Professional UNcertainty Competence

PUNC box

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This publication is part of the Erasmus+ project Professional Uncertainty Competence (PUNC)

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Introduction

Professional **UN**certainty **C**ompetence is the ability to acknowledge, to explore and to handle uncertainty in a productive way.

In the complexity of today's world, professionals face uncertainty in their work. This means that higher education institutions must support learners in developing their ability to deal effectively with this professional uncertainty. In the PUNC project we have addressed the question: "How can a professional uncertainty competence be developed?" Our research forms a key part of the Erasmus+ Strategic Partnership project "Professional UNcertainty Competence" (PUNC is defined as Professional UNcertainty Competence throughout the project).

The six project partners integrated theory-based and practice-based knowledge by using a mixed methods research methodology consisting of two research activities: A transnational literature review and surveys among educators and learners from the partner universities. The research findings were included into the PUNC competence framework, which aims to offer a constructive and progress-oriented approach to professional uncertainty. The PUNC competence framework provides educators and learners with a foundation for acknowledging, exploring, and handling uncertainty in a productive way. It includes a definition of the PUNC competence, a three-step approach (acknowledge, explore, handle), and a PUNC menu filled with elements of knowledge, skills and attitude to create a customized and specific PUNC competence and learning goals. The PUNC competence framework and menu also assist educators in guiding learners in reflecting on their learning objectives and creating a plan for practical application (Bollinger & Van Rooijen, 2022).

Although education is a critical factor for making the necessary changes and training future professionals, previous studies show that higher education institutions (later HEIs) and educators sometimes lack the knowledge, skills, and tools to support their learners to develop their abilities to handle uncertainty in a positive, generative, and productive manner.

Additionally, working systematically with uncertainty is still undervalued even though HEIs increasingly focus on training learners to reflect on themselves as professionals. Without embedding uncertainty in the learning processes, as a part of the learners' professional and personal development, coping with an environment characterized by volatility, uncertainty, complexity, and ambiguity (also referred to as VUCA, see figure 1) can lead to stress, anxiety, and vulnerability, and thus hamper a growth mindset of learners and employability of graduates.

To respond to this need, the ambitious aim of the PUNC project is to fill the competence gap of handling uncertainty productively. For instance, the project professionalizes educators to enable learners to develop their PUNC in their professional performance and thereby find a way through this increasingly uncertain, changeable, and ambiguous world.

Supporting educators to train learners to become resilient professionals who can engage their professional uncertainty in a positive and productive manner has been the main driver to collect and create different exercises/teaching practices/tools that can be used both inside and outside the traditional classroom.

In the PUNC box in section 3, you will find a collection of these practices that have been tested in different settings among the project partners, and you will find instructions for the framing and use of the practices.

After an overall introduction in section 2, you can read about why and how to use the Punc box. You will find a userguide and an overview of the content of the PUNC box as well as a section (2.2) that highlights the importance of reflection for benefitting from using the PUNC box.

In section 3, you find the PUNC box, which is divided in four sections. In section 3.1, you can learn how the PUNC framework can be used as a meta tool. In section 3.2, you can read about the PUNC menu as a facilitating tool. In section 3.3, you find the PUNC box including specific tools and learning activities that can be used by educators and learners to develop their PUNC competence. Finally, in section 3.4, you find user stories from some of the partners in the project.

In section 4, you can read more about the development of the PUNC box. In this section, you can also read about theories and models that act as background knowledge and can support the work with the tools in the PUNC box.

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Why use the PUNC box?

The main reason for educators to utilize the tools in the PUNC box is to fulfill the goal of the PUNC box itself, which is to nurture learners to become more robust professionals capable of dealing with professional uncertainty in a productive way. This is vital in the era of artificial intelligence, where learners must acquire skills and abilities that cannot be replicated by robots. The VUCA model encapsulates the challenges faced by both educators and learners in today´s world.

The VUCA world is characterized by many interconnected variables and even if information is available, it is typically overwhelming and difficult to process. In addition, the causal relationships are not clear, and this is leading to complexity and even situations of "unknown unknowns". This makes the situation unstable and possible solutions and actions unclear and uncertain.

A Guide to Approaching Events in the Four VUCA Categories

HOW WELL CAN YOU PREDICT THE RESULTS OF YOUR ACTIONS?

Complexity
Characteristics: The situation has many interconnected parts and variables. Some information is available or can be predicted, but the volume or nature of it can be overwhelming to process.
Example: You are doing business in many countries, all with unique regulatory environments, tariffs, and cultural values.
Approach: Restructure, bring on or develop specialists, and build up resources adequate to address the complexity.

Volatility
Characteristics: The challenge is unexpected or unstable and may be of unknown duration, but it's not necessarily hard to understand; knowledge about it is often available.
Example: Prices fluctuate after a natural disaster takes a supplier off-line.
Approach: Build in slack and devote resources to preparedness—for instance, stockpile inventory or overbuy talent. These steps are typically expensive; your investment should match the risk.

Ambiguity
Characteristics: Causal relationships are completely unclear. No precedents exist; you face "unknown unknowns."
Example: You decide to move into immature or emerging markets or to launch products outside your core competencies.
Approach: Experiment. Understanding cause and effect requires generating hypotheses and testing them. Design your experiments so that lessons learned can be broadly applied.

Uncertainty
Characteristics: Despite a lack of other information, the event's basic cause and effect are known. Change is possible but not a given.
Example: A competitor's pending product launch muddies the future of the business and the market.
Approach: Invest in information—collect, interpret, and share it. This works best in conjunction with structural changes, such as adding information analysis networks, that can reduce ongoing uncertainty.

HOW MUCH DO YOU KNOW ABOUT THE SITUATION?

Figure 1: VUCA-framework
Source: Bennett & Lemoine, 2014, p. 27

The VUCA framework in figure 1 presents the VUCA environment in a company/business perspective, but the VUCA environment is evident and present in all aspects of life in today's world, and educators must take this into consideration when preparing learners for the 21st century labor market.

In a VUCA world it is evident that not everything can be known beforehand. "Not-knowing", in its broadest sense, can stir up feelings of uncertainty which can be superficial or profound, steady, or rapidly changing. On one hand, feelings of uncertainty can hinder a person from acting and disturb a learning-, work- or personal development process. On the other hand, feelings of uncertainty can stimulate creativity, reflection, thinking out-of-the-box, and other actions. If and to what extent feelings of uncertainty are experienced depends on how "VUCA" the situation is perceived by a person and on his/her capability to deal with the experienced uncertainty. Also, culture and societal structures can determine the perceived and experienced uncertainty. For professionals it is important to be able to handle the professional uncertainty experienced in a productive way (Bollinger & Van Rooijen, R., 2022).

Investigating VUCA in the educational context was the focus of one of the first intellectual outputs of the PUNC project: "Facilitate for the future, Educators Guide for designing Hybrid Learing Environments for the VUCA World" (Sirpa Hänti et al., 2021). The results showed a lack og integrating VUCA in the educational context, training learners in handling VUCA. However, what exists points towards utilizing experiential learning pedagogy to prepare learners for coping with a VUCA work environment or to prepare them for an uncertain future with the CCR (Center for Curriculum Redesign) framework that includes knowledge, skills, character and meta-learning competences. Based on data from educators from five European higher education institutions (the PUNC project partners), who have implemented various hybrid learning environments aimed at preparing learners for the VUCA world, the table in figure 2 demonstrates how VUCA can be integrated into the educational context.

Volatility	**Uncertainty**
Different than earlier courses with their own study group. Working life orientation and new challenges. Usual academic approaches are not applicable. Learners must make up their own approach. Changes in tasks, actors, schedules. Working on the fly. Unfamiliar and heterogenic learners and other stakeholders. Teamwork. Team dynamics. Leaning to collective resources instead of individual approach. No typical strict structure that the learners will follow. Supervised and non-supervised meetings.	Lack of adequate information. Not knowing. Unpredictability of the results. No trust in learners' own capability. No theory, tools, or methods from the curriculum. Working with hypotheses and the means at hand. Reflection. Gaining expertise step by step. Personal engagement. Forecasting is difficult. Need to take an active role.
Ambiguity	**Complexity**
Unknown study path. No educator-centricity. Unclear expectations. Multi-sided tasks. Experimenting and testing. Different interpretations. Not only one right way to do the work. Not only one solution. The criterion to excellent work is unclear. Assessment is mostly based on self-reflection and team learning. Plans must be changed. Earlier experience may help or even disturb.	Many things going on at the same time. Prioritizing is difficult. Expected results are not known. Adjusting and managing several tasks. Many and complex perceptions. The interrelations of the whole and the parts. Difficult to trust own perceptions and to trust others. Individual and team learning. Both academic, professional, and personal skills are needed. The unbalanced combination of study-work-private life. Pooling the collective means and resources. Previous experience can cause confusion.

Figure 2: VUCA components in the educational context.
Source: Sirpa Hänti, Meiju Keinänen, Maria Välvirta Havia, Hazem Al-Bermanei, Mari Ketola & Jonna Heikkilä, 2021

The PUNC box is meant as a help to educators and learners that want to work with uncertainty. Not as case stories, but as firsthand experiences, when using the PUNC box. This has been the primary motivation behind gathering and creating various exercises, teaching practices, and tools that can be utilized both within and outside a traditional classroom setting. These exercises, teaching practices and tools can be used to train and enhance the learners' PUNC competence. The partners have collected and shared tools that have been used, developed, and tested in their respective organizations. In addition, new tools have been developed during the project.

The purpose of the different tools is first to get the learners to realize that they are experiencing uncertainty in different ways, and then to go through a process of acknowledging, exploring, and handling the uncertainty. This process is the PUNC Framework and the steps and action in the process is elaborated in figure 3.
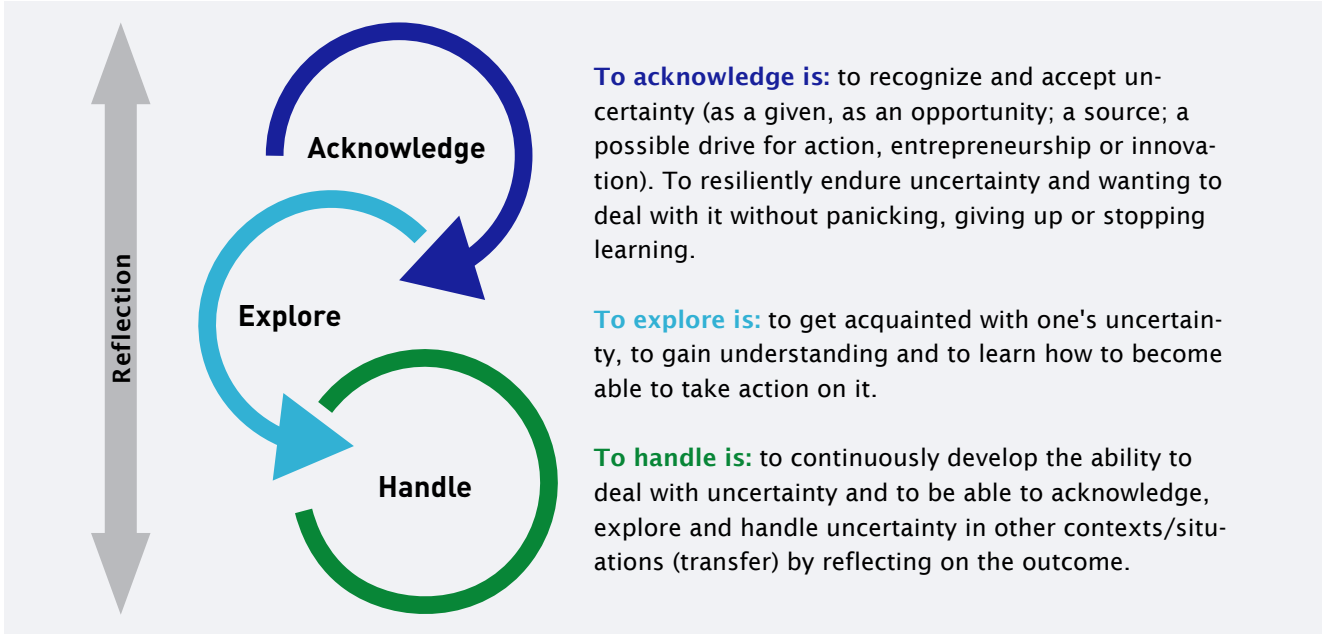

To acknowledge is: to recognize and accept uncertainty (as a given, as an opportunity; a source; a possible drive for action, entrepreneurship or innovation). To resiliently endure uncertainty and wanting to deal with it without panicking, giving up or stopping learning.

To explore is: to get acquainted with one's uncertainty, to gain understanding and to learn how to become able to take action on it.

To handle is: to continuously develop the ability to deal with uncertainty and to be able to acknowledge, explore and handle uncertainty in other contexts/situations (transfer) by reflecting on the outcome.

Figure 3: PUNC framework
Source: Bollinger & Van Rooijen, 2021, p. 17.

To see, feel, work with, and learn to accept uncertainty as a natural part of their everyday life, and work with uncertainty in a productive way, demands that the learners can identify what they need in the form of knowledge, skills, and attitudes to do just that. In order to initiate the process outlined in the PUNC Framework, educators may collaborate with their learners to identify which knowledge, skills, and attitudes the learners need to develop in order to acknowledge, explore, and handle uncertainty. The tools in the PUNC box enable educators and learners' to work with uncertainty by choosing one or more tools from the PUNC box. The process in the PUNC Framework is not necessarily a linear process, where it is granted that there is a deliberate reflection of and acknowledgement of being uncertain. The framework itself can be a dialogue tool used by educators to introduce the concept of uncertainty and the process of dealing with uncertainty. Furthermore, it can be used to frame experiences, the learners might have had already and hereby assisting the learners' recognition of and reflection on uncertainty.

Reflection is a very important part of the learning experience related to acknowledging, exploring, and handling uncertainty. "We do not learn from experience; we learn from reflecting on experience" is a famous saying that refers to the work of John Dewey (1933, p. 78-79). Hence, reflection is incorporated at each stage of the process within the PUNC Framework. With regard to the development of the PUNCompetence, the PUNC menu in figure 4 was created.

The PUNC menu functions as a tool to assist individuals in selecting the necessary training and development focus to effectively manage uncertainty. It encompasses aspects from both the CCR framework and the principles of 21st century skills, which include knowledge, skills, character, and meta-learning competencies. Additionally, it is consistent with the objectives of Inner Development Goals (www.innerdevelopmentgoals.org), a non-profit organization dedicated to promoting scientifically supported skills and qualities that lead to purposeful, sustainable, and productive lives. The PUNC menu can be utilized in various settings, which will be explained in chapter 4.1, where the background of the PUNC menu is further described.

