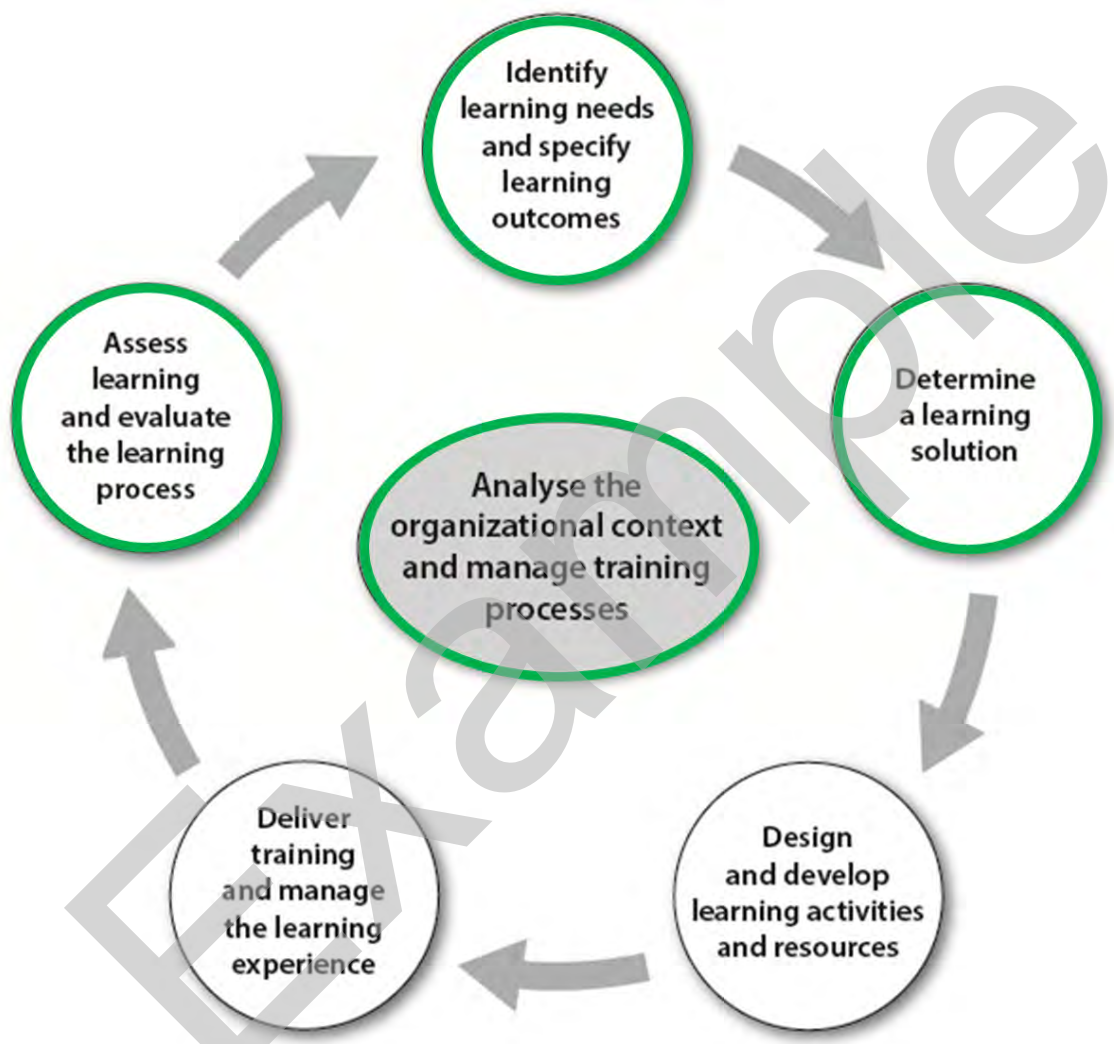
An Extremely Short Summary of the WMO Course for Trainers

1. The Training Cycle



We began by focusing on the training cycle, which forms the basis of this course. This cycle is composed steps in a systematic process, starting with identifying learning needs and ending with assessing learning. Each component also impacts the others through ongoing evaluation and reassessment of decisions and outcomes along the way. For example, learning needs should determine what must be learned and how it should be taught, and assessments of learning might show that teaching methods should be changed, or that not all the learning needs we

