

LEARNING UNIT: Applying critical thinking approach to cope with uncertainty and complexity

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EntreComp Competence Framework

Coping with Uncertainty, Ambiguity and Risk

INTRODUCTION

PURPOSE

The lesson aims to show students some strategies and practical tools based on **critical thinking approach** for coping with and managing the **uncertainty** and **complexity** of the world we live in today.

THEORETICAL AND CULTURAL BACKGROUND FOR UNCERTAINTY AND COMPLEXITY

Some of the key words that characterize today's world are **uncertainty**, **change**, **complexity**, and **interconnection**.

The Greek philosopher [Heraclitus](#) had already addressed the issue of **uncertainty**. Two [quotes](#) represent his worldview:

- "He who does not expect the unexpected will never discover the truth" and
- "No man ever enters the same river twice, for it is not the same river and he is not the same man. There is **nothing permanent but change**".

These quotes make us realize that the **world is always changing** and that we must be ready to face the unexpected.

Moreover, the modern world in which we live is a [complex system](#). A complex system can be: our brain, living organisms, climate, but also the modern society, the web, the social media. These systems have in common that it is difficult to predict their behaviours.

We live in a **globalized society** and world where everything is **connected**: countries, people economies. What happens in one part of the world, even a small part, can affect the rest of the world. This concept is well expressed by the famous quote called "[the butterfly effect](#)" taken from meteorologist Lorenz: "Does the flap of a butterfly's wings in Brazil set off a tornado in Texas?"

For this reason, it is difficult to make predictions. One must always be prepared to face and solve problems and uncertain situations as they arise. One of the greatest philosophers of science, **Karl H. Popper**, expressed this existential situation well with the following sentence: “All life is problem solving.”

ASSESSMENT OF INFORMATION WITH CRITICAL THINKING SKILLS AND TOOLS

There are many ways to deal with uncertain and complex situations where it is difficult to make predictions, but probably the best system is to develop **critical thinking skills**.

Critical thinking is a metacognitive competence concerning the abilities of **reflection, analysis and questioning of information**. Critical thinking applies the approach of reflective and conscious thinking (see Kahneman’s “[Thinking, fast and slow](#)”) instead of intuitive and emotional thinking.

Through critical thinking, individuals can:

- (a) understand logical connections between ideas
- (b) identify and evaluate arguments
- (c) detect inconsistencies and common mistakes in reasoning
- (d) reduce [cognitive biases](#) and prejudices over judgment and decision-making processes.

Critical thinking offers effective methods for **finding and evaluating the reliability of information**.

Bibliography and weblibliography

- Mitchell Melanie, Santa Fe Institute, [Introduction to the Study of Complexity](#), Online course on YouTube, Lessons 1-5.
- Kahneman Daniel, Thinking, Fast and Slow, 2013.
- Kahneman Daniel, Thinking, Fast and Slow, [YouTube, Talks at Google](#).
- [Erasmus Project NERDVET](#), Enhancing critical thinking skills & media literacy in vet.
- UK National Health Service (NHS), [How to deal with change and uncertainty](#)

Purpose and recipients

The Learning Unit is addressed to iVET students and aims to introduce **CRITICAL THINKING** as a method and tool to deal with **uncertain** and **complex** situations.

Learning outcomes

- **Be aware of the importance of critical thinking to deal with uncertain and complex situations**
- Be aware and reduce cognitive biases and prejudices over judgment and decision-making processes

Description of teaching and learning activities

1.1 What: The learning mediator introduces:

- a) concept of critical thinking (what is critical thinking?)
- b) how critical thinking can be applied to different contexts like social media, science, economics, politics, forensics, problem solving, and many more areas of everyday life (what is critical thinking for?)
- c) concepts of cognitive biases and prejudices (what are cognitive biases and prejudices?)

1.2 How: The learning mediator can use the following teaching approaches:

- a) Asking students, the meaning of keywords like critical thinking, bias, prejudice, uncertainty, change, complexity etc. using post-it or digital tools (i.e., Mentimeter) and make a discussion.
- b) Watching and discussing meaningful videos or animations.

Supporting resources

- Erasmus Project NERDVET, Educational toolkit guide for improving students' critical thinking
- [Behaving critically](#), Animation, YouTube, Erasmus Project NERDVET.
- [Why is critical thinking important for your everyday life?](#), Animation, YouTube, Erasmus Project NERDVET.
- From the movie "[Man in Black](#)", Acting without thinking versus critical/reflexive thinking, YouTube.
- [Szalontüdő](#) (Szirmai Márton, 2006), Short film about prejudices: YouTube.

Duration: 1h

Competence level: EQF 3



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