# D3.3.1 Digital interaction toolkit

**CC WATER**

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## WP3

Project description

The objective of this WP is to strengthen partners' competences in the use of ICT tools in learning & teaching methodologies and pedagogical approaches by better exploiting their potential.

The outcome of this WP will be ICT tools embedded into the jointly developed "Water & Climate Change" curriculum and used by partners in their daily teaching.

The main work in this WP will be carried out during 2022-2023. This WP has 4 activities that include one or several sub-tasks specified in the next row. Each activity or its sub-task leads to a specific project deliverable specified in the next table. Activities will be implemented by achieving the milestones. Each milestone leads to a specific deliverable that follows by timeline.

WP3 Assumptions

AS3.1. Novel educational concepts and tools are acceptable in various cultures.

AS3.2. Partners appreciate opportunity of joint remote supervision and mentoring.

AS3.3. Interactive ICT tools for teaching can be available for all partners.

AS3.4. Students are interested in virtual mobility opportunities.

Collection of the interactive toolkit. Partners will carry out a review of digital tools currently used in education and available in other domains of communications. The tools will be grouped by their aims of use, their functionality will be analyzed, and the best tools will be included into the project toolkit. This will include, for example, tools like Slido, Kahoot, Mentimeter, GroupMap, Padlet, MindMap etc. as well as online tests, Wikis and blended learning concepts.

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**WP3**
**TASK T3.3.1: Review of Digital tools currently used in education and available**

**in other domains of communication**

Different learning styles of students have been considered as the foundation of pedagogy. Sensing/feeling, watching/reflecting, thinking, and doing are the four stages of the cycle of learning. Accordingly, different ICT tools demonstrating different pedagogical approaches must be considered in developing a toolkit. Then the activities related to teaching, learning, assessment methods, and sharing resources can be facilitated.

Visual aids arouse the interest of the learner and help the teachers explain the concepts easily. Visual aids are those instructional aids used in the classroom to encourage the teaching-learning process. Visual aids are those instructional devices used in the classroom to promote learning and make it easier and more motivating. The material like models, charts, film strips, projectors, radio, television, maps, etc., are called instructional aids.

# 1 Learning and teaching activities

## 1.1 Developing presentations and videos

**Mentimeter** is used to build interactive presentations with the easy-to-use online editor. Add questions, polls, quizzes, slides, images, GIFs, and more to the presentation to create fun and engaging presentations. Interactive presentations can be created in the presentation builder. Various interactive question types can be built, including Word Clouds and Quizzes, and the entire presentations can be built quickly and easily with Content Slides. Different presentation themes can be selected or can create a presentation according to the requirement. Free stock image and GIF libraries can be integrated. Mentimeter has an easy-to-use presenter mode. The audience interacts anonymously with a smart device. Further, it can use to collect and analyze data taken from participants using smart devices. The tool includes several options such as live polling, word cloud, quiz, questioning and answering, survey, and presentation. Also, it has integrated resources such as templates, webinars, and blogs.

Microsoft PowerPoint can use for showing HD images and create slides. Also, templates can be downloaded from Slidesgo. Prezi, a presentation development software, can create more persuasive, engaging, and impactful presentations than Microsoft PowerPoint. Prezi Video already works with zoom meetings, Microsoft teams, Cisco Webex, GoToMeeting, GoToWebinar, and Google Meet. Designer templates are available freely.

**Slido** is an audience interaction platform that helps users get the most out of meetings and events by top crowdsourcing questions and engaging participants with live polls and quizzes. Slido is used for large enterprises and education for Live polls, question and answering, quizzes, and live video integrations. It has solutions for remote meetings, hybrid meetings, virtual events, and webinars conferences. Further, it is integrated with the resources, Blog, Better Meetings Guide, Use cases, Webinars, Videos, Help Center, and Documents. The students can engage via polling and PowerPoint, and Webex integration is in Slido. However, Slido requires a chat feature, especially when using Webex Events, so attendees only have one app to communicate with event hosts and panelists. Short videos can be created for a flipped classroom and explain assignments and test preparations. In addition, lesson content can be previewed with a short video the students can watch beforehand, so the students come to class prepared.