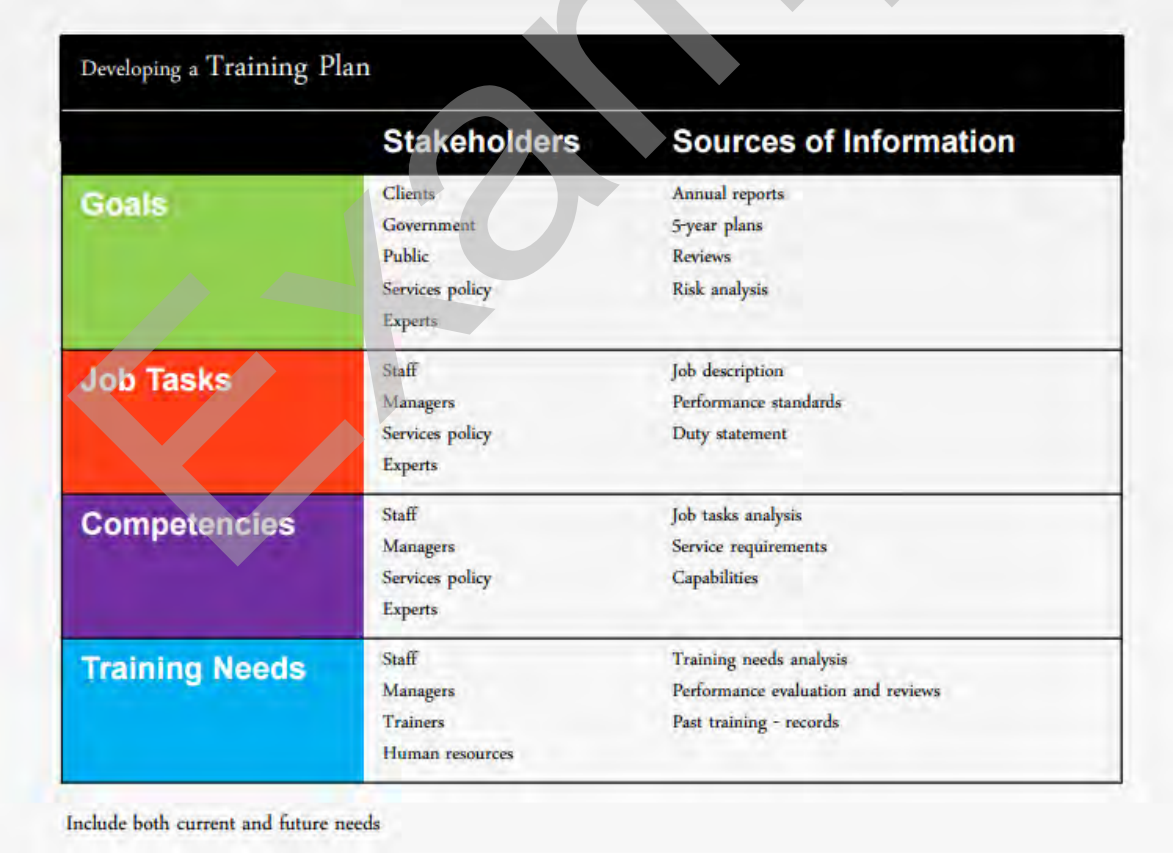
identified.

Module 1 addressed those elements highlighted above in green—learning needs and outcomes, learning solutions, learning assessment, training evaluation, and also the central concern of analyzing the organizational context and managing training. Module 2 focuses on designing learning activities and delivering training. Module 3 continues the treatment of delivering training.

These components also make up the WMO Competencies for Education and Training Providers.

