolat tobulėjantį aukštos kvalifikacijos specialistų parengimą.

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Subtopic: DEVELOPMENT OF CRITICAL AND REFLECTIVE THINKING SKILLS AND DESIGNING THE STUDY SUBJECT

Expected results:

- To expand the theoretical knowledge and understanding of the possibilities of their practical application, related to the development of critical and reflexive thinking through the subject of study.
- To improve the quality of higher education and life-long learning by introducing new teaching methods and innovative assessment tools for the evaluation of students' 21st-century skills (such as critical and reflective thinking).
- To promote voluntary convergence with the EU developments of curriculum development in the field of education studies in the higher education system through the sharing of best practices.

Keywords: critical thinking, reflective thinking, ABD Learning design, IBL (inquiry-based learning), planning of study subject (the content, teaching-learning process, methods and tools).

Theoretical part

In many EU countries, the development of critical thinking skills is associated with the development of other important skills for ensuring social development and social well-being of a person. After all, learning to learn, information literacy, information technology management, responsible decision-making, and creativity are impossible if a person does not think critically (Ananiadou & Claro, 2009). As noted in the OECD Review (2018): "*Students will need to apply their knowledge in unknown and evolving circumstances. For this, they will need a broad range of skills, including cognitive and metacognitive skills (e.g. critical thinking, creative thinking, learning to learn and self-regulation); social and emotional skills (e.g. empathy, self-efficacy and collaboration); and practical and physical skills (e.g. using new information and communication technology devices*)."

That is why critical thinking education in schools (general education, universities) becomes so relevant in modern societies. In reviews of the state of education in various countries, it is noted that as societies change and technologies develop, the purpose of education changes, that is, changes in the understanding of what educational results should be achieved (OECD 2030; OECD 2009, 2009).

1 Figure. OECD Learning Compass 2030

Critical thinking is associated with transformative competencies in nowadays schools. Thus, great attention is paid to the ability to enable change and the maturity of change, person, and social transformation. Here, along with critical thinking abilities, personal reflection abilities are also important, reflecting on one's own and others' actions, how much the decision will be useful to others, and what the possible consequences are (OECD. *Transformative Competencies for 2030*, p. 7). In the OECD Learning Compass 2030, three different types of skills are distinguished (OECD, 2018):

- cognitive and meta-cognitive skills, which include critical thinking, creative thinking, learning-to-learn, and self-regulation;
- social and emotional skills, which include empathy, self-efficacy, responsibility, and collaboration;
- practical and physical skills, which include using new information and communication technology devices.

Critical thinking as a personal skill is so important for developing these transformative competencies (Figure 1) because it is a crucial student skill for these complex competencies. It should be noted that each competency is intricately interrelated with the others. They are developmental in nature, and thus learnable. In this case (teaching and learning processes) have to provide more possibilities for a sequenced process of reflection, anticipation, and action. Reflective practice is the ability to take a critical stance when deciding, choosing, and acting, by stepping back from what is known or assumed and looking at a situation from other, different perspectives. Anticipation mobilises cognitive skills, such as analytical or critical thinking, to foresee what may be needed in the future or how actions taken today might have consequences for the future. Both reflection and anticipation are precursors to responsible actions. The OECD Learning Framework 2030, therefore, encapsulates a complex concept: the mobilisation of knowledge, skills, attitudes, and values through a process of reflection, anticipation,

and action, to develop the inter-related competencies needed to engage with the world (OECD. *The future of education and skills: Education* 2030; OECD. *The Future We Want*, 2018). It should be noted that promoting peace and sustainable development through education is now enshrined in the United Nations Sustainable Development Goal (Target 4.7). For this purpose, it is crucially important to pay attention to critical thinking of the learner, critical thinking development, and ensuring that students recognise the relevance and purpose of their learning. Young and Muller (2016) suggest that if curriculum designers and policymakers want students in 2030 to be critical thinkers, good problem solvers, and able to develop the skill of "learning to learn", they need to focus on the pedagogies and curricula of different knowledge domains. To what extent do formal curricula and assessments help students and teachers connect what they learn to the applications of knowledge in those domains? (OECD Review, 2018)

Based on the review of the education situation carried out by the OECD (2020), it is stated that insufficient attention is paid to the development of critical thinking. As the report notes: cognitive skills are the most emphasised across all countries and territories, with critical thinking first (66%), problem-solving second (59%), but student agency/learning aspect strongly underplayed. The ability to think critically is most common in mother tongue (15%) and least common in physical and health education (4%). The ability to solve problems is most prominent in mathematics education (13%), and least common in physical and health education (5%) and art (5%) (OECD, 2020). (Figure 2)

The ability to think critically is valued and emphasised in various countries and fields of education. However, among universal skills, content is likely to emphasise cognitive skills (e.g., critical thinking) rather than social or emotional skills (e.g., respect, trust) or complex skills (e.g., action, joint action). This chart is based on data provided by primary education teachers. Countries and economies are ranked in descending order of the percentage of teachers who have included interdisciplinary skills in their training programs. Interdisciplinary skills include creativity, critical thinking, and problem solving.

According to the data of the OECD report (2020), compared to other competencies, the ability to think critically is emphasised more in educational programs, i.e., it is included in more than 60% of the curriculum subjects of the participating countries and territories (Figure 2). This competence is particularly emphasised in the fields of humanities and mother tongue in Greece and Japan: in the curricula of both countries, about 60% of all the elements included in this competence fall into these two areas of education. A similar situation exists in other areas of education, such as, science, technology, engineering, and mathematics (STEM) in these countries, with 29% of critical thinking skills in technology and home economics in Japan and 27% in mathematics in Greece. In general, countries and territories with high teacher confidence in their ability to help students develop critical thinking skills are also characterised by a higher proportion of teachers reporting that they often assign tasks that require students to think critically.

Figure 2. OECD data on the inclusion of the development of critical thinking skills in the national curriculums (OECD, 2020)

General principles of study subject content construction (Bloom's, Marzano's, and SOLO taxonomies)

1.1. Definition of critical and reflective thinking.

Briefly reviewing the genesis of the definition of critical thinking to assert critical thinking in the modern sense probably began in 1910 by John Dewey's "How We Think". According to Dewey, the concepts of reflective thinking and problem solving are very important for critical thinking and its formation. Therefore, Dewey explained the concept of reflective thinking by relating it to the scientific method and created the basis for the concept of critical thinking used today. In the 1980s and early 1990s, Ennis conducted research on the definition of critical thinking and provided a broader concept of the term and rational thinking, and later called this broader concept critical thinking. On the other hand, critical thinking for Paul Freire was not an object lesson in test-taking, but a tool for self-determination and civic engagement. According to Freire, critical thinking was not about the task of simply reproducing the past understanding, but more about understanding the present, and possibilities of changes (Yi-Huang Shih, 2018).

According to Paul and Elder (2001), critical thinking is that mode of thinking – about any subject, content, or problem — in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them (Paul & Elder, 2001). Alternatively, attention is paid to thinking operations which are a feature of critical thinking. Thus critical thinking is conceptualised as a combination and synchrony of many cognitive skills in-

cluding experiencing, observing, analysing, conceptualising, synthesising, evaluating, reflecting, and communicating (Howard, Le-Ping Tang, & Austin, 2015). There also are statements that critical thinking includes inductive and deductive reasoning, making correct analyses, inferences, and evaluations (Facione et al., 1995).

The widest panorama of critical thinking concepts is analysed by Lipman (1987). In his works, discussing the features, peculiarities, differences and similarities of critical thinking with other types of thinking processes, the author concludes that:

- Critical thinking is self-corrective thinking.
- Critical thinking is thinking with criteria.
- Critical thinking is thinking that is sensitive to context.

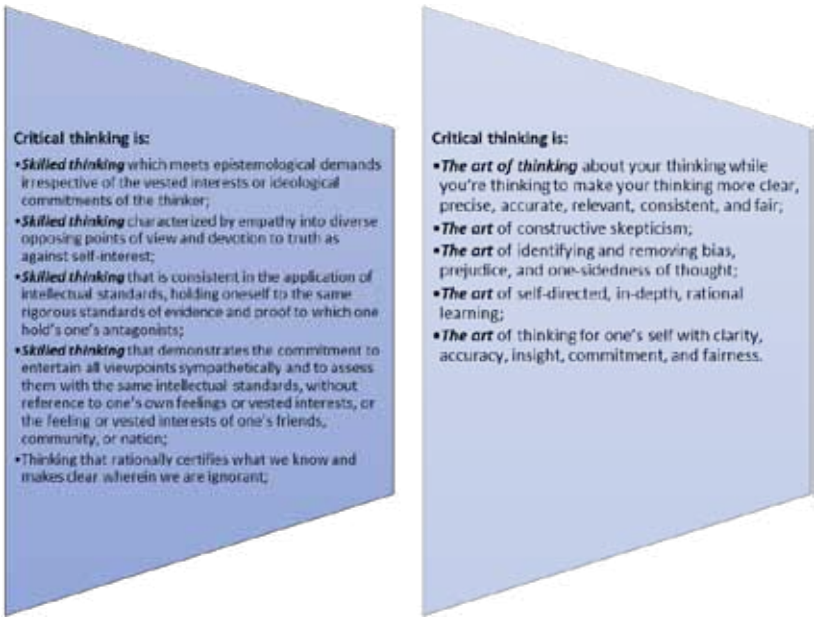

Figure 3. Matthew Lipman about the definition of critical thinking (1987)

Matthew Lipman (1987) defines critical thinking as "skillful, responsible thinking that is conducive to judgment because it relies on criteria, is self-correcting, and is sensitive to context". Cognitive skills comprise verbal, nonverbal and higher-order thinking skills. According to Lipman, noncritical thinking represents a formless, random, untidy, misleading and structureless way of thinking, which is why he defines critical thinking as an applied thinking, so it is not only a process but also starting to develop a product (Demir et al.2011). Understanding the role of criteria in critical thinking is

important for this definition. The criteria and Criteria Development is the stage where the development of criteria and principles to be used in criticism is carried out. It contains the determination of what kind of criteria and features can be used in the criticism of an object, an event, or a phenomenon. It gives the minimum features a criterion should have.

Demir et al. (2011) suggest analysing the definition of thinking by Lipman's features and supplement the understanding of thinking as hopeful thinking. The authors distinguish the quadruple thinking. They claim that thinking ways are divided into two cognitive and affective weights. Accordingly, while critical thinking and creative thinking are mainly cognitive, caring thinking and hopeful thinking are mainly affective thinking ways. They compare critical thinking and caring thinking and conclude that both take to abide by the rules (convergent) in the foreground. They suggest analysing critical thinking as one of the four ways of thinking. According to these authors, critical thinking is associated with cognitive and convergent processes (Demir et al., 2011) (Figure 4).

