Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra




TRAINING METHODOLOGY MANUAL

A practical guide for climate change trainings

HELVETAS

TRAINING METHODOLOGY MANUAL

A practical guide for climate change trainings

Authors: Bettina Jenny, Daniela Lilja and Rupa Mukerji
Contributors: Sarika Pradhan, D.G Shrestha, Devanshu Chakravarti, Siddharth Patil, Surajit Baruah
Photos (front page): Flurina Rothenberger, Simon Opladen, Meinrad Schade
Icons in this manual made by Freepik and Smashicon from www.flaticon.com

Swiss Agency for Development Cooperation (SDC) has supported the development and publication of this training module under the project Strengthening State Strategies for Climate Action (3SCA)

2019

Contents

1. Introduction

Continuous learning is highly relevant for professionals worldwide. Short-term trainings represent one important element of this. But making a training effective, interesting and focused on the learning objectives remains challenging. The trainer's competencies remain key. The trainer needs to be an expert in the thematic field. Furthermore, a trainer must be able and interested to support the learning process of others. Therefore, in addition to a high degree of motivation, trainers need to know and have experience in how to plan and implement a training and to build on a repertoire of suitable teaching and learning methods.

This manual focuses specifically on methodologies suitable for trainings in climate change. Climate change has become a huge challenge globally. Global temperatures are expected to rise up to 2° above pre-industrial levels. The latest IPCC special report "Global Warming of 1.5°C" discusses the likely scenario of a 5°C rise between 2030 and 2052: "Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C." (IPCC, 2018, p. 9)

Climate change is often not taken fully into account, for example in decision making, partly due to limited awareness and knowledge of climate risks and impacts, climate mitigation and adaptation options. Trainings for decision-makers constitute one important measure for enhancing awareness. Therefore, in addition to addressing the general didactic aspects for planning and implementing a training, this manual provides specific suggestions and examples for developing effective trainings on climate change impacts in various sectors.

Climate change and implications for training

Challenge	Short info and relevance for trainings
Climate change, especially the human impact, is a young science and is making fast progress.	The scientific history of climate change began in the early 19th century when ice ages and the natural greenhouse effect were detected. However, it was only in the 1960s that the warming effect of carbon dioxide gas became evident. By the end of the 1980s a consensus has formed among the international scientific community that greenhouse gases cause climate changes and that human-caused emissions induce global warming. (Le Treut, 2007) Fast progress in research has been made in recent decades. It forces a re-assessment and re-thinking. This demands a constant assessment of our actions based on scientific information and research.
Climate systems are complex and information about them remains incomplete.	1. Challenge of teaching in an understandable and tangible way: 2. Visualization (e.g. simulations, experiments) and case studies. 3. Simplify systems and processes adapted to the target group. 4. Address how to deal with incomplete information for decision making.
Scenarios for the future bear uncertainty.	Types of uncertainty (in regional climate models, development pathways and future emission scenarios, etc.) shall be presented and discussed. Trainings address how to interpret data and deal with uncertainties.
Adaptation and mitigation of climate change require multi-sectoral actions at several levels.	This often requires policy making and collaboration at the scientific, political, economic and social level. Trainings should use simplified situations as cases or simulations. The complexity makes the topic challenging to teach, but interactive teaching methods make it attractive.

Objectives of the manual

This training methodology manual seeks to:

- transmit **practice-oriented didactic knowledge** to trainers;
- show concrete steps for **preparing and planning a training** and its sessions;
- provide trainers with **teaching and learning methods** applicable in a participatory way;
- provide insights and examples on its application for **topics related to climate change**.

What does the manual offer?

This training methodology manual provides practical guidance for the trainer on how to set up and conduct a short-term training and it offers practical examples from the climate change sector. It focuses on how people learn, how to plan a training and a training session, what methods to use, and how to assess the training. In addition, it is the trainer's responsibility to look for training contents, feasible regarding complexity and training time, and the relevant tools to meet the participants' needs. The manual is structured in the following way:

Chapter 2: Overview of learning principles, with a special focus on adult learning.

Chapter 3: How to plan a training (learning objectives, negotiations with the client, structure).

Chapter 4: Provision of training and how to plan and structure a training session.

Chapter 5: Teaching and learning methods.

Chapter 6: Resources and materials needed for trainings.

Chapter 7: How to assess trainings in a participatory way.

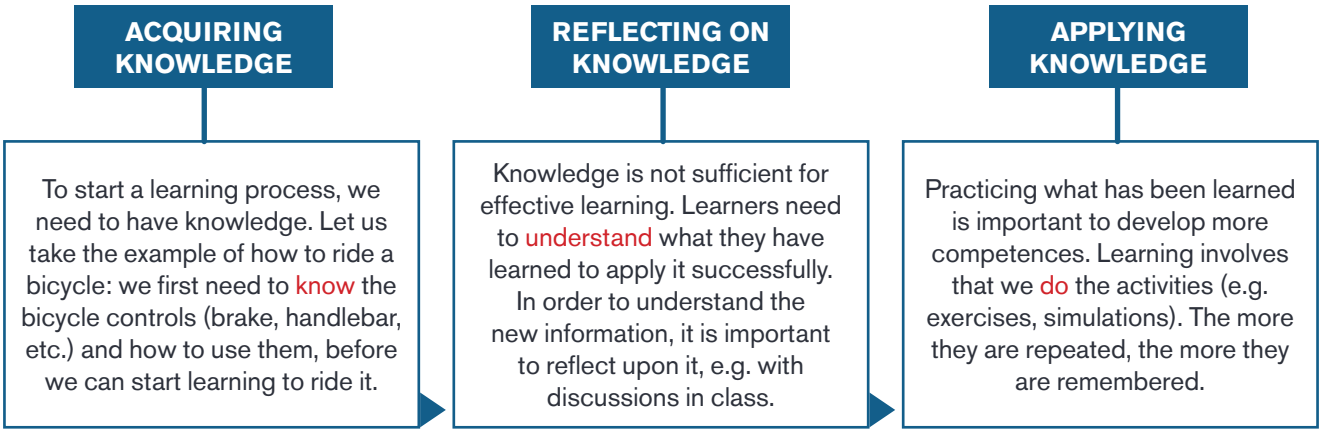
2. Principles of learning

Trainers need to have good knowledge of the training subject. Furthermore, it helps to understand how participants learn and how they can be supported in learning effectively and successfully. The main principles of learning will be further elaborated in this chapter.

How do we learn?

Learning means acquiring new knowledge, skills and attitudes. This leads to changes in how we understand and do things. Learning does not only happen in classrooms, but also in daily life, without us necessarily being aware that we are acquiring new skills. There are three actions (acquiring, reflecting and applying knowledge) relevant to the learning process (Figure 1), which are equally important for learning and acquiring new competences. They support each other and cannot be separated (ESCAP, 2001, p. 16).

Figure 1: Learning process to acquire new competences



Learning and our brain

Our senses and our brain play a crucial part in the learning process. The brain controls and steers everything we do, and it stores information we have acquired during our life. Connections within our brain ensure that we do not forget what we have learned and that we can utilize it when needed. Based on our prior knowledge, the brain "decides" what information it considers worth storing, while everything else gets filtered out. This new knowledge then goes into our **short-term memory**, where we can keep information for several days. For knowledge to go into the **long-term memory**, where we can store it far longer, continuous repetition is crucial.

If we only perform similar, routine tasks, we continue to use the connections in our brain that we already have; however, if we learn new things, we create new connections that become cemented with practice and extensive repetition. **This process of creating new connections in our brain and cementing them through practice and repetition is called learning**. This means that our brain, even its physical structure, constantly changes and develops depending on how it is used.

The learning process starts with our senses: when we hear, see or feel something. Usually, we use more than one sense at the same time. We simultaneously hear what the teacher says and observe what he or she is doing. Based on the information stored in our long-term memory, the brain decides what new information is important enough to keep. Therefore, especially for adult learners, it is important to take into consideration the knowledge they already have and to build upon it in trainings. (Illeris, 2007, pp. 12-15)

Which factors influence (adult) learning?

