



NACIONALINĖ
ŠVIETIMO
AGENTŪRA



Finansuojama Europos socialinio fondo lėšomis

Didactics of higher achievement integration of interdisciplinary topics and coherence of subjects Webinar 3

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14th October 2022

Learning Outcomes

- To consider the Cognitive Competence in the Global context
- To identify the components of Cognitive Competence
- To look at some elements of Cognitive Competence in more detail
- To understand the connection between deep learning and Cognitive Competence
- To consider Cognitive Competence in the Lithuanian context

Competency based Curriculum

A competency-based curriculum emphasizes the complex outcomes of a learning process, that is, the knowledge, skills and attitudes to be used by learners, rather than defining learning primarily by knowledge of traditionally-defined subject content. In principle, such a curriculum is learner-centred and adapts to the changing needs of students, teachers and society (IBE-UNESCO, 2013a, p. 12)

Competency

Competency is the capability to mobilize acquired knowledge, skills and attitudes, which are built upon appropriate and societal fundamental values, in a real-life situation (Opertti, Kang and Magni, 2018a, p. 12)

Lithuanian Definition

Cognitive competence is the motivation and ability to know oneself and the world acquired by assimilating [adopting] the cultural experience of humanity. It includes subject knowledge and abilities, critical thinking, problem solving, self-learning abilities. School learning requires willpower and perseverance, while the motivation for school learning can be both internal and external, derived from the general needs of society.

Cognitive Competence- Across the world

Critical Thinking & Problem Solving (British Council)

Transversal Skills (UNESCO)

Fundamental Life Skills (World Health Organisation)

Framework for 21st Century Learning (P21)

UNESCO Transversal Skills

Leading Global efforts to reach quality education for all



Cognitive Competence/ Critical Thinking

1. Most people think they know about critical thinking, it is nothing new!
2. Most people think they practise critical thinking
3. Many teachers think they develop critical thinking in their students

It is such an important skill for our children it cannot be left to chance

In what way is the view of people in Lithuania the same or different to the three statements above?

Critical thinking and problem solving: (Cognitive Competence) 2 definitions

- Active, persistent and careful consideration of a belief or supposed form of knowledge in the light of the grounds of which support it and the further conclusions to which it tends. (*John Dewey*)
- Self-directed thinking that produces new and innovative ideas and solves problems. Reflecting critically on learning experiences and processes and making effective decisions. (*British Council*)

Video with Tom Hatfield speaking about Critical Thinking

You are about to watch a video with Tom Hatfield talking about Critical Thinking

Identify two key points which you think are important.

Be ready to unmute and share with the group

What is Critical Thinking? (Cognitive Competence)

- <https://youtu.be/-wgqq-fwlKw>
- [#TalkCriticalThinking](#)
- What is critical thinking (and why should I care)?
- Tom Hatfield

There are three types of thinking.

Critical Thinking (Cognitive Competence) is a sub-set of each (Willingham, 2007).

Problem Solving

- Cognitive Competence

Reasoning

- Cognitive Competence

Making Decisions

- Cognitive Competence

Principles of Cognitive Competence

- Cognitive Competence taught in context of subject matter
- Good use of student experiences
- Teacher makes strategies explicit
- Students need to practise, practise, practice

Three key teaching strategies

1. Questioning to develop **deeper thinking and learning**
2. Learning environment which supports Cognitive Competence
3. Quality feedback and corrections

Why is deep learning important?

“When engaged in deeper learning, students think critically and communicate and work with others effectively across all subjects. Students learn to self-direct their own education and to adopt what is known as ‘academic mindsets’ and they learn to be lifelong learners.”

“Deeper learning is the process of learning for transfer, meaning it allows a student to take what’s learned in one situation and apply it to another

Catherine McAuley College

Successful Learning

Researchers, teachers, policy makers and parents have typically judged the success of learning in terms of **how much knowledge** a student had acquired.

Today, it's understood the **quality of knowledge** is just as important as the amount one can possess (*De Corte, 2010; Linn, 2005*).

Breakout session

How would you define high quality learning?

How would you explain it to a parent?

Short Break

20 minutes

Please return and switch your cameras on

What do we mean by deep learning?

Professor John Hattie collated a significant amount of evidence (over 800 meta-analyses) on the effects of different factors on student learning, and concluded that:

*the biggest effects on student learning occur when **teachers become learners of their own teaching**, and when students become their own teachers*

Deep Learning versus Shallow (surface) Learning

DEEP

Learning behaviours such as those related to **higher order thinking skills** for example explaining reasoning, can lead to **deeper learning** when combined with learning behaviours related to lower order thinking skills such as remembering.

SHALLOW

Learning behaviours related to **lower order thinking skills** displayed on their own are likely to lead to learning that is less deep i.e. **shallow or (surface) learning**.