The PUNC menu illustrated in figure 4 can help in navigating before, during and after dealing with uncertainty and development of PUNC.

Knowledge

Knowing, understanding, being aware of ...

Examples of reducing uncertainty
One's experienced uncertainty in a specific situation, context, or task
One's intuition as a source of information
One's self-efficacy
The benefits of making uncertainty productive
The importance to develop vision
The need for being challenged
The need for dialogue
The need for doing something meaningful
The need for encouragement
The need for experiences of success
The need for positive feedback
The need for room for initiative
The need for scaffolding
The need for self-confidence
The need for support from others
Uncertainty as a phenomenon in learning and working

Skills

Being able to ...

Apply communication skills
Apply conflict solution skills
Apply decision makings skills (based on incomplete info)
Ask feedback
Ask questions
Assess a situation
Connect socially
Deal with incomplete information adequately
Deal with open-ended problems
Deal with problems beyond own expertise
Define the goal /aim
Engage in a supportive network
Find, value, interpret and use or share relevant information and resources
Investigate sources (internal/external) of uncertainty
Make own choices
Operate between an existing and familiar present and an unknown future
Prioritize
Regulate yourself
Solve problems creatively
Take initiative
Take ownership of one's learning process
Think critically
Think divergent/lateral
Think out of the box
Understand causality
Zoom in/out

Attitude

Being willing to ...

Accept failures
Accept not knowing what will happen
Acknowledge vulnerability
Be adaptable and open to change
Be agile
Be courageous
Be courageous to take risk
Be curious
Be enquiring
Be ethical
Be flexible
Be ingenuous
Be mindful
Be receptive
Be self-aware
Discover new strategies for problem solving
Embrace doubts
Empathize with different perspectives
Endure
Experiment
Gain information
Learn
Show feelings
Take initiative
Take leadership
Take ownership
Take responsibility for choices and actions
Take risks
Understand and to make sense of uncertainty
Visualize future alternative scenarios

Reflection

The PUNC menu includes theory-based knowledge, skills, and attitudes that aid in bridging the competence gap between perceived uncertainty and coping with it productively

Knowledge (being aware of...) is considered to be a layered construct made up of cognitive/hard knowledge (knowledge parts), understanding (constructs of various knowledge parts), and embodied/tacit knowledge.

Skills (being able to...) are considered skills.

Attitude (being willing to...) is considered conscious intents.

The user can blend components from these three categories to generate a unique and customised learning outcome for an uncertain situation.

Reflection is the fourth component of the PUNC menu. Reflection is important as it consolidates and reinforces the impact of knowledge, abilities, and attitude on every learning outcome (Bollinger & Van Rooijen, 2022).

Figure 4: The PUNC menu
Source: Bollinger & Van Rooijen, 2021.

2.1 Userguide

The PUNC box presents different tools, starting with those with the shortest timeframe. Figure 5 provides an overview of the tools to make it easier to choose and experiment with them.

To assist users in selecting from the various tools, they have been sorted and categorized based on their timeframe, intended use (individual or/and group), purpose (when possible), and relation to one of the elements in the PUNC menu (Knowledge - yellow, Skills - green, Attitude - blue, or all - orange). This serves as a guide and does not imply a detailed connection between the PUNC menu elements and the tools through the use of color.

The horizontal axis displays the various tool names, starting with the shortest timeframe, Two Truths & One Lie (20 min), and ending with 5-5-5 (nearly 5 days). The last tool, DYOT, is somewhat outside the category as it can be utilized by learners and educators outside the "classroom" to create personalized tools.

The different sorting criteria can be found on the vertical axis and include the primary use of the tool, either for individuals or groups. The color of each tool indicates its primary focus on Knowledge (yellow), Skills (green), Attitude (blue), or all (orange). Some of the tools also have additional purposes, such as team-building or ice-breaking, indicated alongside their focus on uncertainty.

The color displayed at the top of each tool description in section 3.3 signifies the primary focus of the tool in relation to the PUNC menu. Despite each tool having a distinct character and providing a unique experience for each learner, it can be challenging to categorize them solely based on the PUNC menu. However, users who have tested and evaluated the PUNC box see it as a crucial aspect in the tool's description. Initially, the use of most of the tools should be facilitated by the educator, but as learners become more familiar with them, they can facilitate themselves.

0-1 hour

Intended use and purpose	Two truths & one lie	Motorola	Speed dating	Neck's reflection taxonomy	Join a group	Roll your Plague	Business cards	Eye Contact	Trigger me	Normalizing nervousness	Your Backpack	Little Red Riding Hood
Individual								X			X	X
Group	X	X	X		X	X				X	X	X
Individual/group/plenum							X	X				
Ice Breaker	X		X				X			X		
Team building	(X)		X			X				X		
Tool for Group formation					X							
Reflection tool		X							X			
See Page	37	38	39	40	42	44	46	48	50	54	55	56

1-3 hours / +1 day

Intended use and purpose	Explore!	Good or Bad?	Courage	Improvisation theater	And Action!	Double team	Prepared for unexpected situations	Process mapping	De Bono Hats	Orientation	Odyssey plan	Camp 48 hours	Five-Five-Five (555)	DYOT (Design your own tool)
Individual	X	X			X			X			X	X		X
Group	X	X		X	X			X	X	X		X	X	X
Individual/group/plenum			X			X	X							
Ice Breaker		(X)												
Team building										X			X	
Tool for Group formation										X				
Reflection tool														
See Page	58	59	60	62	64	66	67	68	70	72	74	76	78	80

Figure 5: PUNC box overview

2.2 Reflection

In order to develop PUNC, which encompasses knowledge, skills, and attitude, and to utilize the tools within the PUNC box, reflection is indispensable. The successful cultivation of learners' PUNC necessitates the integration of both tool utilization and reflection, both before, during, and after the application of one or more tools from the PUNC box.

Educators are encouraged to help learners train and develop their reflection skills by providing guidance and support in reflecting before, during, and after using the tools in the PUNC box. This is because reflection is a vital element in the development of personal competencies. Reflection encompasses not only academic aspects, but also personal and emotional dimensions, as well as introspection regarding one's own behavior. Additionally, it necessitates personal courage and a willingness to engage in processes that develop personal competences (Nielsen, 2003, p. 30). This is precisely what is needed to develop PUNC.

Reflection can also enhance the application of knowledge, skills, and attitudes beyond the educational or experimental setting in which they were acquired. This contributes to transfer, enabling the learners to apply their personal competencies across subjects and disciplines in their future work life.

Reflection can facilitate learning by starting a cognitive process that leads to new understanding, meaning, and knowledge about a situation or experience (Grant, 2002). Through reflection, the learners can address uncertainty when using the tools in the PUNC box or when engaging in discussions with educators about setting learning objectives, drawing inspiration from the PUNC menu.

Reflection can be a difficult task, but it can be developed through training. The taxonomy of reflection by Heidi Neck (Neck et al., 2018) is a valuable tool in facilitating personal reflection and has been applied in learning activities related to personal competences, teamwork, and entrepreneurship to improve learners' reflection skills. This taxonomy presents six levels, allowing learners to engage in critical and analytical reflection, crucial for their deeper learning. An example of the use of the tool can be seen in Figure 6. The tool can also be found in the PUNC box.

Level of reflection	Explanation	Example of reflection after tool: "Courage"
Narrative reflection	What took place? What was said? Who was involved? Objective and factual description	The educator gave an assignment: You have 10 minutes to formulate 1-2 sentences expressing what courage is for you. You will present your sentences in front of the class.
Emotional reflection	How did you feel? How did you manage your emotions (e.g., nervousness, anxiety)?	I got nervous and panicked a little bit. I felt anxious …
Perceptive reflection	Your perceptions and reactions, perceptions, and reactions of others. How did different viewpoints, needs or preferences affect the experience?	I started sweating, my palms felt wet. I talked to my side mate who calmed me down and said I would be fine. It helped and made me relax, think, and focus on the task.
Analytical reflection	Analyze the situation by thinking of the skills and knowledge you gained from the experience. Analyze if anything you have learned relates to anything you have heard about before.	I survived! The others responded with encouragement, everyone was busy with their own sentence, so no one really noticed mine, and it wasn´t that dangerous. I don't remember anything. I learned that if I just calm down, I can do it. I learned something about different ways og expressing courage. also learned what I think courage is. I saw myself as brave, yes!!
Evaluative reflection	Evaluate the experience: What went well and what seemed to go badly. Was the experience positive, negative, useful, helpful?	Useful exercise, I learned that courage is different from person to person, that you can only remember your own sentence afterwards, it was good/healthy for me to be pushed because I found out that I could do it.
Critical reflection	Consider the part you played and the approach you tool. What else might you have done? What else might you have done? What have you learned from the experience? What questions do you have? What do you need to consider?	My instinctive nervous reaction initially blocked a positive experience. Next time I will try to be more rational in my approach. I learned that others feel the same way, no one focuses particularly on me, but mostly themselves.

Figure 6: Neck´s taxonomy of reflection
Source: Neck, et al., 2018.

A final perspective on reflection is that it is not just a tool for learning from a particular uncertain situation or context and making changes for next time, but that it can also be a broader opportunity for rethinking and reconsidering various aspects of one's values, identity, and self-perception. According to psychologist Adam Grant, "Rethinking" (2021) involves taking the time to reflect and potentially change one's perspective, so that learners can know "when to grit and when to quit". In dealing with uncertainty and life in general, it is becoming increasingly important for learners to under-stand and embrace that persistence may not always be the best approach, and that the outcome of reflection can sometimes mean giving up, speaking out, or even shifting one's self-concept. This helps them handle uncertainty in a productive manner.

3

The PUNC box

3.1 The PUNC framework as a meta tool

The PUNC framework can be seen as a meta tool or a user guide that educators can utilize to facilitate the development of learning outcomes. This can help educators and learners selecting a tool from the PUNC box, and ultimately advancing the overall growth of learners' PUNC by:

- **Understanding** the uncertainty experience in terms of acknowledging, exploring, and handling uncertainty.
- **Deciding** which elements of knowledge, skills, and attitude the learner needs to develop regarding this experience.
- **Formulating** one or more learning outcomes that incorporate knowledge, skills and attitude.

The PUNC framework is designed to assist learners in defining their PUNC. PUNC is personal, context- and culture-specific. Uncertainty is perceived differently by each individual and can change based on context and progress in their education. Educators must consider scaffolding and whether the development of PUNC is learner- or educator-driven. At the start of a learner´s education, educators may take the lead in facilitating these learning activities/tools, but as learners progress, they will gradually be able to build their PUNCompetence on their own.

Based on the above, it is important that learners define their own, personalized PUNC. The educator can use the PUNC and the PUNC menu and framework as a starting point in the dialogue with the learners, assisting the learners in defining his/her PUNC. The educator can also use it before, during and after using a tool from the PUNC box to frame the purpose of working with a specific tool and to evaluate the experience and promote the reflections among the learners.

So, the PUNC framework urges the learners to discover the need to acknowledging, exploring, and/or handling uncertainty. The process in the PUNC framework is necessary to make the learners acknowledge which knowledge, skills, and attitudes, they need to train and develop to explore and handle specific uncertainty situations, experiences, and tasks. The relation is illustrated in figure 7.
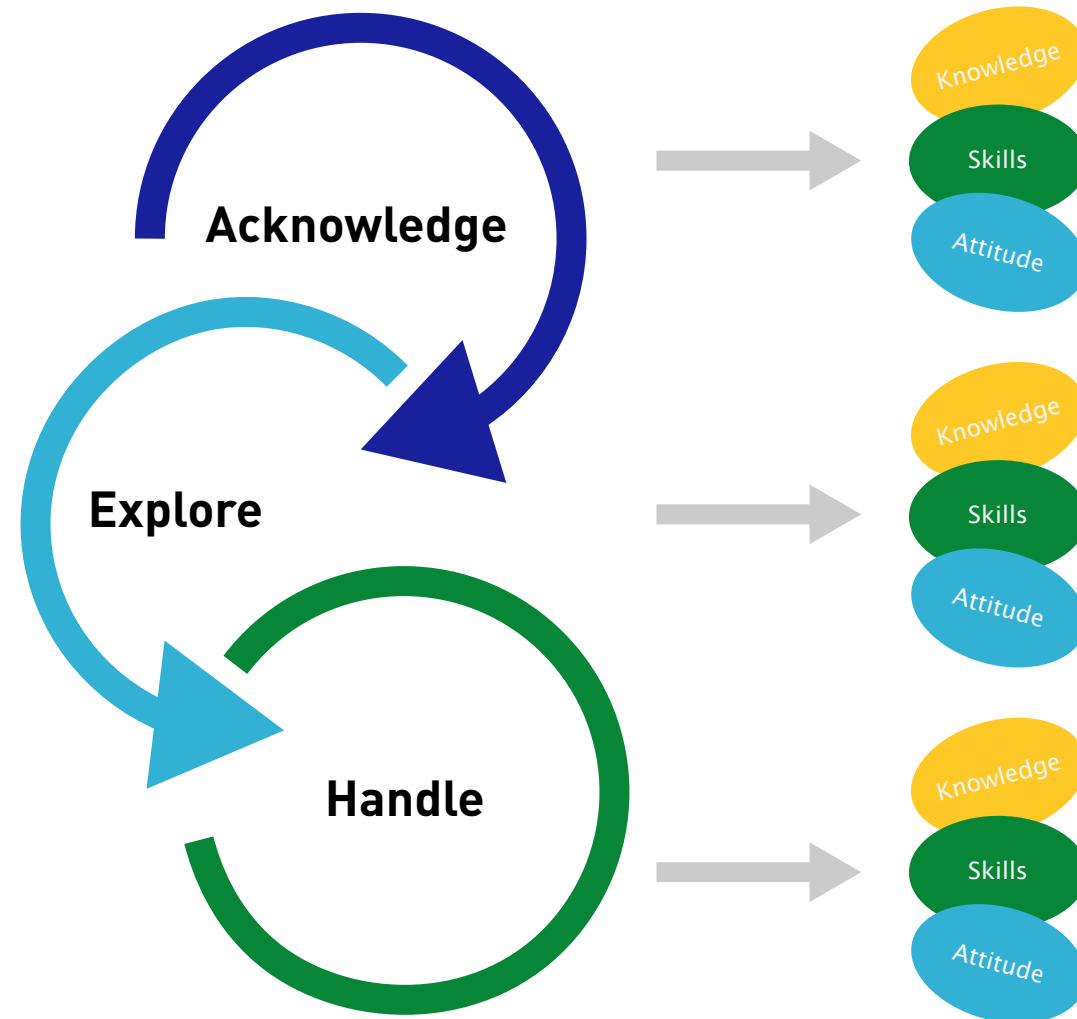
Figure 7: Three-state strategy: Acknowledge, explore, handle
Source: Bollinger & Van Rooijen, 2021.