There are many different factors that can influence the learning process in a positive or in a negative way. As a trainer, identifying reasons why a participant is not learning well can help address these factors and contribute to a better learning. Adults learn differently from children; therefore, teaching methods have to be adapted. Table 1 gives an overview of factors influencing adult learning and recommendations how to support the learning process, as well as concrete examples related to climate change.

Factors influencing learning	Recommendations on how to support learners
The participant's motivation	Adult learning should be goal-oriented. The training and its sessions should begin with the reasons why they are important.
	 Present or brainstorm why it is e.g. important to know about the impacts of climate change for India.
How the participant perceives the relevance of the training	Activities shall be relevant for the participants and linked to their professional life. Use practical examples and hands-on demonstrations to show the learners how they can use what they have learned.
	 Computer simulation on how climate change affects a specific country. Different scenarios are applied and assessed, measures proposed and tested, etc. Indian climate policies: Role play among politicians and scientists.
The relationship between the participant and the trainer and other participants	Training in a classroom should be set up in a way which is comfortable to the learner. Allow enough time for welcoming, settling down and introduction of participants at the beginning.
	 Part of the training could be held outside, and linked thematically to the topic (e.g. forestry, agriculture, water).
Situational factors (e.g. mood, health status, etc.)	Create a good working environment. This increases the chances of having the learners' full attention, which facilitates the learning process.
Time constraints (due to e.g. job or family)	Plan the training so that it fits in the agenda of the target group. Consider their needs when planning the duration, timing and location of the training.
Previous knowledge and/or experience regarding the training subject	If adults can link new information with existing knowledge, learning will be more effective. Let participants share experiences during the training.
	 Ask how participants have experienced climate change themselves.Write keywords on cards (e.g. agriculture, water, migration, extreme events) on cards and ask for comments regarding climate change in India.
The teaching style of the trainer	Adult learners want to take an active role in the training. Ask questions, start discussions and provide examples. Ask for feedback and adapt the training program where feasible. Get feedback at the end of each training day.
Learner's attention span	Participants' attention does not last that long. It is recommended to limit individual presentations to 20 minutes.

Table 1: Factors influencing learning and general recommendations for adult learning (partly adapted from Knowles, 1990 and ESCAP, 2001, p. 17)

The different learning types

Every person has a different learning style. Four learning types can be identified, as depicted in Figure 2, and should be kept in mind when planning training sequences (adapted from ESCAP, 2001, pp. 17-22).

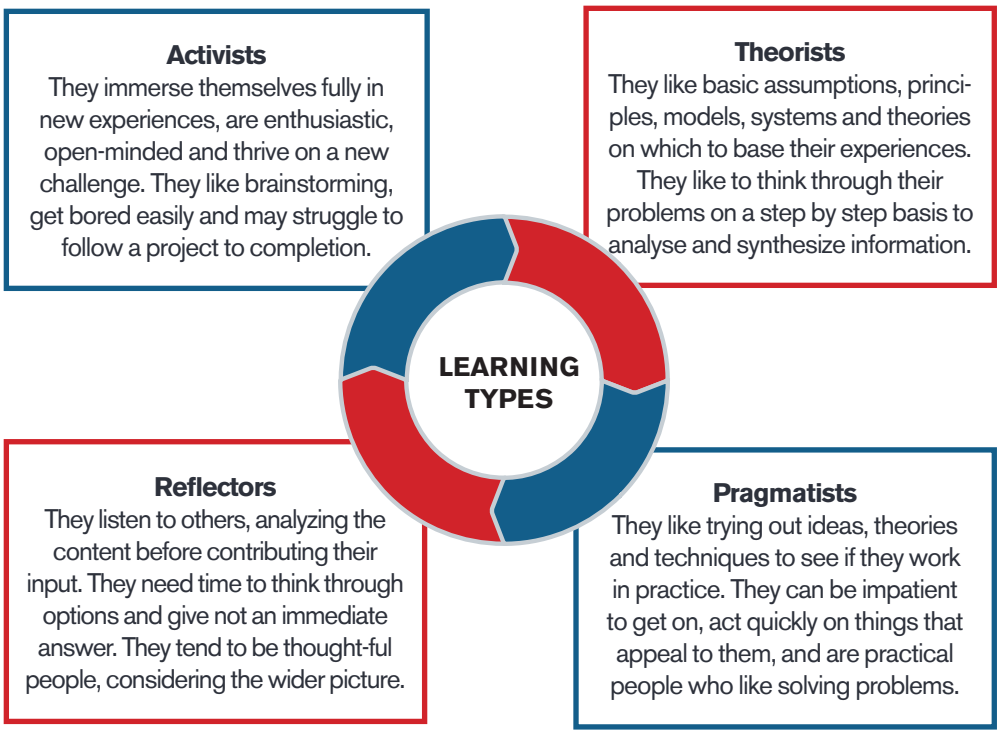


Figure 2: Learning types (adapted from Scotland, 2017, p. 26)

This overview helps to understand participants' possible reactions. Thus, the trainer needs to carefully observe the dynamics within the group and steer it towards the desired direction. As a facilitator, the trainer's role is to react to the participants and adapt the trainings to their "learning needs". Plan trainings and the applied learning methods in such a way that all learning styles are taken into account.

Trainers need to be good and effective communicators, as well as good listeners and questioners. Asking good questions is crucial to supporting reflection, but also to allowing participants to discover their own potentials. Trainers should be able to make themselves understood. They must adapt their language to the group of participants and express themselves clearly and comprehensibly.

3. How to plan a short-term training

This chapter provides an overview of main planning steps (see Figure 3) to be taken into consideration when designing a short-term training program of a few days up to one to two weeks.

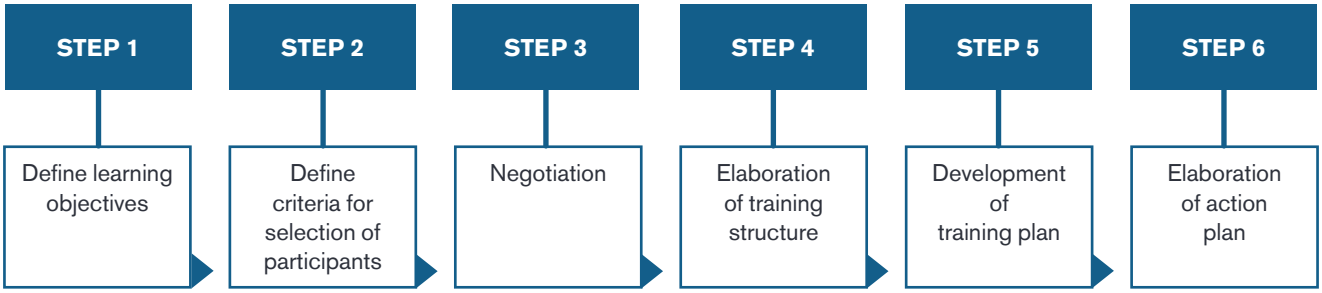


Figure 3: Designing steps for a training program

1 Define the learning objectives of the training

In many cases, a client, e.g. an institution, company or organization, will request a training, and ask the internal or external trainer(s) to design and implement it. First, it is crucial to learn and discuss the learning objectives of the training with the client. This process clarifies the client's expectations of the trainers and is essential for the success of the training. The formulation of the overall learning objectives is a key step in preparing a training workshop. It defines competences and knowledge that participants may gain and hopefully apply afterwards in their professional environment. Later on, learning outcomes will be defined in each session that will contribute to the overall learning objectives.

Overall, it is recommended to clarify the following points with the client at the beginning:

- What are the main focus and the learning objectives of the training?
- Why is the training being offered?
- Is it a stand-alone training or part of a training series?
- Which are the participants' backgrounds?

This clarification process with the client is important for a trainer. Ultimately, the trainer must be convinced that he/she can reach the objectives with the training offered. If not, the trainer must further negotiate or propose additional measures to be taken beside the training.

2 Elaborate criteria for selecting participants

The selection of participants is important for making a training effective. Therefore, whenever possible, try to be involved in the selection. You may define basic criteria that participants must fulfil and ensure that they will be considered in the selection process. Criteria are usually related to professional background, experience, (potential) position, e.g. if the person can apply the new knowledge and have an influence in the future. If you cannot influence the selection of the participants, get as much information as possible about them and adapt your training to their needs.