Table 1. Connections of the concept of critical thinking with different forms of thinking (Demir et al., 2011)

	Convergent	***Divergent***
Cognitive	Critical thinking	Creative thinking
Affective	Caring thinking	Hopeful thinking

Many researchers list the sub-dimensions of critical thinking in different ways. For example, according to Watson and Glaser (1964), critical thinking has 5 sub-dimensions. These are the following: 1. Getting to know the problem.2. Collecting and selecting suitable data for the solution of a problem. 3. Getting to know the structured and non-structured assumptions. 4. Selecting and formulating the assumptions that are related and leading to conclusion. 5. Deducting the valid results and discussing the validity of the deductions. Ennis and Millman (1965) regard critical thinking skills under 4 sub-dimensions. These are: 1. Inductive judgment 2. Deductive judgment 3. Judging the reliability of the assertions 4. Defining the assumptions at discussions. The Paul-Elder (2001) critical thinking system consists of three components:

1. Elements of thought (reasoning).
2. The intellectual standards that should apply to the elements of reasoning.
3. The intellectual traits associated with a trained critical thinker result from the consistent and disciplined application of intellectual standards to the elements of thought.

Complementary relations connect the concepts of critical and creative, responsible, hopeful, rational, convergent, and other thinking. According to most researchers, critical and creative thinking is the two sides of a coin. Both are cognitive. Even though they are cognitively based on terms of processes and have a common denominator, they are separated at the end of the process of thinking in terms of the outcome obtained. Lipman (2003) is to say that critical thinking is included both at the beginning and at the end of creative thinking. In that way, there becomes a cycle, since the individual should inquire about the current case in order to start the process of creative thinking, which is why there is a need for critical thinking. Similarly, the extent of the product put forward by creative thinking is related to critical thinking in the process of judgment.

Gary and Schik (2022) state that reflection has been framed as a vital process of meaning-making leading to growth through questions such as "*What happened? Why did it happen? What are the implications of this for what might happen in the future?*" On the other side, introspection is a particular kind of reflection by which we place ourselves within those questions, and it becomes possible in the context of critical thinking. Therefore, in addition to asking the questions that develop the study project (a student's research work), it is also worth asking "*What did I/we/they do? Why did I/we/they do that? What was I/were they thinking? What was the effect? What does it mean?*" These questions can be focused on our behaviour, our thinking, or our emotions. As researchers emphasise, when reflection takes the form of introspection, the mental work can get harder, in part because of the inherent subjectivity involved. From this perspective, introspection has the potential to make us better at what we do while at the same time challenging us to confront the realities of our work as objectively as possible. Gary and Chick (2022) present the introspection taxonomy and invite teachers to expand upon, criticise, apply, or revise it.

Critical Thinking is defined as questioning and evaluating ideas and solutions (OECD, 2016). This definition embodies components of metacognition, social and emotional skills (reflection and evaluation within a cultural context), attitudes and values (moral judgment and integration with one's own goals and values), as well as a combination of many cognitive skills including experiencing, observing, analysing, conceptualising, synthesising, evaluating, reflecting, and communicating. Critical thinking is a higher-order cognitive skill and includes inductive and deductive reasoning, making correct analyses, inferences, and evaluations.

The importance of Bloom's, Marzano's, and other taxonomies in preparing the study subject

Bloom's Taxonomy is known since 1956, when Benjamin Bloom with collaborators Max Englehart, Edward Furst, Walter Hill, and David Krathwohl published a framework for categorising educational goals. The framework elaborated by Bloom and his collaborators consisted of six major categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. The categories under Knowledge were presented as "skills and abilities," with the understanding that knowledge was the necessary precondition for putting these skills and abilities into practice. All these categories are connected and involve stages of increasingly complex thinking.

Many universities around the world prepare specific recommendations for their teaching teams about the possibilities of applying Bloom's taxonomy in planning and conducting study subjects. For example, Teaching Innovation and Pedagogical Support (TIPS) is a partnership between the University of Arkansas' Wally Cordes Teaching and Faculty Support Center (TFSC), IT Services, and Global Campus. The center has prepared a few recommendations how to apply Bloom's taxonomy in the study process. These 6 levels can be used to structure the learning outcomes, lessons, and assessments of your course (University of Arkansas):

1.Remembering:	retrieving, recognising, and recalling relevant knowledge from long-term memory.
2.Understanding:	constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarising, inferring, comparing, and explaining.
3.Applying:	carrying out or using a procedure for executing or implementing.
4.Analysing:	breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organising, and attributing.
5.Evaluating:	making judgments based on criteria and standards through checking and critiquing.
6.Creating:	putting elements together to form a coherent or functional whole; reorganising elements into a new pattern or structure through generating, planning, or producing.

Curriculum mapping and lesson planning platform for K-12 schools - ***CHALK*** - suggest the use of Bloom's taxonomy for various reasons and purposes, and structure learning in classrooms at all levels. And this common recommendation can be useful for colleges and universities. Bloom's taxonomy is applied not only just for assessment:

- It is helpful for setting clear and measurable objectives of study subjects/study activities. Since all six stages and the expectations under each are expressed as verbs, the taxonomy places its focus on observable behaviours that demonstrate student learning within a specific lesson, unit, or study subject.
- Organising content of the study (academic knowledge, theories, facts, information) within a study subject (within a study program): *which standards should you address and in what order?* This framework helps outline the sequence of learning in study program maps, unit plans, and lesson plans by identifying which standards align most closely with lower-level stages like "Remember" and "Understand" vs. those that align with higher-level stages like "Analyse" and "Create".
- Designing an appropriate evaluation system (assessments and self-assessments) for students.
- Collaborating with other study program professors/teachers. Bloom's taxonomy provides a structure or scaffolding of learning that can help set expectations for progression throughout a student's entire educational journey at your university/school.

For the Content of a study subject, Bloom's taxonomy helps to address the question, *"What should students know or be able to do at the end of this study year?"* For the units of lessons/seminars, Bloom's taxonomy helps to create and link unit plans by considering the behaviours through which students will show mastery of the topic they are learning before they are ready to move on to the next one. Bloom's taxonomy can even help to map student learning within a single lesson or between lessons, or projects in support of larger unit or curriculum goals. No matter the type of outcome, we can recommend a few tips to follow when writing them:

- Make sure those verbs are appropriate to each level of the taxonomy. If students are at the "Apply" level, for example, you can expect them to be able to do everything at the levels of "Understand" and "Remember" as well… but not at the levels of "Evaluate" or "Create".
- Avoid favouring higher-level outcomes over lower-level ones. After all, deep learning needs a strong foundation.
- Express outcomes in terms of what students will learn, rather than what will be covered in the seminar. (CHALK, 2021).

When discussing the emotional domain of Bloom's taxonomy, it is noted that it is particularly important in higher education, as certain attitudes and values must be developed. The attitudes and values to be developed must be clearly stated so that students, teachers, and the public know what a specific study program aims to achieve (Savickienė, 2010). According to Savickienė (2010), the requirements within study subjects or in the study program defining the attitudes and values that students should develop during their studies are associated with the results of studies in the emotional field.

Level	Process	Description
6	**Self-System Thinking**	Identifies learning motivation Identifies emotional responses Identifies improving ability or understanding Assess own learning
5	**Metacognition**	Gauge own level of accuracy Determine own understanding Monitor own progress toward a goal Outline learning goals and plan to achieve them
4	**Knowledge Utilization**	Investigate outcomes Experiment to find different outcomes Test theories Solve Problems and make decisions
3	**Analysis**	Inform of consequences Make generalisations Spot errors Categorise Note similarities and differences
2	**Comprehension**	Draw up information Design information outputs Combine information and summarise Structure information
1	**Retrieval**	Displaying more complex processes Simple procedural actions Recollection of simple information Producing information Recognising information appropriateness Identifying information and assessing for accuracy

Figure 5. Summary of Marzano and Kendal's New Taxonomy (2008)

The criteria according to which it is possible to perceive the emotional results of the study or study program in Bloom's taxonomy: the expression of the study result in one verb, the orientation of the study result to the student, the correspondence of the study result to the purpose, the mutual harmony of the study results, and the connection of the study result with the evaluation of its achievement. Marzano released a new version of taxonomy called *The New Taxonomy of Educational Objectives* (2000). Marzano claimed that this was a response to the shortcomings of the widely used Bloom's taxonomy. "The New Taxonomy is designed as a replacement for Bloom et al.'s taxonomy. Although that work was powerful and enduring, it had some flaws and inconsistencies that can now be reconciled" (Marzano and Kendall, 2008). Marzano and Kendall's taxonomy is two-dimensional. One-dimension addresses the levels of mental processing. Instead of categorising learning activities, it describes six levels of processing knowledge of the mental process. And the other dimension addresses

three domains of knowledge. This taxonomy includes three systems of thought: Cognitive System, Metacognition System, and Self-System. Different types or domains of knowledge are also included: information, mental procedures, and psychomotor procedures. These domains provide the content. According to the six levels of processing knowledge, the highest level (6) denotes the so-called Self-System that contains a network of interrelated beliefs, attitudes, and expectations that are involved in making judgments as to whether to engage in a new task. It is at this level that the motivation of accomplishing the goal is determined. If the decision is made to engage in a new task, the metacognition system (Level 5) is activated. At this level, goals relative to the new task would be defined and strategies would be developed for reaching these goals. Finally, the Cognitive System (levels 1 to 4) is responsible for the effective processing of knowledge. Researchers from Cambridge Assessment (UK) claim that two taxonomies are better than one (Greatorex et al., 2019). They merge the taxonomies of Hutchins et al. (2013), Marzano and Kendall (2007, 2008). In conclusion, they have found that the taxonomies of Hutchins et al. (2013) and Marzano and Kendall (2007, 2008) can be combined. Moreover, the combined taxonomy was successfully used to compare the domains, categories and operations elicited by a variety of tasks and assessments, as well as compare the demand of such tasks and assessments. Furthermore, this taxonomy is accessible and appropriate for a variety of assessments and subjects. According to Irvine (2020), using the principle of Marzano's taxonomy in the study process students indicated that the classroom activities were enjoyable and interesting, and that the students were more engaged in their own learning compared to the regular classroom instructional strategies, which typically consisted of traditional, teacher-centred lessons. The performed analysis confirms that when planning the study process, it is important not only to transmit academic knowledge, and a clear desired result of teaching and learning, but also to actualise the academic content for a student, to create opportunities for students to get involved in research activities (inquiry-based learning), reflect on them, learn, and reflect together with others.