3.2 The PUNC menu as a facilitating tool

The PUNC menu is an integral component of the PUNC Framework and can be utilized in various ways in connection with the PUNC Framework.

- It can serve as a helpful and inspiring tool to facilitate conversations between educators and learners on how to handle uncertainty positively and productively. The learners can express the different types of uncertainty they face and find ways to manage it, while the educators can use the menu to outline specific knowledge, skills, and attitudes and inspire the learners.

- The PUNC menu can inspire educators to create new teaching practices, experiments, and learning activities. They can consider the amount of uncertainty they want the learners to experience and use tools from the PUNC box to achieve specific learning outcomes and manage different perceptions of uncertainty.

- The PUNC menu can also be used by educators to help learners identify and explore their own uncertainty while constructing learning outcomes for tasks, projects, internships, and external interactions with businesses. Additionally, the PUNC menu can inspire learners to develop their own tools to turn uncertainty into a professional competence.

A competence encompasses elements of knowledge, skills, and attitude. In the context of PUNC, this means that a learner can define which knowledge, skills, and attitude they want to develop. As illustrated in figure 7, they can do this by considering the three stages of acknowledging, exploring, and handling uncertainty, and determining what elements of knowledge, skills, and attitude are necessary for handling uncertainty productively. The PUNC Menu presents various options for knowledge, skills, and attitude, from which both educators and learners can select, as shown in Figure 4.

3.2.1 Learning outcome
Once a learner has decided on the aspect they want to focus on and has used the PUNC menu to determine the necessary knowledge, skills, and attitude, they can formulate a specific learning outcome - see figure 8. This learning outcome outlines their personal PUNC for that particular situation. By focusing on concrete knowledge, skills, and attitudes, the learner is better able to direct their attention to what they want to learn.
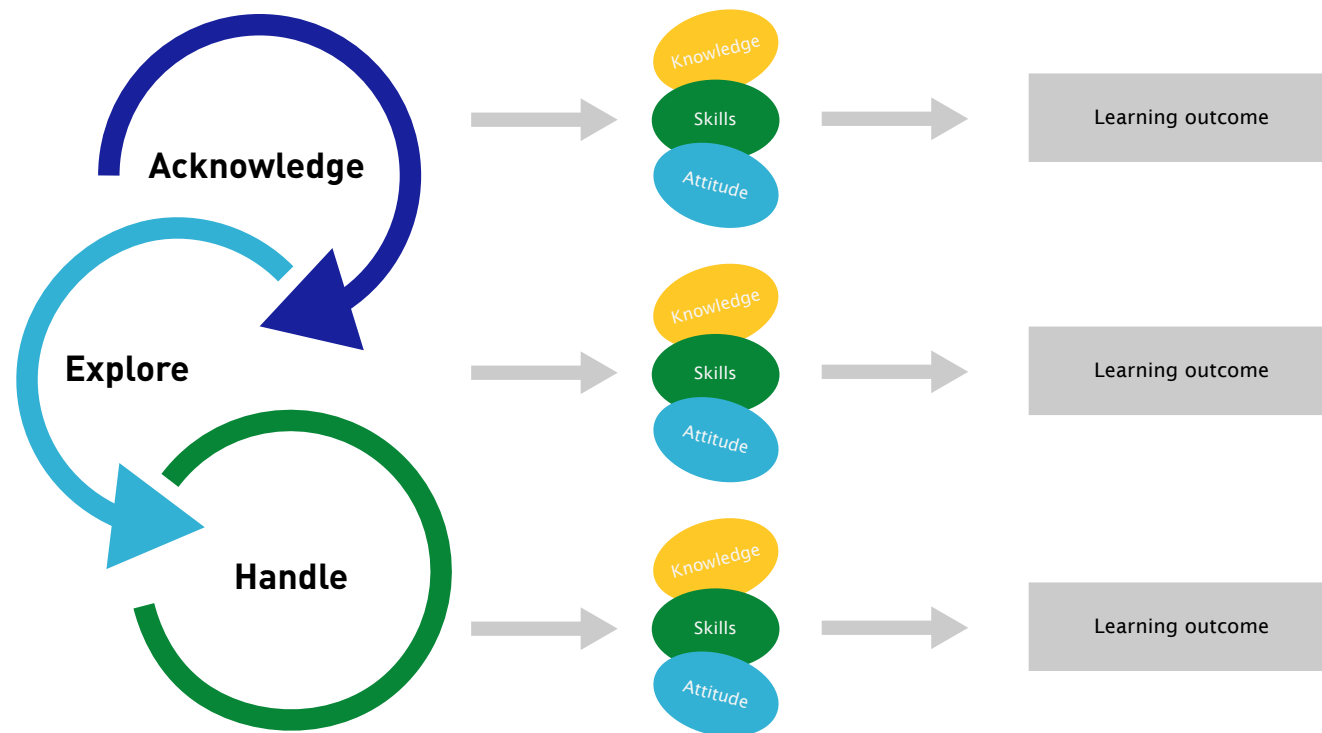
Figure 8: Formulating PUNC learning outcomes
Source: Bollinger & Van Rooijen, 2021.

Figure 9: From uncertainty to specific learning outcomes and action

Again, it should be emphasized that reflection is important for the learners´ learning outcome that the learner is encouraged to reflect on the choices he has made and their outcome.

3.2.2 From uncertainty to specific learning outcomes and action

The PUNC Competence framework offers support for the formulation of specific, contextually relevant, and highly individual learning outcomes. The need for such a learning outcome emerges from the learners' reflection on an experienced uncertainty.

Based on this reflection they decide which of the PUNC elements of the menu (knowledge, skills, attitude) are relevant for them to develop in this specific case. Then they combine these elements in one or more personal PUNC learning outcomes.

There are four steps that a learner can take to translate their experience of uncertainty into a concrete learning outcome that enables them to manage their uncertainty in a productive manner, as shown in Figure 9. These steps can be facilitated by an educator, undertaken by a single learner, or completed by a group of learners working together.

The four steps will be explained in figure 10, followed by three specific examples of learning outcomes.

Step	Explanation
1 Describe your uncertainty experience and decide on your focus	Experiences of uncertainty can be difficult to comprehend. To discover what you need to develop so that you can handle this uncertainty in a productive way, it is very helpful to put your uncertainty experience into words by telling or writing about it. If you have a clear view of your uncertainty experience, try to decide what you want to do with it? Do you want to acknowledge it? Or to explore it? Or to handle it to make it productive?
2 Choose relevant elements from the PUNC menu	When you have described your experience of uncertainty, go to the PUNC Menu. In the PUNC Menu you'll find various elements of Knowledge, Skills, and Attitude. Go through the Menu and try to find elements of knowledge, skills, and attitude that you want to develop. What knowledge do you think you need? What do you want to be able to do? What do you want to be willing to?
3 Define your personal learning outcome	After having chosen these elements, you can start formulating one or more learning outcomes. Try to combine the chosen elements of the PUNC menu is the learning outcome. If it is not possible to make combinations, then you can formulate a separate learning outcome for that element.
4 Come into action!	The learning outcome(s) gives you a concrete direction in which you want to develop. Discuss with others and decide on the action that is needed to achieve this learning outcome. And then: come into action! Make sure that you learn from any action you undertake or any insight that you gain. Reflection before, during and after step 1-4 will help you draw lessons from your experience and will also help you handling your experienced uncertainty productively.

Figure 10: Defining learning outcome based on PUNC framework and -menu

3.2.3 Examples of learning outcomes

The examples below illustrate how a learner can acknowledge, explore and handle uncertainty in three different situations by using the four steps as an approach.

Step	Explanation
1 Describe your uncertainty experience and decide on your focus	A learner experiences uncertainty when he is assigned a task that he doesn't understand. He wants clarity as he doesn't know what the results must be.
2 Choose relevant elements from the PUNC menu	• Having knowledge of where to find relevant information. • Being able to: ask questions. • Being willing to: take initiative, be courageous.
3 Define your personal learning outcome	Defining learning outcomes: I am able show courage by taking initiative to ask my tutor for support on where I can find relevant information regarding my task.
4 Come into action!	Arrange meeting with the tutor.

Example 1: Task uncertainty

Step	Explanation
1 Describe your uncertainty experience and decide on your focus	A learner experiences uncertainty while working on a final exam together with a fellow learner. The fellow learner fails to deliver the material that they agreed on. How to pass the exam?
2 Choose relevant elements from the PUNC menu	• Having knowledge of where to find relevant information. • Being able to: deal with an open-ended problem; connect socially, apply communication skills.
3 Define your personal learning outcome	Defining learning outcomes: 1. I am able to deal with this open-ended problem by connecting socially with my fellow learner by applying adequate communication skills for the problem to be discussed. 2. I am willing to deal with this open-ended problem by showing feelings, being courageous and by being receptive to gain information about why he fails to deliver.
4 Come into action!	Express my feelings and concerns to my fellow learner. Ask questions about the reasons for the missing delivery of materials.

Example 2: Uncertainty regarding collaboration with fellow learner

Step	Explanation
1 Describe your uncertainty experience and decide on your focus	A learner experiences uncertainty during the first day of his/her internship at the company of his/her dreams. The learner has high expectations for the traineeship, and he thinks that his/her colleagues have high expectations of him/her too. The learner feels that he/she must succeed in everything, and he/she has to be highly appreciated by the colleagues.
2 Choose relevant elements from the PUNC menu	• Having knowledge of one's intuition as a source of information; one's experienced uncertainty. • Being able to: investigate sources of uncertainty (internal/external); ask questions; take initiative; connect socially, apply communication skills, accept not knowing what will happen. • Being willing to: embrace doubt; endure; be receptive.
3 Define your personal learning outcome	Defining learning outcomes: 1. I can trust my intuition by using my former uncertainty experiences as a source of information. 2. I am able and willing to investigate sources of uncertainty (internal/external) in former experiences of uncertainty. 3. I am able to apply communication skills like asking questions. 4. I am willing to take initiative and be receptive to connect socially. 5. I am willing to endure and able to accept not knowing what will happen and embrace doubt.
4 Come into action!	Do my very best to solve the tasks assigned to me. Continuously take initiatives to achieve the desired learning outcomes.

Example 3: Uncertainty during first day of internship

3.3 Tools

This following overview and description of tools is intended for inspiration and to get an idea of a possible effect and ways of using a tool. Please be creative, find your own way of working with the tools and feel free to adjust the tools to your own insight, context and taste. Every tool starts with a short description and the aim(s) of the tool and possible effect(s) is stated under "Key takeaways".

The color displayed at the top of each tool's page signifies the primary focus of the tool in relation to the PUNC:

	Knowledge

	Skills

	Attitude

	Knowledge, skills and attitude

	Reflection tools

It should be noted, that despite each tool having a distinct character and providing a unique experience for each learner, it can be challenging to categorize them solely based on the PUNC menu.

Two truths & one lie

20 min.+

Description:
3-6 persons in each group.
Each person writes down 3 facts about themselves, 1 of which is a lie. Each person takes turns reading their list aloud, and the rest of the group writes down the one they think is a lie. The group now discusses and tries to identify the lie. Continue for each person in the group.

Usage suggestions:
Best at the beginning. Icebreaker tool when the group are assembled for the first time.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Materials list:
Pen and paper

Key Takeaways:
The learners get to know a bit about each other in a fast and funny way.

Teaching Tips:
The educator can start by giving an example.

MOTOROLA
A reflective discussion tool

10-30 min.

Description:
Team discussion based on MOTOROLA may vary between 10-20 minutes based on the topic/subject. Also, an educator and external partners involved in work may join. MOTOROLA comes from a US based company called MOTOROLA where there was a need to effectively discuss, collect and share project work findings inside the organization. The idea of the MOTOROLA tool was also taken into education as it is simple yet powerful tool for reflective discussion.

Usage suggestions:
MOTOROLA can be used during or after certain events, projects, learning sessions etc.

Teaching Tips:
The aim is that the group would learn to be in a dialog type of discussion and is able to reflect and assess their own work and decisions made. The educator can ask clarifying questions, challenge, and participate in discussion but not lead the discussion.

Materials list:
MOTOROLA discussion questions:
- What went well?
- What we learnt?
- What to improve?
- What to put in practice?

Group will discuss and reflect based on four main questions (above). One will act as a secretary and write down a summarization based on the team's discussion.

Key Takeaways:
To be able to identify what was done well, where and how to improve the performance, what was learned and what are key takeaways what can be put into practice (e.g., in the next project)

Speed dating

30 min.

Description:
Could be used in the beginning, for team building, getting to know each other. Papers with certain themes are distributed on tables, two learners meeting for 3 minutes at each table. Topics e.g., Turku, Summer, studies, free-time, future, interests, design, transport vehicle, etc.
After 3 minutes the tables are changed with a new pair.

Usage suggestions:
In the beginning of the course/project, perhaps first year learners, multidisciplinary course.

Teaching Tips:
Ice-breaker use, gives initiative to the learners, makes them talk about easy and outside-of-school topics

Materials list:
Paper with discussion topics, perhaps supportive questions. Clock for timing.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Neck´s taxonomy of reflection
A tool for reflection

15-60 min.

Description:
Individual reflection-based Neck´s taxonomy may vary between 15-60 minutes, depending on the task or experience. An educator may facilitate the exercise, especially the first time, to introduce the reflection model to learners. Neck's taxonomy of reflection was developed by Heidi Neck, a distinguished professor of Entrepreneurship at Babson College in the USA. When asked to reflect, it is common to not know how to do so effectively. Without intentional and focused reflection, we often resort to writing in a diary or journal, which does not lead to learning from our actions. Neck's taxonomy is a tool for intentional and focused reflection, allowing learners to become aware of feelings of discomfort, critically analyze their own feelings and knowledge, gain new perspectives, evaluate outcomes and learning, and draw conclusions.

Usage suggestions:
Necks taxonomy of reflection can be usedduring and/or after certain, events, projects, learning sessions etc.

Materials list:
Use the template – and maybe show example of use (see figure 6) when introducing the tool.

Teaching Tips:
The aim is that the learner will learn to reflect beyond their immediate feelings (frustrations) in a difficult situation and will be able to learn from them. In the long run, this will help changing their mindset and approach when tackling uncertainty. The educator can ask clarifying questions, challenge, support and sum up the learning points and key takeaways that can be used in similar situations in the future.