It is important to also think of what participants afterwards can apply to change their work (learning transfer). "Conditions are favorable for learning transfer if a participant is mandated from within his organization, i.e. his/her section or his/her department. Ideally, the superior defines his/her objectives for what he/she expects the staff member to take home from this training program." (Fröde-Thierfelder & Schwedersky, 2009, p. 36)

A trainer tries to anticipate the participants' needs, but it is equally important to learn directly from the participants about their needs. This will help in designing a demand-oriented training and will motivate the participants, as they will feel involved from the beginning. This can be done, for example, with a short online survey for everyone or just for a few, selected participants prior to the training. In addition, the number of participants needs to be defined. Ideally, a minimum and maximum will be set, and the final number within these barriers is negotiated with the client. The maximum number will also depend on the number of trainers, potential computational simulations or excursions, etc.

3 Negotiate the training budget, duration and venue

"This is a decisive milestone in the design process because it entails negotiations with the client, what is available in terms of budget and what is needed to reach the objectives of the training program. In most cases, this is a difficult balancing act. The client organization might push for increasing the number of participants per training workshop while you as trainers would need to explain that you cannot reach certain learning objectives when you have a group of 25 instead of 15 participants, for example. Another critical parameter is 'duration'. The normal reaction of a client organization with a tight budget is to cut down on the days for a training event and to increase the number of participants. It is crucial for trainers at this stage not to accept responsibility for achieving certain learning objectives if the duration and number of participants are not tuned in a way that these learning objectives can be achieved. It might then be wise for you to reconsider the whole assignment and eventually refrain from taking it further with this client organization." (Fröde-Thierfelder & Schwedersky, 2009, p. 36)

The venue of the training is a decisive factor for the training success. Therefore, it is recommended to consider several aspects, as shown in Table 2, and to potentially visit the venue before taking a decision.

General conditions	Interior of the venue
Enough daylight and low noise level	Space on walls for visualization purposes
Space for different settings, e.g. group work	Availability of equipment (e.g. projector, flipchart)
Comfortable zone nearby for breaks / lunch	Mobile chairs and tables for flexible seating options

Table 2: Suitable venue conditions

4 Elaborate the structure of the training

Once the learning objectives have been developed, you can define which main topics are needed to reach them, e.g. in a mind map. The whole training may start with an opening and an introduction session. These two sessions are important to make participants feel comfortable, to orient them around the topics of the workshop, and to start becoming part of the learning group. If the start is successful, participants are more likely to be "on board" and eager and motivated to participate and learn. Therefore, allow enough time for this process. Finally, the training will probably end with an assessment of the training and closure.

Timing: It is recommended to allow for long enough breaks during the training day (e.g. 30 min. for coffee breaks and 60-75 min. for lunch). This allows participants to regain energy and to network. The training duration per day, excluding breaks, should not exceed 7 hours.

Arrange all training days on one page and distribute all the sessions to a specific day. In this moment, you may have to rethink if all selected topics can really be covered or if you have to adapt and reduce the selection. Finally, the entire training program and its sessions are shown on one page, e.g. A4 landscape. This overview allows you to present it at the beginning of the training and also when a new session starts, and to link the sessions directly to the learning objectives. An example is given in Figure 4.

Adaptation to climate change

Venue, date	Facilitators/ Training institution		
Time	**Day 1**	**Day 2**	**Day 3**
08.30 – 12.15	M0: Welcome and introduction, logistics **M1: Basic concepts on climate change (CC)**	*Looking back… (participants)* **M3: Interpretation and use of information**	*Looking back… (participants)* **M6: Monitoring of adaptation to climate change**
	Break	Break	Break
	continued	**M4: Climate risk assessment**	continued
noon	Lunch	Lunch	Lunch
13.30 – 16.30	**M2: Basics of climate information**	**M5: Identification and prioritization of adaptation options**	**M7: CC adaptation: Integration into planning of work**
	Break		Break
	Practical exercise outside		Training evaluation Closing
evening	**Optional:** social event one evening		

Figure 4: Example of a training program (adapted from Fröde-Thierfelder & Schwedersky, 2009)

5 Develop a training plan

The training overview or structure is a good basis for developing a training plan for each day. This plan is only for the trainers' use. It must consider what is feasible within a given timeframe. Each session has to contribute to a part of the learning objectives. In addition, teaching and learning methods shall be adequately selected, taking especially the aim and duration of the session into account. The application of different didactic methods makes the learning process more interesting for the learners. If one method is applied (too) often, participants get tired of it and are less motivated to participate actively.

For the elaboration of the training plan, you may start by defining the content and methods for a session and then seeing if and how this is feasible within the given timeframe. A minimum standard usually describes when, what, how and who (see Figure 5).

Time	Session & objectives	Content	Method	Material & preparation	Responsible person
Duration Include enough breaks	Main topic Learning objective(s) of session	Main knowledge and skills to be acquired	Select suitable method for each phase	List technical and facilitation equipment	Person in charge

Figure 5: Possible structure of a detailed training plan

6 Elaborate an action plan

Based on the training plan, an action plan is elaborated, which defines the training preparations of the trainers prior to the training, and tasks during and after the training. It states the task, responsible person and deadline for fulfilling the task. It is recommended to hold planning meetings of the organizational team (including the person responsible for logistics) during the preparatory phase. In addition, a final planning meeting should be scheduled for the days before the training and one debriefing meeting should be held after the training to analyze the training and to consider potential adaptations for the next training.

4. How to plan a training session

A training usually consists of one or several units or sessions. Each session has a specific focus with its own learning objective(s). This chapter describes how to develop these learning objectives and which steps are recommended for planning a session.

Learning objectives of a session

The learning objective of a session defines what participants should be able to do or understand after the session. The objectives must be specific, understandable, reachable, and should be defined at the beginning of the session's planning. (see Table 3)

Steps	Elements	Examples
Capability	Participants are capable, able to…	1. Participants are able to explain the main factors influencing climate change 2. compare the effectiveness of main measures to lower carbon dioxide percentage of the atmosphere 3. differentiate between climatology and meteorology 4. assess main options for climate mitigation for a specific region
A verb that indicates the action	define, describe, present, compare, explain, demonstrate, calculate, apply, analyze, compare, differentiate, measure, verify, create, design, etc.	
Topic/ action	e.g. carbon dioxide in the atmosphere, sources of global warming, etc.	

Table 3: How to elaborate a learning objective of a session

Phases of a session

For the elaboration of a didactic structure of a session, there are different options. In this manual, an option based on two models, the 5 E learning model (Bybee, 2009) and the AVIVA model (Städeli, Grassi, Rhiner & Obrist, 2013), is presented. Its 5 phases are briefly explained in Figure 6 and further explained below. Methods described in the different phases are mostly explained in chapter 5.

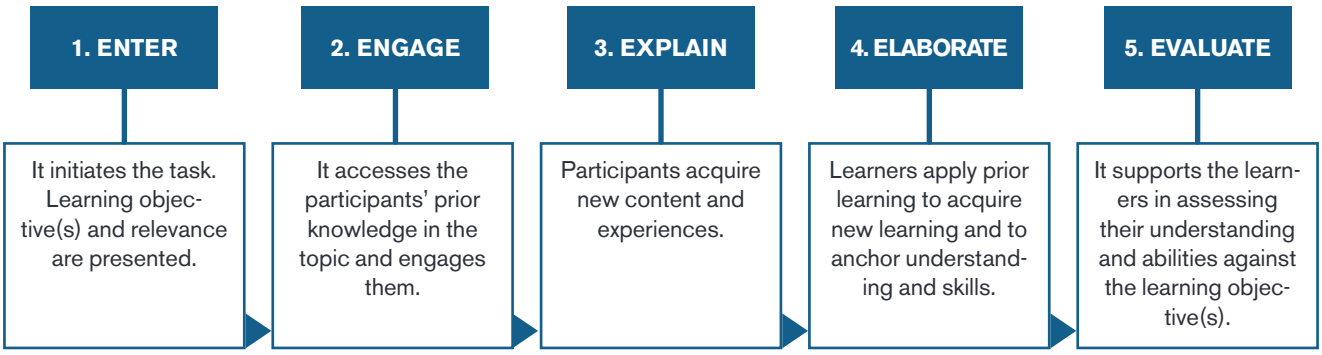


Figure 6: Learning session phases (adapted from Bybee, 2009; Städeli, Grassi, Rhiner & Obrist, 2013)

1 Enter

In this phase, it is important that learners leave their daily routine and enter into the learning process. First, the trainer welcomes the participants to the new topic and ensures that they feel comfortable and not disturbed. Explain and visualize the content of the session, its relevance, the learning objectives and the steps planned (e.g. with a projector or white board). Determine the beginning of this session clearly (e.g. with a gong, welcoming words and strong eye contact with the participants), so that the participants are ready to "dive into the world of learning".