The SOLO taxonomy can be used to assess knowledge and understanding. SOLO (Structure of Observed Learning Outcomes) is a structure of observed learning outcomes created by Biggs and Collis after analysing the specifics of university studies and students' knowledge and understanding. According to Biggs (2003), the SOLO taxonomy, which hierarchically describes student achievements, is an excellent instrument for planning, implementing, and evaluating study programs and the educational content of individual subjects. When planning the subject of study, it is important to think about the evaluation of knowledge. The main object of any understanding is our knowledge, which we acquire while studying, studying in higher education. When assessing students' knowledge or knowing, it is important to know what kind of knowledge it is and what kind of knowledge we expect from students (Biggs, 2003; Biggs

& Collis, 1987; Bulajeva et al. 2011). Knowledge or knowing can take different forms (types of knowledge) (Biggs, 2003):

- *Declarative knowledge* is knowledge about objects, phenomena, etc. Knowledge of essential facts is official, research-based, reasoned, reliable, logically consistent academic knowledge. This knowledge is usually presented in academic lectures in higher education. Declarative knowledge is easily verified by a test or by offering students to present their own examples.
- *Procedural knowledge* is skill-based knowledge of procedures, sequence of actions, operation according to algorithm. This knowledge is the basis of competence.
- *Conditional knowledge*. It combines higher-level declarative knowledge with procedural knowledge. This is knowing when, why, under what conditions one or another activity must be performed.
- *Functional knowledge* is based on the idea that understanding has been practically applicable in new situations.

The SOLO taxonomy can help overcome the challenge of assessing student's understanding. The hierarchical structure proposed by this taxonomy allows the teacher to determine the complexity of understanding of the studied material when analysing student answers.

Each level of hierarchical understanding is described as follows:

- Prestructural: a student does not understand the studied material. When answering, he/she relies on irrelevant information, does not provide a meaningful answer.
- Unistructural: the answer focuses on one aspect or structural element of the studied material.
- Multistructural: in answering, a student focuses on several important aspects, but they are not interconnected.
- Relational: several essential parts are linked and integrated into a coherent whole; details are linked to conclusions; the studied material is well understood.
- Extended abstract: in reporting, the learned material is presented broadly as a generalised structure, based on additional studied information, shows the highest-level cognitive abilities, abstracting and theorising of specific material (Bulajeva et al., 2011).

Developing critical and reflective thinking in higher education: student assessment, self-assessment, and self-directed learning

It should be noted that nowadays didactics approach to students' role in education has changed (Figure 6). It is increasingly being talked about students' agency as student's learning, self-directed learning, and lifelong learning. Agency can be exercised in nearly every context: moral, social, economic, and creative. Student agency is closely related to student learning, the assessment process, and the critical thinking. For

example, students need to use a moral agency to help them make decisions that recognise the rights and needs of others. Exercising moral agency requires that a student thinks critically and asks such questions as "*What should I do? Was I right to do that?*" (Leadbeater, 2017). It is essential to choose the most suitable methods and forms of the evaluation of teaching and learning results for the effective implementation of the critical and reflexive thinking in the educational process. Methods and forms of assessment and self-evaluation are appropriate because they encourage critical thinking and reflection in students.

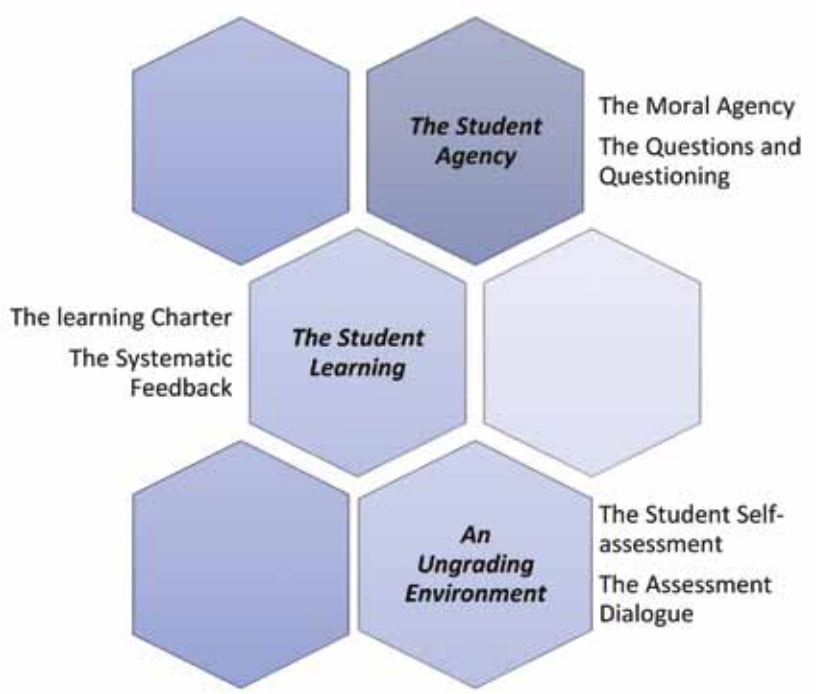

Figure 6. The essential aspects of Developing critical and reflective thinking in higher education (by Leadbeater (2017), Katopodis & Davidson (2020), Winstone & Carless (2020), Cox et al. (2022), Meinking & Hall (2022); Hill&West (2022)

According to Cox et al. (2022), crucial components of the course are the need to better integrate student self-assessment and the development of metacognitive skills. The authors have showed how useful are to evaluate the use of a weekly "rapid responses (RR) to learning" process in the context of teaching a graduate course on research methods. The RR process involves the use of a short set of open-ended questions about key moments in learning that students complete, in writing, during the last

five minutes of each class. The questions ask students to identify salient take-away messages, note when they felt the most and least engaged, name actions that were taken by anyone that were affirming or confusing, and consider specific "aha" moments. Researchers have found that the systematic feedback they obtained in this way supports weekly monitoring of student learning, facilitates response to trouble spots, and assists in the assessment of student engagement and classroom climate. It also provides insight into the efficacy of pedagogic strategies.

Based on Meinking and Hall (2022) findings, high-achieving students can experience personal growth, meaningful learning, and productive struggle in an ungrading environment, though the process will not be without moments of anxiety and discomfort. These findings are important not just for what they might tell us about this student population's response to an ungrading environment, but also and importantly about ungrading as a practice in other contexts. As researchers state, publications about ungrading, especially in higher education classrooms, have been relatively scant, with conversations and the sharing of resources predominantly relegated to social media, blogs, and other web-based platforms. This seeming dearth of scholarly conversation is particularly interesting in light of the number of instructors who have adopted ungrading or non-conventional grading practices in a broad array of their courses. For instructors wishing to adopt or adapt the approaches explored there, the authors strongly suggest incorporating the learning charters or similar reflective, process-based writing opportunities as a way of building trust and transparency between individual students and instructors. While not everyone might be ready to take on a full version of ungrading, introducing elements of it (e.g., low stakes assignments, collaborative moments, self-assessments, or comments-only feedback) can offer an entry point and comfortable space for experimentation.

Hill and West (2022) state that the assessment dialogue prompt changes to longer term learning strategies. There is evidence of closing feedback loops, as teacher-student dialogue improves work and enhances outcomes in terms of short-term actions (single-loop feedback processes) and more complex longer-term adjustments to learning strategies (double-loop feedback processes) (Carless, 2019). The teacher initiated meta-dialogue about the purpose and process of feedback. It is evident that students are able to reflect upon and internalise the teacher's written and verbal comments.

The students incorporate the comments into ongoing ways of thinking and act productively to improve their drafts (Winstone & Carless, 2020). Students self-evaluate their work by monitoring their performance against the criteria (Steen-Utheim & Wittek, 2017; Tai et al., 2018). This process is part of self-regulation (Nicol & MacFarlane-Dick, 2006), and it assists students in understanding and applying feedback within and beyond individual tasks.

A different approach to the evaluation process in higher education is offered by Katopodis and Davidson (2020). They make clear why it is important to ungrade in high education and give details on how they implement ungrading. Laura Gibbs (2020) presents her approach "all-feedback-no-grades" alongside student comments and her ungrading wish list. From their point of view, grading and critical, independent, and responsible learning are difficult to reconcile. A key criticism of traditional grading practices is that grades represent how well a student follows instructions, not what they have learned (Blackwelder, 2020; Stommel, 2020). The authors reflect that "something about the letter grade causes learning to stop" (Chiaravalli, 2020, p. 83), and that "conventional grading can be an obstacle to real learning" (Katopodis & Davidson, 2020, p. 120). Moreover, grades focus attention in the wrong direction, for both learners and educators. Undue attention paid to performance results in learners being unable to fully engage with what they are doing. As Blum (2020b) declares, grades lead to "a misplaced focus on accumulating points rather than on learning" (Blum, 2020b, p. 3).

For the planning of the study subject and the development of student's critical thinking, not only the content of the study subjects and the planned topics but also a properly prepared evaluation system and criteria are important. It is obvious that the assessment system needs to achieve a balance between academic knowledge and the ability to apply it, to make complex (non-template) decisions independently. Consider using a transparent assignment framework to structure your assignment details and better support students' ability to complete the work for your course. Frequently it means that the lecturer/teacher has paid attention to overview (to introduce the assignment task and relate it to the recent course concepts and ideas); purpose (to indicate why are we doing this assignment: what do we hope to practice or learn as a result of this activity?), and to include learning goals or objectives for the assignment. One of the most important stages in achieving the development of students' critical thinking is the time and attention devoted to the discussion of evaluation/self-evaluation criteria (to include a rubric or other clearly articulated evaluation plan (ideally provided to students before they submit the assignment); after that clearly indicate your policy for accepting late assignments and indicate how and when students will be provided with feedback. Hill and West (2022) declare that engaging in dialogic feedforward has helped the students to clarify the task requirements in terms of aims and content (e.g., ideas and analysis) and form (e.g., the structure and coherence of the text). The survey has showed that students reported an improved ability to decode feedback through questioning, discussion, and verification of their revised understanding, jointly appraising the work with the teacher, and identifying actions for improvement(Figure 6). Students commented that the face-to-face dialogue engaged them actively in the feedback process, developing their skills of critical thinking, and empowering them in their learning.

Higher education didactics: study methods, tools, assessment, and forms (blended learning, synchronous and asynchronous teaching)

Various aspects are important for the development of critical thinking in higher education: formulation of study content/topics; selected teaching and learning methods, learning tools; the ratio of contact and non-contact time; mixed learning; and distance learning. Increasingly, national education leaders are calling for schools to "teach less and learn more", to provide time to reflect by hiring more teachers, reducing the content in the curriculum and setting aside timetabled time for teachers to engage in professional planning, reflection, and sharing (OECD, 2017)(Figure 7).

One of the proposed methods for developing students' critical thinking is the Anticipation-Action-Reflection (AAR) cycle. The AAR cycle is the learning spiral through which students develop transformative competencies and student agency. Critical thinking skills are highlighted in this cycle. Here it is emphasised that it is important in all stages of the cycle: the process of using strategic foresight and planning (Anticipation), critically evaluating and reassessing one's actions to develop a deeper understanding and improve future actions (Reflection) (OECD, 2016). As it is emphasised in this cycle, students' critical thinking is required in all its stages. Reflection is a rigorous, disciplined way of thinking. It enables learners to improve their thinking, which leads to better actions towards well-being over time. Through reflection, learners gain a sense of power over their future actions – and a sense of direction – leading to the development of agency (for more information refer to this link: OECD, 2016).