Deep Learning versus Shallow (surface) Learning

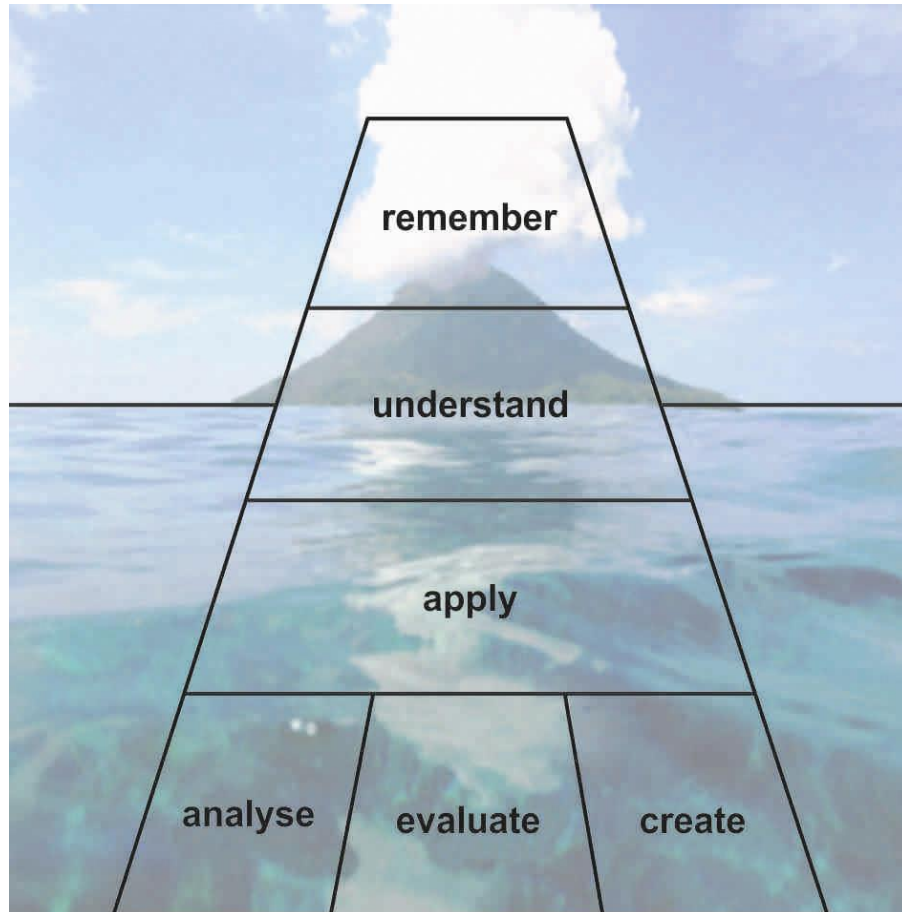
DEEP Learning

Explain the **reasons** why online learning is useful way of engaging in a course of study?

SHALLOW Learning

Name the platforms which can be used for online learning

Blooms taxonomy (upside down)



- The highest order thinking skills (analyse/evaluate/create) are **deep** on the ocean floor
- The lowest skills (remember/understand) are peaking out on the **surface (shallows)** of this volcanic island

New Pedagogies for Deep learning

New Pedagogies for Deep learning	Lithuanian Competencies
Collaboration.	
Creativity.	Competence of Creativity
Critical thinking. Being able to evaluate information and arguments, and identify patterns and connections to construct meaningful knowledge and apply it in the real world.	Cognitive Competence
Citizenship. The ability to consider issues based on a deep understanding of diverse values and a worldview, as well as a sincere interest to solve complex real-world problems.	Civic Competence
Character. Traits such as grit, tenacity, perseverance, and resilience; as well as the ability to make learning an integral part of living	
Communication.	Communication

Cognitive Competence (Critical Thinking) & All the Competencies

- **Cognitive Competence** should be taught in the **context of subjects**.
- **Cognitive Competence** is for **all students not just for advanced students**.
- **Student experiences** offer a way in to complex concepts.
- Make **Cognitive Competence** strategies **explicit** and **practise** them.

Source: Willingham, 2007.

Daniel T Willingham on Critical thinking (Cognitive Competence)