2 Engage

To understand, memorize and apply new knowledge, it is important to link it to the learners' prior knowledge.

Possible methods:
- Brainstorming about the topic (in plenary or groups)
- Collecting experiences about the topic (groups, pairs, plenary)
- Guiding questions (plenary or groups)
- Let the participants formulate questions or hypotheses
- Presentation of a challenge related to the topic and request for problem-solving strategies

You can also use short newspaper articles or videoclips to introduce the topic in an attractive way, combining it with one of the methods mentioned above.

3 Explain

In this phase, learners acquire new knowledge and skills. Either they acquire them themselves or the trainer provides information. It is important that the type and complexity level of information is adequate to the learners' prior knowledge and level of education.

Possible methods:
- Presentation by the trainer
- Demonstration by trainer, copied and further developed by the learners afterwards
- Video: Learners have to answer 3-4 questions while watching, followed by a discussion
- Working assignment: Reading of a text, followed by an exercise (individual work or in pairs)
- Exposure, field visit

4 Elaborate

It supports learners in further anchoring new learning from the "Explain" phase. It deepens and extends new learnings and links them more intensely with prior knowledge. Overall, learners develop a deeper and broader understanding of the topic. This phase often requires the same or even more time as the previous three phases together.

Possible methods:
- Work assignment
- Rotating working stations
- Simulation
- Role play and debates
- Field visit with tasks (group work)

5 Evaluate

This phase helps the learners assess their understanding and abilities and indicates to the trainer if the session's learning objective has been met.

Possible methods:
- Quiz
- Flashcards with questions and answers
- Short cases to be solved in pairs
- Feedback of participants about main learnings and open questions
- Self-assessment of participants

Preparing a session

When preparing a session, the trainer can use the training plan and elaborate in more detail. If a session is properly planned, the trainer has considered the content and how to meet the learning objectives, knows the topic and its challenges, and has perhaps also looked up missing information. Finally, the trainer should feel confident to teach the topic. The different learning phases are usually not actively communicated to the participants. Table 4 provides an example of a session planning.

Session & learning objectives	Participants are able - to explain the greenhouse effect and its influence on average global temperature. - to describe several main factors how mankind contributes to current climate change. - to roughly interpret main temperature modelling scenarios for their region.			
Time	**Phase**	**Content**	**Method**	**Material**
8.30-8.45	Enter	Welcome Introduction Overview of session and objectives	Graph: carbon dioxide in atmosphere over last 1000 years. Elaborate axes and content with learners. Tell short story about it	Drawing on blackboard
8.45-9.05	Engage	How do participants experience climate change?	Brainstorming, with drawing on blackboard Working in pairs: Share one example from your professional or personal life.	Black or white board or flipchart
9.05-10.20	Explain	Basic functioning of greenhouse effect and influence on temperature on earth Influence of increased concentrations of greenhouse gases on ecosystem (e.g. focus on glaciers and oceans) Contribution of mankind to climate change	Watch video, answer questions, discuss in plenary. Read article, answer guiding questions in a group. Group work and presentation in plenary or carousel (text about human influence factor for each group).	Video sequence Articles Flipchart sheets
10.20-10.50	Break			
10.50-12.30	Elaborate	How may climate change affect our climate in the future (global level and region of interest) What implications may it have for our life? How to deal with uncertainty of scenarios.	Computer simulation exercise, providing future climate scenarios Influencing factors can be regulated Uncertainty level is indicated and explained Implications for mankind is described	Computer program and laptops
12.30-12.45	Evaluate		Feedback of participants about main learnings or Quiz	
12.45-14.00	Lunch			

Table 4: Example of a session plan about the greenhouse effect

5. Teaching and learning methods

There are many ways to impart knowledge, just as there are various ways to learn (see chapter 2). As a trainer, it is important to know these different ways and choose an appropriate one for the target group. If you succeed to make the subject interesting and encourage active participation, you automatically support the participants' learning process. In this chapter, different teaching and learning methods will be presented.

The role of the trainer

Participatory methods where participants are actively involved have a very good learning outcome. However, this gives the trainer a bit of a different role, less of a knowledge broker and more of a moderator, facilitator, coordinator, and time-keeper. A trainer's role is to listen carefully and ask clarifying and stimulating questions to motivate the participants (see Figure 7).

Mix different methods	Doing the same thing over and over is boring. Keep the participants interested by changing methods.
Create a good training flow	Put the methods in a sequence that is aligned with the technical content.
Be mindful of group dynamics	There is a risk that quiet participants are ignored or that one individual is too dominant. The trainer has to be sensitive to this.
Hand over control	To increase ownership, a trainer should sometimes hand over certain tasks to participants (such as summarizing a session, etc.).
Be flexible, but in control	As the trainer, you need to have the leading role in steering the process. If something is not working, you should be flexible enough to change your plans.

Figure 7: Recommendations for trainers (adapted from Fröde-Thierfelder & Schwedersky, 2009, pp. 16-17)

Social forms of learning

In Figure 8, main social forms of learning are shown. Mixing different social forms creates variation. For example, participants can read a text by themselves, which they then discuss in pairs or in groups.

Individual work

Examples

reading a text

solving exercises

answering questions

Working in pairs

Examples

discussing

sharing ideas

solving a problem

running a simulation

Group work

Examples

discussing

solving a problem

working on a case

Figure 8: Main social forms of learning

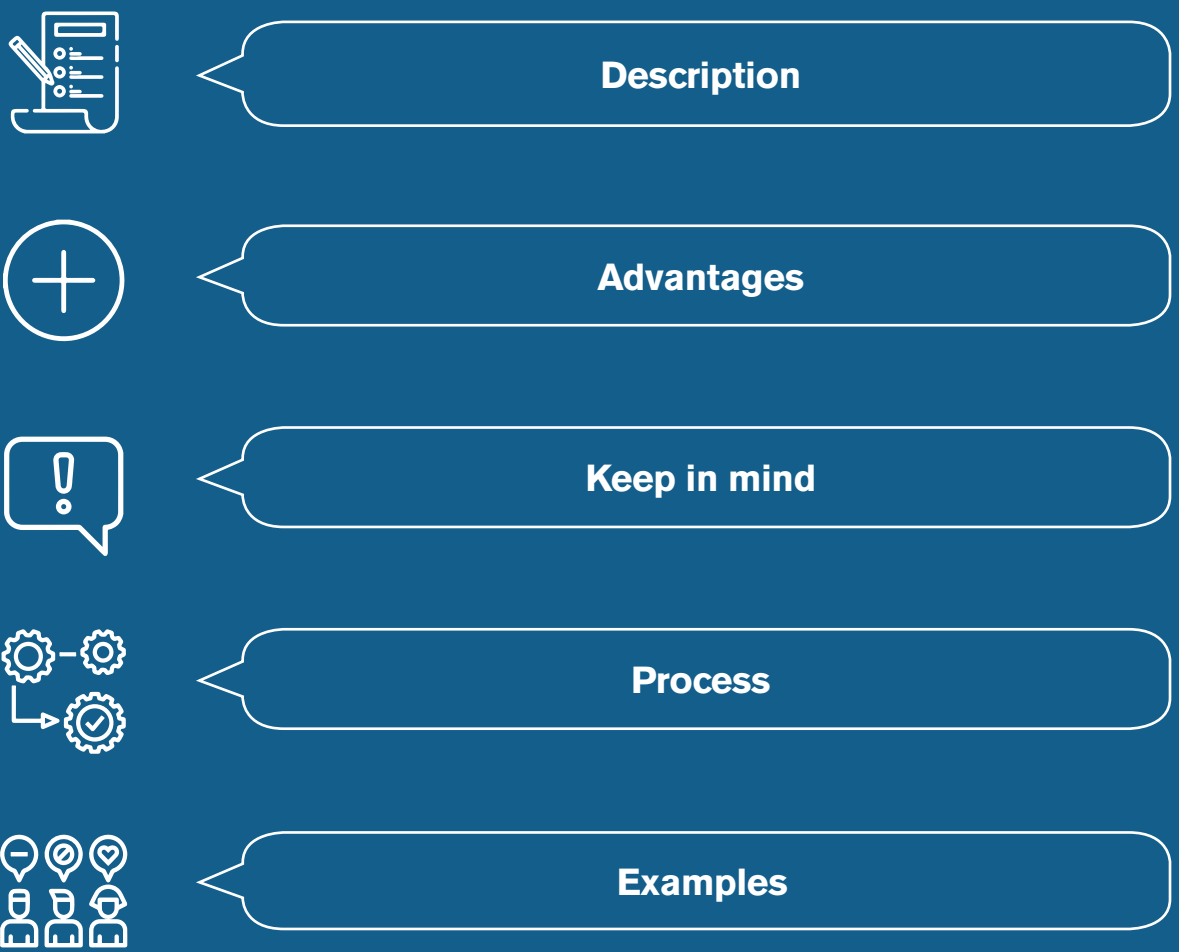
Overview of teaching and learning methods