Key Takeaways:
To be able to identify what can be learned from an activity, challenge, learning activity, uncertain situation and what are key takeaways what can be put into practice (e.g., in the next project)

Template: Neck´s taxonomy of reflection

Level of reflection	Explanation	Reflection
Narrative reflection	What took place? What was said? Who was involved? Objective and factual description	
Emotional reflection	How did you feel? How did you manage your emotions (e.g., nervousness, anxiety)?	
Perceptive reflection	Your perceptions and reactions, perceptions and reactions of others. How did different viewpoints, needs or preferences affect the experience?	
Analytical reflection	Analyze the situation by thinking of the skills and knowledge you gained from the experience. Analyze if anything you have learned relates to anything you have heard about before.	
Evaluative reflection	Evaluate the experience: What went well and what seemed to go badly. Was the experience positive, negative, useful, helpful?	
Critical reflection	Consider the part you played and the approach you took. What else might you have done? What have you learned from the experience? What questions do you have? What do you need to consider?	

Source: Based on Neck et al., 2018.

Join a group

Description:

Learners are given very vague instructions on how to divide into groups. If learners worked in groups previously, they must be informed that the group composition for this task must be different. The number of learners in one group is their own decision (between 3 and 6 people), various competencies and knowledge will be essential to perform the tasks, which should end with a group presentation.

The exact task should be related to the course main area, therefore Join the group! Can be used for every course. On the other hand, learners are familiar with the general area of the task. The task should not be too demanding but should finish with a group presentation. What's important, each group member must take part in a group presentation (say something), but the overall time for presentation is the same for all groups and should be strictly obeyed.

Questions for discussion:
- How did you manage to divide yourself into groups? (Any scheme, similarities etc.)
- Can you recognize your emotions during this phase?
- What do you think about the information about the task that you are going to solve before group division? (Was it sufficient, clear etc.)
- Why is it more often that people work within the same groups? (Benefits and disadvantages of such behavior)

Usage suggestions:

Best at the beginning. Icebreaker tool when the group are assembled for the first time.

Key Takeaways:

To understand that uncertainty may have positive outcomes, leaving the comfort zone can be beneficial for achieving goals, working only with those we already know well might lower our adaptation ability, lower chances for new experiences and benefit from other people competencies

Reflections:

The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Teaching Tips:

Some learners might experience problems joining a group, therefore groups should have 3 to 6 members, the given task for group work should not be highly complicated as the merits of the group works is to experience uncertainty during the phase of group division and insufficient information about the task before, during the group division phase the educator can make some observations on learners behavior which could be relevant to bring up during the discussion phase (note for example how learners approached others, words).

Roll your plague

30 min.+

Description:

Total time about 30 min.:
- 5 min. intro
- 15 min. construction and testing time
- 10 min. reflection

Organize the whole group in teams of 3 to 5 people. You need at least 2 teams.
There are 2 variants of this exercise: 1) Pasta Tower 2) Paper bridge.

The whole idea is to divide the time of the exercise and add there 2 unpredictable events that occur during the exercise. The teams are supposed to use a 10 min timeslot to build the construction in 1 out of 3 variants. After 3 min and after 6 min the facilitator stops the time, roll dice (k6) and inform the teams about the plague that is happening. Examples of the plagues:'

1. Plague of mice is coming to town. One of your team members is allergic tom mice fur and goes on sick leave for 2 min. Choose 1 person to sit on a bench for 2 min.
2. Rat race competition, every team is recruiting and offering better wages. Every team is rolling the dice and choosing one person who is going to another team.
3. Tornado, during night the tornado came through the construction place. The facilitator uses a hair dryer to expose the construction to wind for 15 sec.
4. Sore throat attack – you cannot speak for 2 min.
5. Winter holiday trauma – you were on winter holidays skiing and snowboarding and had an accident. All the team members cannot use their primary hand till the end of the game.
6. Budget cut - you need to remove half of the materials that you have not used yet.
7. The PUNC level can be modified by informing or not informing about the occurrence of the plagues. You can even change the game to inform them about the plagues and ask them to plan a strategy of overcoming them 2 min before the start of construction work, but we recommend just putting the teams in deep waters to experience the uncertainty.

Variant 1 Pasta Tower

(Prepare one table per team, materials are prepared on the tables)

Your task is to build the highest tower only from given materials that on its top can hold a marshmallow. The height will be measured from the lowest point of the structure to the marshmallow.

Usage suggestions:

When the participants want to focus on uncertainty in the group dynamics. How to quickly acknowledge uncertainty when the success of a team depends on fast reaction and change in the thinking process challenging their cognitive flexibility.

Material list:

Per team:
- 20 straws of spaghetti
- 1 marshmallow
- 50 cm of paper masking tape
- 50 cm of a string

Key Takeaways:

Experiencing the uncertainty and reflection - both individual and a group one is the key takeaway from this exercise. Time limitation and unexpected events increases the intensity of experiencing uncertainty which is the trigger for reflection of the group process and how we can acknowledge, explore, and handle uncertainty

Variant 2 Paper Bridge

(Prepare two chairs per team, that are at 60 cm from each other)

Your task is to build a bridge - only from the given materials - that can hold as many shoes as possible. A bridge scores when it does not break for 10 sec after a shoe is put on the bridge. The shoes can be put on the bridge only between the chairs.

Teaching Tips:

Put focus on reflection and discussions about feelings of the individuals and how they acknowledge, explore and handle uncertainty. How they felt in the beginning, during and after the exercise. What the uncertainty made with their minds, feelings, bodies. How they reacted and how they thought they should react. All insights are ok – it's all about experience and having a retrospection of the events to handle uncertainty better in the future.

Reflections:

Ask the questions and discuss the answers:
1. How do you feel? Before, during and after the exercise?
2. How challenging was it to acknowledge uncertainty in such an exercise?
3. What was your team response to the first/second plague? How can you improve your team's response? What is helping you in your team response? What was difficult in giving a response to the plague?
4. What benefits can you see from experiencing such plagues? Are there any?

Creative business cards

45-60 min.

Description:
Each learner is supposed to create a creative business card and use it to learn more about members of the class.

At the very beginning learners get small sheets of paper and the following instruction: "Your task is to create a business card on this small piece of paper. But you are supposed to do it in a specific way. On the one hand a business card should look ordinarily (how one's expects a business card to look, with your name, city, etc.), while on the other hand it should present its author in the most imaginative and creative way possible (a picture, no words). The artistic quality of the business card is not important - what counts is an original and interesting idea. For this part of the task, you have 4 minutes."

After those 4 minutes: "Now you should stand up and approach someone you do not know or know poorly and exchange your business card for that of the other person. Tell each other about your business cards, exchange, and go to another person with that someone else's business card (which they received in the first round) and tell this person about the creator of the business card you have in your hand. Try to convey as much of the original content as possible. After 2-3 exchanges - take a chair and make a circle."

Now everyone in turn tells the group about the person whose business card they currently have, referring to the appearance of the business card and what they remembered from the information received. The creator of a given business card waits for the presenter to finish, and then he/she can correct the interpretation and add some information that was missing/important, etc. Avoid talking to people you have already spoken to and your own card.

Questions for discussion:
- Can you recognize your emotions during this task?
- Why is it important to avoid words in the "creative" part of the business cards?
- Why do we ask you to exchange cards and avoid your own?

Usage suggestions:
Can be adapted to all kinds of courses. Maybe best in the beginning of the course.

Teaching Tips:
Make sure each learner understands the task and draws what he/she is supposed to draw. Start the presentation with a volunteer and then ask the person who was presented to talk about the business card in his/her possession. Make sure the owner of the business card presented is sitting in silence during the presentation. Do not make the groups too big.

Materials list:
Small (business card like) sheets of paper

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Eye contact

30-45 min.

Description:

The learners must find a classmate that they do not know that well yet. The 2 learners placed each other directly opposite each other. The task is to keep eye contact for the next 2 minutes. The educator manages the time. This activity takes place inside the school's premises, in the classroom in front of other learners and the educator. It is important that, the learner experiences psychological safety and dare to be vulnerable, but at the same time show courage

Usage suggestions:

This exercise can be used at all educational levels. It is best placed in the middle of the semester, so that learners know each other, and it is probably best placed in a context where the learners work with personal competences and character qualities.

Teaching Tips:

Introduce the PUNC menu after the exercise and the following discussion of the importance of eye contact in relation to being and showing mindfulness. It can be a discussion and evaluation tool for framing and elaborating the reflection on the exercise, talking about mindfulness and how learners can work with mindfulness and being present in the now.

Materials list:

Articles, both academy and non-academic, podcasts, movies, and YouTube videos about mindfulness, promoting learners' reflections about perspectives on mindfulness, what is it, which types of mindfulness are available, which tools and how to work with mindfulness. This can be used for framing and developing their own experiences and perceptions of mindfulness. Most materials are based on academic and empirical research results from the Center for Mindfulness at the University of Aarhus (https://mindfulness.au.dk/en/)

Prework required by learners:

Read curriculum according to materials list. The eye contact exercise is not revealed in the material, but is presented at class by the educator

Key Takeaways:

Why and where is eye contact important, professionally, and personally? What can eye contact do? Why is it crucial for being mindful?
Usually, the learners find that this exercise challenges personal boundaries, but the reflection afterwards make them see the relevance in doing and facing an uncertain and uncomfortable situation.

Time plan:

It is given by the educator.
1. Instructions for the exercise
2. The exercise
3. Dialogue 2 & 2 about the exercise.
4. How was it? Reflection, first individually or 2 & 2, then in plenum
5. Introducing the PUNC menu as a tool to help and inspire reflection
6. wrap up of the exercise, why and where is eye contact important, professionally, and personally? What can eye contact do? Illustrated by a YouTube video: https://www.youtube.com/watch?v=mEcqoqvIxPY

Reflections:

After the exercise, the learners must talk and reflect on how the exercise was. They must discuss: Is it important to be able to keep eye contact? Why – why not? When – which contexts? What does it say about a person, if he/she is able to keep eye contact – not able to keep eye contact? What is the relation to mindfulness? Is it relevant in relation to being mindful?

Trigger me!

30-60 min.

Description:

Faced with a difficult decision? Feeling a bit overwhelmed? Feeling uncertain? Finding it hard to move forward? Time to do something about it! Reflect on it yourself or discuss it with others. Find out what's motivating you – or holding you back. Turn your 'alarm bells' into 'actions' and make your uncertainties productive!

Trigger Me! can help you recognize and explore moments of uncertainty in your process. By coming to terms with your uncertainty and translating it into concrete action, it can help you become more productive.

You will work with the following elements:

- **ALARM BELL** - What's making you feel uncertain or unsafe, or giving you second thoughts?
  Examples include an unclear situation, deadlines, evaluations, feedback, people around you, a lack of information, doubts about your abilities, expectations, open structure, personal responsibility.
- **ANCHOR** - What gives you a sense of certainty, security, or greater control?
  A positive experience in the past, for example, or other people's support, feedback, or self-confidence.
- **ENERGISER** - What's a real source of energy for you? What do you enjoy doing? What gives you pleasure?
  Exciting discoveries or results, for example, or satisfying your curiosity. Or relevance, working together, compliments, self-confidence, pride, recognition.
- **ACTION** - Which action could you take when you look over the other cards?

You will work with the following triggers:

SELF-DISCLOSURE: During your process, you both take decisions and have new learning experiences. You can show this to those around you by means of self-disclosure. This can be done by striking up a conversation, adopting a certain attitude or by sharing images or products that have come out of these choices or learning opportunities. Self-disclosure involves showing aspects of yourself – and this can make you feel more confident or, in contrast, more uncertain.

JUDGEMENT: Your personal process may be influenced by a test, grade, or feedback. This form of evaluation is offered by someone else (a fellow learner, educator, or colleague). And could be experienced as a judgement on you as a person. You may also have you own opinions about your personal commitment, quality, or results. This can make you either more or less certain because judgements can be both negative and positive – taking the form of a compliment, for example.

RISK: To really take something away from your process – indeed make the very most of it – you must be prepared to take risks. The risk of being judged by others, or self-disclosure. Or 'investment risk', for instance: will the time and energy you invest in this process ultimately yield the desired results? This can lead to both certainty and uncertainty.

COMPETENCE: During your process, you can feel competent to a greater or lesser degree. This feeling can change from one moment to the next, but overall, it can make you feel more, or less, certain. Whether or not you feel competent also depends on your previous and current experiences, your self-image and on other people's responses.

FREEDOM: Every process offers some form of freedom: freedom of choice, for example, or freedom to take the initiative. A lot of freedom can be great if you want to feel independent. But it can also backfire if you have a need for structure and guidelines like clear criteria or a strict planning. In other words, a lot of freedom – or, in contrast, very little freedom – can lead to both certainty and uncertainty.

OTHER PEOPLE: Other people also play a role in your process. They can offer support, empowerment, judgements, expectations, feedback, or confirmation. This interaction can also make you feel more, or less, certain of yourself. You have all sorts of other people in your environment: fellow learners, for example, educators, friends, your partner, parents, or other people who are important to you.

Usage suggestions:

1. Choose a specific moment in your process where you hear an Alarm Bell going off in your head. This could also be a moment in the past if you prefer to reflect on that. Write down this Alarm Bell with a **red marker**. Write Anchors (**in green**) next to this Alarm Bell which you can use to quiet down this Alarm bell. As well as Energizers (**yellow**), which give you a fresh boost of positive energy. After this, think about which concrete Actions (**blue**) you can take to handle this feeling of uncertainty. Write at least one action for every Anchor and Energizer. Be sure to take a picture – as a record of your insights!

2. Instead of starting off with an Alarm Bell start by choosing a Trigger and determine where and how (positive/negative) it plays a role in your process. Find other Triggers that relate to this first one. Lay them side by side for a better overview.

3. Combine your Triggers with the colored words. Write down an Alarm Bell. Choose the Triggers that you think are particularly relevant to this Alarm Bell. Then determine which Anchors and Energizers go with each of your Triggers and write them next to the Alarm Bell.

Trigger me!

30-60 min.

Colored markers, paper

Teaching Tips:
The user can combine this tool with Process Mapping.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Normalizing nervousness

45 min.

Description:
A line for how nervous members of the group is feeling right now is made, and members place themselves accordingly. Learner tutor tells why he/she chose that place and how it shows today and then asks other members standing in diff places on the line. As a group it is discussed how doing the exercise felt. Short material on stress/being nervous is distributed and a short video is watched together (on how to overcome fear of presenting). Discussion led by the learner tutor on e.g., what did I learn about the phenomena, what was surprising or new, what familiar, did you change your perception on other people's nervousness, how to cope the feeling, how to make it easier to handle, how can the group help with that, how can the audience help. Supportive questions are given to the learner tutor beforehand.

Usage suggestions:
In the beginning of the course, not the first time though. Learner-led course/project. 1st year learners especially.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Materials list:
https://areena.yle.fi/1-3025849
https://www.yths.fi/app/uploads/2021/02/JAN-NITTAMINEN-OSANA-ELAMAA-opiskelijaopas.pdf
https://www.youtube.com/watch?v=CBVO-6WKe2g
(in Finnish)

Prework required by learners:
Material can be shared beforehand, Supportive questions are given to the learner tutor beforehand.