Another effective way to put new educational methods into practice is to use a reflective writing system to have the teacher or teachers' team to describe their approach and the strategies they have implemented, and at a "meta" level to assess what contributes to the viability or success of teachers' self-prepared professional development plan (Figure 7). Measures of success can be constructed using utilisation-focused evaluation (Ferris and Samuel, 2020). Archer-Kuhn et al.'s (2020) study results reveal an increase in students' reflective and integrative learning in higher education if it includes inquiry-based learning. Higher education study programs (such as science, education, and others) have taken up inquiry-based learning, noting such benefits as increased student engagement in their learning and the development of critical thinking skills. Several conditions are very important in this case: experience of inquiry-based learning, adjustments required for learning process, impactful facilitators to learning, and developing deep learning.

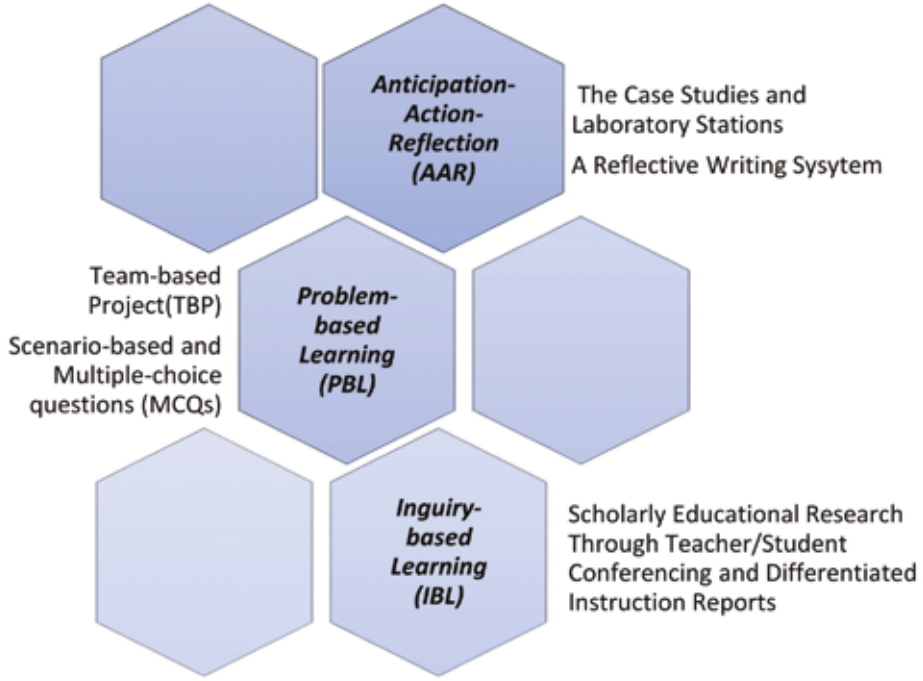

Figure 7. The Cores of Higher education didactics for development students' critical thinking (by Pedaste et al. (2015), OECD (2016), Archer-Kuhn et al. (2020), Ericson et al. (2020), Ragupathi et al. (2022), and on)

The development of critical thinking in higher education is closely related to the inquiry-based learning process. Inquiry-based learning like social constructivism focuses on learning that comes from interactions with others (Miller-Young, Yeo, 2015). During the inquiry process, students construct knowledge from new and former knowledge to create new subjective realities. In doing so, students are faced with critical questions such as what is valued as knowledge, and how they know what they know. As is it noticed by Archer-Kuhn et al. (2020), in order to develop students' critical thinking it is very important to integrate the inquiry-based learning (IBL) strategies and to include the scaffolding of assessment tasks and formative feedback to support inquiry process such as the development of powerful, critical, and essential questions, as known as the central question, utilising a structured controversy, videos, brainstorming, and a checklist for the development of an inquiry question.

In the process of inquiry-based learning, students' cognitive activity is not limited to finding and presenting facts related to the problem under investigation. It also includes research questions raised by students, formulation of hypotheses (assump-

tions), planning of research activities, experimentation, data collection and recording, their analysis and interpretation, and reasoning. It should be noted that the role of teachers in the organisation of research-based education can be diverse: from a research instructor, mentor to a facilitator of research performance. Depending on students' learning and research experience, the research conducted by the students can be divided into: 1) structured research, where the teacher helps formulate the research question(s), and prepare a detailed plan; 2) guided research, where the teacher presents only the problem, question(s) to be solved; 3) open research, when the teacher submits only the problem, idea (Pedaste et al., 2015). Medelain et al. (2022) emphasise the importance of inquiry-based learning in a student's education. With a basis in the theoretical works of Plato and John Dewey, inquiry-based learning stresses the importance of learning to ask good questions over knowing—and notably, memorising—the "right" answers. The emphasis of inquiry-based learning is on the learner rather than the instructor, with the student determining the focus of an investigation that is meaningful to them (Jennings & Mills, 2010), often in close collaboration with a faculty member. Students learn to ask effective questions, consider multiple points of view, engage with critical analysis, reflect on their own learning, and collaborate with others in the co-construction of knowledge (Jennings & Mills, 2010). With inquiry-based learning, the faculty serve as mentors by asking questions of their own, helping students to work through real-world problems, and exposing them to disciplinary approaches to investigation (Medelain et al., 2022).

More motivated to engage in the study process are those participants who experience the greatest interest and intrinsic motivation with hands-on, problem-based laboratory stations, followed by problem-based case studies and video lecture activities. As it is noted by Ericson et al. (2020), case studies and laboratory stations are rated as more enjoyable, novel, challenging, and attention-demanding than video lectures. The greater overall situational interest experienced during laboratory stations and case studies indicates that educators and instructional designers can leverage these and similar activities to create learning environments that promote interest, intrinsic motivation, engagement, and critical thinking.

Styles and Povli (2022) have showed the benefits of metacognitive activities (Bleicher's workshop: A Virtual Last Class Workshop) from using a constructivist model for teaching and learning in classes and towards a metacognitive experience of the class that asks students to focus on learning outcomes and critical thinking. In this workshop, students must think critically and reflectively about their process of learning relative to the coursework and evaluate their progress using the learning tools and curriculum provided to them. This student-centred self-monitoring asks the students to lead the way and nudges them towards being self-directed learners.

Alexeeva-Alexeev et al. (2022) have studied undergraduate student attitudes towards team-based projects, connecting those attitudes to challenges and overall perception of this work. The study has been conducted with 220 students in the context of three subjects taught at a Spanish University that included collaborative projects as mandatory assignments to be developed throughout the subject. The findings point out the difficulty in solving specific communication needs and managing students' involvement and commitment to the project. The results show that gender, year of study, students' age, academic degrees, and the context of curricular subjects significantly influence the acquisition of skills related to collaborative work, facilitating or hindering their development among university students. These results have practical implications for the design of collaborative projects within higher education academic programs. They also suggest that the way collaborative work is usually planned is not very effective and should be reconsidered. The team of researchers suggested evaluating the differences found among the groups formed according to the following criteria: (1) gender, (2) year of study, (3) interdisciplinary character of the team, (4) students' age, (5) degree, and (6) subject, within which the team-based projects were developed. All of them can be considered as factors that influence the development of skills related to collaborative work. In this regard, significant differences have been detected in similar aspects: (i) the interdisciplinary character of the team; (ii) equal involvement in the project; (iii) poor commitment to the success of the project,; and (iv) communication. In describing features of interdisciplinary teams, team-based work through interdisciplinary teams, comprised of members with different knowledge, experience, or skills, is very rewarding for students because it helps to create an improved learning environment, develop critical thinking and open mindedness, generate new ideas from multiple perspectives. The other important factor is the size of the student group. It is pointed out that collaborative work is much more effective in small groups. This makes it possible to share different skills of each participant for the benefit of the group to find a proper solution to the problem; for instructors to facilitate; to design a course with real-world experience, integrate real professionals, and deal with complex interactions (such as using a cross-disciplinary client-based project flipped classroom).

Ghaith and Awada's article (2022) on *Scaffolding Understanding of Scholarly Educational Research Through Teacher/Student Conferencing and Differentiated Instruction* reports the results of a qualitative study of the effectiveness of a critical reading instructional intervention based on teacher/student conferencing (TSC) and differentiated instruction (DI) in improving the participants' understanding and evaluation of published educational research. TSC and DI entailed using a subset of teaching strategies including pre-teaching, self-selection of critiqued articles, cooperative learning, embedded instruction, extended instruction, reflection to scaffold students' challenges, provid-

ing constructive feedback, enabling students to describe their feelings, assessing their learning, and setting goals and plans for further development. Another suggestion by Ragupathi et al. (2022) asserts to promote the development of critical thinking abilities in higher education by implementing a course design that employed a series of scenario-based multiple-choice questions (MCQs) and informal peer discussions. The researchers have analysed the extent to which the course design was effective at promoting critical thinking and student experience. Deductive analysis of students' qualitative responses indicates that the course design was successful in promoting students' development of critical thinking. Both deductive and inductive analysis of students' qualitative responses also suggest that students largely had favourable attitudes towards this course design, though some expressed concerns. They have described that a course design employing scenario-based MCQs and informal peer discussions promoted the development of critical thinking in students enrolled in a large-cohort introductory humanities course. Study findings have demonstrated that the course design strongly promoted aspects of critical thinking involving explaining, interpreting, and perspective-taking abilities. Moreover, the course design's potential to develop critical thinking skills involving empathy and self-knowledge has also been evident. Additionally, students suggested that although peer discussions made the overall experience in the course more enjoyable, captured students' interest, and enriched their intellectual capacities, they also gave rise to issues such as unfairness and confusion over course content. Instructors and instructional designers keen on employing similar course designs in the context of higher education may consider these strategies to strike a balance between providing a space for adult learners to mature as autonomous, self-regulated problem-solvers and a space that ensures fair opportunities.

The ratio of contact and non-contact learning, and the appropriate provision of students with learning tools are important for the development of critical thinking in higher education. An effective tool for planning these activities is the *ABC Learning Design*. *ABC Learning Design* is a high-energy, hands-on curriculum development workshop developed at University College London (UCL). This tool helps teaching teams work together to create a visual 'storyboard'. The storyboard is made up of pre-printed cards representing the type and sequence of learning activities (both online and offline) required to meet the learning outcomes of a module or program.

