



# GSEU

GEOLOGICAL SERVICE | FOR EUROPE

## GSEU WP2 TRAIN-THE-TRAINER COURSE

How to teach

Level 3

Ljubljana, 18-19 June 2024

Sebastian Pfeiderer, GSA

[www.geologicalservice.eu](http://www.geologicalservice.eu)



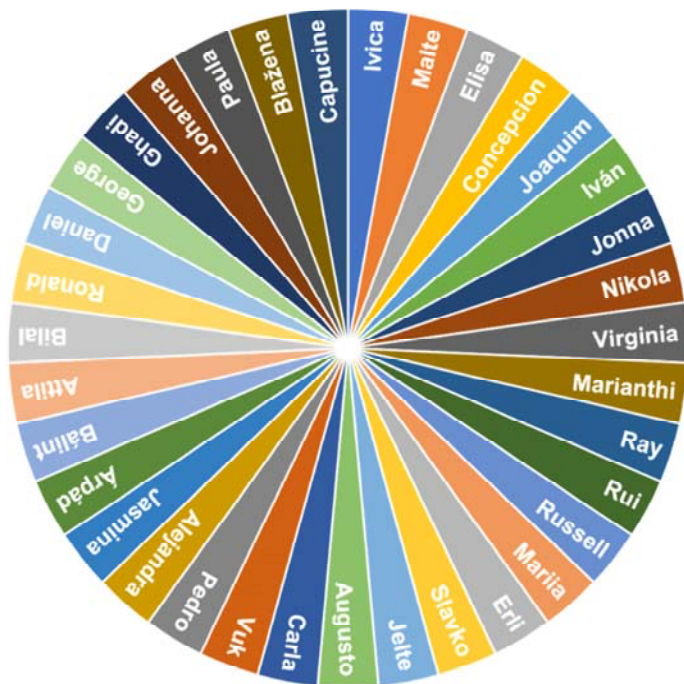
June 18, 17h – 18h

## How to teach

- Principles
- Methods
- Teaching Concepts and Implementation

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- click again to stop





## WHEN DESIGNING YOUR COURSE...



<https://educationatechnology.net>



1) Principles - 2) Methods - 3) Concepts and Implementation

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When designing your course, ask yourself three questions:

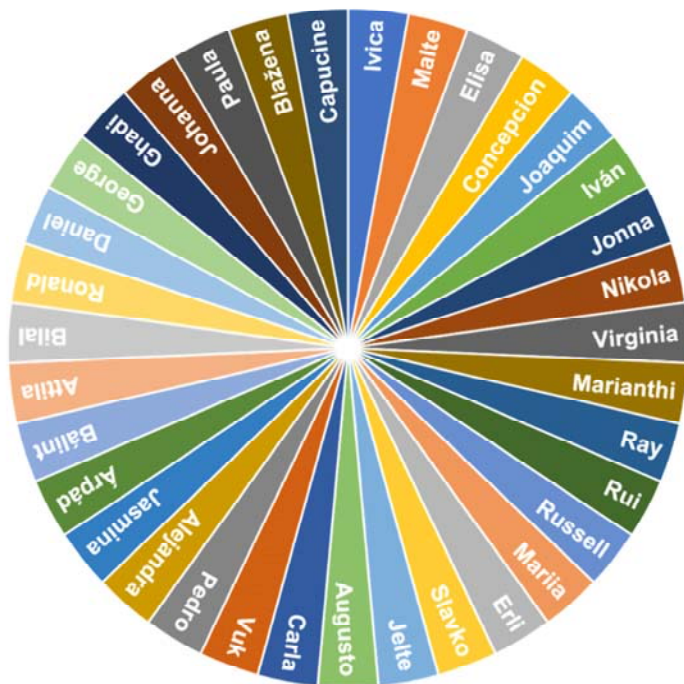
- What learning goals and objectives do I want the students to reach by the end of this course?
- What activities can I implement to support student understanding?
- How will I ensure / assess that my students have reached the learning goals and objectives?

