

Learning and Teaching Resources

myScripting Term	WMO TtT Term	What is what? A quick guide on learning and teaching strategies	Some examples
Content delivery (lectures and readings)			
Lecture	Lecture, Demonstration	<p>The instructor conveys content in an orally form and communication is unilateral (monologue). This can either be in presence or virtual.</p> <p>The aim is to teach content.</p>	<p>Giving a presentation (lecture), either synchronously in presence/virtually or asynchronously with a recording.</p> <p>http://youtube.com/watch?v=oN9N0gSX7KQ</p>
Textbook	Reading, Tutorial	<p>The content is presented electronically on a screen or printend on paper. In addition to texts, visual aids such as images and knowledge structures can also be used.</p> <p>There are tools that allow learners to directly comment on the content (e.g. "PDF annotate" or "perusal"; see <i>Annotation Text</i> below)def</p>	<p>A printed book, a PDF, a website with continous text, some graphics, tables and pictures.</p> <p>https://www.eoas.ubc.ca/books/Practical_Meteorology/</p>
Learning Video, Podcast, Animation	Media/Video, Tutorial	<p>The content is presented verbally and/or pictorially by the instructor and received by the learners audibly via the ear and/or visually via the eye.</p> <p>Please note that the danger of superficial absorption of information can be countered, for example, by accompanying assignments (e.g., annotation video or integrated tasks), by formulating guiding questions or by asking learners in the video to recite the most important aspects to themselves orally (see <i>integrated Tasks in a Learning Video</i> below).</p>	<p>A nice example of learning videos from the UK Met Office:</p> <p>https://www.youtube.com/channel/UCylCbuzRsB92Gc1l8ru6Vlg</p> <p>http://youtube.com/watch?v=Lg91eowtfbw</p>
Classroom discourse	-	<p>The instructor conducts a conversation with the learners with a reference to the learning objective (in contrast to the conflict discussion, for example). This conversation is led by the instructor (impulse questions, word allocation) and often shows the sequence</p> <ol style="list-style-type: none"> 1. initiation about a question of the instructor 2. response by the learner and 3. feedback from the instructor. <p>The aim is either to collect previous knowledge, to get opinions from the learners or to develop / apply knowledge together.</p>	<p>A (written) example of an effectful classroom discourse</p> <p>https://education.stateuniversity.com/pages/1916/Discourse.html</p>

Activation (case-based, experiential, project-based, guided practice and feedback)			
Anonymous Discussion	-	Learner are allowed to make discussion posts that are anonymous to their peers.	Anonymous discussions are most effective in a virtual environment, for example an anonymous discussion in a moodle forum. Please make sure that you adapt the settings so that the posts are really anonymous.
Assignment / Task	problems, questions	<p>With an assignment / task, new knowledge is either developed independently or learned content is applied to a new context.</p> <p>The aim is active engagement with the learning content and the transfer of learning content into professional context.</p>	<p>There are various forms of assignments/tasks. A simple form could be a preparatory task for new content that will be taught later.</p> <p>A more complex form of an assignment/task could be a problem where students work out the learning content themselves (problem based learning, PBL). Here are two videos that explains problem based learning:</p> <p>http://youtube.com/watch?v=XbH7-Qa9xaU</p> <p>http://youtube.com/watch?v=cMtLXXf9Sko</p>
Exercise	practice, exercises	<p>In an exercise, previously developed learning content is applied. In contrast to a task, exercises are aimed at repeating what is already known and therefore serve to consolidate already developed (partial) skills.</p> <p>An exercise should be formulated as a specific – preferably written – assignment that clearly defines the desired result.</p>	<p>An exercise can be written, where people need to repeat and consolidate new information or practical, where people need to apply the new information in their daily tasks.</p> <p>You can do exercises with the help of a simulator, where a person needs to forecast the weather and then produce and communicate correct warnings for a specific weather situation.</p>
Case	case study	<p>A case forms the basis for explorative case-based learning. The case describes a problem that is worked on by the learners under the guidance of their instructor. The case can be presented as a video, text or audio.</p> <p>This can either be related to problem-based learning (PBL) or case-based learning (case study)</p>	<p>"Case Study Development Guide" by COMET (opens as PDF):</p> <p>https://etrp.wmo.int/mod/resource/view.php?id=8660</p> <p>Here you can find some results of case studies carried out by employees of the UK Met Office.</p> <p>https://www.metoffice.gov.uk/weather/learn-about/weather/case-studies</p>
Glossary	-	<p>A glossary is comparable to a dictionary. A list of terms is created in it, which are then defined. A typical application of a glossary is, for example, a FAQs glossary.</p> <p>Entries in the glossary can be created and maintained by the learners and/or the</p>	<p>An example for a very extensive glossary on meteorological terms:</p> <p>https://www.weather.gov/otx/Full_Weather_Glossary</p>