Practical part and reflection questions

1. Why is critical thinking education relevant not only in the 20th century but also in the 21st century? (Figure 1,2)
2. How has the concept of critical thinking changed and evolved? How would you define critical thinking? How would you add (what is relevant/not relevant) to Lipman's description (Figure 3)
3. How does critical thinking relate to reflective, creative, and other thinking? And how can this understanding help in the selection and development of study materials?
4. How can we develop it during the study process? What suggestions would you have in comparing the information provided (Figure 7 and Table 1)? What teaching and learning methods would you add to the list?
5. How are the specificities of critical thinking education related to the planning of the content (knowledge, skills, context) of the course, the educational tasks (variety of forms and methods of study), the assessment of the students, and the self-assessment? (Figure 6).
    a) And how can the ABC LD instrument help in this planning? (https://blogs.ucl.ac.uk/abc-ld/)
    b) The information in the video can be an excellent opportunity to discuss with colleagues different scenarios for the development of student's critical thinking in HE.(https://youtu.be/4pnv_sFT8pQ)

Summary

KRITINIO IR REFLEKTYVAUS MĄSTYMO ĮGŪDŽIŲ UGDYMAS IR STUDIJŲ DALYKO PROGRAMA

Šiame poskyryje pristatoma kritinio ir refleksyvaus mąstymo ugdymo svarba rengiant specialistus aukštojoje mokykloje bei apžvelgiamos įvairios studijų dalyko programos rengimo galimybės siekiant užtikrinti kritinio mąstymo ugdymą ir ugdymąsi. Daugelyje ES šalių kritinio mąstymo įgūdžių ugdymas siejamas su kitų svarbių įgūdžių ugdymu, siekiant užtikrinti asmens socialinį vystymąsi ir socialinę gerovę. Juk mokymasis mokytis, informacinis raštingumas, informacinių technologijų valdymas, atsakingas

sprendimų priėmimas ir kūrybiškumas neįmanomi, jei asmuo nemąsto kritiškai (Ananiadou ir Claro, 2009; EBPO, 2016; OECD 2030; OECD 2009).

Poskyryje glaustai apžvelgiama kritinio mąstymo bei jo ugdymo sampratų genezė. Atskleidžiami įvairūs kritiniam mąstymui bei jo ugdymui reikšmingi aspektai. Pasak Dewey, kritiniam mąstymui ir jo formavimuisi labai svarbios refleksyvaus mąstymo ir problemų sprendimo sąvokos. Taigi Dewey paaiškino refleksyvaus mąstymo sąvoką, susiedamas ją su moksliniu metodu, ir sukūrė šiandien vartojamos kritinio mąstymo sąvokos pagrindą. XX a. aštuntajame dešimtmetyje ir devintojo dešimtmečio pradžioje Ennis atliko kritinio mąstymo apibrėžties tyrimus ir pateikė platesnę šios sąvokos ir racionalaus mąstymo sampratą, o vėliau šią platesnę sampratą pavadino kritiniu mąstymu. Kita vertus, kritinis mąstymas Freire buvo ne testų laikymo pamoka, o apsisprendimo ir pilietinio aktyvumo priemonė. Kritinis mąstymas yra siejamas ir su sąmoningomis pastangomis gerinti savą mąstymo kokybę, atsakingai atsirenkamus intelektinius standartus (Yi-Huang Shih, 2018; Paul-Elder, 2001). Atkreiptas dėmesys į mąstymo operacijas, kurios yra kritinio mąstymo bruožas. Taigi kritinis mąstymas konceptualizuojamas kaip daugelio kognityvinių įgūdžių, įskaitant patyrimą, stebėjimą, analizę, konceptualizavimą, sintezę, vertinimą, apmąstymą ir bendravimą, derinys ir sinchronizacija (Facione et al., 1995; Howard, Le-Ping Tang &Austin, 2015). Plačiausią kritinio mąstymo sąvokų panoramą analizuoja Lipmanas (1987). Savo darbuose aptardamas kritinio mąstymo bruožus, ypatumus, skirtumus ir panašumus su kitais mąstymo procesų tipais, autorius daro išvadą, kad:

- Kritinis mąstymas yra savikorekcinis mąstymas.
- Kritinis mąstymas - tai mąstymas su kriterijais.
- Kritinis mąstymas yra mąstymas, jautrus kontekstui.

Pažymėtina, jog kritinį mąstymą bei jo ugdymą nagrinėjamuose darbuose kritinio mąstymo gebėjimai siejami su kūrybinio bei atsakingo mąstymo gebėjimais (Demir et al., 2011), refleksyvaus mąstymo gebėjimais (Paul-Elder, 2001); besimokančiojo introspekcijos gebėjimais (Gary, Chick, 2022). Išskiriamas mąstymo kriterijų vaidmuo. Kriterijai ir jų kriterijų kūrimas - tai etapas, kuriame mąstytojas kuria kriterijus ir principus, kuriais bus remiamasi analizėje (Yi-Huang Shih, 2018; Paul-Elder, 2001). Apibendrinant, kritinis mąstymas apibrėžiamas kaip idėjų ir sprendimų kvestionavimas ir vertinimas (OECD, 2016). Šis apibrėžimas apima metakognityvinių, socialinių ir emocinių įgūdžių (apmąstymas ir vertinimas kultūriniame kontekste), nuostatų ir vertybių (moralinis vertinimas ir integracija su savo tikslais ir vertybėmis) komponentus, taip pat daugelio pažintinių įgūdžių, įskaitant patyrimą, stebėjimą, analizę, konceptualizavimą, sintezę, vertinimą, apmąstymą ir bendravimą, derinį.

Poskyryje analizuojami bendrieji studijų dalyko turinio sudarymo principai remiantis Bloomo, Marzano ir SOLO taksonomijomis. Daugelis pasaulio universitetų rengė

specialias rekomendacijas savo dėstytojų komandoms apie galimybes taikyti Bloom taksonomiją planuojant ir vykdant studijų dalykus. Pavyzdžiui, Mokymo naujovių ir pedagoginės pagalbos (*Teaching Innovation and Pedagogical Support*, TIPS) programa. Sudarant studijų dalyko programas bei rengiant studijų dalyko turinį rekomenduojama atsižvelgti į Bloom taksonomijoje išskirtus 6 lygius: žinias, supratimą, taikymą, analizę, sintezę ir vertinimą. Bloom taksonomija taikoma: nustatant aiškius ir išmatuojamus studijų dalykų / studijų veiklos tikslus (kadangi visi šeši etapai ir lūkesčiai pagal kiekvieną iš jų išreiškiami veiksmažodžiais, taksonomijoje dėmesys sutelkiamas į stebimą elgesį, kuris rodo studentų mokymąsi per konkrečius studijų dalyko mokymosi etapus); studijų turinio (akademinių žinių, teorijų, faktų, informacijos) organizavimas studijų dalyke (studijų programoje); padeda apibrėžti lūkesčius dėl studentų daromos pažangos visų studijų metu. Marzano pateiktoje ugdymo tikslų taksonomijoje plėtojamos Bloom taksonomijos idėjos papildant šešis kognityvinio proceso etapus metakognityvine ir savęs pažinimo sistemomis (The New Taxonomy of Educational Objectives, 2000). Dviamatėje Marzano ir Kendall taksonomijoje savęs pažinimo sistemoje, kuri apima tarpusavyje susijusių įsitikinimų, nuostatų ir lūkesčių tinklą, ir yra priimamas sprendimas siekti tikslo (motyvacija veiksmui). SOLO taksonomija reikšminga studijų metu įgyjamų žinių, supratimo ir įgūdžių vertinimui. SOLO (angl. *Structure of Observed Learning Outcomes*) - tai stebimų mokymosi rezultatų struktūra, kurią, išanalizavę universitetinių studijų specifiką ir studentų žinias bei supratimą, sukūrė Biggs ir Collis.

Pažymėtina, kad išskirtinis dėmesys kritinio mąstymo ugdyme tenka besimokančiojo veikmei (angl.-*student agency*), studentų savarankiškam mokymuisi, savivaldaus mokymosi aplinkų kūrimui, kompetencijos mokytis visa gyvenimą stiprinimui (6 pav.). Greta besimokančiojo veikmės pabrėžiama ir moralinė veikmė, kurios dėka besimokantysis priima sprendimus atsižvelgdamas į savo bei kitų žmonių teises ir pareigas (Leadbeater, 2017; Katopodis & Davidson, 2020; Winstone & Carless, 2020; Cox et al., 2022; Meinking & Hall, 2022; Hill&West, 2022). Siekiant veiksmingai organizuoti kritinio ir refleksyvaus mąstymo ugdymą studijų procese, išskirtinis vaidmuo tenka tinkamam mokymo ir mokymosi rezultatų vertinimo metodų ir formų atrinkimui. Remiantis Meinking ir Hall (2022) išvadomis, studijos pertekliniu vertinimu (įvertinimu) neperkrautoje aplinkoje studentams leidžia labiau patirti prasmingą mokymąsi ir daromą asmeninę pažangą. Studijų dalyko planavimui ir studento kritinio mąstymo ugdymui svarbus ne tik studijų dalykų turinys ir planuojamos temos, bet ir tinkamai parengta vertinimo sistema bei kriterijai. Akivaizdu, kad vertinimo sistema turi pasiekti pusiausvyrą tarp akademinių žinių ir gebėjimo jas taikyti, savarankiškai priimti sudėtingus (ne šabloninius) sprendimus. Šiame kontekste ypač svarbus studijų dalyko programos rengime tampa grįžtamojo ryšio organizavimas, vertinimo (įvertinimo ir įsivertinimo) metodų bei formų atranka (Carless, 2019; Katopodis & Davidson, 2020;

Hill&West, 2022). Kritinio mąstymo ugdymui aukštojoje mokykloje svarbūs įvairūs aspektai: studijų turinio ir (arba) temų formulavimas; pasirinkti mokymo ir mokymosi metodai, mokymosi priemonės; kontaktinio ir nekontaktinio laiko santykis; mišrus mokymasis; nuotolinis mokymasis. Vis dažniau organizuojant mokymą ir mokymąsi pedagogai yra raginami "*mažiau mokyti ir daugiau mokytis*", studentams suteikti pakankamai laiko apmąstymams ir veiksmui (numatymas-veiksmas-refleksija (AAR) mokymo(si) ciklas), plėtoti studentų reflektavimo įgūdžius (greitų atsakymų metodas (RR); plačiau į studijų programą įtraukti tyrinėjimų (IBL), problemų sprendimu (PBL), komandiniais projektais (TBP) grįstus mokymo metodus; plėtoti aukštųjų mokyklų mokslininkų ir studentų akademinį bendradarbiavimą organizuojant bendras mokslines konferencijas, diskusijas, tyrimus (Pedaste et al., 2015; OECD, 2016; OECD, 2017; Ferris&Samuel, 2020; Archer-Kuhn et al., 2020; Ericson et al., 2020; Ragupathi et al., 2022) (7 pav.).

Poskyryje glaustai pristatoma kontaktinio ir nekontaktinio mokymosi santykio, tinkamo studentų aprūpinimo mokymosi priemonėmis bei kritinio mąstymo ugdymą skatinančios ugdymo aplinkos kūrimo veiksminga priemonė - mokymosi planas ABC. ABC LD (*ABC Learning Design*) - tai praktinė mokymo programų rengimo priemonė, sukurta Londono universitetiniame koledže (UCL). Ši priemonė padeda dėstytojams bei jų komandoms dirbti kartu ir sukurti vizualinę studijų programos dalykų (jų programų) pateiktį, analizuoti aktualius šiuolaikinio studijų organizavimo aspektus, priimti tinkamiausius kritinio mąstymo ugdymui didaktinius sprendimus.