A goal is a broad statement about what the course wants to accomplish (e.g. In general, this course is about learning...).

An objective is a specific result you (as instructor) are trying to achieve (e.g. increase the students' understanding of...).

An outcome is the measurable result at the learner's side (e.g. as a result of this training, students are able to...). To measure the outcome - and to identify remaining knowledge gaps - you need feedback activities after the teaching activities.

Always define an outcome for each activity and announce it at the beginning!

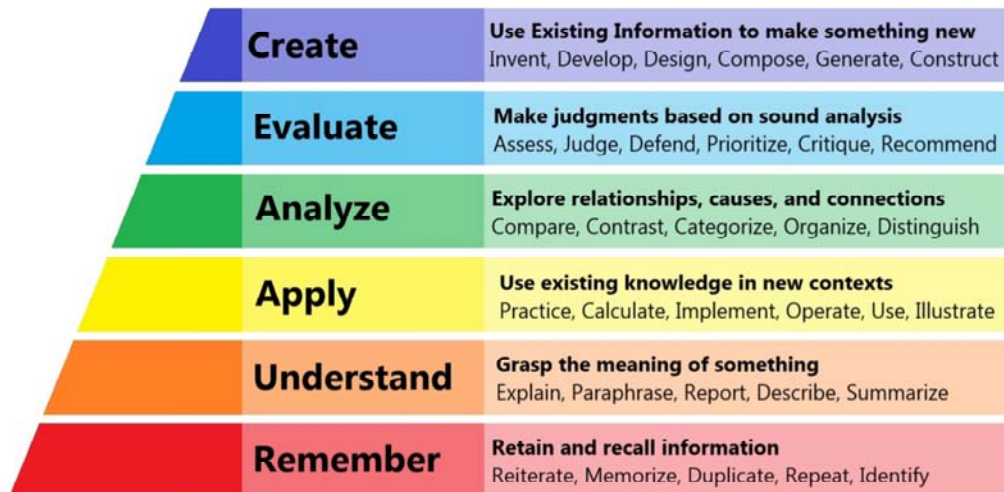


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## LEARNING LEVELS



<https://helpfulprofessor.com/levels-of-understanding/>

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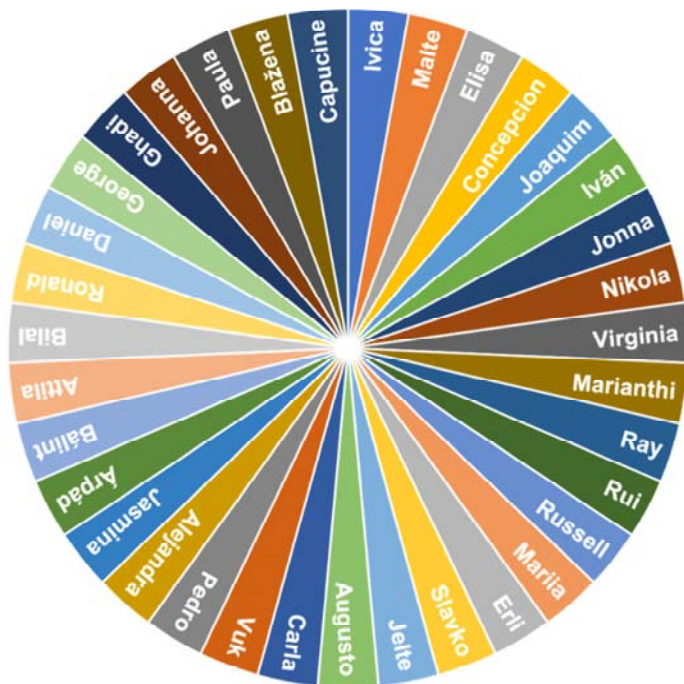


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When designing your course and developing learning objectives, start by considering the level of learners in your course.