In general, learning occurs best when all senses are being used. Use visualizations (graphics, videos, simulations, etc.) and whenever possible, outdoor practical experiences during the sessions. Actively doing something stimulates the learning process in a way that passively listening to a lecture cannot. Therefore, active teaching and learning methods are valuable for enhancing the learning process and to internalize knowledge.

On the following pages, several teaching and learning methods are explained. They cannot always be separated easily; for example, a simulation done by the trainer can also be a demonstration; a discussion can be acted out in the form of a role play; and a case study can be part of a working station rotation.

The different methods are accompanied by several links to examples. These illustrate how the methods can be applied to specific topics and used as inspiration. Ideally, the thematic content of the exercise is linked to the participants' professional environment.

Legend of icons



Lecturing and presentation

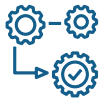
Lectures usually take place in a classroom-format and allow the trainer to impart lots of information to a big group within a short time period. Participants can be involved to some extent through questions. Presentation as a technique can also be used by participants to present on a topic in which they have expertise or to present the results of a group work/assignment.

- helpful for
  - introducing participants to a new subject
  - providing an overview or a synthesis
  - conveying facts, statistics
- covers a lot of material in a short time
- lecturer has more control than in other situations

- one-way communication, not experiential in approach
- lecturer needs skills to be an effective presenter
- inappropriate method for changing behavior or for learning skills

For preparation purposes:

- provide learners with 2-3 guiding questions and tell them to take notes
- limit presentation to max. 20 minutes (due to attention span)
- make clear statements on what is being explained and why it is relevant
- ensure the information is organized in a logical manner
- have an engaging style of presentation and involve participants (questions, let them explain or demonstrate something, etc.)



1. Introduce the topic – let the participants know about the content and its relevance
2. Present the material using visual aids
3. Summarize the key points you have made
4. Invite the learners to ask questions or initiate a discussion on guiding questions

The platform "UN CC: Learn" provides helpful material: https://www.uncclearn.org/

Specific learning resources: https://www.uncclearn.org/learning-resources/un-cclearn-resource-guides-advanced-learning

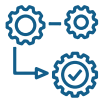
Adapted from CEDPA, 1995, p. 37

Demonstration

A demonstration is a practical presentation given by the trainer of how to perform a certain task or exercise. It is always used together with other teaching methods. Often, the students have to repeat the task themselves at a later point in time.

- helpful for
  - teaching a specific skill or technique
  - modeling a step-by-step approach
- easy to focus learner's attention
- shows practical applications of a method
- hands on for the participants, who can actively try the method themselves

- important to plan and practice ahead of time
- enough "working stations" with material need to be available
- not useful for large groups
- requires giving detailed feedback to learners when they try themselves



1. Introduce the demonstration and its purpose
2. Present the material you are going to use (if needed)
3. Demonstrate the whole process (giving an overview)
4. Demonstrate again, explaining each step
5. Invite the learners to ask questions
6. Have the learners practice themselves (written step-by-step instruction can be helpful)
7. Discuss how easy/difficult it was and summarize the exercise

Good example (video) of a demonstration on global warming:

https://www.jpl.nasa.gov/edu/teach/activity/global-warming-demonstration/

Adapted from CEDPA, 1995, p. 38

Discussion

Discussions can take place in different forms, e.g. as group work or classroom discussions in plenary form, moderated by the trainer or one of the participants.

- discussions cement the content learned during the "explain" phase
- active engagement with the content enhances learning
- encourages participants to share and consider different perspectives
- helps them to develop problem-solving skills

- the participants need background knowledge to engage meaningfully
- encourage all learners to actively participate in the discussion
- some form of moderation helps keep the discussion on track
- ask WHY–questions to give a discussion more depth
- use teaching resources to write down important points made during the discussion
- arrange the room in a way that encourages discussion (e.g. in a circle)

1. Before the discussion, explain the topic and ask a guiding question, then give the participants time to think about their argument and let them write down answers
2. Clarify the rules: no interruption, respecting each other's opinion, etc.
3. Open the floor with a guiding question
4. End it by summarizing the main points

Which are the main measures the country of the participants should consider taking in the next five years to reduce its impact on global warming? What do participants think about their feasibility and effectiveness?

Adapted from DePaul University, 2019

Role play

In role plays, two or more people enact pre-defined roles from real-life situations related to a training topic. This performed scenario will be discussed and can help analyze a problem and identify its causes and possible solutions. Debates can also be enacted in role plays.

- stimulating and fun
- can increase self-perception and enables participants to see the consequences of their actions and how others might feel/behave in a given situation
- simulates the real world and provides a safe environment to explore problems
- helps to change people's attitudes

- preparation is time-consuming
- needs to be executed properly, otherwise participants may not take it seriously
- not all participants may feel comfortable taking part in a role play
- actors must have a good understanding of their role
- actors might get carried away with their roles
- time keeping is challenging: should not take too long to avoid boredom

1. Select actors and observers among the participants
2. Prepare the actors so they understand their roles (orally or in written form)
3. As a guiding question to the observers to set the stage
4. Conduct the role play
5. Ask the observers about their observations
6. Thank the actors and ask them how they felt about the role play
7. Ask participants what they have learned
8. Summarize the activity

Mock UN negotiation role play on climate change including a climate simulation and the effects the different scenarios have on different countries: https://www.climateinteractive.org/programs/world-climate/

Adapted from CEDPA, 1995, p. 40; Strasser & Mewes, 2013, p. 157

Case Study

Case studies usually describe a real-life or fictitious situation in which a professional must make a decision. The trainer plays a facilitating role and helps the participants find causes and possible solutions. They can be solved in pairs or in groups and can last from one or more hours up to a whole day.

- helps to generate a good understanding of a situation and to find solutions
- creates enthusiasm and interest among the participants
- provides a safe opportunity for developing problem-solving and analysis skills
- brings real life situation, but does not involve personal risks

- requires a lot of planning time to select, adapt or even write a case
- the case must be closely related to the learners' experience
- problems related to climate change are often complex, and a case study is a simplification of the real world. There is not always just one right solution
- participants need enough time to familiarize themselves with the case
- if available, take a real-life problem (for example, a climate change-related issue that occurred in a village, such as the drying out of a water well)
- if the participants feel that the case is not realistic, their enthusiasm may decrease

1. Introduce the case and give participants time to familiarize themselves with it
2. Present questions for discussion or the problem to be solved
3. Give learners time to solve the problem/s and ask them to write down their findings
4. Have some learners present their solutions
5. Ask the participants what they have learned and how the case might be relevant to their own environments and link it to the overall learning objectives
6. If available, present the real-world outcome of the case
7. Summarize and recap the most important points

Fictional case: The GIZ case study of the fictional island of Zanadu can be used for a training on climate change adaptation. Several handbooks, manuals and presentations are available https://www.adaptationcommunity.net/trainings/training-materials-integrating-climate-change-adaptation-development-planning/

Adapted from CEDPA, 1995, p. 39; Strasser & Mewes, 2013, p. 156

Simulation

A simulation is a performance of a real-life situation, which allows participants to apply their knowledge in real-life situations without worrying about the consequences of their decisions. Simulations can include a preparation for a field trip or producing different climate scenarios in a computer-based program with changing input data.