Key Takeaways:
Normalizing being nervous by talking about it, especially important in the beginning of the studies, supports team-building.

Your Backpack
(Inspired by Sarasvathy et al, 2006)

45 min. +

Description:
Your Backpack is an individual task. The learner must answer (work with) three questions: Who am I? What do I know? Who do I know? A tool to help answer the first two questions could be the competence-triangle. A triangle with theoretical, practical and personnel competencies at the sides. For the question "Who do I know?" a map of all the learners' connections can be made. What competencies do my connections have that could be useful at some time?

Usage suggestions:
Best at the beginning. The learner gets a picture of his/her own means and resources that will keep on developing. When faced with uncertainty and challenges the learner will know what resources are at hand.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Materials list:
Pen and paper

Key Takeaways:
The learner gets an understanding and a perspective on the resources that are within his/her reach – in the Backpack. Or in a team as a whole.

Teaching Tips:
It is a tool for the individual learner – but all the "resources" can pe pooled together if the learner is part of a team.

Theoretical foundations:
https://www.researchgate.net/publication/228145520_The_Bird-in-Hand_Principle_Who_I_Am_What_I_Know_and_Whom_I_Know

Little Red Riding Hood

45 min.

Description:

Learners receive a short version of the well-known fairytale, such as (preferably) "Little Red Riding Hood", "Hansel and Gretel", etc.

Task: Learners are supposed to reinterpret the fairytale based on their area of expertise/field of their studies, i.e., Economy, psychology etc. They are supposed to look for the symbols (the road, the basket, etc.) and metaphors (grandma, wolf, girl, etc.) and give them a new meaning. At the end – a new version/understanding of the classic tale, related to their field of studies, will appear.

Questions for discussion:
How did you manage to look for and name all metaphors and symbols?
Can you recognize your emotions during this task?
What was the most complicated part of this task?
Why did we use fairytale?
And why did we use this <title> fairytale?
What did you learn?

The answers can be linked to the other parts of the PUNC framework: explore and acknowledge.

Materials list:
The fairytale

Teaching tips:
Groups shouldn't be too big. Probably dividing the class into groups of 4 members is the best solution. Cheer learners and emphasize that there is no right solution, that they are supposed to play with the idea and create an elaborated story.

Key Takeaways:
To understand that uncertainty may have positive outcomes, leaving the comfort zone can be beneficial for achieving goals, working only with those we already know well might lower our adaptation ability, lower chances for new experiences and benefit from other people competencies

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Explore!

Description:
Learners will take a picture or choose a piece of music which depicts their uncertainty experience/uncertainty feelings. They will explain their choice to the other team members, who can then ask questions for clarification. Suggestions for questions that can be asked:
- why did you choose this picture/music piece?
- what does it mean to you?
- to what part of the uncertainty experience/feelings does it refer to?
- which keyword might correspond with your picture/music piece regarding your uncertainty experience/feelings?

Materials list:
A mobile phone or laptop to show the pictures/music

Prework required by learners:
Learners can be asked in advance to search for a relevant picture or piece of music.

Teaching Tips:
Give the learners space to ask questions; educator also takes part in the exercise and presents examples of his/her uncertainty

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Good or bad?

Description:
The educator starts the session with an example of his/her own uncertainty experience and asks learners to think about a situation in which they experienced uncertainty.
One by one the educator asks the learner to share his/her uncertainty experience.
In duo's the learners ask each other: "is the experienced uncertainty good or bad for you as a professional?" and they will talk together about it. The GOOD will be written on a green post-it and the BAD will be written on a red post-it. The post-its will be glued to a paper and the whole group of learners can ask more information about a word/sentence on the post-its: Questions that can be asked:

- Why is the uncertainty experience good or bad for you as a professional?
- What are your feelings about the uncertainty experience?
- What do you want to do with the uncertainty experience and the uncertainty feelings?

Learners must feel the space to say that they will not do anything with the good or bad uncertainty experience.

Materials list:
Red and green post-its, flaps

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Key Takeaways:
That people can differ in experiencing uncertainty and uncertainty feelings

Teaching Tips:
- Secure the safety of the group.
- Do not judge any given answer of learners,
- Give learners the space they need within the time frame,
- Make every learner's experience important
The answers can be linked to the other parts of the PUNC framework: explore and handle.

Courage

Description:
What is courage to you? Reflection based on the curriculum and the learner's own experiences and thoughts about courage. The task is to formulate 1-2 sentences that expresses the learner's perception of courage and be ready to stand up in the classroom and share them with the learners' classmates.

This activity takes place inside the school's premises, in the classroom in front of other learners and the educator. It is important that the learner experiences psychological safety and dare to be honest and vulnerable and at the same time show courage.

Usage suggestions:
This exercise can be used at all educational levels. Is best placed in the middle of the semester so that learners know each other, and it is probably best placed in a context where the learners work with personal competences and character qualities.

Time plan:
Is given by the educator.
1. Preparation time for the individual learner
2. Presenting in a voluntary order
3. Introducing the PUNC menu as a tool to help and inspire reflection.
4. How was it? Reflection, first individually or 2 & 2, then in plenum

Materials list:
Articles, both academy and non-academic, podcasts, movies, and YouTube videos about courage, promoting learners' reflections about perspectives on courage and framing their own experiences and perceptions of courage.

Prework required by learners:
Read curriculum according to materials list. Reflect and prepare 1-2 sentences, maybe rehearse the presentation.

Teaching Tips:
Introduce the PUNC menu after all learners have presented their perception of courage. It can be a discussion and evaluation tool for framing and elaborating the reflection on the exercise, talking about courage, demanding courage.

Reflections:
The reflection part is extremely important and valuable. What happened to the individual learner? What kind of uncertainty did he/she experience, and how did he/she handle it?

Can you put words on your experience of uncertainty? What did you think? How did you approach the task? Can you use the experience to handle other or likewise situations in the future? Can you use the PUNC framework as a help and maybe train and develop your courage or attitudes related to courage?

The learners are encouraged to use the reflection taxonomy by Heidi Neck to reflect on this exercise.

Improvisation theater

1 hour +

Description:

Drama as a tool to experience, explore and handle uncertainty can be used in many ways. Here we want to propose improvisation games that can make the participants challenge themselves in the situation with high uncertainty to grasp the feeling and try to explore and handle the situation.

1. Strobe Monument

It's a group exercise (min 4 people, max 8). The task is to create a monument that will be changing like in the strobe light by a new person joining the composition. Every participant chooses the number to indicate the order. The first person stands in a pose in front of the others in a posture, gesture, mimics that he or she wants to give character to the monument. The task for the next person is to get the mood of the monument and by joining the composition completely change the character of the piece of art. The bigger, the funnier, the more unexpected change the better.

2. Cab Driver

It's a group exercise. You need 2 chairs placed next to each other like in the cab. 2 people are on the stage and the rest are watching or waiting for their turn. The group chooses 2 people to start. One will be a driver, the second one will be a client. The cab driver starts by sitting on the driver's seat and starts driving. Then the client gets in the cab and sets the scene by changing the situation and starting the discussion. The driver does not know who the client is and where the person wants to go and why.
When the scene gets boring, or it's stuck in a dead end, the driver must find a pretext to get out of the car. Then the client sits behind the wheel and looks for the client. The next person in a queue gets in the cab and another scene starts.

3. Job interview

One person is chosen to leave the room. He or she will be the person who applies for a job. The rest of the group must choose which job this person is applying for. When they agree on the position, they invite the person to join the rest. Then the rest of the group asks questions regarding this post. The interviewee has 2 goals: 1) he really needs to get the job and 2) he needs to guess which position he is applying for. The questions need to be constructed in a way to give small hints to the interviewee but not disclosing the position from the beginning. The facilitator can end the interview when the situation is stuck in one point or when the interviewee seems to know the job he is applying for.

Usage suggestions

When the participants want to focus on uncertainty in the group dynamics. How to quickly acknowledge uncertainty when the success of a team depends on fast reaction and change in the thinking process challenging their cognitive flexibility.

Time plan:

1. Introduction
   a. Goal
   b. Agenda
   c. Grand Rules
2. Choice of a game
3. Game play
4. Reflection

Key takeaways:

Experiencing the uncertainty and reflection - both individual and a group one is the key takeaway from this exercise. Time limitation and unexpected events increases the intensity of experiencing uncertainty which is the trigger for reflection of the group process and how we can acknowledge, explore and handle uncertainty.

Teaching Tips:

Put focus on reflection and discussions about feelings of the individuals and how they acknowledge, explore and handle uncertainty. How they felt in the beginning, during and after the exercise. What the uncertainty made with their minds, feelings, bodies. How they reacted and how they thought they should react. All insights are ok – it's all about experience and having a retrospection of the events to handle uncertainty better in the future.

And... action!

Description:
Learners want to handle their experienced uncertainty. They first will individually answer these 4 questions with as many examples as possible:

1) what they are good at
2) what they can rely/trust on (as a person, or regarding skills/attitude/knowledge)
3) which persons and which contextual matters they can trust on
4) what gives them energy.

Everyone (including the educator) will write their answers on a post-it and stick them on one of the 4 flaps or directly on a flap. The results are 4 flaps which can support the formulation of actions.

Educator and learners will look at their experienced uncertainty and based on the flaps all can:
- be inspired with several ideas which could help them to formulate actions.
- formulate what one needs to come into action.

Working in duo's (or trio's) they can support the formulation of actions by asking each other these exemplary questions:
- what do you want to change regarding your experienced uncertainty/feelings?
- can it be changed?
- what do you need from yourself?
- what do you need from others (private persons/context/ context related professionals)?
- what are you good at regarding what you want to change?
- what can you rely on (in yourself and others) about what you want to change?
- can you formulate the desired change in maximum 2 sentences?
- what action are you going to take tonight/tomorrow/next week?
- how do you monitor your action?
- when are you satisfied about your action(s)?

Important to stimulate to find relations between the intended action(s) and the qualities of a person (what he is good at, whom he can trust, on what he can fall back to, what gives energy).

Let learners reflect afterwards on their insights and what they learned from the other learners.
Talk next session about the intended or conducted actions and keep this alive during every session.

Materials list:
4 flaps

Key takeaways:
Actions are related to the quality a person has.

Teaching Tips:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.
- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Double Team

1-2 hours

Description:
Use of time and number of participants: 1-2 hours, 8-15 persons.

Method: Start by designing the question or the theme. Say," Please write down 5-10 thoughts or ideas by yourself". After this, ask people to pair up, discuss the idea and choose three. Ask the pairs to present their three ideas and publish them on a wall. Say," Please discuss the published ideas and, again, choose three. Go and mark your choices on the pieces of paper on the wall." You now have data on what the group considers important. The winners are then grouped and, if necessary, another vote can take place.

Usage suggestions:
When to use: Particularly suitable for a large group.

Materials list:
Paper and pens, wall, post-it's are handy

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Teaching Tips:
E.g., Can be used in a project environment when ideas are needed and/or when the group stuck. Creates discussion, makes learners communicate, facilitates peer support and learner initiative. Useful when encouragement and creativity is needed.

Prepared for unexpected situations

2 hours

Description:
The educator initiates a session with learners to imagine how unexpected situations could threat the success of a professional project or contract and take preventive actions to deal with them.

FIRST PART: 1h
Introduction (15 min): The educator will introduce the importance of managing uncertainty in a professional environment. Following that, the educator will describe a realistic professional situation related to the subject. Learners will then be divided into small groups.

Brainstorming task (10 min): Each group will imagine several hypothetical external situations that can threaten success or profitability.
Impact of the problem (10 min): For each situation, the group will evaluate the impact of the problem.
Sharing (10 min): The educator will contribute with additional situations if necessary.
Group situations (5 min): The identified situations will be grouped.
Assignment of scenarios (5 min): A scenario will be assigned to each group.

SECOND PART: 1h
Preventive actions (20 min): Each group will define preventive actions to its scenario and evaluate how they could be reflected in the extra costs.
Sharing (25 min): Each group will share their outcomes with the other learners.
Decision (10 min): Using a voting scheme, the class will choose 3 preventive actions to implement.
Final remarks and conclusions (5 min): The educator will emphasize the importance of considering uncertainty about unfavorable scenarios and preventive measures to better cope with them.

Teaching Tips:
Examples of possible scenarios to be considered: pandemic situations; natural disasters; a key person leaves the team; problems in the supplying chain; obsolesce of materials employed (unavailability in case of future needs); increase of costs (energy, materials, real state, salaries); changes in mandatory regulations.

Usage suggestions:
Which external scenarios could lead us to an unfavorable situation? How critical is the impact on our professional matters? What can we do to cope with them? Should we consider implementing preventive measures? Which of them are cost-effective?

Process Mapping

2 hours

Description:

(maybe combined with Trigger me!)

Process mapping is a visualization tool in which an individual learner, a tutor or a group of learners or tutors, produces a physical map of their research processes with a focus on uncertainty. Next to other meaningful elements of the process at hand, participants are asked to plot the above-mentioned elements of uncertainty in the map of their professional processes. By doing so, they gain insight in the place, form, and intensity of uncertainty at certain moments in the process.

Comparing a professional process with a journey, one can see it as travelling from start to finish with the metaphor of a map as a visualization of this journey. In particularly, maps provide a theoretical model for considering the unknown and they provide means for knowledge exploration and coordination. They can be very helpful for learners because they help to make the difference between deliberate and accidental voyages. By visualizing the process at hand learners can gain insight and control over their own journey through the learning space.

Key takeaways:

The result of these activities is a process map with meaningful elements, speckled with different colors in different places between Start and Finish, accompanied with clarifying keywords. This visualization provides knowledge on where, how, and why safe uncertainty plays a role in the research process. This information can be exchanged between the participants by presenting their maps to each other, supporting dialogue on the subject, and improving mutual understanding on the subject between the participants.

Materials list:

Large sheets of paper, markers in various colors, stickers in various colors. Trigger me!

Usage suggestions:

In a workshop setting and working on a large sheet of paper, small groups of participants visualize their process between a self-chosen start and finishing point. Between start and finish, the map is filled (linear, iterative, or otherwise) with words/drawings of meaningful elements like incidents or events that appear during the process. This part of the research mapping activity is supported by participants questioning each other or making suggestions from their own experience. This we regard as an important generative force for the process itself because this dialogue can support visualization.