Consider the following about your students:

- Before they understand a concept, students must remember it.
- For students to be able to apply a concept, they first have to understand it.
- In order to evaluate a process, they first have to analyze it.
- To create an accurate conclusion, students would have to have completed a thorough evaluation.



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## THE 70-20-10 RULE

**20%**

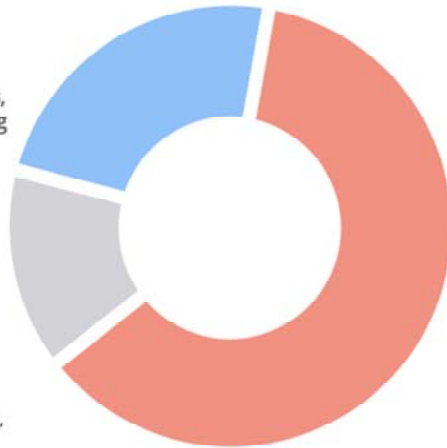
### **Social Learning**

Communities, networks,  
coaching and mentoring

**10%**

### **Formal Learning**

Learning courses, classes,  
and training programs



**70%**

### **Experiential Learning**

New and challenging  
experiences

<https://www.ispringsolutions.com/blog/70-20-10-learning-model>

1) Principles - 2) Methods - 3) Concepts and Implementation



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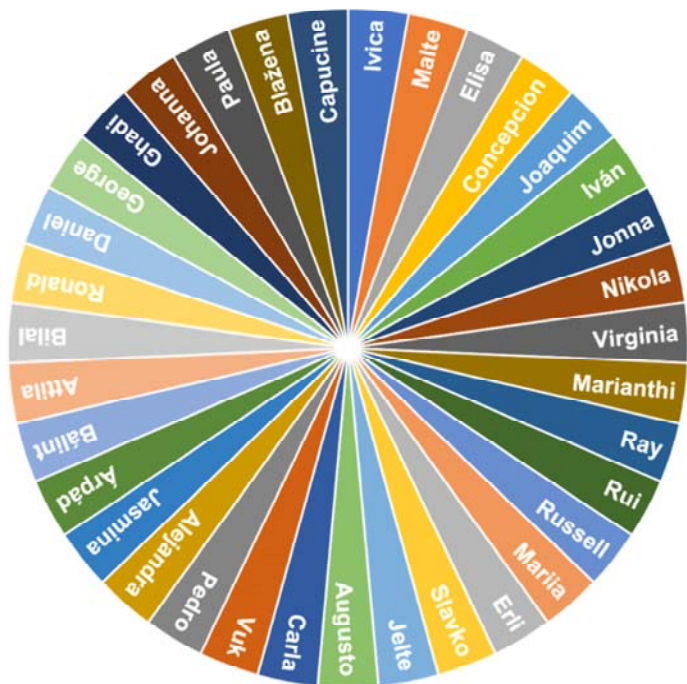
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70% of all learning comes from hands-on experiencing (learning by doing, through trial and error)

20% of learning comes from learning from co-workers and peers (using social resources to fill gaps)

10% is learned through traditional instruction (frontal lecturing)