- possibility to apply knowledge and examine attitudes in a real-world situation
- interactive and practical; high degree of learner involvement
- participants can discover and react on their own and get immediate feedback

- preparation and implementation are time-consuming: the facilitator must be well-prepared (availability of material, room, testing of simulation, etc.)
- a simulation is often a simplistic view of the reality

1. Prepare the learners to take on specific roles during the simulation
2. Introduce the goals, rules, and timeframe for the simulation
3. Facilitate the simulation
4. Ask learners about their reactions to the simulation
5. Ask learners what they have learned from and develop principles
6. Ask learners how the simulation relates to their own lives
7. Summarize

Climate Change Policy Simulator, where the climate outcome is depicted depending on your actions: https://www.climateinteractive.org/tools/c-roads/

Adapted from CEDPA, 1995, p. 41

Rotating working stations

A rotating working station (also called carousel) consists of different hands-on exercises and tasks relating to one overall topic. The content of the stations should not build on the content of another station, as there is usually no order to follow. Participants rotate between the single stations, either done alone (not recommended due to a lack of interaction), in pairs, or in small groups. While it is an attractive form that stimulates participants, it requires much preparation and is an ambitious training form for the trainer as well as participants.

- participants actively engage with learning content
- participants work at their own speed
- promotes team building, exchange and networking among participants
- participants need to physically move around, which is activating
- gives trainer time to help participants individually
- helps participants to see where they struggle with the new knowledge

- requires enough space to set up different stations
- assignments have to be clear, straightforward and feasible
- test all working stations yourself and modify where needed
- diversity of the stations is important to keep the attention span, e.g.
  - solving a small case
  - construction or measurement (e.g. weather measurement instrument)
  - interpreting a map or a graph and discuss evolution and future implications
  - analyzing different types of materials (e.g. rock or soil types) and its implication (e.g. for a dwell, rock fall, etc.)
  - quiz or game
  - simulation (real-world example) or experiment
- ideally, solutions are provided at each station
- usually requires much time (several hours)

1. Explain the procedure of the rotating working stations (clearly state the overall time and per station they will have for their own time management)
2. Explain stations that are not self-explanatory
3. Ensure that everybody is busy and help if someone is struggling
4. If applicable, provide solutions
5. Give participants time to ask questions and sum up the activity

A good overview on how to set up working stations and examples of learning methods: https://www.blended-learning.org/models/

Further examples based on an adult teacher's experience with working stations: http://beyondthetools.com/2016/04/have-you-thought-about-using-stations-in-adult-education/

Adapted from Schweitzer, 1995

Quizzes and games

Quizzes and games are good methods to assess a training at the end or to test the understanding of the participants. They can also be used to test the prior knowledge and impart new information.

- check the learning progress and understanding of the participants
- fun, motivating exercise
- interactive, engaging
- flexible timewise (can take 5 minutes, half an hour or even longer)

- best used in combination with other methods (e.g. after a lecture or group work)
- questions should be clear and comprehensible
- can be either done individually, in groups or classroom

1. Prepare questions beforehand or look for a ready-made quiz
2. Decide on form of presentation (orally, paper forms or digital)
3. Explain quiz to participants
4. Execute quiz
5. Evaluate, discuss answers and clarify unclear points (in case of paper forms, let the forms be corrected by the neighbors)

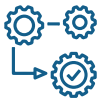
Digital platform www.kahoot.com offers great opportunities to create a quiz. Participants use their smartphones to answer questions online. The results can be shown on a screen in real-time and the trainer can immediately evaluate the correct answers with the students.

Exposure or field visit

Nothing enhances learning as much as first-hand experiences. Exposure or field visits give participants the chance to see or apply what they have learned in the real world. Field visits have to be well prepared and well embedded in the training. They can last a day or only an hour (e. g. just visiting the mudflow nearby or looking at houses in the neighborhood and discussing climate-friendly heating and insulation of houses and industry).

- real-life examples
- awareness raising of the complexity of the real world
- stimulates the learning process

- field visits need to be well-prepared including
  - transportation
  - coordination with external personnel
  - safety measurements (is the terrain safe/accessible, etc..)
  - if applicable: Involve local community, follow procedures, ask for admittance
- make the objective of the field visit clear
- participants need guidance, a clear assignment on what to observe and do
- participants should take notes and pictures (e.g. with their phones)
- inform participants about what to bring (especially with regards to weather)



1. Prepare well (transportation, schedule, safety, etc.)
2. inform participants of the aim, their assignment and rules
3. Ensure chance to ask questions
4. A little flexibility is needed: something interesting might come up unexpectedly
5. Plan enough time to discuss and summarize the trip afterwards

- a visit to a successful example of climate change adaptation, e.g. a rejuvenated spring, improved soil quality, reforestation, etc.
- a visit to a village affected by natural hazards and an assessment of the issue in the field; this could also be the basis for a case study continued back in the classroom

Additional methods

Brainstorming

Brainstorming is a process to collect as many ideas and thoughts as possible and writing them down without prioritizing them. While collecting ideas, there are no right or wrong answers, thus giving everybody a chance to bring in their ideas. Visualizing the ideas, e.g. on a flipchart, helps to later prioritize and order them. Brainstorming can be done to collect prior knowledge of participants of a topic at the introduction of a new session, or to collect ideas on how to go about solving a problem, etc. (Fröde-Thierfelder & Schwedersky, 2009, p. 20).

Work assignments

Work assignments can be done in different social forms, ideally in pairs or groups, to encourage exchange and networking among participants. They can include reading and discussing articles, answering questions and solving problems, conduct a specific case study or other exercises to strengthen the newly acquired knowledge. It is important to provide the work assignment in written form, and that it contains the following elements:

- Title
- Context and task with clear objective and questions
- Product to be delivered (e.g. presentation, short text, simulation, construction, etc.)
- Time available
- Material available
- Working form (e.g. group, individual work)
- Assess and discuss the outcome and show how it relates to the overall learning.

Flashcards

Flashcards contain information about a certain topic on either one or both sides. They can be pre-printed or written by the participants and help memorize and test newly learned knowledge. This is especially helpful for familiarizing oneself with new vocabulary concepts.

Videos

Video sequences can be part of a lecture, precede a discussion or introduce a case study and should be well embedded in the session plan. It is important that learners are given 3-4 questions to answer while watching, followed by a discussion in groups, pairs or in plenary.

6. Resources and material

Teaching and learning resources

Teaching and learning resources include any kind of material used during the training, such as handouts, manuals, videos or other digital applications. Visual and audio stimulations bring variety and make sessions more interesting. It also helps the participants remember new things and makes the training more effective (ESCAP, 2001, pp. 34-5).

What teaching and learning resources are used during the training depends on your sequence plan, on what is suitable for the different sections, and on the availability of technical equipment. Below is an overview of resources and how they can be used. This list should not be considered exhaustive.

Trainer's manual. It is only for the trainer and it provides an overview of the training methodology, the training content, background information, and explanations for exercises and group works.

Training manuals. They are handed out to the participant and give an overview of the training content. In addition to describing the content, they may also contain exercises, questions, inputs for reflection and further reading recommendations.

Handouts and worksheets. The trainer prepares them beforehand to be read or filled out during the session. They can contain activities such as multiple-choice surveys, pictures to label, sketches to make or other quizzes.

Presentations. They are a visual support to the trainers' explanations (phase of information delivery). They can be prepared e.g. in Microsoft PowerPoint (if projector available) or on posters (e.g. flipchart sheets or white boards.)

Videos. It is important that the videos fit well with the topic and are not too long. In addition, questions should be provided beforehand for participants to answer while watching. This activates the participants and enhances their understanding of the content. Ensure that the right technical equipment is available.

'Sticky' notes ("Post-its") or facilitation cards. They are helpful for collecting and grouping ideas and notes. The trainer and participants can write on them and stick them on a whiteboard, wall, flipchart, etc.