		instructors. However, a glossary is only an activity if the entries in the glossary are created by the learners, otherwise it's a form of content delivery.	
Integrated Tasks in a Learning Video	-	<p>H5P allows you to enrich videos with MC questions, pop-up text, and other types of interaction.</p> <p>Since interactions are handled individually, this element is mainly suitable for asynchronous learning activities. If no specific tool for integrating interactive elements is available, a video/screencast can be created, and an active request made to pause the video and to solve a task.</p>	<p>A nice tutorial for creating interactive videos with H5P:</p> <p>https://vucollaboratehelp.vu.edu.au/help-guides/interactive-tools/h5p-interactive/240-using-the-h5p-interactive-video-tool</p>
Peer Feedback	-	<p>The learners give feedback on contributions of their colleagues.</p> <p>This can be used as a form of activation, interaction or assessment.</p>	<p>Need some helpful rules for peer feedback in groups? See here:</p> <p>https://writingscientist.com/group-feedback/</p>
Project Assignment	project	<p>A project assignment includes a real problem, which is worked on independently and constructively by the learners. A characteristic feature of a project assignment is that a tangible end product is expected. The working conditions, as well as the required goals, are often only vaguely formulated, and different solutions are possible.</p> <p>Learners often work on a project assignment for a longer time period.</p>	<p>An example of a project assignment by the Lund University:</p> <p>https://pdf4pro.com/amp/cdn/vvrf01-guidelines-project-assignment-lth-bf30b.pdf</p>
Word Cloud	-	<p>A Word Cloud serves to visualize information. The entered keywords are displayed as a word cloud. The frequency of the keywords determines the size of the individual words.</p> <p>It can be used to collect pre-knowledge, to get feedback or to collect keywords after a "content-delivery"-activity.</p> <p>Tools: sli.do, Mentimeter, ...</p>	<p>Word clouds can be created with different tools, for example using Mentimeter: https://www.mentimeter.com/features/word-cloud</p>
Other	game		<p>"Flood Control Game" by M. Ramos, S. van Aniel, F. Pappenberger (2012):</p> <p>https://hepex.inrae.fr/resources/hepex-games/</p> <p>→ Scroll down to <i>flood control game</i>.</p> <p>English version:</p> <p>https://hepex.inrae.fr/download/3634/</p>
Other	roleplay		<p>In a roleplay communication skills can be trained. For example, people can</p>

			<p>train communicating warnings to clients, partners or the public or advising clients with specific needs.</p> <p>5 Ways to use Role-Playing in eLearning:</p> <p>http://youtube.com/watch?v=kF4gKbVFROs</p>
Interaction (discussion)			
Annotation Text, Annotation Video (Transcript)	-	<p>Annotation is a direct comment and/or question. Such an annotation is then visible to everyone - or a defined group. In contrast to video annotation, a text instead of a video is commented on in the text annotation.</p> <p>Please pay attention to the specific data protection guidelines, if you're using external tools such as Perusall, PDF annotate or similar.</p> <p>Transcript is a direct text that is visible to everyone - or a defined group. In contrast to text annotation, video annotation annotates a video instead of a PDF.</p>	<p>A social e-reader and annotation tool:</p> <p>https://perusall.com/</p>
Blog	-	<p>A blog is a chronologically sorted list of entries by the blog author. Blogs can be run by one person or by groups. They usually record experiences and/or opinions on a topic.</p> <p>The aim is to document personal learning experiences (learning journal) or a group process and supports reflection on the learning activity.</p>	<p>Use a standard (moodle?) forum that is displayed in a blog-like format. Open it either for everyone, for a specific group or only for a single person, depending on your needs.</p>
Chat	-	<p>A chat is a text-based <i>synchronous</i> discussion. Chat sessions can be saved and published.</p> <p>The aim is to either exchange on a specific topic (learners among themselves or with an instructor) or to clarify questions during / after a lecture.</p>	<p>During virtual synchronous lectures, chats (e.g. in Webex, Zoom, ...) can be used to ask the learners to share their answers, opinions or comments on a certain aspect of the presentation, to collect questions or to share documents, links, thoughts with learners.</p>
Discussion in a forum	open/structured discussion	<p>The forum is an exchange platform. In contrast to the chat, communication is asynchronous. Individual contributions are therefore not answered immediately, but with a delay.</p> <p>In <i>Moodle</i>, a forum can be set up as a question and answer forum (Q&A forum). In this case, learners will only be able to see other people's posts after they have published a post themselves. This can be useful when working on a task requires</p>	<p>Forums are a nice way to interact in online learning. There are plenty of different formats for forums. Think about what the goal of your forum is and then choose the appropriate format. Adjust the settings to suit your needs.</p>