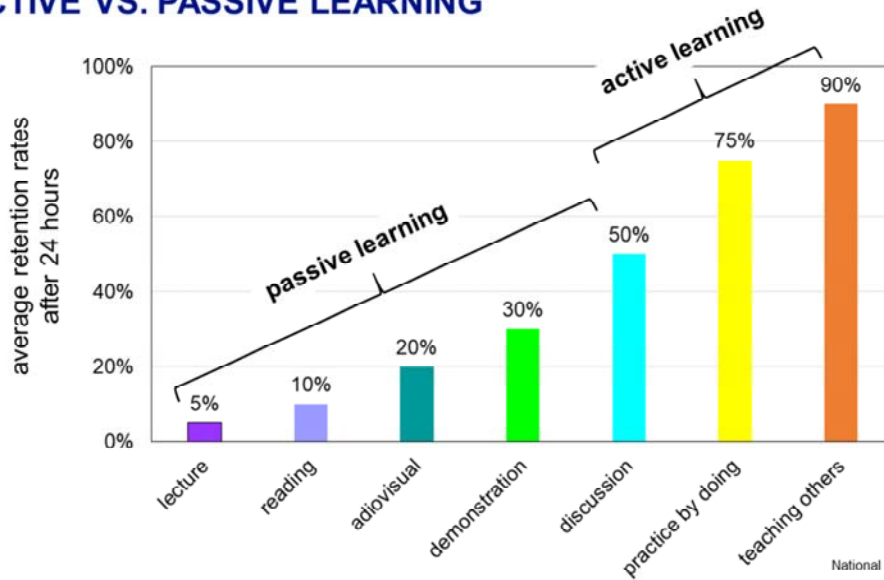




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## ACTIVE VS. PASSIVE LEARNING



National Training Laboratories, Bethel, Maine

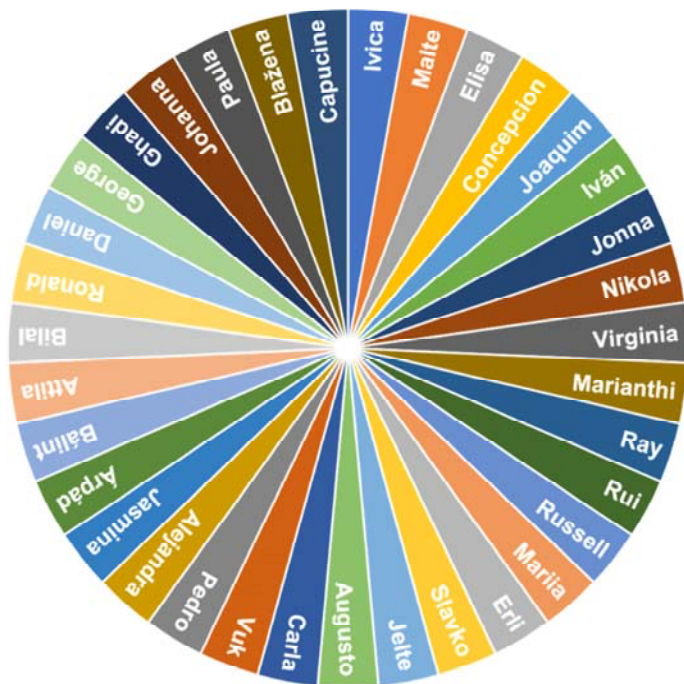


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always alternate between

- activities where participants listen passively (take new information in) and
- activities where participants become active (brainstorm, recall facts, exchange information, explain principles, solve problems, implement theories, interpret new situations, organize material, draw connections, discuss concepts, produce ideas...)



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- click again to stop



## TIME MANAGEMENT

- set time limits for each task
- have a clock visibly in front of you
- focus and prioritize
- identify activities you can drop
- plan buffer time



1) Principles - 2) Methods - 3) Concepts and Implementation



June 19, 9h – 10h

## How to teach

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## METHODS AND ACTIVITIES



### **Brainstorming activity**

- Which teaching methods have you experienced in level 1 and 2?
- What other teaching methods do you know?