Flip Charts. You can prepare the flip chart beforehand and use it as a teaching poster, draw or write on the flip chart during the training, or stick post-it notes or pictures on the flip chart. Participants themselves can write on the flip chart and use it to present the results of group discussions.

White-or blackboard. They can be used like flip charts to collect or illustrate ideas. The trainer can prepare the board beforehand or write on it during the session, either to explain something or to take notes during discussions. The participants can also use them to visualize processes, to take notes or for presentations.

Interactive learning material. There is a range of interactive learning materials on the web. They are computer-based and can be used on- or offline. Examples include simulations for elaborating scenarios, and videos explaining situations or processes. A list with examples regarding climate change can be found below.

Interactive learning material creates variety during a session and can enhance learning. However, there are a few things to consider when using interactive learning materials (partly adapted from NSF, 2018):

- Integrate the material well into the training sequence. Is it suitable for the topic? Does it provide added value?
- Give a short introduction to the contents and source. With questions or tasks given at the beginning, you can guide the participants' attention to topics you want them to focus on.
- Don't use too much interactive learning material.
- After the interactive session, take time to discuss the content.
- Test the material following your guiding questions or your exercise and check the timing, potential challenges, feasibility of task, and plausibility of the application results.

Learning should be fun.

You can use short tests, brain teasers or quizzes regularly in your training sessions. These are not serious tests, but an easy way to keep people thinking and to test their knowledge and understanding during the training. You can even give small prizes for the winning groups.

Examples of climate-related interactive learning material

UN CC:learn

The “One UN Climate Change Learning Partnership” offers a range of interactive learning resources on climate change. This includes e-learning courses, videos, learning platforms and other materials.

https://www.uncclearn.org/

AdaptationCommuity.net

This website focuses on the measures to adapt to climate change. It provides a range of approaches, methods and tools on the planning and implementation of adaptation action for climate change.

https://www.adaptationcommunity.net/

Climate simulator

C-Learn is a simplified version of a climate simulator. Its primary purpose is to help users understand the long-term climate effects of various actions to reduce fossil fuel CO_2 emissions, reduce deforestation, and grow more trees. Participants can ask multiple, customized what-if questions to understand why the system reacts as it does. (CLEAN, 2018)

https://www.climateinteractive.org/

NASA Global Climate Change

On the NASA website on climate change, you can find many facts, online satellite images and videos on how the surface of the earth has changed due to climate change.

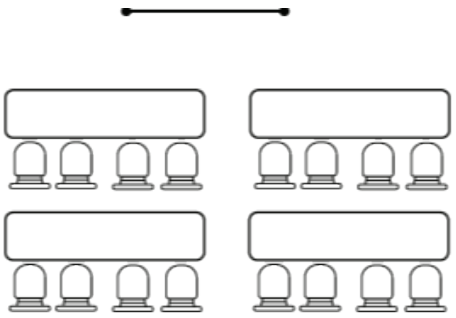
https://climate.nasa.gov/

Classroom setup

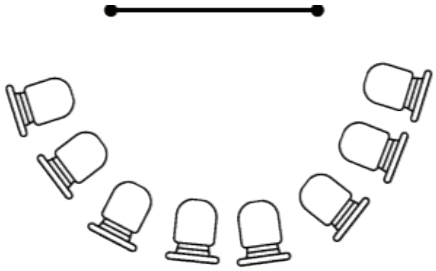
Fresh air and natural light are important for learning. Therefore, ensure that there is enough light. Ideally, you have daylight, so if you have curtains or shutters, open them and only darken the room if you need it, e.g. to use the projector. Open the windows regularly, even if it is hot outside, to let fresh air in. If it is very hot, an air conditioner set to a pleasant temperature can help create a comfortable learning atmosphere.

For group work, think about how the room can be split into smaller entities (separate tables, smaller rooms or then move out to the garden if the place allows it). Plan enough breaks or even energizers, so participants can get some fresh air and recharge their batteries for a few minutes.

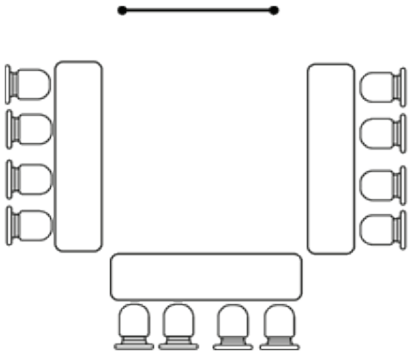
Identify an appropriate workshop set-up for the participatory methods, Table 5 gives a few examples. A traditional classroom setup allows little interaction and is thus not recommended, as it does not encourage interactive learning. It is further important to have enough space to move around, to come together for energizers or for other activities, especially for working in groups (Fröde-Thierfelder & Schwedersky, 2009, p. 17).



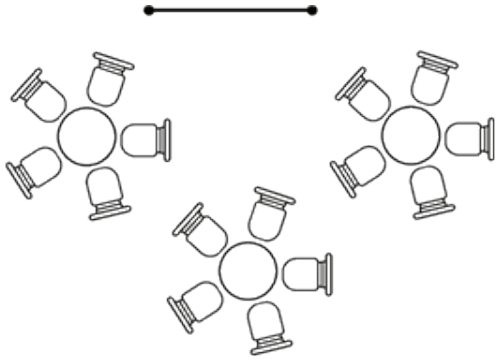
Not recommended as it allows little interaction between participants



Allows for interactions and discussion – everyone can see everyone



Setup also allows interactions, **recommended** for lecturing with discussions and other activities.



Recommended setup for group work and assignments/working stations.

Table 5: Possible classroom set-ups (adapted from Strasser & Mewes, 2013)

Make use of nature as training place

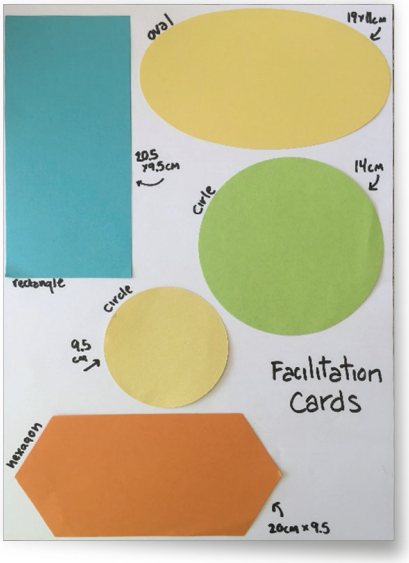
Nature (garden, sitting arrangements under trees, etc.) can be used as working space for group work, simulations, role plays or other activities. A change of environment can refresh the brain and stimulate the thinking process.

Material and equipment

The following checklists help you to have the material you need ready. This list is not conclusive. You might have other good ideas on resources to use!

Facilitation material:

- Flipcharts and flipchart papers (write in big size and make sure everybody in the room can see it)
- Pinboards with pins
- Sello tape or sticky tape
- Markers in different colors
- Facilitation cards in different colors and sizes (to collect ideas, present cases, etc.)
- Sticky notes (Post-its)
- Chalkboards/whiteboards (and chalks)



Technical equipment:

- Video projector for presentations
- Sound equipment (speakers) to show videos
- Laptop
- Connector between laptop and projector
- Screen or white wall
- Camera for photo documentation (e.g. smartphone)
- Electricity or generator facilities including extension cables
- Internet (for online videos or interactive learning material)
- Specific technical equipment: chemicals, rock samples, weather measuring instruments, etc.

Preparation is key!

Good preparation will make you feel more at ease during the course and it will also ensure the smooth running of the training. Think about what equipment and resources are needed and assemble them in advance. Ensure that the room setup is suitable for the material used, so that everyone can see the screen, the flipchart or the whiteboard clearly.

Do a short technical test round before the actual training starts:

- Is the link to the internet connection working?
- Are the computer and the projector connected?
- Is the sound good?
- Is all the material readily available?

7. Assessment of the training

Assessments are important to evaluate whether the objectives of the trainings or sessions have been reached. Assessing the participants helps them to see if they have reached the learning goal, but it also helps the trainer to improve the training.