2. The Role of Competencies

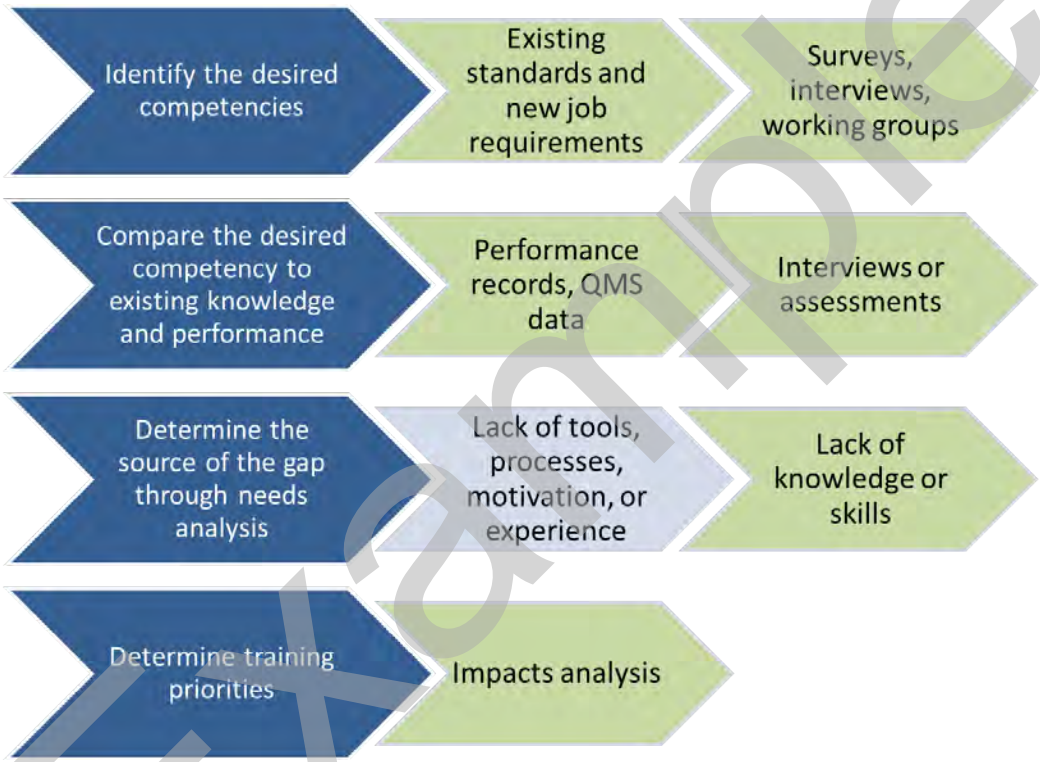
Next we looked at the role of Competencies in defining training needs. The required job competencies of staff members are driven by the organizational goals and by the job tasks or responsibilities designated to meet those goals. The competencies, in turn, form the basis of the training needs (or learning needs).



3. Learning Needs Assessment

Next, we looked at the process of learning needs assessment, which is the how we determine when and what training is required or of highest priority.

This is done by identifying the desired competencies, comparing desired competency level to the existing performance level, identifying the source of the gap, and establishing training priorities. Some performance gaps, such as lack of tools, processes, sufficient experience, or motivation, cannot be resolved by training.



4. Learning Outcomes

Next, we looked at how to write Learning Outcomes.

Learning outcomes describe what teachers and trainers intend learners to achieve during any particular education or training event, such as a class, course, or programme of study.

Examples of learning outcomes:

Evaluate and use NWP products in the forecast process.

Use satellite remote sensing products for wildfire applications.

Identify and retrieve adequate climate data from different sources to generate seasonal climate products for energy and agricultural industry users.

Choose and apply methods of assessing nutrient load in water resources.

Documenting the intended learning outcomes guides your training development, helping you decide what content is required (or not required) and what activities and practice opportunities will help learners achieve benefits from training. They also tell you how you should assess learners.

5. Think-Do-Feel Table

We discussed the use of the Think-Do-Feel table to analyze your learners to better understand:

- What do they think and feel about this topic and the training?
- What do they currently do? What changes do you want?
- How you can help them toward the desired change.
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	Now	After
Think	What do people think about this topic now?	What do you want them to think?
Do	What, if anything, do they people do now?	What do you want them to do?
Feel	How do people feel about learning this topic?	How do you want them to feel?

6. Learning Solutions

Professionals learn their skills in a wide variety of ways, both formally and informally. **Learning solutions** is a term we use to describe the modes of learning we have available to us (e.g., online learning or classroom) and the environments that provide opportunities to learn (e.g., a course, self-directed study, on-the-job training, mentoring or coaching).