## METHODS AND ACTIVITIES

### Teaching methods you have experienced in level 1 and 2

- frontal lectures
- interactive classroom activities
- group work
- classroom discussions
- quizzes and games
- Q&A checkpoints
- live polls and surveys

1) Principles - 2) Methods - 3) Concepts and Implementation



## METHODS AND ACTIVITIES

### Other teaching methods



brainstorming



fishbowl  
discussion



peer teaching



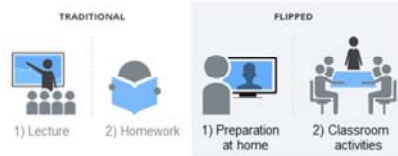
world café



jigsaw



blended learning



flipped classroom



role play

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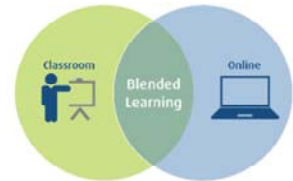
When you plan an activity, think about

- which topic do you want to address
- what learning objective do you want to achieve
- what is the exercise's outcome
- how long will the exercise last
- how to setup the class room
- how to build groups
- necessary equipment (rooms, tables, whiteboard, marker pens, post-its, etc.)
- possible digital tools





## Blended Learning



- alternate activities where
    - teacher and students are physically present with
    - online activities (with/without teacher)
1. students self-educate online (and control where, when, and how fast!)
  2. regular online meetings with teacher for
    - question & answer forums
    - individual support
    - progress checks
  3. physical meetings for
    - practical work
    - social interaction, personal collaboration

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Blended learning has been shown to be more effective than purely face-to-face or purely online activities.

<u>online activities without teachers</u>	<u>with teachers</u>
online courses	virtual classroom
recorded talks	live-streamed webinars
online tests, quizzes, games	online student-teacher meetings
e-book studies	question & answer forums



## Flipped Classroom

- students discover new material at home
  - video lessons
  - reading
  - digital research
  - → **acquire information**
- explore topics in greater depth in class
  - work on problems
  - practice concept
  - discuss with peers
  - → **construct knowledge**



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Preparation at home requires (online) availability of course material, such as books, papers, slides, recorded lectures.

Classroom activities depend on students having covered the material at home.

If students have acquired content at home, in-class activities can focus more on developing higher-order thinking skills.



## Brainstorming

### during brainstorming

- accept all contributions
- do not judge / correct / dismiss / criticize
- only point out repetitions
- keep session focused
- stop session when time is up / no more contributions



### after brainstorming

- organize / group / summarize contributions
- comment on false contributions
- add missing contributions

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- either everybody in the audience can raise their hand voluntarily and the facilitator writes contributions on a flipchart
- or each participant gets empty post-its, writes on them and sticks them on the board
- or use a turn-taking approach (such as pass-the-ball)
- or use online whiteboard (padlet, miro, mural)

aim for quantity over quality

can be used for

- recap / warmup
- collecting ideas at the onset of problem solving or for new content generation

### Example for Brainstorming:

- topic: differences between E-, F- and G axis aspects
- objective: recall various factors and sort out which one affect which axis
- outcome: students know the criteria relevant for the E-, F- and G-axis
- material: flipchart, post-its



## Fishbowl Discussion

### inner circle

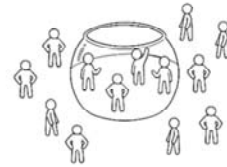
- 5 - 7 persons including moderator
- discuss a given topic for a given time
- represent various perspectives

### outer circle

- 10 - 20 persons
- observe discussion passively
- can submit questions to inner circle
- one person can enter inner circle briefly to add something

### after discussion

- outer circle expresses thoughts and comments
- moderator summarizes the discussion



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suitable for (controversial) discussions, analyses or evaluations in large groups  
aims at commonly developing ideas, solutions or alternatives  
enables shy participants to benefit from discussion

- operation: explain rules; group students into inner and outer circle on a voluntary basis; explain topic of discussion (5 minutes)
- start discussion (30 minutes)
  - moderator keeps everybody in inner circle on topic, stops monologues, asks for clarification, probes for deeper insights..
  - outer circle writes questions on cards to submit to inner circle or sends person into inner circle for a short statement / comment / question; add aspects not yet covered, stimulate discussion
- plenary feedback round after discussion (10 minutes)