		<p>originality or initiative since learners cannot be influenced by other people's contributions.</p> <p>It covers similar aims as the above described <i>Chat</i>.</p>	
Content-specific Discussion	open/structured discussion	<p>A content-specific discussion is an exchange platform for specific discussion.</p> <p>All learners in the course can see and respond to posts from all other learners. Usually, there is one specific discussion string or forum per topic.</p>	<p>Ask participants to exchange ideas on a specific topic, to contribute their experiences or even to work on a specific topic and share the results in a forum. Think about what the goal of your forum is and then choose the appropriate format. Adjust the settings to suit your needs.</p>
Course-wide Discussion	open/structured discussion	<p>A course-wide discussion is an exchange platform for general discussion.</p> <p>Additional course-wide discussion topics can be added to guide how learners share and find information during the course run. It can also be used for general questions or organisational and administrative issues.</p>	<p>A main course forum can serve as a central place where an instructor can share important information or learners can ask general questions.</p>
Divided Discussion	open/structured discussion	<p>A Divided Discussion is a group specific discussion forum.</p>	<p>If there are two different classes attending the same online course, you might want them to be divided into two groups and the discussions to be restricted to the users of one group.</p>
Feedback	-	<p>Feedback from the instructor or peers on the learning status or process.</p> <p>Feedback is essential for the learning process as it motivates the learner and improves his / her performance. By giving regular and valuable feedback, the current state of knowledge is made visible and the illusion of knowing is avoided.</p>	<p>Valuable feedback is essential in teaching and learning. Here are some hints for providing effective feedback:</p> <p>https://www.teachthought.com/pedagogy/20-ways-to-provide-effective-feedback-for-learning/</p>
Simulation	Simulation	<p>With a simulation, processes are reproduced as realistically as possible. A distinction is made between simulations with computers (e.g., flight simulators or business simulation) and without computers (e.g., car crash test or fire simulation). Simulations are used when, for example,</p> <ul style="list-style-type: none"> • A real-life investigation would be too complex, too expensive, ethically unacceptable, or too dangerous (e.g., driving or flight simulator). • The real-life system does not yet exist, cannot be observed, or is too complex (e.g., simulation of circuits or the Big Bang). <p>One advantage of simulations over reality is that they are easier to modify and reproduce. The simulations benefit learners who might have difficulty acquiring knowledge from</p>	<p>There are different forms of simulations and simulators, from simple to complicated. Some examples can be found here:</p> <p>http://eumetrain.org/simulators.html</p> <p>https://www.smhi.se/en/climate/education/adaptation-game-1.153788</p> <p>https://scied.ucar.edu/games-sims-weather-climate-atmosphere</p>

		reading and processing textual content alone. However, simulations can also present some groups of learners with difficulties. To minimize barriers to learning, consider the intended learning outcome of the simulation.	
Voting / Survey	-	The learners are asked for information in a vote/survey. Learners and the course team use course discussions to share ideas, exchange views, consider different viewpoints, and ask questions. Different tools can be used.	You can either use the tools available in your online learning environment (e.g. Moodle) or use external tools such as Slido. https://www.sli.do/
Wiki	-	A Wiki is a website whose contents are not only read but also created and edited by learners. This means that texts on a specific topic can be created together without exchanging files. The result is a collection of linked pages that are also thematically related to each other. Every participant can view and edit any page. A special programming language is not necessary. Wikipedia is one of the best-known Wikis.	In some learning management systems you can set up a wiki to build knowledge together. https://moodle.com/news/build-knowledge-learners-using-wiki-moodle/ https://docs.moodle.org/311/en/Using Wiki In case you are not familiar with Wikis and Wikipedia yet... ☺ https://en.wikipedia.org/wiki/Wikipedia
Assessment			
Quiz (Test)	test or quiz	Learners must either answer questions themselves (free text tasks), fill in a close, assign elements correctly (assignment tasks) or select the correct answer(s) from a selection of answers provided. Only tools with clear user recognition are suitable for summative learning controls. A quiz needs not only be used to check learning, but also as an activation task: <ul style="list-style-type: none"> • Collect previous knowledge (entrance test) • Quiz creation by learners to deal with what they have learned (Quiz preparation) 	In most learning management systems there are different options for quizzes. As a nice alternative to a standard quiz, you can use the H5P plugin. With the H5P-plugin a series of interactive quizzes can be designed. They can either be used for formative or summative assessment. https://h5p.org/getting-started https://h5p.org/tutorial-question-set https://docs.moodle.org/311/en/H5P
Multiple Choice Problem (Checkbox Problems / Dropdown Problem)	test or quiz	Multiple choice problems include a question or statement and several answer options. By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem. In multiple choice problems, learners select one or more options from a list of possible answers. To answer the problem correctly, a learner must select all of the	When testing in a virtual environment, one most certainly chooses multiple-choice questions. Writing multiple-choice questions seems like a very simple task. But there are some things to consider when writing multiple choice questions:

		options that are correct answers, and none of the options that are incorrect.	https://testing.byu.edu/handbooks/14%20Rules%20for%20Writing%20Multiple-Choice%20Questions.pdf
Numerical Input Problem / Text Input problem	test or quiz	The numerical / text input problem type is a core problem type that can be added to any course. At a minimum, it includes a question or statement and a response field for a numeric / textual answer. By adding hints, feedback, or both, you can give learners guidance and help when they work on a problem.	To set up a balanced exam, it is advisable to mix different questions types. In many learning management systems (e.g. Moodle and/or the H5P plugin) question types can easily be mixed. Go on try these possibilities!
Open Response Assignment (ORA) / Open Questions	test or quiz	Open response assessments (ORA), sometimes also called peer assessments, are a flexible assignment type in which learners answer questions that might not have definite answers. Learners submit text responses or short essays. You can also require learners to submit an image or other type of file to accompany their written responses.	To set up a balanced exam, it is advisable to mix different questions types. In many learning management systems (e.g. Moodle and/or the H5P plugin) question types can easily be mixed. Go on try these possibilities!
Learning Journal	-	<p>A learning journal is a form of diary that the learners keep about their work and learning experiences. This can either be in the form of a blog or in an offline version that will be provided to the instructor at the end of a learning phase.</p> <p>The aim is to stimulate the reflection on the personal learning process, to monitor the learning progress and to transfer the acquired knowledge into the work context.</p>	<p>Reflection is an essential component for effective learning. By asking learners to regularly reflect their own learning process and current state of knowledge, they learn to better assess their strengths and weaknesses.</p> <p>In a learning journal, learners can either summarize the new knowledge in a free form or answer specific questions provided by the instructor.</p> <p>Here's an example:</p> <p>https://www.anu.edu.au/students/academic-skills/writing-assessment/reflective-writing/learning-journals</p>
Portfolio	-	A portfolio is a collection of learner artifacts (e.g., audio, video, texts, etc.). It documents learning outcomes (product orientation), but it can also map and illustrate the process of skills development in a given period and for specific purposes.	A portfolio can be used in a similar way to a learning journal, but the format is more open. Learners can add audio recordings, videos, etc.
Presentation	-	<p>Learners present their work (e.g. task, case, project) in oral form to the instructor and their peers.</p> <p>It can be combined with a <i>peer feedback</i> or with an <i>oral examination</i>.</p>	Presentations can be synchronous in presence/virtual with the help of a poster or PowerPoint slides (or similar). They can also be asynchronous and previously recorded.
Peer Feedback	-	Learners evaluate each other's work (e.g., text, video, or presentation) by giving peer feedback (peer assessment). This can be used as a form of activation, interaction or assessment.	Here you can find some helpful rules for peer feedback in groups:

			https://writingscientist.com/group-feedback/
Oral Examination	-	<p>Students answer questions and solve tasks set by the instructor in oral form. Oral examinations can be conducted not only for individuals but also for group work.</p> <p>This form is useful, for example, when</p> <ul style="list-style-type: none"> • the focus is on the solution process and less on the result • there are only isolated test items (e.g., verification) • something needs to be demonstrated (e.g., with a tool) • a context must be explained 	An assessment on-the-job can also be an oral examination. In most bigger weather services, meteorologists are usually assessed on-the-job (OTJ) at regular intervals.
Written Work	-	Learners complete an assignment in written form covering several pages as part of a course/module/seminar. The aim is to enable an intensive and in-depth examination of a specific topic.	Following an internal training event, the employees are asked to write a short text where they explain how they apply the new information in their daily work.
Other	actual work (on-the-job)		In on-the-job-assessments, employees are being observed and evaluated during a regular shift by an assessor.