Formal solutions include

- Short classroom courses, one week or less (can include workshops, seminars, etc.)
- Long classroom courses, multiple weeks
- Online courses, mostly synchronous (made up of live presentations or webinars)
- Online courses, mostly or fully asynchronous (mostly self-directed, with limited or no live sessions)

Informal and Semi-Formal solutions include

- online seminars or webinars (often less than a day, but might be grouped in a series)
- conferences or seminars (in-person meetings)
- self-directed learning (the learner accesses information and learning resources as assigned or under their own initiative)
- on-the-job training (job practice under the guidance of an experienced person)
- a job manual or documented instructions (using printed or online resources for self-help on the job)
- mentoring and coaching (a more experienced person provides periodic guidance over an extended period of time)
- learning from colleagues (in office or off-the-job discussions, or through formal or informal communities of practice, including online discussion forums or blogs)

We choose learning solutions based on practical criteria, characteristics of the learning objectives, and on the pedagogical values we hold. **Blended solutions** that combine those listed above are often the best choices.

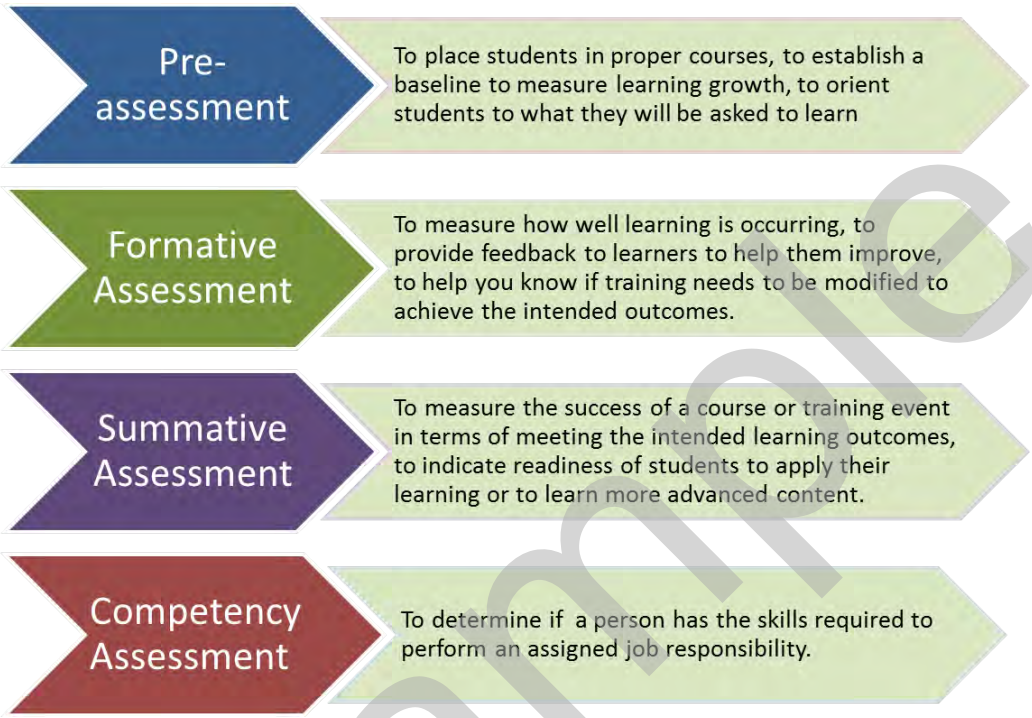
7. Bloom's Taxonomy

We looked at Bloom's Taxonomy as a tool for defining more complex learning outcomes and assessment approaches.

Recall	•Remember definitions or details of a concept, principle, or concrete thing. •Example: State what data is captured in a satellite channel
Comprehension or Understanding	• Explain something, or infer something from what is known. • Discuss the implications of something and describe it in one's own words.
Application	• Using knowledge to make a small-scale judgment or decision, or in following a procedure.
Analysis	• Determining which information is most relevant, how it can be classified or organized, or what it indicates.
Synthesis and Evaluation	• Usually listed as two separate levels • Using knowledge to create a new application, hypothesis, or interpretation, or to evaluate the quality of something

8. Purposes of Learning Assessment

In the unit on Learning Assessment, we looked at several purposes of assessment.