### Example for Fishbowl discussion:

- topic: UNFC classification of a controversial case study
- objective: analyze project specifics, extract relevant information for each axis, apply UNFC concepts, derive UNFC class; collect and sort arguments for and against certain UNFC class possibilities, solve controversy
- outcome: students understand prioritization of aspects, UNFC classification of the mining project
- material: chairs set-up in circles, cards



## Peer Teaching

- students teach students
- in small groups
- course facilitator does not interfere
  
- for consolidating existing knowledge
- for reviewing material
- for filling gaps
  
- can be combined with flipped classroom
- can be combined with world café



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good for groups with students at different levels or with different personalities  
high degree of student interaction, less teacher-centred

**Example for Peer Teaching** (combined with flipped classroom, optionally world café):

- topic: CRM Act
- objective: understanding of the implications of the CRM Act on UNFC application
- outcome: students are aware of the points where the CRM Act is relevant to UNFC
- operation:
  1. As preparation at home, each student is asked to read up on the CRM Act (web search for legal text, study slides provided by teacher, ...); you can inform some students to focus on UNFC relevance and invite them to take the teacher's role in the following class session
  2. In class, form groups of 5 students (including one designated peer teacher in each group), and provide space for each group to work undisturbed
    - let groups start with exchanging and collecting the information gained at home
    - announce to all groups to start the peer teaching phase; if there is a group without a designated peer teacher, let this group decide ad hoc who will take this role
    - the peer teacher explains, what the CRM Act has to do with UNFC; write important info on flipchart
  3. Optionally, you can reshuffle groups (while the flipcharts remain at the tables!), designate new teachers and repeat the exercise to maximise the outcome; the new teacher uses the flipchart (and builds on the results) of the previous group
- material: print-out of CRM Act and slides; flipchart, pens, loose chairs

If done online, the peer teaching happens in break-out rooms, each with an interactive whiteboard - and without you (as course facilitator) present!



## Jigsaw



- form jigsaw groups, each consisting of  $n$  students
- divide a day's topic into  $n$  sub-topics
- in each jigsaw group, each student individually reads over one sub-topic
  
- students of the same sub-topic join temporary "expert teams" to discuss and rehearse the main points of this sub-topic
  
- bring students back to their jigsaw group
- each student presents their sub-topic to the group
- together, they discuss how sub-topics interlock

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Well suited for cooperative learning.

The facilitator's role is restricted to rein in dominant students, potentially correct expert teams' results before they are being presented.

### Example for Jigsaw:

- topic: class definitions along the three UNFC axes
- objective: learn the concept of classifying a mining project along three axes
- outcome: students can define and explain the meaning of the classes along each axis
- operation:
  1. split students into groups of three students each
  2. in each group, the students individually read over the definition of classes and sub-classes (one student reads about the E-axis, one about the F-axis, one about the G-axis)
  3. all students of the same axis join temporary expert teams and compare / remember / complement each other on what they have read; collectively, they prepare the main points of the class definitions to present once they are back in their groups
  4. back in their group, each axis expert explains the main points to the others; together they discuss how (and where) various aspects of a mining project are taken into consideration for the final UNFC result
- material: notepad for taking notes



## Role Play



### setup

- build one group for each role
- groups choose actor and prepare them for role play

### conduct role play

- each actor presents their perspective
- playfully debate and (try to) develop a common solution

### debrief

- summarize main takeaways

suitable for advanced learners to appreciate different perspectives  
use a case study which has been discussed previously  
aims at having fun!

