5 Teacher's notes – Volume 5 – Innovation, creativity and option generation

Volume 5 focuses on the necessity of innovation and creativity for the implementation of a successful CP project since both are efficient approaches for the generation of CP options. The first part of the textbook introduces different creativity techniques and principles of creative idea generation. Furthermore, it includes recommendations on the application of creativity techniques in a CP project.

The second part of the textbook concentrates on the specific generation of CP options and comprises various valuable CP information sources, general checklists and thoroughly proven CP tricks from consultants. The picture is completed by information on the evaluation and feasibility of the generated options.

The teacher's notes provide comments on all **training units (workshops)**. The background material can be used as described below.

Use of the background material "Innovation, creativity and option generation"	
Material	**Comment**
Textbook	The textbook provides the basic background information and includes illustrations which can be used in the workshop. The trainer should be familiar with the theory of thought processes and their relation to creativity and innovative processes. He should have all possible information sources and up-dated internet links on CP option generation readily available for his participants. The textbook itself can be distributed as training material to the participants.
Examples	The examples illustrate the generation of CP options where one of the CP tricks mentioned in the textbook, the "waste box" method, is applied in order to minimize production waste. - Specific CP option generation: the waste box - Brainstorming session on waste logistics
Exercises	The exercises support the knowledge transfer to the participants. Most of the exercises are designed for group work, Exercise 5-1 is an individual exercise. - *Overcoming thinking barriers:* This is an individual exercise. Use it at an early stage of the workshop, ideally when dealing with thinking barriers. The participants can apply to themselves how difficult it is overcome traditional thought patterns. - *Brainstorming:* The participants learn how to find CP options in a brainstorming session. The problems to be solved can either be taken from a list included in the exercise or from proposals by the participants. - *Evaluation – water flow reducer:* This exercise illustrates the classical evaluation of a CP option in view of its technical, environmental and economic feasibility. The necessary calculations as well as the results are presented in a logical and easily understandable way.

Use of the background material "Innovation, creativity and option generation"	
Material	**Comment**
Slides	The slides start with information on creativity and innovation as provided in the textbook. They include the brainstorming exercise and CP-relevant topics in case the participants do not suggest any problems themselves. The part on CP option generation follows the structure of the textbook. Please test the Internet links before your presentation as the addresses change frequently!
Worksheets	The first three worksheets focus on the evaluation of CP options generated during a brainstorming session. Worksheet 5-4 comprises some optical illusions as an example for customary thought patterns governing our perception and can be used either in the workshop itself or for company work. Worksheet 5-5 is a checklist on information sources for the option generation process. - *Evaluation of brainstorming ideas (Worksheet 5-1)*; - *Evaluation of ideas (Worksheets 5-2 and 5-3)*; - *Perception (Worksheet 5-4)*; - *CP information sources (Worksheet 5-5)*.
Checklists	The checklists focus on creativity barriers in a company and provide tips for successful innovation. Special CP checklists (economic, environmental and technical evaluation) are included in the textbook.
Questions	The questions check the participants' understanding of the information covered during the training course or workshop. Most of the information is included in the textbook, therefore links to the textbook are provided. The trainer can decide if and how he checks the participants' knowledge and if he wishes to use these questions. In addition, the questions can be used as a quick self-check for the trainer.

Training course/Workshop

The participants of a workshop or training course on "Innovation, creativity and option generation" are consultants or trainers.

The following table shows an example schedule of a one-day workshop which is designed as part of a series of workshops. This schedule has proved to be efficient with different target groups.

The second table comprises the suggested materials, learning objectives and success indicators for the different teaching units.

Example schedule of a training course/workshop

Topic	Contents	Time	Min.	Method
Welcome		**9.00**	**15**	
	Welcome of participants		5	All
	Programme of the day, organizational matters		10	All, flipchart
Feedback		**9.15**	**60**	
	Company representatives report on the progress since the last workshop focusing on implementation steps in the company. WS 5 always offers a kind of a "break" in the workshop series by stimulating the creative potential of the participants. It should provide a great deal of room for creativity and innovative option generation.		60	All
Coffee break		**10.15**	**20**	
Introduction to innovation and creativity		**10.35**	**45**	
	What is creativity? How can knowledge of thought processes help us to better understand creativity processes? Different creativity methods – for which problems are they used? Thinking barriers.			Trainer: presentation with slides (video beamer, slides)
Exercise: Thinking barriers		**11.20**	**10**	
	How to overcome thinking barriers (Exercise 5-1)		10	Individual work (prepare enough copies). Flipchart: have one of the participants draw the solution on the flipchart.
Creativity meetings: Example brainstorming		**11.30**	**20**	
	What is important in a brainstorming session? Prerequisites, time frame, moderator, taking notes Four principles of brainstorming		20	Presentation by the trainer (beamer). Project the four principles during the brainstorming session.
Exercise: Brainstorming		**11.50**	**50**	
	First you decide on the problems the groups want to solve. Then two or three groups carry out a brainstorming session (not longer than 15 min.). (Exercise 5-2)		40	Each group gets a flipchart and names one moderator and one person who takes the notes. Presentation
Lunch		**12.40**	**80**	