9. Types of Learning Assessment

We also discussed types of assessment available for learning assessment, and discussed advantages and challenges for implementing more complex assessments.

Types of Assessment

Quiz items: True/False	Papers or projects
Quiz items: Fill in the blank	Student-generated diagrams/illustrations/concept maps
Quiz items: Clickable hot spot	Observation
Problems and exercises	Self-assessment
Quiz items: Multiple choice	Role play
Quiz items: Short or long text answer	Peer assessment
Quiz items: Matching	Simulation or case study
Discussion	Real-time event application
Interviews	Portfolio of student work

10. Training Evaluation

Finally, we discussed training evaluation, and distinguished this from learning assessment in its purpose not to assess student learning, but the effectiveness of training. We first looked at who and what can be evaluated.

Who is being evaluated	What is being evaluated
Learners	Readiness for training, application of training, attitude toward training, and learning (in this case, as an indicator of training effectiveness)
The training team (teachers, trainers, instructional designers, training support, administration)	Training resources, learning activities, delivery, logistics, use of facilities, planning
The training department (including the managers)	Decisions on training needs and priorities, choice of learning solutions, planning processes
The organization (the departments that utilize and request training and the management levels who influence training decisions)	Decisions on training needs and priorities, support for training, support for performance improvement, provision of an effective work environment
Learners' organizations	Support for training application and performance improvement

11. Four Levels of Evaluation

We then examined Kirkpatrick's 4 Levels of Evaluation, and considered who is being evaluated at each of the levels.

Level 1: Reaction

Participants' thoughts and feelings about the learning experience are evaluated, including, whether it was effective, whether it was positive, and whether it was relevant and valuable

Who is evaluated? Directly, the training team is evaluated. Indirectly, the learners and training department are evaluated.

Level 2: Learning

Increase in participants' knowledge, skills, and associated behaviors are assessed.

Who is evaluated? Directly, the learners are evaluated. Indirectly, the

training team and training department are evaluated.

Level 3: Behavior (or Application)

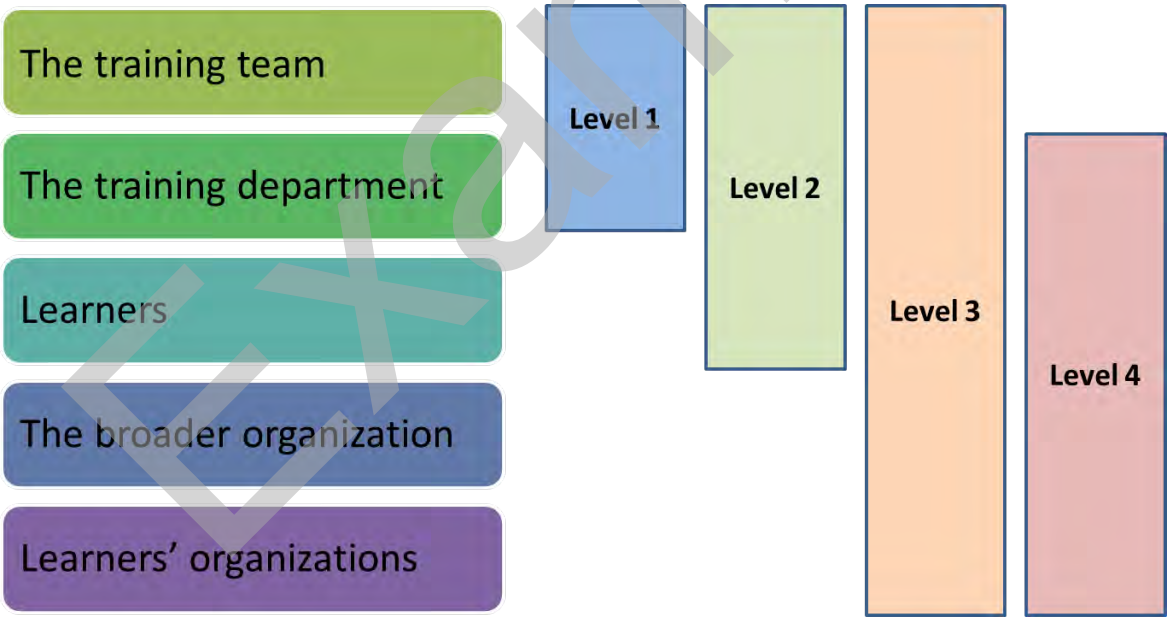
Whether learners apply what is learned to their jobs is evaluated.