In order to explicate uncertainty in the process map, the elements of Trigger Me! Can be added to the visualization (alarm bells, anchors, energizers, Triggers, Action). The intensity of presence of these elements can be expressed by stickers. For example, when a certain element is present at a particular spot on the map, the participant can put stickers on it on a scale of 1 to 10 (1: not much; 10: very much). To specify the meaning of a specific moment, keywords can be added.

Reflections:

The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

De Bono Hats
Effective thinking process

90 min. +

Description:

Six Thinking Hats (by de Bono Group) is easy to use and an effective thinking process. The task requires a team of six members. Each person takes a thinking role that is identified with a colored metaphoric "thinking hat." By wearing and switching "hats," everyone can easily focus or redirect thoughts, and discussion.

Usage suggestions:

Thinking Hats can be used for different kinds of problems or topics that can be discussed. Usually, the blue hat is worn by the same person as an organizer or discussion leader role. The rest of the hats can be assigned so that the entire group wears the same color hat at the same time or a different hat to each person and then rotate the hats to encourage more ideas.

Time plan:

Time per each round may vary based on the topic and how active the discussion is. Different ways to implement but this is one option:

- 10-15mins explaining what the idea of De Bono Hats is and what hat colors are and those ways of thinking.
- 10-15 min The Blue hat introduces the topic and gives 5-10 minutes to participants first collect thought under of hat.
- 10-20 mins per a different hat round then switch

Key Takeaways:

Use "hat thinking" to make better decisions, learn collaboration, express feelings, and different ways of thinking.

Reflections:

The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Materials list:

Yellow hat	This hat symbolizes brightness and optimism. Explore the positives and what is or can be good and what works well.
Black hat	This hat is for being cautious and looking for risks, difficulties, and problems. Spot weak points, things that might go wrong, risks, why something is not working. This is not a negative hat but a cautious one.
Red hat	The red hat is about feelings, gut feeling, and intuition. Express emotions and feelings and share your fears, likes, dislikes, loves, and hates. No need to justify feelings.
Green hat	This hat focuses on creativity and possibilities. Seek different kind of solutions, alternatives, new ideas.
Blue hat	The Blue hat is a manager for the process. This hat leads or facilitates the discussion and organise and controls the process. Introduce the topic and keep focus on the outcome.
White hat	White Hat is the fact hat. It searches for information known or needed, proven facts, further information needed, what is relevant and what's not. White hat perspective is objective and neutral.

Orientation

Description:
In the beginning of a course/project/assignment/etc. a learner sets personal goals, and a team discussion follows. In addition to personal orientation, learner groups discuss individuals' goals and expectations and based on these, the groups' goals and action plan are defined. The group discussion helps team dynamics by defining the common goals and rules and thus engages the whole team to its best potential.

Usage suggestions:
Can be used at all educational levels. In the beginning of a course, project work, group work, individual task etc. Wide variety of possibilities. The goals set in this activity can be reviewed at the end of the study unit.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Materials list:
Supportive materials and questions may be used to help the learner set the focus.

Prework required by learners:
Individual orientation is the prework for the group orientation.

Time plan:
1. personal orientation & setting individual goals.
2. group discussion
3. setting goals for the group

Key Takeaways:
Clarity and goals for future work.

Description:
An activity that helps the individual learner in turning uncertainty and ambiguity into possibilities and identifying ways to explore the possibilities.
Time for activity (estimated):
1-2 hours to outline three alternative plans for finding an internship.
1 hour to present the plans to selected friends or fellow learners.
1 hour to present and discuss the plans with tutor
½ hour for final reflections and identification of next steps

Usage suggestions:
The Odyssey Plan is used in the later stages of the learner's educational program, where an internship can be either a mandatory part of the program or an add on.

Teaching tips:
As a tutor of learners in their final semester, you can encourage them to use the tool. For example, as preparation for the first tutor meeting regarding the internship.

Materials list:
'Odyssey Planning work sheet' can be downloaded at https://designingyour.life/

Prework required by learners:
Sign up for the internship and make yourself familiar with the formalities and learning goals.

Theoretical foundations, post work, etc.
The Odyssey plan is adapted from the book Designing your life by Bill Burnett & Dave Evans 2016.

Time plan:
Proposed steps:
- Download the work sheet.
- Identify and describe three alternatives for traineeships that you find interesting and would like to investigate further.
- Give each alternative a title and outline the questions that each alternative plan address
- (E.g., 'Internship in a small company' and 'What are the pros and cons of choosing a small company?' 'How can I use my existing network in the process?' 'Is this an interesting career path for me'? etc.)
- Fill in the Odyssey plans with the activities you think that the different alternatives require. The activities are placed on the timeline from period 0 (now) to 5 (the end of process).
- Assess each alternative with regard to:
- Resources that (do you have the required resources needed – time, money, skills, contacts?)
- Likability (do you fell hot or cold about this alternative)
- Confidence (how confident do you feel about the alternative – can you pull it off?)
- Coherence (does the alternative make sense you and is it consistent with how you see yourself now and, in the future,)
- Share the alternative plans with others (e.g., classmates, friends, or your tutor)
- Note comments and feedback and what energizes you the most when presenting and talking about the alternatives.
- Reflect on the process and how you feel now about the three alternative plans. Make decisions about how to proceed

Camp 48 hours

48 hours +/-

Description:
An activity (normally) taking place outside the school's premises, where learners in teams (cross disciplinary) of 5-8 members are trying to solve a case challenge from an external partner – typically a private company. "One assignment- one deadline". All teams present their solutions at the end of the camp.

Usage suggestions:
A camp can be used at all educational levels. As a teambuilding -, semester start -, problem solving -, creativity event etc. All depending on purpose and challenge.

Teaching tips:
As a tutor of learners in their final semester you can encourage them to use the tool. For example, as preparation for the first tutor meeting regarding the internship.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Materials list:
Tools for creative processes – again depending on the learners' educational level.

Prework required by learners:
Depending on the challenge – from working as novices to domain experts.

Key takeaways:
While the external partner (and often the learners) focus on the end output, the interesting element is the process (the true learning experience). It is extremely important to debrief and evaluate with the learners afterwards.

Teaching tips:
At BAAA, we have been working with different "camp-constructions" for many years now. What is interesting is how different the learners' experiences, evaluations and reflections are after the camp. Of course, it is a matter of the individual learner and his/her personal background, but it is very much also a matter of how the learners are able to handle uncertainty, i.e., his/her "PUNC-level". We haven't thought of this while planning each camp – "the program is a secret" has been a cornerstone for our concept for very long. What is clear now is how easy it is to plan this activity with very different levels of uncertainty. From "We are leaving school Monday morning and are back again Wednesday afternoon" to "the full program": Where, why, team, accommodations, food, very detailed schedule, output, etc.

5-5-5 (five-five-five)

Five days+/-

Description:
555 is a team task. In groups of five and in five days, the learners are to make five hundred DKK (Danish currency) grow as much as possible or grow as much "value" as possible. The instructor starts and ends the process.

Usage suggestions:
Can be used as a team activity in the beginning of a course (program) or during a course – depending on the learning goals.

Reflections:
The reflection part is extremely important and valuable. What happened in the teams, what kind of uncertainty did they experience, and how did they handle it? As individuals and as a team.

- Can you put words on your experience of uncertainty? What did you think? How did you approach the task?
- Can you use the experience to handle other or likewise situations in the future?
- Can you use the PUNC framework as a help?

Teaching tips:
The exercise can be used to focus on many different areas. Teamwork and team dynamics, planning versus action, handling uncertainty, network skills, business thinking, value? It often depends on how much information/knowledge the learners get in advance.

Time plan – Depending on "uncertainty level":
Light version: Introduction to the Effectuation principles and Innovators' DNA, finding the teams' common fields of interest, pooling their individual network, etc. Then start off 555 the week after. Heavy version: First exercise they meet, when coming to school Monday morning.

DYOT (Design your own tool)

Description:

To create one (or more) personalized tool(s) that helps the person to react to a specific uncertainty experience in a productive manner.

The learner follows these steps (based on the 5 elements of design thinking) with himself in mind:

Step 1: Personify!
- Create an image that depicts the uncertainty that you experience, and you want to address.
- Why is this need so important to address?
- What happens if this need is not addressed?

Step 2: Focus!
- Define the core issue that is at stake in this experience of uncertainty (you can make use of the PUNC menu)

Step 3: Diverge!
- Try to create as many ideas as possible on how to address the issue from step 2. You can use various existing brainstorming techniques (online, offline).
- If possible, include other people in this step, so that as many ideas as possible will be collected.

Step 4: Converge!
- Make a Top 3 of the ideas from step 3.
- Turn these ideas into actionable activities.

Step 5: Do!
- Try out all three activities and evaluate their results.
- Decide on how to adjust your ideas and try them out again.

Step 6: Enjoy your uncertainty experience!

Usage suggestions:

This activity can be done individually, or at least be initiated by an individual, but it is highly recommended that the initiator includes significant others in the process as both uncertainty and learning to handle it are phenomena that includes rather large social aspect.

DYOT can be done just-in-time or as a reflection activity.

3.4 User stories

This section will feature accounts of experiences with the utilization of certain tools. These experiences will be presented in the form of personal narratives from educators who have used the tools. The user stories will not follow a particular format or be directly linked to specific tools, but will be presented exactly as they were conveyed or written, in order to be as authentic to the lived experience as possible.

3.4.1 Experiences from BAAA

During the 1st semester 2022 on the top-up bachelor in Innovation & Entrepreneurship, we used the tools: Creative Business Cards, Your Backpack, 5-5-5 and Camp. We used the thinking behind the three-stage strategy process; Acknowledge, Explore and Handle. The purpose was gradually to expose the learners to different kinds or levels of uncertainty. From short exercises to longer and more intense periods. If we look at the PUNC menu, many of the different knowledge, skills, and attitude elements would be experienced by the learners, depending on the specific learners "starting point".

All of the tools were introduced and initiated by educators. Learners who opt for this program typically possess greater readiness to operate in uncertain circumstances than learners from other fields. Consequently, the outcomes and assessments of the tools may vary significantly from those of other courses. The initial tools are employed as part of the curriculum during the first two and a half weeks, and again after a four-week interval. The schedule is outlined below.

As we have previously attempted the 5-5-5 exercise, we are aware that it can elicit a moderate to intense sense of uncertainty. Week 35 is devoted to the study of theories that guarantee the subsequent week's process (5-5-5) will seem less confusing and chaotic to the learners.

Week	34 (Wednesday to Friday)	35 Teaching three days	36	40
Teaching focus	Introduction, team-building, visit by role models	Effectuation	Team project. Working on their own.	48-hour idea generation workshop. Teamwork and pitch training
Tool	Creative Business Cards	Your Backpack	5-5-5	Camp

Creative Business Cards (CBC)

We used CBC the first day the learners met each other. After one hour of welcoming, we introduced the tool exactly as it is described in the tool format. It was in a class with 30 learners. The exercise went okay, but we made some important observations:

For many of the learners, the task "present its author in the most imaginative and creative way possible" was not that easy. Some of them drew pictures of their interests, some of their friends, some just a question mark. It would have helped if we, the educators, had framed the exercise a bit better. For example: "Draw your main free time activity", "Draw your future job activity", "Draw where you are in 5 years", "Draw what you aspired to become during your childhood dreams". Many of these extra questions have been tried since, with great success.

The exchange part went fine, and everybody seemed to enjoy the exercise. 30 learners, however, were too many, which we experienced when each learner presented the last business card they received. Next time, we will do it in three groups of ten. It is too long to keep up the tension and interest. We evaluated the use of CBC online, and the learners felt comfortable with the exercise, finding it was a valuable tool to work with coping the tension of meeting new classmates.

Your Backpack

This tool is used as a part of the teaching the principles of Effectuation. One of the principles in the theory is "bird in hand". To identify the resources the learner has at hand, they answer these questions: Who am I, what do I know? and who do I know? During the class, each learner tries to answer the questions and write them down. They are told that this is an ongoing process and that their "backpack" will just get bigger and bigger, but at the same time maybe feel lighter, because they are more prepared to meet uncertainty than before.

Afterwards, when the learners are grouped into fives, they have the opportunity to combine their resources and commence a project that is established on a more robust foundation from the outset (in theory).

A significant aspect of utilizing the tool is that the learners acquire the skill of articulating their competencies and converting their learning experiences into valuable resources. In our experience, it makes the learners much more aware of what they know and how it can be utilized in a productive way.

5-5-5

From the beginning, 5-5-5 (from BAAA) was developed to force the learners to act, and then afterwards reflect and build on their experiences from the session. Their teambuilding and team dynamics, their process from idea to reality, their use of the effectuation principles, their evaluation of the ideas, desirability, feasibility, and viability etc.

The evaluations are very diverse. Between love and hate. But if the week turns out "bad", it is almost every time a matter of team problems and the uncertainty that arises. The reflection part is therefore extremely important. What happened and why – how can I/we be better prepared next time – so we can turn the uncertainty into something productive.

The activity can be twisted in many directions. It can be of a shorter period, it can be without money using T-shirts, stones, old bottles etc. instead. The main purpose of the activity is to act and learn from your reflections on the uncertainty felt and experienced.

Camp

At Business Academy Aarhus, we have been working with the "camp concept" for almost 20 years now. From the beginning, it has been about bringing learners from different disciplines together with the purpose of creating better ideas and solutions to challenges of many different kinds, and at the same time making the learners experience what it means to work in an interdisciplinary team. But now, when we look at the activity in a PUNC setting, it makes very good sense as a tool for working with uncertainty – in real time. The reflection part is now more important than ever.

Depending on how well-prepared and informed the learners are beforehand, the tool can be extremely uncertainty-provoking. We have utilized the tool in various settings and scenarios, ranging from situations where the learners only knew that they would be away for 48 hours' when boarding a bus, to instances where they spent days beforehand, preparing in their new teams to work within the domain that the challenge is a part of.

Our experiences over the years are that the learners from this generation are now looking more for security than risk than earlier generations. Or maybe it is just the educators that get older.

The feedback from the learners comes in many dimensions. From: "the best learning experience ever" to "the worst thing I have tried ever". So, it is important that there is time for reflection, feedback, and debriefing. Normally, it is done first individually, then in plenum. Each learner writes three positive things and three negative things about: the challenge, the process (with deadlines and feedback, feedforward during the process), the group/teamwork, the place, and accommodations. After the individual session, they are put back together in the groups they were a part of at the camp. Together, they will reflect on what went well and what did not go well during their team process, and why. At the end of the session, the collective feedback will be shared in plenum.

3.4.2 Experiences from Turku
Speed Dating

Speed Dating is one way to get learners to interact with each other and to get to know each other. It has been created by a learner tutor, who used it in a multidisciplinary project course, where 1st year learners are at first unfamiliar with the project assignment, with each other and perhaps have even recently moved to a new city. Thus, everything is unclear and makes learners feel uncertain and nervous, but in the course they are expected to make an effective and active project team. The advice "Now get to know each other" rarely works nor just saying names and degree programmes, while a simple and structured exercise can help break the ice.