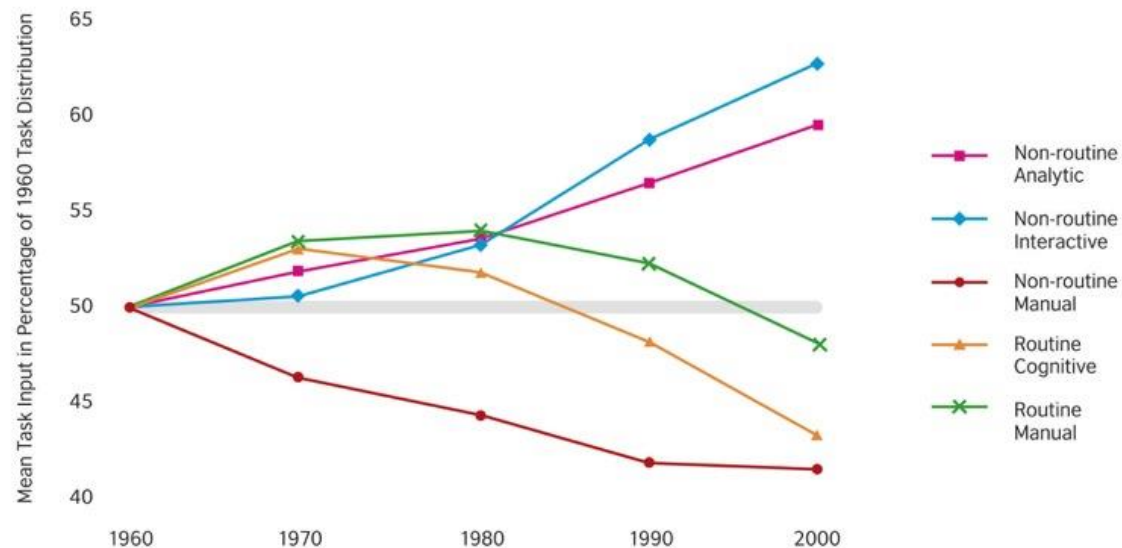
- Critical thinking is successful thinking
- Learning to think similar to learning to speak
- Not difficult to think successfully, but deciding to think
- You need good subject knowledge (domain) to think critically
- People think successfully in one situation but fail to apply the thinking to a new situation
- Dwell on surface structure and fail to realise we have solved a similar problem before
- Ability to TRANSFER to other situations
- Deep Structures are often abstract and difficult to understand

Four features of Critical Thinking (Cognitive Competence)

1. Considering different perspectives
2. Evaluating evidence
3. Solving non routine problems
4. Looking for deep structure

Why solving non-routine problems is so important?

Figure 1: Economy-Wide Measures of Routine and Non-routine Task Input, 1960-2000



Source: Updated chart from R. Murnane in a private communication (2010). Based on Autor, D.Levy.F. and Murnane, R. (2001) "The Skill Content of Recent Technological Change: An Empirical Exploration." NBER Working Paper 8337, Boston, MA: National Bureau of Economic Research.

Routine and non-routine problems (*British Council*)

Routine questions. Routine questions can be answered or solved using methods familiar to students by replicating previously learned methods in a step-by-step fashion.

Non-routine questions. Non-routine questions are those for “which there is not a predictable, well-rehearsed approach or pathway explicitly suggested by the task, task instructions, or a worked-out example”.

An easy way to introduce Critical thinking

Starter activities

Any subject

Any age

Using any of the features of Critical thinking

1. Considering different perspectives
2. Evaluating evidence
3. Solving non routine problems
4. Looking for deep structure

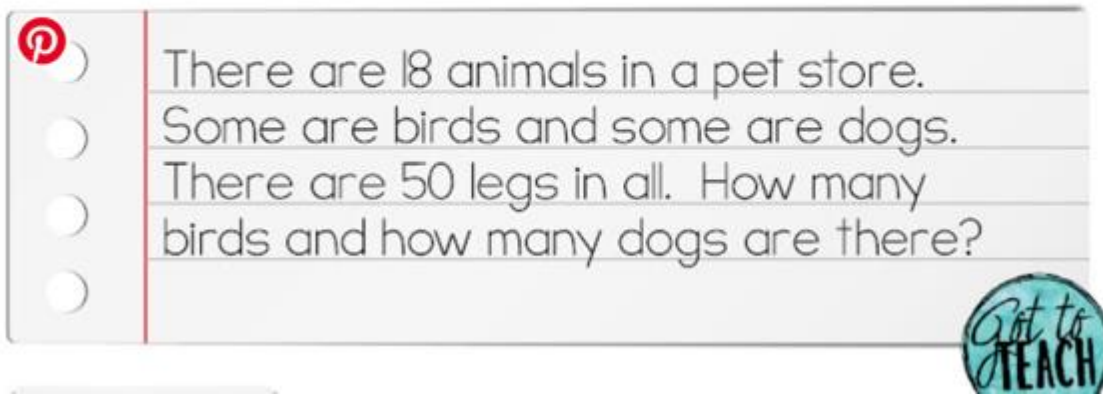
We will now
give you, 3
examples to try
out

Non Routine Questions


There are 10 people in a room, if they all shake hands with each other how many handshakes will take place?

Non Routine Questions


Animals in a pet store




There are 18 animals in a pet store.
 Some are birds and some are dogs.
 There are 50 legs in all. How many birds and how many dogs are there?



Non Routine Questions



If the cone weighs 6 kg, what are the weights of the cube and the cylinder?



Breakout Session

Can you share any examples you have seen of Cognitive Competence being developed with students in a classroom?

What simple activities do you think could be used in any subject to develop cognitive competence?

Break for 25 minutes

Please return and switch your cameras on so we know you have returned

Presentation by

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Using Data in Lithuania

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