Who is evaluated? Directly, the learners are evaluated. Indirectly, their organizations are evaluated, and the training team and department are evaluated.

Level 4: Results

The impact of the targeted learning outcomes are evaluated. Does the training, assuming it has been successful, have an impact on organizational performance?

Who is evaluated? The departments of the organizations in which learners work are evaluated. Indirectly, all components of the training system other than the training team are being evaluated (assuming level 2 and 3 evaluations showed success).



12. Gathering Data for Training Evaluation

There are many ways you can gather the data you need for evaluating your training. Below are a few of these.

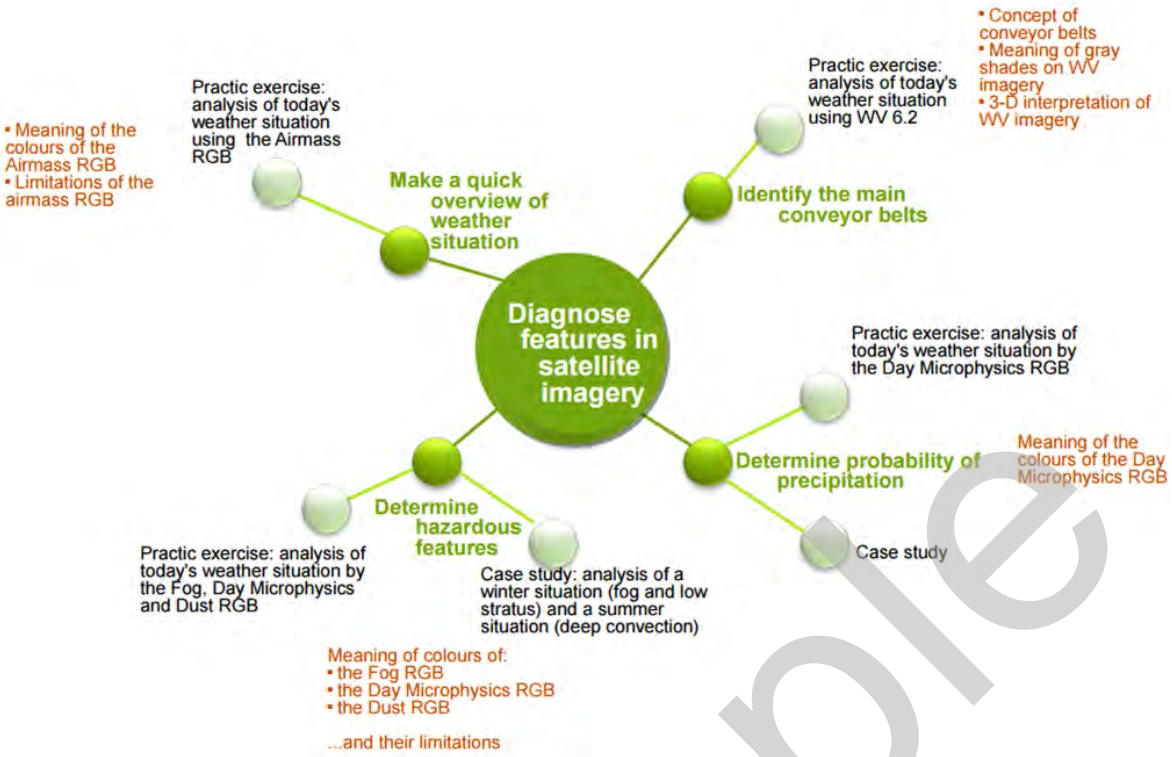
- End-of-course Questionnaires
- Mid-course Questionnaires
- Discussions about the course all students or a small group
- Scheduled meetings with individual students
- Informal meetings (lunch, dinner, field trips, coffee, etc.)
- Test reviews and feedback sessions (reviewing test results)
- Using homework results as a clue to how the course is going
- Gauging learning during classroom discussions
- Using frequent quizzes, problems, and questions to gauge learning
- Use a forum, blog, or wiki to gather feedback on training activities
- Discussing the course with your training team
- Using an outside observer
- Comparing final tests with pre-course test results
- Administering long-term feedback questionnaires to students and/or supervisors in the departments they work after the course (six months to one year)

13. Active Learning

Active learning tactics specific actions or procedures one can apply to achieve the goal of active learning. During the course, we offered 12 active learning tactics for creating learning activities. It was suggested that you adapt them, using whatever parts work for you, mixing or matching to meet your particular needs and constraints. We also looked at 4 more general strategies with which the tactics are associated. These are presented below.