Speed Dating is an easy teambuilding tool, where learners get to talk about outside of school things, get to know each other and make the course or project kick-off more informal. The tool requires some pre-work when themes for discussions are written on paper and set on separate tables. Some suggestive questions can ease the discussion as well. The themes can include some topics and questions that can also help the course or project ahead eg. what are your interests or what kind of skills would you like to learn. But remember to keep most of the themes and questions light- this is teambuilding, and the key is for the learners to get to know each other!

Orientation

The orientation is widely used in project courses and in the project learning environments. Learners may feel overwhelmed and disoriented at the beginning of a course or a project work. Taking the time to set personal goals for learning as well as goals for the project work, helps in organizing the work and seeing the actual tasks instead of big hazy assignments. It is a tool that enables the feeling of having the control of the situation and the learning.

Bringing the discussion to the group level helps team dynamics and it also helps everyone to gain the set goals. And the goals of the individuals are merged into a common goal. Learner groups have described the discussion as setting the foundation for the project work.

The orientation should be completed with the reflection when closing the project or ending the study unit. When reflecting the learning and work during the project or course, the accomplishments and project outcomes should be reflected on the goals set in the beginning. Were the goals achieved, what else was learned or achieved and what are the take-outs from this project?

Motorola

Why to use Motorola? Building the skill of critical thinking and ability to reflect on an outcome of the work are essential parts of learning. Our Business Academy learners have been using Motorola regularly as one project tool and end of learning situations what we call "trainings". Motorola is a handy tool at the end of a real customer projects when learners will reflect the whole project and work that has been done. Motorola is not just a tool for assessing what was good and what to improve, but it puts learners to think what they have learned and how they can apply the learnings in the next projects they are doing. Motorola can guide learners at very detailed level in discussions and make deeper observations or can be kept as a relatively light tool depending on the matter discussed.

A role of the educators is to help Motorola-discussion, ask questions, share their own observations, and challenge learner to think differently. Motorola is a simple but powerful tool and easy to apply in all kinds of situations. Once the idea and how to use Motorola is familiar learners can use it easily by themselves, also in working life!

3.4.3 Experiences from HU
TriggerME!/ Explore/ Good or bad?/And action

We used the tools in groups of maximum 10 learners. It is important that there is time and space enough to discuss and share feelings, ideas and thoughts.

TriggerMe and explore are both tools that support learners to give words and images to their uncertainty. General discussion in the groups supports learners in their feelings that they are not the only one who have uncertainty moments. The discussion also helps to understand their own uncertainty feelings and in what way it hampers their learning. Giving the cause of their uncertainty a kind of 'name', using the triggers, gives insight in reframing uncertainty."

Some reactions of the learners after using the tools:
- Only by doing I will take steps to make uncertainty productive.
- By using anchors and energizers and linking actions to that, you can make your uncertainty more productive.
- I have to look more at my properties and that the alarm bell can be softened.
- Have a conversation about your alarm bell.
- Share more and ask questions about uncertainty, to support each other.
- Others can help you, it doesn't have to be done alone.
- Look at what was positive in every situation and start a conversation with people you trust.
- Baby steps forward are still steps forward.
- Not everything you think is true.
- It is good questions to make people think.
- I can now go one step further.

4

About the PUNC box

Before the specific tools were developed, the partners had to agree on the guidelines and the design principles for the development of the tools.

Some elements to consider and include in the guidelines are that **simplicity** is important. And that the guidelines/design principles for content in the PUNC box should be relatively "loose" and thereby applicable for all partner institutions. The guidelines/design principles must make room for 3 levels or types of activities and tools:

- Existing activities and tools from each partner institution.
- Activities and tools developed during/in the PUNC project from each partner institution.
- A 'Design your own tool (DYOT)' for educators and learners to develop their own tools.

Thus, the purpose of the design guidelines is to set an overall framework for developing activities and tools, to customize and include existing activities and tools and to make it possible to develop new activities and tools. All of which must give educators and learners the opportunity to address, train and achieve PUNC, meaning the ability to Acknowledge, Explore and Handle uncertainty in a productive way.

4.1 Guidelines/design principles of the PUNC box

We see the development of the PUNC box as a hierarchy illustrated in figure 11. Below, we will elaborate on the hierarchy.

Design principles

What is the specific content in the design principles? The PUNC framework is a dynamic starting point for development of an activity or a tool. Based on the framework, how can the activity or tool be designed to acknowledge, explore, and handle this specific kind of uncertainty?
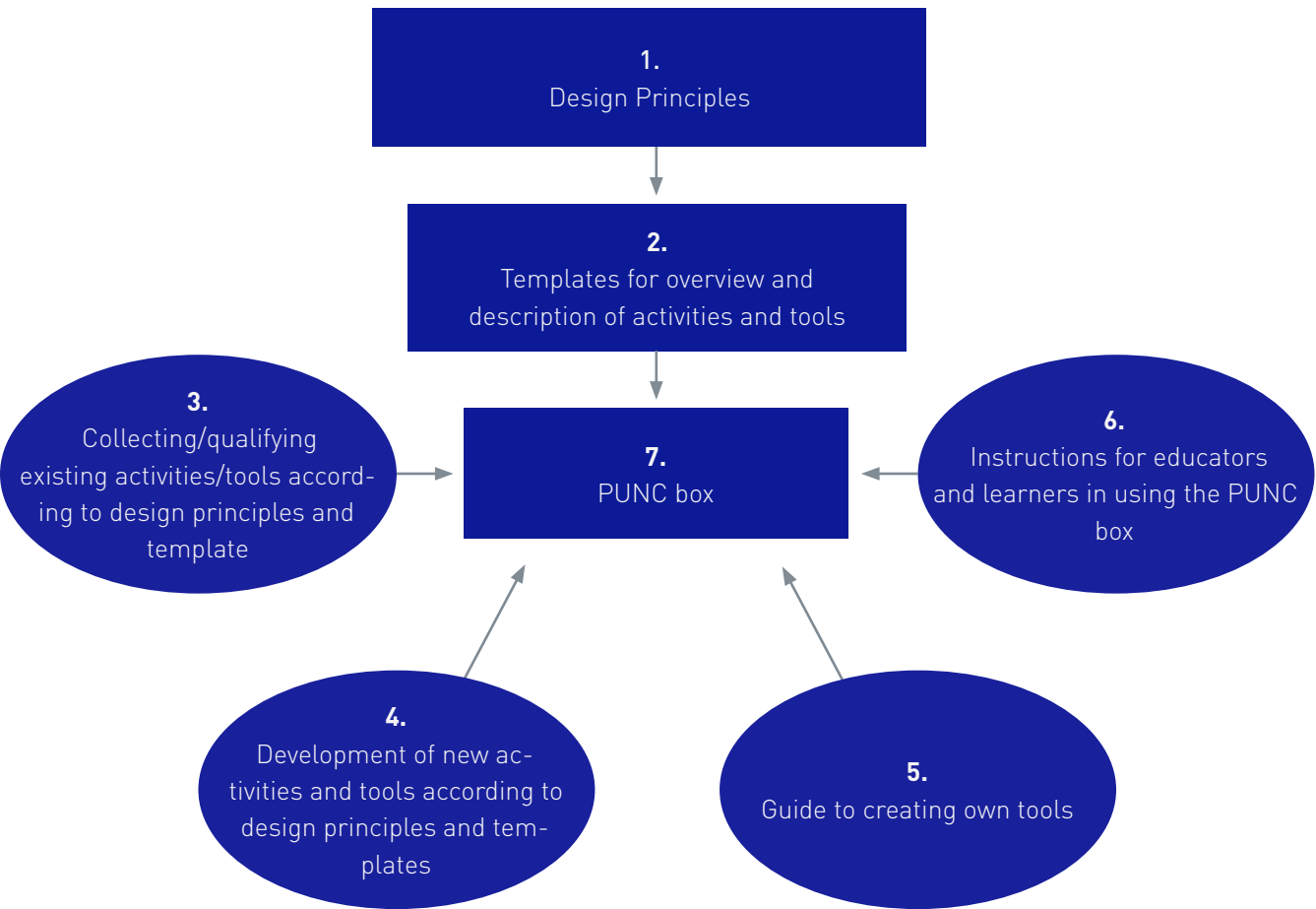

1.
Design Principles

2.
Templates for overview and description of activities and tools

3.
Collecting/qualifying existing activities/tools according to design principles and template

7.
PUNC box

6.
Instructions for educators and learners in using the PUNC box

4.
Development of new activities and tools according to design principles and templates

5.
Guide to creating own tools

Figure 11: Principles for developing the PUNC box

PUNC Framework

A method to support the develop-ment of your PUNC by:

- <u>Understanding</u> your uncertainty experience in terms of acknowl-edging, exploring and handling uncertainty (*Sensemaking*)

- <u>Deciding</u> on which elements of knowledge, skills and attitude (K/S/A) you want to develop regarding this experience

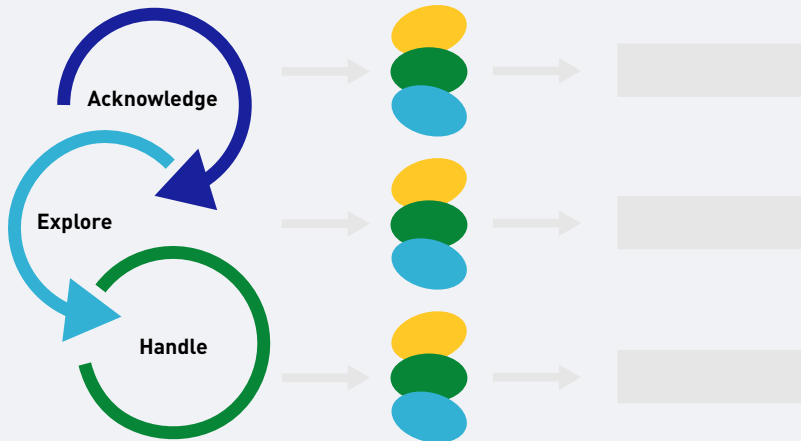- <u>Fomulating</u> one or more learning outcomes in which these K/S/A are incorporated

Figure 12: PUNC Framework

To understand the experienced uncertainty and decide which elements of knowledge, skills, and attitude to develop, the VUCA framework can be used as a sup-porting principle in designing activities and tools.

Another dynamic element of the PUNC framework is that activities and tools can be learner driven or educator driven, depending on the specific situation in which the framework is applied. If the activity or tool is educator driven/initiated there can be predefined learning outcomes and handpicked tools. Alternative-ly, the activity or tool can be learner driven, meaning that the learner must define own learning outcomes, create, or pick tools for achieving the learning out-comes and define milestones for the process against achieving PUNC.

Volatility	**Uncertainty**
Different than earlier courses with their own study group.	Lack of adequate information.
Working life orientation and new challenges.	Not knowing.
Usual academic approaches are not applicable. Learners must make up their own approach.	Unpredictability of the results.
	No trust in learners' own capability.
Changes in tasks, actors, schedules.	No theory, tools, or methods from the curriculum.
Working on the fly.	Working with hypotheses and the means at hand.
Unfamiliar and heterogenic learners and other stakeholders.	Reflection.
Teamwork.	Gaining expertise step by step.
Team dynamics.	Personal engagement.
Leaning to collective resources instead of individual approach.	Forecasting is difficult.
No typical strict structure that the learners will follow.	Need to take an active role.
Supervised and non-supervised meetings.	
Ambiguity	**Complexity**
Unknown study path.	Many things going on at the same time.
No educator-centricity.	Prioritizing is difficult.
Unclear expectations.	Expected results are not known.
Multi-sided tasks.	Adjusting and managing several tasks.
Experimenting and testing.	Many and complex perceptions.
Different interpretations.	The interrelations of the whole and the parts.
Not only one right way to do the work.	Difficult to trust own perceptions and to trust others.
Not only one solution.	Individual and team learning.
The criterion to excellent work is unclear.	Both academic, professional, and personal skills are needed.
Assessment is mostly based on self-reflection and team learning.	The unbalanced combination of study-work-private life.
Plans must be changed.	Pooling the collective means and resources.
Earlier experience may help or even disturb.	Previous experience can cause confusion.

Figure 13: VUCA Components in the educational context

Uncertainty arises from all the VUCA elements, and uncertainty comes in different levels. Activities and tools must be developed and designed within the range of high uncertainty to low uncertainty, allowing educators and learners to work within the range of the PUNC progression framework. The level of uncertainty will indicate the need for scaffolding or not, so it must be considered where in the progression framework, the activity or tool has its starting point.