### Example for role play:

topic: case study of a mining project in the planning stage to be classified according to UNFC

objective: agree on one UNFC classification of the mining project

outcome: students appreciate ambiguities and different angles of approach

operation: explain activity, then split into 3 (optionally 4) groups (10 minutes)

1. each group chooses a representative and prepares them how to act, what to say, what to stress, how to stand their ground (10 minutes)
  - the representative of group 1 will take the role of a company CEO developing a mining project and seeking a licence and financial support; the person does not necessarily have to be from a mining company in real life
  - the representative of group 2 will take the role of the mining authority assessing the chances of permit granting; the person does not necessarily have to be from a mining authority in real life
  - the representative of group 3 will take the role of the UNFC evaluator; the person does not necessarily have to be from a Geological Survey in real life
  - optionally: the representative of group 4 will take the role of the creditor; the person does not necessarily have to be a banker in real life
2. actor 1 starts with a short (2 minutes) introduction, actors 2 and 3 (and optionally 4) ask additional questions and develop / discuss their assessment / evaluation, other students observe role play (15 minutes)
3. after the pre-set time is up, the other persons in the group can comment (10 minutes)

material: flipchart or PowerPoint slide for actor 1 to present their case



## World Café

### setup

- table setup as in coffee house
- one topic and one facilitator per table



### operation

- form small groups (5 - 6 persons) and go to tables
- 10 minute discussion on given topic
- write results on flipchart
- reshuffle groups
- 10 minute discussion... } repeat  $n$  times ( $n = \text{number of tables} - 1$ )

### poster session (display of flipcharts)

- each facilitator summarizes results of discussion, assessment

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very efficient for multiple discussions, knowledge sharing, cooperative learning

first discussion starts with facilitator introducing the topic

reshuffle means new table AND new group forming; facilitators and flipcharts stay at the same table

new round of discussion starts with facilitator explaining / summarizing previous round(s)

each discussion round uses different colour pen

with e.g. 4 tables / groups: have 4 discussions (and 3 reshuffles in between)

finally display all 4 flipcharts as poster session (assessment phase)

optionally: all return to their first table and learn results of other groups

### Example for World Café:

- topic: national UNFC training course design and roadmap for national UNFC implementation
- objective: general teaching concept
- outcome: participants know what to consider when developing their national training course
- operation: explain activity, form 4 groups, go to tables
  1. facilitator introduces table topic
    - topic 1: Who are the target groups for UNFC national training and what pre-existing knowledge do they have
    - topic 2: What modules / aspects do you need to teach
    - topic 3: What are country-specific aspects for national UNFC implementation / training
    - topic 4: How do you want to balance passive and active learning in class and at home
  2. groups brainstorm / discuss and write results on flipchart
  3. reshuffle to new tables
  4. new group adds new aspects / facts to existing flipchart
  5. after 4 discussions return to plenary session
  6. facilitators summarize / assess flipcharts
- material: 4 tables, one (stationary) flipchart paper per table with topic as title, multiple pens of 4 colours



June 19, 10h – 11h

## How to teach

- Principles
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## World Café - Activity

**topic:** national UNFC training course design  
**objective:** general teaching concept  
**outcome:** participants know what to consider when developing their national training course



**operation:** 4 tables, 1 topic at each table

- topic 1: Who are the target groups for UNFC national training and what pre-existing knowledge do they have?
- topic 2: What modules / aspects do you need to teach?
- topic 3: What are country-specific aspects for national UNFC implementation / training?
- topic 4: How do you want to balance passive and active learning in class and at home?

10 minutes for each discussion round

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1. hand out one paper slip with itinerary (sequence of tables; e.g. table 2 - table 4 - table 3 - table 1) to each participant
  2. explain activity, go to tables
  3. first discussion starts with facilitators introducing the topic
  4. groups brainstorm / discuss and write results on flipchart, max. 10 min
  5. facilitators keep everybody on topic, stop monologues, ask for clarification, probe for deeper insights
  6. reshuffle to new tables according to personal itinerary; facilitators and flipcharts stay at the same table
  7. new round of discussion starts with facilitator explaining / summarizing previous round(s), max. 10 min (later rounds may need less time)
  8. new group adds new aspects / facts to existing flipchart
  9. each discussion round uses different colour pen
  10. with 4 tables: have 4 discussions (and 3 reshuffles in between)
  11. after 4 discussions return to plenary session
  12. display all flipcharts as poster session (assessment phase)
  13. facilitators summarize / assess flipcharts, max. 10 min
- material: 4 tables, one (stationary) flipchart paper per table with topic as title, multiple pens of 4 colours, paper slips with itinerary for each participant



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Thank you for your attention!