14. Learning Action Maps

A significant strategy for planning training that can achieve intended outcomes is the Learning Action Map. This map links a job-task analysis, which breaks down a competency or smaller scale job task into is smaller sub-tasks, to the learning activities that will help learners achieve the intended learning outcome. The example below shows how a Learning Action Map might look for the job task, Diagnose features in satellite imagery.



15. Designing Learning Activities

The course presented a worksheet to help in making all the considerations necessary for designing and implementing a learning activity. This worksheet included the following:

Activity Description: The description should be adequate to communicate to participants what kind of learning activity it is, what they are expected to do, and what, in general, they will be learning.

1. Which learning outcome(s) will the activity address? In other words, what primary skills and knowledge do you want them to learn? What practice will the activity provide?
2. Are there any secondary skills or non-technical competencies you want students to develop? (for example, critical thinking, communication skills, teamwork, leadership, decision-making, etc.)
3. What are the characteristics of your participants? (Knowledge level, language level, homogeneity, etc.)

4. What learning solution, mode of delivery, or training context will be used? (Classroom, online synchronous, online asynchronous, on-the-job, etc.)
5. Which active learning tactic(s) will you use?
6. How will participants be grouped? (Full group, small groups, individual, etc.)
7. What instructions will you provide to participants in the activity?
8. How will participants interact with the other participants and with facilitators in the activity?
9. What supporting resources are required? (For example, data, instructions, technologies, instructional resources, etc.)
10. What is the role of the teacher or trainer in initiating the activity?
11. How will the teacher/trainer monitor and manage the activity to ensure it stays on track?
12. How will you debrief or summarize the activity with participants to be sure they have learned?
13. How will you know if the activity was successful? Will any form of assessment be used within the activity or afterward?

16. Using Simulations in Training

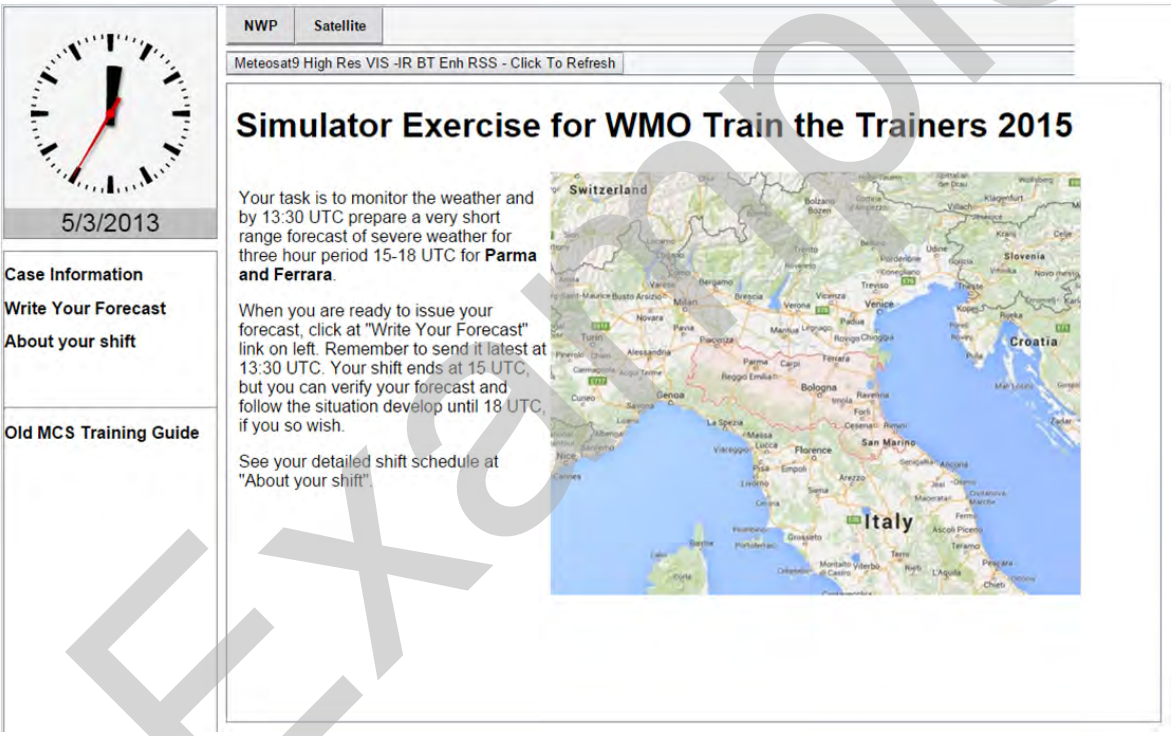
The unit on Learning Activities provided special focus on the use of simulations. Some of the reasons for using simulations offered included:

Daily work provides too little few opportunities to gain relevant experience for situations that occur infrequently. People need to:

- develop awareness on possibilities
- realize the risks and develop competences to deal with them
- learn how to cooperate and react quickly during extreme events

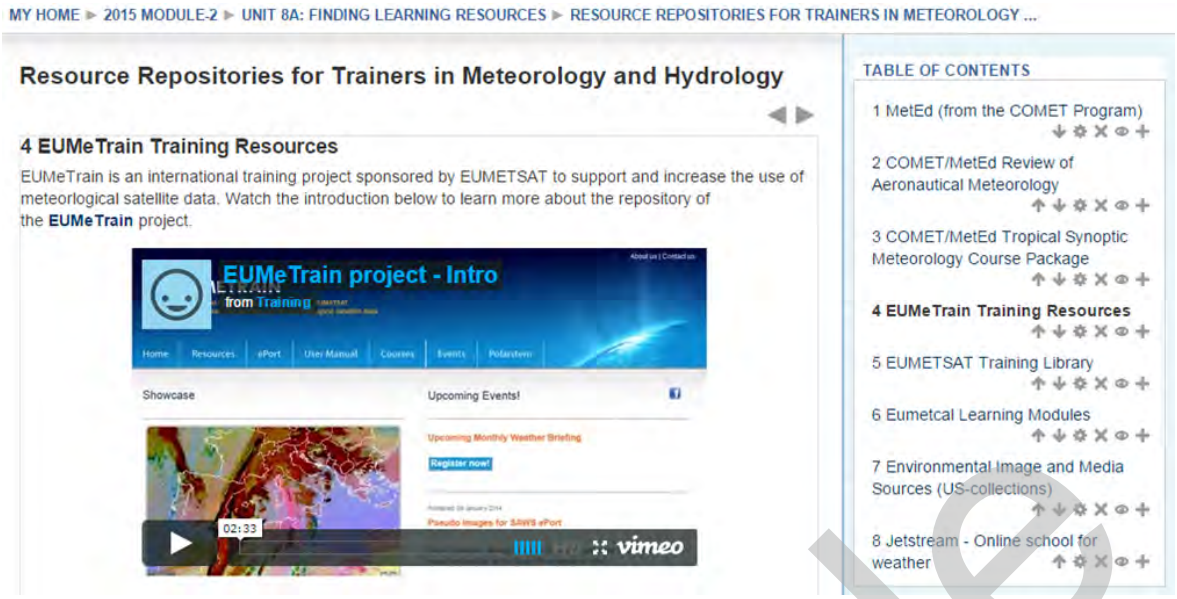
Experience is learning! Simulation provides opportunities to learn in realistic situations. Learners are able to:

- experience processes in order to internalize them
- gain insights and practice decision making



17. Open Educational Resources

In the Unit on Finding Learning Resources, we discussed and shared some favorite locations to find useful online resources available to incorporate into training, or to inspire us in developing our own. A short collection of Resource Repositories for Trainers in Meteorology and Hydrology was shared.



18. Visual Design Principles

Five fundamental visual design principles were discussed and demonstrated. These principles are useful in designing any instructional visuals, like presentation slides, but also handouts, texts, and web pages. The 5 principles are presented below.