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Subtopic: CREATIVITY IN HIGHER EDUCATION: ENVIRONMENT, TEACHING AND LEARNING

Expected results:

- During this course, learners will strengthen their knowledge of the concept of creativity, its various definitions and characteristics.
- In the course, material is presented on the specifics of creativity in higher education, during the process of studies taking place there.
- Learners will learn about the possibilities of developing creativity by appropriately adapting or choosing the study environment, carrying out teaching and learning activities.
- Learners will have the opportunity to evaluate their taught subjects and methods in terms of creativity, reflect on their activities, and discover new opportunities for creativity development in the higher education process and in their pedagogical activities.

Keywords: creativity, higher education, teaching, learning, study process.

Theoretical part

Introduction and problems of the topic

Creativity, a key engineer for facilitating social harmony, sustainable human development, technological invention and scientific revolution, is manifested in human activities at different levels, from everyday life to advanced technological industries. To date, there is no consensus-based definition of creativity; however, according to a standard definition, creativity is often perceived as **the ability to produce something new/novel and appropriate/useful** (Yong, et al., 2019).

Creativity specifically has become a critical consideration, because "creativity becomes a force of great value when it is applied to causes that benefit humankind and the

world at large". There are a number of definitions of creativity, depending on different authors. Ozimec says that "Creativity is such kind of creation by which one produces something new, different from known, which include individual way of problem solving, discovery of unknown". While Isaksen notes that creativity is not unambiguous phenomenon which could be defined precisely (Gaspar & Mabic, 2015).

Bohm sees creativity as potentially opening *the way to transform the individual.* More importantly, educators have their own implicit definition of creativity that influence their acceptance of creativity as an important skill to be taught. In contrast to the popular view in which creativity is characterised as merely weird or non-conformist, an appropriate definition for educators focuses on the process culminating in a novel and effective solution to an open-ended problem. The importance of both novelty and effectiveness is reflected in the following definition. Creativity is "… the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)" (Gaspar & Mabic, 2015).

According to Yong, et al. (2019), creativity, as *a key product of human culture and a tool for enriching culture,* has a very close but complex relationship with culture. Simply speaking, if culture is the "background", then creativity is the "object" that, when used, will become the new "background" for the emerging and future "creativity (objects)". No one can live and be creative without culture.

Creativity is deeply rooted in all cultures, but its definition and characteristics vary from culture to culture. According to the literature, **the dichotomy of "the West" and "the East"** is one of the most significant approaches in describing cultural differences in understanding and defining creativity.

"The East" usually refers to Asian countries, especially East Asian countries such as China and other countries influenced by its culture, such as Japan or Korea. They have common similarities in social and cultural aspects that are different from "Western" countries. These countries are often considered to predominantly represent "collectivist cultures" (i.e., cultures that emphasise that the collective interest should take precedence over the interests of the individual and that belonging to the collective is more important than being unique) and to have a similar tradition that reveals its origins in such philosophies, such as Taoism, Buddhism and Confucianism.

"The West", generally considered to represent "individualist cultures" (i.e., those that value individual goals and interests over collective interests and goals), refers to the United States, Western Europe, Canada, Australia, and New Zealand, which are closely related to ancient Greece and the ideas of Christianity, Judaism, and rationality.

The likelihood of such East-West grouping has largely been confirmed by several large-scale studies, such as the World Value Survey (1998) and the GLOBE Project study

(2019). Research shows that Western cultures focus more on process- and product-based creativity and emphasise the pragmatic, problem-solving outcome of creativity, while Eastern cultures are highly interested in the creative spirit and personal creativity, treating creativity as a form of revelation or rediscovery and emphasising the role of creativity in facilitating personal satisfaction and enlightenment or the self-expression of an inner essence or ultimate reality.

Western research shows that creativity is associated with such descriptions as "curious", "imaginative", "independent", "inventive", "original", "wide interests", "nonconformist", "individualistic", "confident", "assertive", "brave", "artistic", "open", "intelligent", "talented", and "sense of humour"; such descriptions were often identified as implicit personality traits describing a creative personality.

Eastern research found that all participants listed "originality", "novelty", "thinking", "wisdom", "observation skills", "flexibility", "willingness to try", "self-confidence" and "visualisation" as the main characteristics of a creative person.

To *Westerners, creativity means breaking with tradition and moving towards something that does not exist*, while to *Easterners, creativity means reinterpreting or rediscovering tradition.* Similarly, in the West, creativity is valued primarily for solving specific problems through insight or achieving personal success, while in the East, the value of creativity lies primarily in the social and moral contribution that an individual can make to society.

Although a focus on the need to embed creativity studies has been slower to emerge in relation to higher education, Livingston (2010), Das (2012), and Meng et al. (2017) all argue that **study at this level should foster the development of students' creativity**. Meng et al. (2017) go as far as to argue that "fostering and developing students' creativity is more necessary and urgent than ever before" (p. 605). However, Frick (2011) contends that "there is often a lack of systematic and developmentally organised learning experiences that specifically encourage creativity".

In a study based in the United Kingdom, Speers and Wilson (2018) focused their attention on creativity in the university sector. Arguing that universities are places for "idea generation, learning, and new and valuable thinking", they claim that creativity is often overlooked, underdeveloped, and under-rewarded. The authors describe a project designed to embed everyday creativity without it becoming constrained or instrumentalised; it is not specified at what year levels or programs the students are studying. After completion of workshops and interviews, the authors argue that there are mixed outcomes; although the program does not successfully embed creativity in an everyday situations, they refer to some success in individual and small group situations. The authors proceed to argue that the key conditions of tolerating ambiguity, space to "play", freedom, permission, trust, and risk-taking are essential to support creativity.

Creativity and aspects of creativity in higher education

The case studies have demonstrated that exemplary teachers were intentional in their efforts to foster creativity. There is evidence that **creativity can be designed for and fostered in higher education,** in face-to-face, blended and online spaces. In the creative environment teachers cultivated and negotiated an ecosystem of complex relationships, which included four key elements derived from the *Grounded Theory** themes:

1) ways of being creative motivated by a myriad of personal and domain specific goals and practices;
2) methods of designing for creativity by setting up the conditions for creativity;
3) working with the environment rather than against it to establish generative spaces and overcome constraints;
4) the importance of facilitation style, whereby creativity is modelled and mentored.

**Grounded theory*: A methodological approach to the collection and analysis of qualitative data developed by Glaser and Strauss (1967). The purpose is to inductively build theory from the data.

Figure 1. A learning and teaching perspective on fostering creativity in higher education based on four key elements

Creativity is an active process necessarily involved in innovation. It is a learning habit that requires skill as well as specific understanding of the contexts in which creativity is being applied. **The creative process is at the heart of innovation and often the words are used interchangeably.**

According to Kampylis and Berki (2014): "Creative thinking is defined as the thinking that enables students to apply their imagination to generating ideas, questions and hypotheses, experimenting with alternatives and to evaluating their own and their peers' ideas, final products and processes".

Kaufman and Beghetto (2009) have developed **four categories of creativity** which help to reveal the nuances between different levels and types of creativity (see Table 1).

Table 1. Four categories of creativity

***Big-C* creativity** (sometimes called 'high' creativity)	*Big-C* creativity is reserved to describe the work of an elite few who have transformed their discipline with their inventions. Their work has been generally accepted as being innovative and ground-breaking, even if it was considered controversial when it was first created. Some examples are scientific works such as Einstein's theory of relativity and Darwin's theory of evolution, and works of art such as Picasso's *Guernica*, Jane Austen's novel *Emma* or Ludwig van Beethoven's *Symphony No. 9* in D Minor. *Big-C* creativity is out of reach of most of us, and *Big-C* creators themselves are often as extraordinary as their creations.
***Pro-c* creativity**	This type of creativity has involved time (usually at least 10 years) and effort to develop. A musician who showed promise as a child, has trained to degree level and now makes a living teaching and playing classical music could be classified as *pro-c*. A physicist working at a university who teaches and undertakes academic research could also be classified as pro-c.
***Little-c* creativity**	*Little-c* creativity is about acting with flexibility, intelligence and novelty in the everyday. This results in creating something new that has originality and meaningfulness. This everyday kind of creativity can be found in the kind of person who can resolve a complex problem at work, is a keen gardener with an eye for design, or takes creative photographs and exhibits them on a photo-sharing website. School-age learners may work at *little-c* level if they engage in purposeful practice in their discipline. *Little-c* creativity involves practice and may be developed over a long period of time. The internet has provided the infrastructure for *little-c creativity* to thrive. Websites such as YouTube, Instagram and Etsy enable creative people to share their expertise and work.

***Mini-c* creativity**	*Mini-c* is defined as the novel and personally meaningful interpretation of experiences, actions, and events. This is the kind of creativity that can be nurtured by teachers and parents. *Mini-c* happens when a person demonstrates flexibility, intelligence and novelty in their thinking. It is usually applied, but not necessarily limited, to children's creativity. *Mini-c* creativity may not be visible to outsiders and may consist purely of ideas and connections that the learner creates. As Vygotsky explains: any human act that gives rise to something new is referred to as a creative act, regardless of whether what is constructed is a physical object or some mental or emotional construct that lives within the person who created it and is known only to him. Piaget suggested that "to understand is to invent" which means that a learner invents an understanding of new material for themselves. *Mini-c* creativity could describe a learner's achievement in finding several different ways of approaching a maths problem. It could also involve making a new connection between their existing knowledge and a new piece of information which helps them to understand the subject more fully.

The boundaries between these categories can be blurred and they are not age specific. A person could fit into multiple categories in different areas of their life. For example, a chef who could produce dishes at a *pro-C* level while at work might work at a *little-c* level when attending a watercolour painting class.

The two categories most relevant to schools are *little-c* and *mini-c* creativity. They highlight the fact that being creative and innovative is not so much about revolutionary ideas or new inventions that change the world. It is about individual growth achieved through small insights. **Creativity and innovation are fundamental to all disciplines and an essential part of the learning process**, forming an important dimension of learning how to learn. They are also fundamental to teachers improving their professional practice and to school development (Kaufman & Beghetto, 2009).

Being innovative and creative are dependent on other attributes. Being creative requires reflection, encourages engagement and develops confidence and responsibility. The ability and inclination to be creative is essential to living a fulfilled and successful life, and it is valued in higher education and the workplace. There are many other benefits of maximising one's own creative potential such as physical and psychological health improvements, improved resilience in the face of difficulties and even lower levels of aggression.

Our understanding of innovation and creativity have progressed and broadened over time. In the early 20th century creativity was considered to be an innate, elusive quality that individuals were born with. Initially creativity was most closely associated

with the arts but grew to include science, technology and other disciplines. In the 21st century *creativity is increasingly viewed as a distributed and collaborative process of communal sense making and problem solving* (Kaufman & Beghetto, 2009).

As with all the learner attributes, cultural perspectives are also very important when considering creativity. Confucian heritage cultures, for example, tend to see creativity more as a collective exercise. They place responsibility for creativity on the social group rather than the individual. Individuals, therefore, are not encouraged to stand out from the class in the same way or to the same extent as in Western cultures. This does not mean that creativity is in any way less valued (Kaufman & Beghetto, 2009).