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### **Additional slides for World Café facilitators**

- target groups and pre-existing knowledge
- modules / aspects to teach
- country-specific aspects
- balance passive and active learning in class and at home





## Topic 1: Who are the target groups for UNFC national training and what pre-existing knowledge do they have? (table to be edited)

Target audience	Pre-existing knowledge
Ministry officials	<ul style="list-style-type: none"> <li>• <u>perhaps to some degree</u>: CRM Act, National Mining Act, other relevant national aspects (fiscal, environmental)</li> </ul>
Mining Authority employees	<ul style="list-style-type: none"> <li>• National Mining Act, national classification system, national permitting process, other relevant national aspects (fiscal, environmental)</li> <li>• <u>perhaps to some degree</u>: CRM Act, UNFC basic principles, historic data and data gaps, resource geology, (uncertainties of) resource estimation</li> </ul>
GSO employees	<ul style="list-style-type: none"> <li>• resource geology, (uncertainties of) resource estimates, historic data and data gaps</li> <li>• <u>perhaps to some degree</u>: CRM Act, UNFC basic principles, National Mining Act, national classification system, national reporting, national permitting process</li> </ul>
Private companies	<ul style="list-style-type: none"> <li>• resource geology, (uncertainties of) resource estimates, historic data and data gaps, National Mining Act, national classification system, national reporting, national permitting process</li> </ul>
University students	<p>depending on curriculum</p> <ul style="list-style-type: none"> <li>• resource geology</li> <li>• <u>perhaps to some degree</u>: (uncertainties of) resource estimation, national classification system</li> </ul>

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## Topic 2: What modules / aspects do you need to teach? (table to be edited)

Target audience	Modules											
	international							country-specific				
	CRM Act	UNFC basic principles	general UNFC theory (level 1)	Bridging international systems to UNFC	detailed UNFC theory (level 2)	(Uncertainties of) Resource estimates, Historic data and Data gaps	UNFC Guidance Europe, INSPIRE codes	National Classification System, National reporting	Bridging National system to UNFC	National Mining Law	National Permitting Process	Other relevant national aspects (fiscal, environmental)
Ministry officials	x	x					x					
Mining Authority employees	x	x	x	x	x		x		x			
GSO employees	x	x	x	x	x	x	x	x	x	x	x	x
Private companies	x	x	x	x	x		x		x			
University students	x	x	x	x		x				x	x	x

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### **Topic 3: What are country-specific aspects for national UNFC implementation / training?** (list to be edited)

- National Mining Act, related legal framework
- national classification system, national reporting & definitions
- national permitting process
- national fiscal and environmental rules
- national resource management, land access, land use practice
- national players & institutions, their roles and mandates
- national data providers, data accessibility
- historic data and data gaps

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## Topic 4: How do you want to balance passive and active learning in class and at home? (table to be edited)

learning	types of activities	percentage
passive learning in class	<ul style="list-style-type: none"><li>lecturing</li></ul>	10 %
passive learning at home	<ul style="list-style-type: none"><li>reading books</li><li>watching recorded presentations</li><li>watching live-streamed webinars</li></ul>	20 %
active learning in class	<ul style="list-style-type: none"><li>group work (case study analyses, discussion, peer teaching)</li><li>interactive class room activities (discussion, peer teaching, world café, role plays)</li><li>brainstorming, quizzes, games, live polls &amp; surveys</li></ul>	40 %
active learning at home	<ul style="list-style-type: none"><li>online test, quizzes, games</li><li>online question &amp; answer forums</li><li>virtual classroom</li><li>digital research</li><li>homework, preparation for class sessions</li></ul>	30 %

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