Brainstorming session, part two: Evaluation		**14.00**		
	The participants evaluate the brainstorming ideas using Worksheets 5-1, 5-2 and 5-3.			Group work on flipcharts, presentation
Successful idea generation		**14.30**	**20**	
	Summary on creativity meetings: ideal mix of the group, external conditions, etc.			Presentation of trainer. Integrate participants by letting them guess.
Break		**14. 50**	**30**	
Introduction: CP option generation		**15.20**	**30**	
	Standard options and information sources. What has to be considered for the technical, environmental and economic evaluation.			Presentation, interrupted by questions to the participants
Exercise: Water flow reducer		**15.50**	**40**	
	2 – 3 groups assess the CP option water flow reducer based on the data provided in Exercise 5-3.			Explanation of group work Presentation of group work: flipchart
Implementation of environmental projects		**16.30**	**20**	
	Picking the low hanging fruits = measure-oriented, quick implementation. More complex problems can be solved by using creativity techniques.			Presentation by trainer
Continuation and outlook		**16.50**	**10**	
	Summary continuation of the work, worksheets, homework			Trainer/flipchart
End		**17.00**		

Explanation of the topics of the training course	
Topic	**Materials/learning objectives/success indicators**
Introduction to innovation and creativity	*Materials*: - Slides explaining creativity, innovation and thought processes; - Textbook of this volume. *Learning objectives*: - Show the participants that creativity can be trained and is an ability everyone has. Stress the difference between innovation and creativity; - Influences on creativity (external/internal factors); - Say a few words on the different creativity methods, using examples where you can; - Talk about the other side of the coin: there are a lot of thinking barriers we have to face. *Success indicators*: - Participants learn that creativity can be trained and lose their fear of not being creative; - They know the importance of creative thinking and innovation processes for CP work in a company; - They know (in theory) about the possible thinking barriers and can group them.
Exercise: How to overcome thinking barriers	*Materials*: - Copies of the exercise for each participant, flipchart with the exercises in chapter 5-1. *Learning objective*: - Participants principally know the reasons for thinking barriers, BUT they can't help remaining in the same old thought patterns and have difficulties in solving the exercise. *Success indicator*: - Participants have understood that it is not easy to leave old ways of thinking behind.
Creativity meetings: Example brainstorming	*Materials*: - Textbook, slides and Exercise 5-2 of this volume. *Learning objective*: - Participants learn how to carry out a brainstorming session. *Success indicator*: - Participants can carry out a brainstorming session on their own.
Exercise: Brainstorming	*Materials*: - In Exercise 5-2 of the background material; - Before starting the brainstorming session with 2 – 3 groups (5 – 7 persons per group) write all the problems to be solved on a flipchart. Let the participants chose which topic/problem they want to deal with during the brainstorming session. *Learning objective*: - Carry out a brainstorming session as a model for brainstorming in a company. *Success indicator*: - Participants can carry out a brainstorming session in a company.
Brainstorming session, part two: Evaluation	*Materials*: - see background material textbook and Worksheets 5-1, 5-2 and 5-3. *Learning objective*: - In a second step all the ideas from the brainstorming session are evaluated in view of their feasibility. It is important to allow for a certain time between the brainstorming session (you collect all the ideas) and the evaluation (you decide which ideas are feasible). *Success indicator*: - The participants find some useful ideas for the solution to (CP) problems.

Explanation of the topics of the training course	
Topic	**Materials/learning objectives/success indicators**
Successful idea generation	*Materials:* - Textbook, slides and background material. *Learning objective*: - What has to be considered when setting up a creativity or innovation team. *Success indicator*: - The participants have a clear idea of the composition of such a team in a company.
Introduction: CP-option generation	*Materials:* - See background material textbook, slides and Worksheet 5-5. *Learning objectives*: - Learn which information sources can be used for CP option generation; - Prioritize personal information. *Success indicator*: - The participants know where to find reliable information on CP options.
Exercise: Water flow reducer	*Materials:* - See background material exercise and textbook. *Learning objective:* - Carry out a technical, environmental and economic evaluation of a particular CP option (water flow reducer) as well as a feasibility study. *Success indicator*: - The participants are motivated to carry out a similar evaluation in a company.
Implementation of environmental projects	*Materials:* - See background material textbook and slides. *Learning objective*: - Summing up the importance of creativity and innovation for CP work. *Success indicator*: - The participants get a feeling for different types of environmental problems and how to approach and solve them.