Higher education needs to see creativity within the important role it plays in preparing people for an uncertain and even more complex world of work, a world that requires people to utilise their creativity as well as their analytical capacities. Sternbrerg and Lubart (1995) argues that a **person needs three different sorts of abilities to be successful:**

1. analytic abilities - to analyse, evaluate, judge, compare, and contrast;
2. practical abilities - to apply, utilise, implement, and activate;
3. creative abilities - to imagine, explore, synthesise, connect, discover, invent, and adapt (Papaleontiou-Louca et al., 2014).

Peculiarities of the process of creativity education in HEIs

Among ten key **recommendations** to European higher education institutions which have been derived from the findings and conclusions of the Creativity Project, the following are **related to creativity:**

- Striving towards a creative mix of individual talents and experiences among students and staff, providing common fora for researchers from different disciplines and offering diverse learning experiences will likely result in conditions favourable to the creativity of the higher education community.
- It is recommended that HEIs explore the concept of a learning organization for their management and governance structures. As important as these structural elements are, they must be complemented with ethical and cultural concerns in order to create an institutional milieu favourable to creativity (Gaspar & Mabic, 2015).

Higher education needs to ensure that graduates have the right skills to equip them for a lifetime in a fast changing working environment. Therefore, education should focus on the *personal and social dimensions of human existence* as well as the *academic and vocational* dimensions. Additionally, it is necessary to establish an appropriate *learning environment* that will encourage students to gain experience, develop their creativity and take advantage of opportunities that their own business

environment offers, while developing their entrepreneurial behaviour. As Lynda Ball et al. (2010) stated "HEIs provide an environment that fosters creative practice and encourages important employability skills (Papaleontiou-Louca et al., 2014).

A distinctive characteristic of the creative curriculum is that opportunities for transfer of the creative process occur naturally, as students experience **different contexts** in which to apply their learning through live projects, exhibitions, commissions and learning alongside teacher practitioners. Furtherstil, capacity building is required in *research communities to nurture academic careers*, meet aspirations for new knowledge and innovation in the HE sectors, and to bring in the next generation of teacher practitioners".

Hence, higher education must *provide students with a valuable learning methodology*, from which to evolve their practice and important transferable processes and skills that need to be made more explicit. As Knight and Yorke (2003) noted, "the final task for teachers is to design promising learning environments and then help students to discover what they afford, what might be learnt, how and why" (Papaleontiou-Louca et al., 2014).

Essentially, creativity *depends on the people who make up the higher education community.* The more teachers understand about creativity, creative learning and motivation, the more they can help to enhance their students' creativity, as creative teaching approaches encourage students to link their generic and disciplinary skills and highlight the importance of the students' role in developing these skills. Of course, equally important factors in enhancing student creativity and to contribute to the fruitful results of the staff, are *structural, ethical and cultural conditions* of the institution in order to create an institutional milieu favourable to creativity.

Another core concept in indulging or suppressing creativity is that innovative practices have to be *constructed directly in the contexts* where they take place and not separately from them. In fact, the content by teacher is just a stimulus for learning but then the teacher himself cannot predict where learners will go through the creation of new meanings and new learning paths in different and various environments. Not only the way of teaching, but also the role of the instructor has to be improved, and in many cases, it has been enhanced.

Inspirational researchers, but also technology through ICT replace in many cases the "traditional" role of the teacher, and this is played not only in the classroom, but also in alternative virtual learning environment, much-needed capacity-building in research in contexts where this is lacking. ICT resources offer access and flexibility and like e-mail, instant messaging, and online social, networking spaces, they provide opportunities for joint projects and academic research, collaboration, as well as personal and professional networking. The alternative or blended teaching/learning environment has been strongly considered nowadays in reducing the stress of the "standardness" in education, especially in highly scientific sectors.

E. Papaleontiou-Louca et al. (2014) state that the **following areas are representative as stimulus in bringing creativity in universities**:

- ICT development and proper utilization;
- social inclusion;
- game based learning;
- motivational individual and group;
- quality assurance and management decisions at administrative level;
- industry and government acceptance and cooperation and involvement;
- PDP (Personal Development Plan);
- training in people delivering the courses, motivating the students;
- designing the curricula;
- the assessment methods, changing the metaphor from relevance to risk taking and mistake acceptance;
- international environment based on internationalization;
- mobility and life-long learning;
- aging population and cross-cultural training;
- Furthermore, cloud computing as part of ICT tools streams from a metaphor for the Internet and its blend with computing – access to networks, software services, data storage, etc.

The authors mentioned above outlined the promotion of creativity in many forms three of which take the form of possession, product and process. **In order to promote creativity as possession, that which also develops ownership, teachers should:**

- adopt a learner-centred pedagogy;
- accept the mysterious aspect of creativity;
- encourage an openness to experience;
- help learners to articulate their thinking;
- develop the receptivity of learners;
- be flexible in responding to learners' interest;
- offer opportunities for self-expression;
- acknowledge the emotional dimension of learning; devote time to the development of creative ideas;
- create safe but bounded spaces for creative activity.

Furthermore, in order **to promote creativity process, teachers should:**

- present creativity as an explicable process;
- focus on achievable rather than exceptional creativity;

- explain processes in the form of creativity tools;
- require that the process results in an outcome;
- break down problems or activities into component parts;
- expect all learners to engage in creative process;
- teach a staged approach to problem solving activities;
- combine active individual and group teaching methods;
- reveal and emphasize the complexity and interrelatedness of ideas;
- devote extra time and space for emergence to occur (Papaleontiou-Louca et al., 2014).

Tips that may suit in creativity education

Seeling (2012) was right saying not only that "our brains are creativity machines", but also that creativity can be taught; because we are all naturally creative and we just have to unlock our "Innovation Engines". Moreover, the goal "is to create new and sustainable ways of *including young people* in the cultural life of their communities, nurturing their innate creativity and supporting teachers, cultural and creative organizations and individuals to work with them. Not only these are creating opportunities for creative graduates, but *encouraging young people to pursue a creative education*".

More specifically, in enhancing creativity it is also maintained that **certain teaching approaches** become necessary. Some of these approaches are the following (Papaleontiou-Louca et al., 2014):

The *Creative cycle* approaches: Kessler (2000) describes these approaches as including the following stages: preparation, incubation, inspiration or illumination and verification. Preparation involves the gathering of skills, principles and data. Incubation by contrast involves the doing of nothing, "letting go". This is an essential unused period, of receptivity and openness, sometimes even chaos or disorder (and thus offers a potential challenge in the classroom). Inspiration, or illumination, comes directly out of the incubation space. Finally, verification involves the refining of the outcome.

The *Single-strategy* approaches: These might include questioning approaches which wonder about possibilities and are both prepared to follow, and to be supported in, seeing the questions through to an outcome.

The *Multi-strategy* approaches: Shallcross (1981) has also identified a range of strategies that included the allowing of adequate space and time for developing a creative response to any given situation. University teachers often interfere too early in a students' thinking process, preventing them from working out ideas for themselves.

In addition, it is also essential to provide an *appropriate environment* for creativity in the classroom which includes fostering self-esteem and self-worth and at the same

time adopting a questioning approach which wonders about possibilities and is both prepared to follow, and be supported in, seeing the questions through to an outcome.

In addition, Torrance (1974, 1966) added another **approach as the *Recording and assessing creativity*.** Torrance described four components by which individual creativity could be developed and assessed. These four components are:

- fluency – the ability to produce a large number of ideas;
- flexibility – the ability to produce a large variety of ideas;
- elaboration – the ability to develop, embellish, or fill out an idea;
- originality – the ability to produce ideas that are unusual, statistically infrequent, not banal or obvious.

E. Papaleontiou-Louca et al. (2014) suggest several **methods to achieve the *Creativity* goal:**

A. *Promotion of Creativity at Individual's Level.* Intrinsic motivation arises when the task itself is a source of interest, enjoyment, self-expression, and personal challenge. An individual will be intrinsically *motivated by a task* if it increases his/her acknowledgement of own capability and autonomy. These feelings of competence and self-determination will, in turn, be influenced by task characteristics, such as skill variety, challenge, autonomy, and feedback.

Furthermore, Personal Development Planning (Jackson, 2010) initiated in the UK helps students plan and reflect on their abilities of managing their learning development, and it is an important policy that might be utilised in promoting more creativity in higher education.

Students are advised that, from time to time during their scientific careers, they will come across unexpected results. They are advised to follow these observations and capitalise on them. Challenging assumptions: students are requested to list the assumptions they normally make about a specific subject or problem. Then, they are asked to challenge the assumptions by simply asking "What if?" Analogy: in an analogy two things that are essentially different, but which nonetheless have some similarities, are compared. Students are asked to define a problem then to try to generate an analogy, perhaps by looking to nature for inspiration.

They then use the analogy to apply knowledge or technology from its source to their problem with the aim of bringing a new insight or perspective. The idea is that the analogy will help suggest an entirely novel solution to the problem. Personal analogy: students are encouraged to look for novel insights and solutions by imagining themselves part of the problem under consideration, as many of us imagine ourselves visually in various situations easier than we can imagine others. The importance of a

fresh eye: students are advised to network and collaborate with people from a range of backgrounds, such as family, friends, colleagues from related or not related disciplines and industry.

B. *Promotion of Creativity at Group Level.* Group chat, idea incubation and submission: people are often at their most creative during periods of "*relaxed attention*". Students are asked to incubate their ideas for a few days and to think about them when they are feeling relaxed (e.g., when taking a shower, during sports, chatting, etc.). They are also *encouraged to exchange ideas with other members of their group using the website's Forum or Chat facility*, anonymously or not. Group sessions: each group member will have had the occasion to produce, develop and submit ideas for reflection by the group, with a constant pressure and synergy between the individuals and the group.

A constructivist approach to group activities is the *Game-Based Learning*, where teachers and trainers will develop innovative learning artefacts that are interesting and engaging for their students in groups, interdisciplinary activities and real-life game simulations. In admiring the advantages of business simulations, Senge (1990) uses the expression "micro world" to describe the way individuals can immerse themselves and "learn by doing".

At the same time *digital games* do stimulate students' motivation towards learning. For example, Wynder (2004) describes the results of the game simulation "My Muse" in a second-year management accounting course, which successfully offers students the opportunity and motivation to develop creative solutions.

Other games simulations used in the literature as creativity boosters and tools for teaching for creativity are Europia, Fabrica de Tados and many other social Sims. Some (i.e., Europia) are have been developed in joint venture among different European countries and within the framework of projects funded by Lifelong Learning Programme. In consequence, digital games are now a main characteristic and trend in universities and in various industrial training to promote active learning and improve students' problem-solving skills instead of memorisation.

It has been confirmed that for certain target groups (e.g., students), they can increase personal realisation and reach higher performance. The success factors for games based, according to Mellini et al., (2010) are goals, rules, challenge, rewarding systems/short feedback, engagement/immersion, adaptability/flexibility, several levels of access, replay ability, competition/collaboration, entertainment, educational objective, student's profile and communication, learning resources, evaluation methodologies, comprehensive learning scenarios, progressive acquisition of knowledge, personalisation, level of autonomy of the learner, motivation, usability, well designed graphics, reusability.