Assessing the learners

Assessments and feedback show participants where they stand in the learning process. It means acknowledging what they have achieved so far, and where there is room for improvement. Therefore, performance assessments should be done continuously during the training. For example, at the end of each day, a short, written reflection (e.g. in the form of a training journal) can be done, focusing on the following sample questions:

- What have I learned today?
- What was useful and why?
- What was not useful and why not?
- Do you I have further questions for clarification purposes?

This could also be done in a discussion in plenary form. However, there is the risk that some participants refrain from providing their honest opinion. Alternately, a short multiple choice or quiz can be handed out to check the understanding of the content and where there is a need for further discussion.

Planning the assessment

Before doing an assessment, you must clarify why, what and how to assess (see Figure 9).

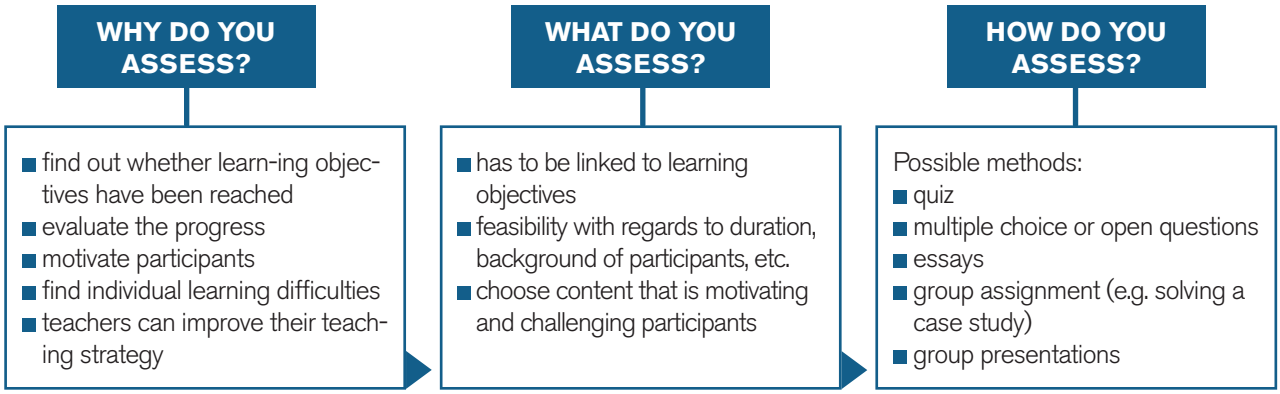


Figure 9: Planning an assessment (adapted from ESCAP, 2001)

Assessing the training

Assessing the training helps the trainer to see whether the trainer has chosen the right methods to help the participants reach the learning objectives of the training. This allows the trainer to improve the training and to personally improve in the role as a trainer. The procedure is similar to the participants' assessment. It is important to define WHAT should be assessed and HOW. The following points can be part of an assessment:

- quality of teaching methods
- validity of teaching methods
- quality of teaching and learning resources
- whether learning objectives are realistic
- workload for participants
- participants' appreciation of the course
- check whether training is linked with participants' professional world

The most common form, especially for a short-term training, is to ask participants to either provide a short written or oral feedback based on a few guiding questions. Again, doing so in written form allows for the anonymity of the participants and thus will most probably yield the most honest answers. Another way is to write a few questions on flipcharts or whiteboards and let the participants rate them with points (see Figure 10). Ideally, the trainer leaves the room during the exercise to guarantee anonymity. A comment field can help the participants clarify and add valuable information. The assessment can also be done electronically, with a small online survey.

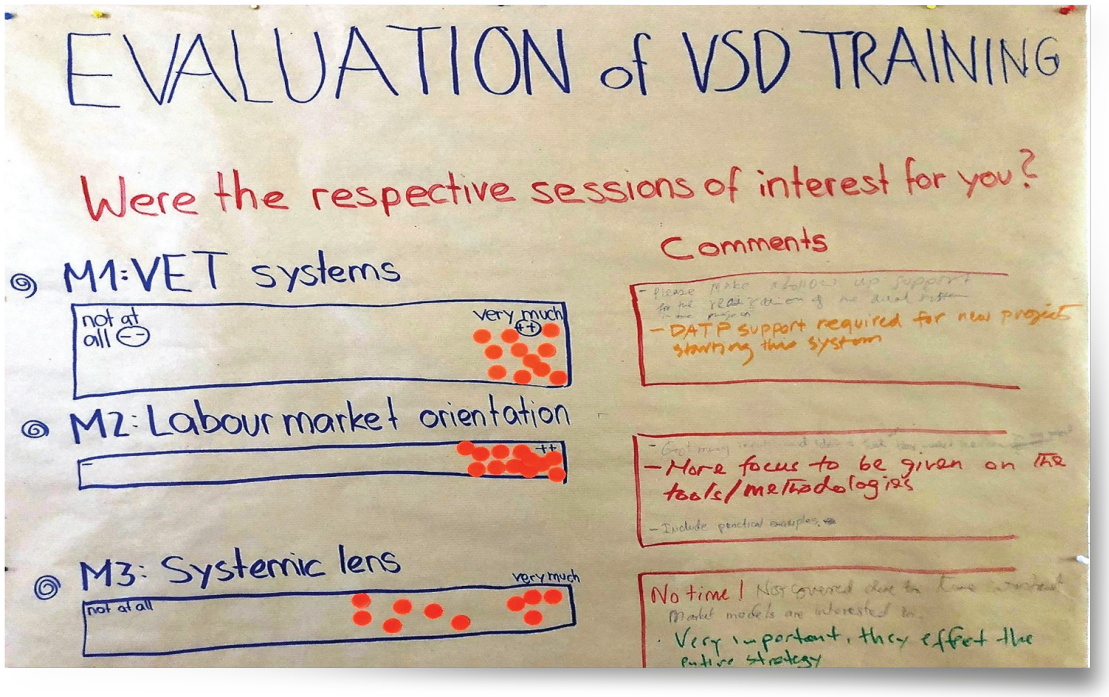


Figure 10: Example for a visual training evaluation

8. Bibliography

Bybee, R. (2009). The BSCS 5E instructional model and 21st century skills. Washington, DC. Washington DC: National Acade mies Board on Science Education.

CEDPA (1995). Training Trainers for Development. Washington DC: The Centre for Development and Population Activities.

CLEAN (2018). C-ROADS: World Climate Simulator. Retrieved from Climate Literacy and Energy Awareness Network: https://cleanet.org/resources/42836.html

ESCAP (2001). Train the Trainer. Training Fundamentals. Instructor's Reference Manual. New York.

Fröde-Thierfelder, B. & Schwedersky, T. (2009). Integrating climate change adaptation into development planning. A practice-oriented training based on an OECD Policy Guidance. Trainer's Handbook. Bonn and Eschborn: Deutsche Gesellschaft für Internationale Zusammenarbeit.

Illeris, K. (2007). How We Learn. Learning and non-learning in school and beyond. New York: Routledge.

IPCC (2018). Global Warming of 1.5°C. Intergovernmental Panel on Climate Change.

Knowles, M. S. (1990). The Adult Learner. A neglected species. Houston: 4th ed. Gulf Publishing.

Le Treut, H. R. (2007). Historical Overview of Climate Change Science. In S. D. Solomon, Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 95-127). Cambridge and New York: Cambridge University Press.

NSF (2018). How to Use Media to Enhance Teaching and Learning. Retrieved from Pedagogy in Action: https://serc.carleton.edu/sp/library/media/how.html

Schweitzer, J. (1995). The Use of Learning Stations as a Strategy for Teaching Concepts by Active-Learning Methods. Journal of Geological Education, 366-370.

Scotland, N. E. (2017). The Knowledge Network. Retrieved from Train the Trainers' Toolkit. Helping others to facilitate learning in the workplace: A Practical Guide.: http://www.knowledge.scot.nhs.uk/media/6866097/trainthetrainers__final_.pdf

Städeli, C., Grassi, A., Rhiner, K. & Obrist, W. (2013). Kompetenzorientiert unterrichten – Das AVIVA Modell. Fünf Phasen guten Unterrichts. hep. Zurich.

Strasser, C. & Mewes, H. (2013). Trainer's Manual. Facing the Impacts of Climate Change: Indian SMEs and Adaptation. New Delhi: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.