Furthermore, in the design principles it can also be relevant to consider the learning approach. Is it inductive or deductive? This is relevant for considering the level of uncertainty and derived need for scaffolding and the process of formulating learning outcomes.
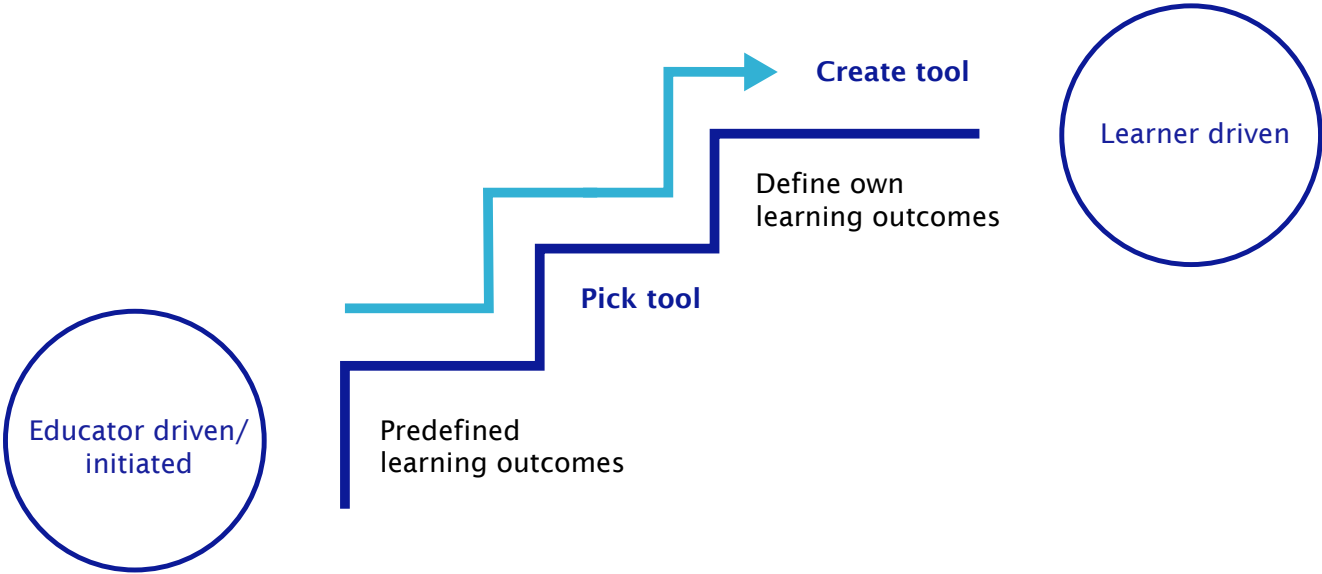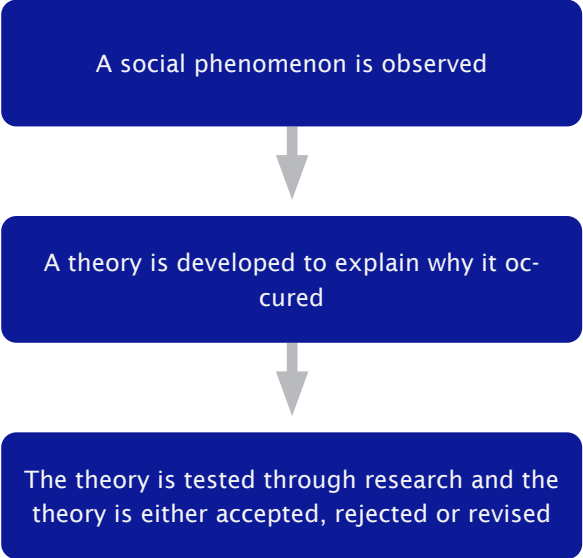
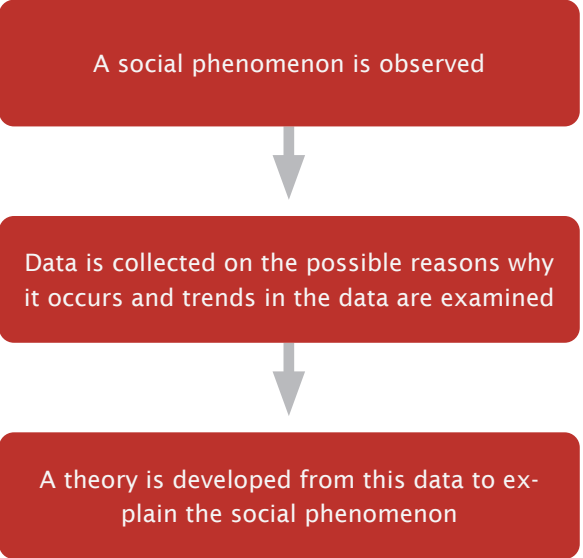Figure 14: PUNC Progression Framework

Deductive Approach

A social phenomenon is observed

A theory is developed to explain why it occured

The theory is tested through research and the theory is either accepted, rejected or revised

Inductive Approach

A social phenomenon is observed

Data is collected on the possible reasons why it occurs and trends in the data are examined

A theory is developed from this data to explain the social phenomenon

Figure 15: Inductive vs. deductive approaches
Source: www.researchgate.net

Knowledge

Knowing, understanding, being aware of ...
Examples of reducing uncertainty
One's experienced uncertainty in a specific situation, context, or task
One's intuition as a source of information
One's self-efficacy
The benefits of making uncertainty productive
The importance to develop vision
The need for being challenged
The need for dialogue
The need for doing something meaningful
The need for encouragement
The need for experiences of success
The need for positive feedback
The need for room for initiative
The need for scaffolding
The need for self-confidence
The need for support from others
Uncertainty as a phenomenon in learning and working

Skills

Being able to ...
Apply communication skills
Apply conflict solution skills
Apply decision makings skills (based on incomplete info)
Ask feedback
Ask questions
Assess a situation
Connect socially
Deal with incomplete information adequately
Deal with open-ended problems
Deal with problems beyond own expertise
Define the goal /aim
Engage in a supportive network
Find, value, interpret and use or share relevant information and resources
Investigate sources (internal/external) of uncertainty
Make own choices
Operate between an existing and familiar present and an unknown future
Prioritize
Regulate yourself
Solve problems creatively
Take initiative
Take ownership of one's learning process
Think critically
Think divergent/lateral
Think out of the box
Understand causality
Zoom in/out

Attitude

Being willing to ...
Accept failures
Accept not knowing what will happen
Acknowledge vulnerability
Be adaptable and open to change
Be agile
Be courageous
Be courageous to take risk
Be curious
Be enquiring
Be ethical
Be flexible
Be ingenuous
Be mindful
Be receptive
Be self-aware
Discover new strategies for problem solving
Embrace doubts
Empathize with different perspectives
Endure
Experiment
Gain information
Learn
Show feelings
Take initiative
Take leadership
Take ownership
Take responsibility for choices and actions
Take risks
Understand and to make sense of uncertainty
Visualize future alternative scenarios

Reflection

An important design principle is also that all activities and tools must have learning outcomes picked from the PUNC menu in terms of Knowledge, Skills and Attitude respectively.

The integration and formulation of milestones for progress must be included when developing and formulating activities and tools for the PUNC box. Inspiration for learning outcomes and milestones can also be found in Bloom's Taxonomy.

Next step
The PUNC box is, as already mentioned, a collection of tools from the different partners in the project, and some of them have been developed during the project. Each partner has handed in the tools using the same framework, developed for this specific purpose. The original framework can be seen in figure 17.

Figure 16: The PUNC Menu

PUNC Level: Categorizing from red (difficult) to green (easy) Decide placement on the PUNC scale on basis of: A: Level of uncertainty/pain: 1) How much do you (learner) know about the situation? 2) How likely are you to predict the result? B: Level of the task: 1) How complex is the task? 2) How time demanding?
Activity/Tool / Exercise (name):
Initiator (Learner <-> Educator):
Learning outcome (Elements from the PUNC menu):
Description: Total time for the activity, Progression level (Learners' need for scaffolding), individual or team activity, internal/external partners, in or outside school premises, curriculum or extra/co-curriculum, concept for the activity (e.g., Innovation camp: One assignment - one deadline) etc.
Usage suggestions: When, where, who
Materials list:
Prework required by learners:
Time plan (maybe in steps):
Key Takeaways:
Teaching Tips: How, where, when why can this activity/tool/exercise be used? Single or multiple purposes, e.g., training specific learning outcomes from the PUNC menu, as a reflection tool, discussion tool etc.
Theoretical foundations, Post work, etc. can be added

Figure 17: PUNC tool framework (version I)

Each partner used the PUNC menu to categorize which kind of as well as which level of uncertainty were predominant when the different tools were used. Of course, it will always be very individual how the uncertainty is felt, and the reaction to the kind of uncertainty differs. It is always a matter of the setting and the framing of each tool, and maybe a cultural factor could also be very important. For example, has the question of assessment of the tools been an important issue to discuss? There may be very different traditions and opinions in the different partner institutions.

Each partner used the overview matrix (see figure 18) and marked the different kinds of knowledge, skills, and attitudes that the specific tool would normally address.

PUNC ACTIVITIES AND TOOLS

Column group headers:

- **Knowledge** — Knowing, understanding, being aware of…
- **Skills** — Knowing, understanding, being aware of…
- **Attitude** — Being able to…
- **Meta**
- **Participants**
- **Uncertainty level**
- **Faciliator**
- **Domain**
- **Time span**

Rows (Partner — Description of tool):

Partner	Description of tool
BAAA	EXclusion prevention game
BAAA	48 hour Camp
BAAA	Two truths and one lie
BAAA	Competence triangle
BAAA	Toolbook for teambuilding and -facilitation
HU	TriggerMe!
HU	Processmapping
HU	DYOT
HU	Good or Bad
HU	EXplore!
HU	And…Action!
TUAS	Speed dating (in the beginning)
TUAS	X0 ideas, (or X00 ideas)
TUAS	Hatchery Circle (role play)
TUAS	Capstone showroom (final competition)
TUAS	Capstone, pitching event- presenting the project
TUAS	Project plan
TUAS	Capstone, EXhibition day- starting day
TUAS	Orientation (settings goals, personal & group)
TUAS	Reflection (at the end of the work/project)
TUAS	Reading cirle and dialogue conversation
TUAS	MOTOROLA reflection/feedback model
TUAS	De Bono Hats
UG	Join the group
UG	Little Red Riding Hood
UG	Business cards

Figure 18: Overview matrix (version I)

It was a difficult task to point out the different categories of uncertainty because it is always an individual evaluation, and the framing of the tool can thus differ very much. Most of the tools and exercises will be initiated by the educator who has a sense of what will happen during the use of the tools. It will be a completely different situation if the learners are handed a tool and told to use it, or if they choose a tool and use it by themselves without a educator framing the use.

From the beginning, it was the intention that the matrix could be used as a help to the educator to choose a tool for a specific learning situation. Other criteria such as timespan, individual sessions, group sessions, class sessions, learning objectives etc. were used, but a focus group test showed that it was not that easy to use as expected. Many of the tools have now been tested by other institutions than the ones that developed them, and the feedback has been incorporated in the PUNC box.

The results of testing the tools showed that it is critical to reflect before, during, and after using them. However, this is not always an intuitive process for learners, as supported by the Kübler-Ross model, see figure 19.

Reflection will make the learners aware of feelings of discomfort, but also enable them to critically analyze the feelings and possessed knowledge, so that learners could gain new perspectives on exploring and handling uncertainty. For instance the value and benefits in handling uncertainty through the acquirement of specific knowledge, skills, and attitudes, that should be the output of using tools from the PUNC box. The ability to make the analytical, evaluative, and critical reflections, that are needed to learn and develop, and handle based on a certain experience, exercise, or use of tool, depends very much on the facilitation, but also on the learners' awareness and acceptance of the stages of feedback grief.

The stages of feedback griefs are closely related to the whole purpose with the PUNC box (and the PUNC project), namely, to urge the learners to experiment, make decisions, to and integrate and work productively with uncertainty instead of denying uncertainty or become frustrated over perceived uncertainty.
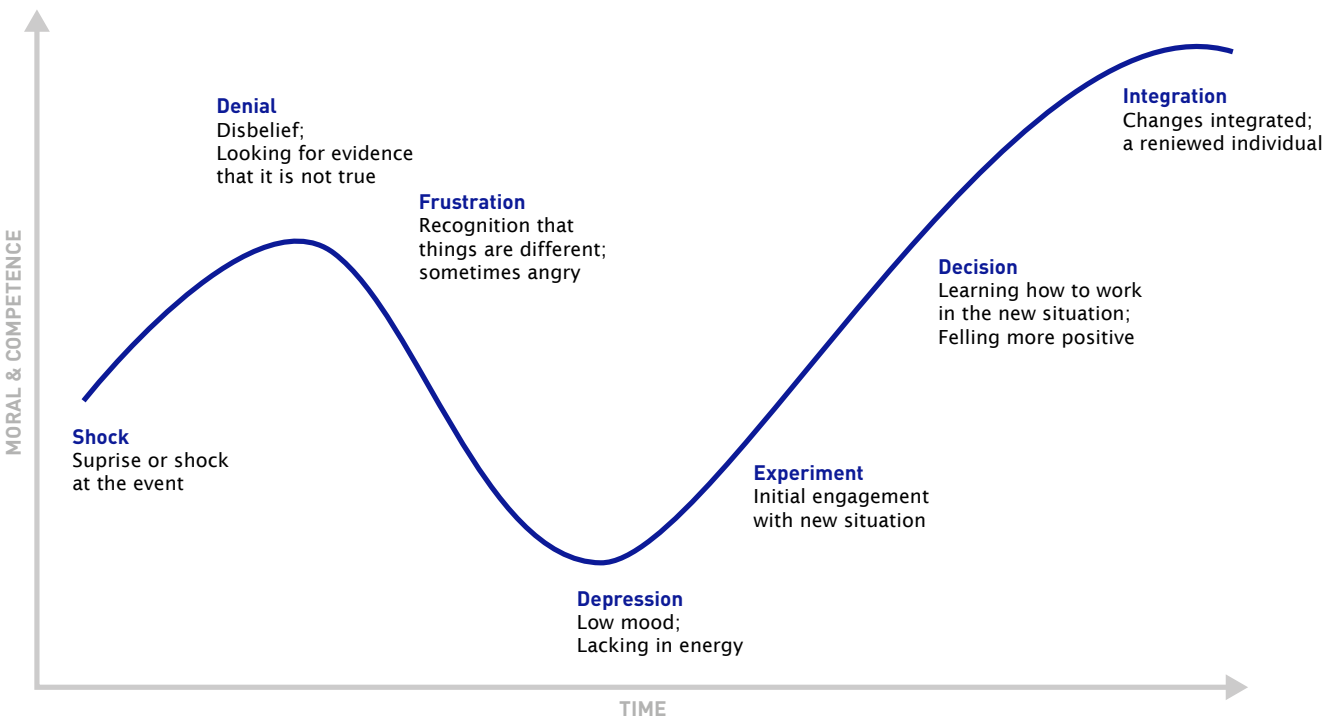

Figure 19: Kübler-Ross model – 5 stages of grief
Source: Kübler-Ross & Kessler, 2005.

5

List of literature

Bennett, Nathan og Lemoine, James, 2014. *What VUCA Really Means for You.* [SSRN Scholarly Paper] Tilgængelig hos: <https://papers.ssrn.com/abstract=2389563> [Set 21 dec. 2022].

Bollinger, S. & Rooijen, R., 2022. *Develop your PUNC with the Professional UNcertainty Competence Framework.* Bollinger, Stein & van Rooijen, Ritie, 2021. PUNC Literature review (IO.2).

Dewey, John, 1933. *How we think: a restatement of the relation of reflective thinking to the educative process.* Boston: Houghton Mifflin

Fadel, Charles, et al., 2015. *Four-Dimensional Education.* [online] [online] Tilgængelig hos: <https://policycommons. net/artifacts/1767468/four-dimensional-education/2499114/> [Set 21 dec. 2022].

Grant, Anthony, et al., 2002. *The Self-Reflection and Insight Scale: A New Measure of Private Self-Consciousness.* Social Behavior and Personality: an international journal, 30, s.821–835.

Hänti, Sirpa, et al., 2021. F*acilitate for the future - Educator's guide for designing hybrid learning environments for the VUCA world* (IO.1).

Kübler-Ross, Elisabeth og Kessler, David, 2005. *On Grief and Grieving: Finding the Meaning of Grief Through the Five Stages of Loss.* Simon and Schuster.

Neck, Heidi M., et al., 2018. *Entrepreneurship: the practice and mindset.* Los Angeles: SAGE.