C. *Cooperation vs. Competition Competitive pressures* can be powerful motivators and powerful inhibitors for learning about invention. Cooperative processes are essential to design, engineering and invention, which can be both undercut and reinforced by competitive dynamics. Competitive tension and cooperative partnership are both essential to innovation in the "real world".

Creative teaching occurs when a teacher combines existing knowledge in some novel form to get useful results in terms of facilitating student learning. This may be either planned before the act of teaching, or invented as a response to the demands of the learning situation.

Practical part and reflection questions

Practical task for university teachers:

- Choose one of yours subjects and one topic of this subject and model the teaching of this topic "differently".
- Applying methods of creativity education, changing the environment, sources, ways of finding them, etc.
- Describe the changes; provide a description of the possibilities of such changes and the expected results.

*

1. Define creativity, give your definition of creativity.
2. Describe the differences in the concept of creativity between Western and Eastern cultures.
3. Discuss the importance of nurturing creativity in higher education.
4. Indicate ways in which teachers can develop student creativity.
5. Identify the methods/means of developing student creativity applied in your personal practice and predict what you promise to apply in the future.

Summary

KŪRYBIŠKUMAS AUKŠTOJOJE MOKYKLOJE: APLINKA, MOKYMAS IR MOKYMASIS

Šiame poskyryje aptariamas kūrybiškumas, kuris pristatomas kaip pagrindinis variklis, skatinantis socialinę harmoniją, tvarų žmogaus vystymąsi, technologinius išradimus ir mokslo revoliuciją, pasireiškiantis žmogaus veikloje įvairiais lygiais – nuo kasdienio

gyvenimo iki pažangių technologijų pramonėje. Iki šiol nėra sutarimu pagrįsto kūrybiškumo apibrėžimo; tačiau kūrybiškumas dažniausiai suvokiamas kaip gebėjimas sukurti kažką naujo ir naudingo (Yong ir kt., 2019). Pasak S. Yong ir kt. (2019), kūrybiškumas gali būti įvardijamas, kaip pagrindinis žmogaus kultūros produktas ir kultūros praturtinimo įrankis, turintis labai glaudų, bet sudėtingą ryšį su kultūra. Paprasčiau tariant, jei kultūra yra «fonas», tai kūrybiškumas yra «objektas», kurį panaudojus taps nauju «fonu» besikuriančiam ir būsimam «kūrybiškumui (objektams). Svarbiausia, kad niekas negali gyventi ir būti kūrybiškas be kultūros.

Poskyryje analizuojamas kūrybiškumas, kaip kultūros dalis, būdingas visoms kultūroms, tačiau jo apibrėžimas ir priskiriamos savybės įvairiose kultūrose skiriasi. Literatūros duomenimis, „Vakarų“ ir „Rytų“ dichotomija yra vienas reikšmingiausių požiūrių, apibūdinančių kultūrinius kūrybiškumo supratimo ir apibrėžimo skirtumus. „Rytai“ paprastai reiškia Azijos šalis, tokias kaip Kinija ir kitas jos kultūros paveiktas šalis, Japoniją ar Korėją. Šios šalys atstovauja „kolektyvistinėms kultūroms“ (t. y. kultūros, kurios pabrėžia, kad kolektyvinis interesas turi būti svarbesnis už individo interesus ir kad priklausymas kolektyvui yra svarbiau už unikalumą), kurių ištakos yra daoizmo, budizmo ir konfucianizmo filosofijose. „Vakarai“, paprastai laikomi atstovaujančiais „individualistinėms kultūroms“ (t. y. toms, kurios vertina individualius tikslus ir interesus, o ne kolektyvinius interesus ir tikslus), paplitusioms JAV, Vakarų Europoje, Kanadoje, Australijoje, kurios yra glaudžiai susijusio su senovės Graikijos, krikščionybės, judaizmo bei racionalumo idėjoms. Kaip atskleidžia „World Value Study“ (1998) ir GLOBE projektinis tyrimas (2019), Vakarų kultūros daugiau dėmesio skiria procesais ir produktais paremtam kūrybiškumui ir akcentuoja pragmatišką, problemų sprendimą, o Rytų kultūros labai domisi kūrybine dvasia ir asmeniniu kūrybiškumu, kūrybiškumą traktuoja kaip apreiškimo ar atradimo iš naujo formą.

Šiame poskyryje pristatomas Jungtinėje Karalystėje L. Speers ir N. Wilson (2018) atliktas tyrimas, kuriame daugiausia dėmesio mokslininkai skyrė kūrybiškumui universitetų sektoriuje. Autoriai teigia, kad universitetai yra „idėjų generavimo, mokymosi ir naujo bei vertingo mąstymo vieta“ ir, kad kūrybiškumas dažnai yra nepastebimas, nepakankamai išvystytas ir nepakankamai atlyginamas. Kūrybiškumas yra aktyvus procesas ir būtinai susijęs su naujovėmis. Tai mokymosi įprotis, reikalaujantis įgūdžių ir konkretaus supratimo apie kontekstus, kuriuose taikomas kūrybiškumas. Kūrybinis procesas yra inovacijų pagrindas, todėl šie žodžiai dažnai vartojami pakaitomis. Anot Kampylis ir Berki (2014): „Kūrybinis mąstymas apibrėžiamas kaip mąstymas, leidžiantis studentams pritaikyti savo vaizduotę kuriant idėjas, klausimus ir hipotezes, eksperimentuojant su alternatyvomis ir vertinant savo bei bendraamžių idėjas, galutinius produktus ir procesus. “ (Kaufman, Beghetto, 2009).

Poskyryje pateikiama teorinė medžiaga apie tai, jog aukštajame moksle kūrybiškumas turi būti laikomas svarbiu elementu studijų procese, turinčiu didelę įtaką ruošiant žmones neapibrėžtam ir sudėtingam darbo rinkos pasauliui, kuriame studentams teks panaudoti visą savo kūrybiškumą ir analitinius gebėjimus. Sternbrerg ir Lubart (1995) teigė, kad žmogui reikia trijų skirtingų gebėjimų, kad jis būtų sėkmingas:
1) analitiniai gebėjimai – analizuoti, vertinti, spręsti, lyginti ir konstruoti;
2) praktiniai gebėjimai – taikyti, panaudoti, įgyvendinti ir aktyvuoti;
3) kūrybiniai gebėjimai – įsivaizduoti, tyrinėti, sintezuoti, jungti, atrasti, išrasti ir pritaikyti (Papaleontiou- Louca1 et. al, 2014).

Tarp kitų svarbių rekomendacijų Europos aukštojo mokslo institucijoms, kurios buvo pateiktos remiantis kūrybiškumo tyrimų išvadomis, paminėtinos šios:

- Siekti kūrybiškai derinti individualius studentų ir dėstytojų gebėjimus ir patirtį, apjungti į bendras veiklas skirtingų disciplinų mokslininkus; dalintis įvairia patirtimi, siekiant sudaryti kuo palankesnes sąlygas aukštosios mokyklos bendruomenės kūrybiškumui.
- Rekomenduojama, kad aukštosios mokyklos išnagrinėtų savo, kaip besimokančios organizacijos koncepciją bei ją papildytų etiniais ir kultūriniais struktūriniai elementai, siekiant, kad būtų sukurta kiekvienam asmeniui kūrybiškumui palanki institucinė aplinka (Gaspar, Mabic, 2015).

Poskyryje rašoma, kad aukštasis mokslas turi užtikrinti, kad absolventai turėtų reikiamų įgūdžių, kad jie būtų pasirengę gyvenimui ir veiklai greitai kintančioje darbo aplinkoje. Todėl švietimas turėtų sutelkti dėmesį į asmeninius ir socialinius žmogaus egzistencijos aspektus, taip pat į akademinius ir profesinius aspektus. Be to, būtina sukurti tinkamą mokymosi aplinką, kuri skatintų studentus įgyti patirties, ugdyti kūrybiškumą (Ball ir kt., 2010) Išskirtinis kūrybiško mokymo aukštojoje mokykloje bruožas yra tai, kai studijų metu studentai patiria skirtingus kontekstus, kuriuose savo mokymąsi gali pritaikyti per gyvus projektus, parodas, užsakymus ir mokydamiesi kartu su dėstytojais praktikais. Svarbu stiprinti studentų mokslinių tyrimų gebėjimus, kad būtų skatinama jų akademinė karjera aukštojo mokslo įstaigoje ir taip „augtų“ naujos kartos dėstytojai. Iš esmės kūrybiškumas priklauso nuo žmonių, kurie sudaro aukštosios mokyklos bendruomenę. Kuo daugiau dėstytojai supras apie kūrybiškumą, kūrybišką mokymąsi ir motyvaciją, tuo labiau jie galės ugdyti savo studentų kūrybiškumą. Žinoma, ne mažiau svarbūs veiksniai, skatinantys studentų kūrybiškumą ir prisidedantys prie vaisingų darbo rezultatų, yra aukštosios mokyklos struktūrinės, etinės ir kultūrinės sąlygos, siekiančios kurti kūrybiškumui palankią institucinę aplinką. E. Papaleontiou- Louca et. al. (2014) teigimu, yra nemažai rodiklių, parodančių, ar konkrečioje aukštojo mokslo įstaigoje yra tinkamos sąlygos kūrybiškumo ugdymui. Keletas jų: IKT plėtra ir tinkamas panaudojimas; socialinė įtrauktis; kokybės užtikrinimo ir valdymo sprendimai administraciniu lygmeniu; bendradarbiavimas su socialiniais partneriais

ir valstybinėmis institucijomis; asmeninės pažangos planai; dėmesys dėstytojų kvalifikacijos tobulinimui; studentų motyvavimas; studijų programų rengimas; studijų tarptautiškumas, dalyvavimas mainų programose; mobilumas ir mokymasis visą gyvenimą ir kt.

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Maketavo Karolis Saukantas
Viršelio dailininkė Eglė Dučinskienė

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Tel. (8 46) 398 891, el. paštas: leidykla@ku.lt, interneto adresas: http://www.ku.lt/leidykla/
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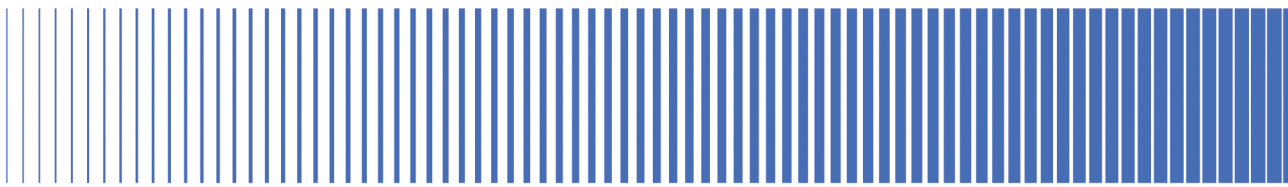

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