**YouTube platform** can be used to share lesson videos free online. The videos can be used to introduce a topic, explain an online activity, motivate the learners, or extend the information conveyed by the eLearning course. Furthermore, YouTube can be used to create an eLearning community.

**OBS Studio** is a free and open-source software for video recording and live streaming. It helps create scenes of multiple sources, including window captures, images, text, browser windows, webcams, capture cards, and more. OBS studio can easily stream to both social media and other streaming platforms and offers a wide range of features for screencasting. Furthermore, it customizes the quality of capture, sets the resolution as per requirement, or uses the resolution of the monitor. Aso, the streamlined settings panel gives access to a wide array of configuration options to tweak every aspect of broadcast or recording. However, the OBS tool can intimidate novice users, and it is not available on Android.

**Powtoon** is a visual communication platform that gives the freedom to create professional and fully customized videos. Powtoon uses for making videos, animated videos, whiteboard doodling, screen recordings, presentations, and custom characters. Further, Powtoon presentations can be a built-in slideshow or movie forms. Various pre-made templates are available, video animation can be shared via a public link, and the animated presentations can be downloaded as PDF or PowerPoint PPT files. Ready-made templated are available, and it is not hard to use and can be easily shared with the public.

An offline version of the animated video can also be saved, and the work saves automatically. However, as a limitation, the Powtoon presentations have a watermark and difficulty viewing others' presentations because of the long loading time. Further, several options and features are only available in a paid subscription.

## 1.2   Glossary

The glossary activity module enables participants to create and maintain a list of definitions, like a dictionary, or collect and organize resources or information. A teacher can allow files to be attached to glossary entries, and the linked images are displayed in the entry. The entries can be searched or browsed alphabetically or by category, date, or author. Entries can be approved by default or require approval by a teacher before they are viewable by everyone. If the glossary auto-linking filter is enabled, entries will be automatically linked where the concept words and phrases appear within the course. A teacher can allow comments on entries. Access can also be rated by teachers or students (peer evaluation). Ratings can be aggregated to form a final grade recorded in the grade book. Glossaries have many uses, such as a collaborative bank of key terms, a 'getting to know you' space where new students add their name and personal details, a 'handy tips' resource of best practices in a practical subject, a sharing area of useful videos, images, or sound files, and a revision resource of facts to remember.

**Lexipedia** helps to build a visual thesaurus. It is simple to use. When just type in any word and Lexipedia instantly displays the target word and other words. It also color-codes the words by both parts of speech and relationships. A complete definition is displayed for the checking words. Like Lexipedia, Snappy Words is another visual thesaurus. Visuwords is another online graphical dictionary. It can use to look up words to find their meanings and associations with other words and concepts. Further, it produces diagrams reminiscent of a neural net.

**WordHippo** is an online website and application providing a range of tools related to using words for creative and recreational purposes such as writing, translations, word games, etc. Word Hippo is a word study tool for synonyms, antonyms, etc. Look for rhyming words, opposites, translations to various languages, plurals, definitions and uses for the word, etc. The site also makes suggestions for other words if the student makes a typo or does not know the spelling. The advantage of WordHippo is that it is the best possible website and application for the provision of word-related tools and utilities on the internet. However, the limitation is that it is transitioning to a different page.

## 1.3   Collaborative work

While conducting collaborative work online, the student should have the ability to share their thoughts effectively. The wiki activity module enables participants to add and edit various web pages. A wiki can be collaborative, with everyone able to edit it, or individual, where everyone has their wiki, which only they can edit. A history of previous versions of each page in the wiki is kept, listing the edits made by each participant.

**Wikis** have many uses, such as for group lecture notes or study guides, for members of a faculty to plan a scheme of work or meeting agenda together, for students to collaboratively author an online book, creating content on a topic set by their tutor, for collaborative storytelling or poetry creation, where each participant writes a line or verse, and as a personal journal for examination notes or revision.

Wiki is a rich text editor with the ability to insert visual content (images, tables, sketches, code snippets). Also, it can record a video, organize documents into folders or channels, comment within documents, tag teammates, and integrate with specialized tools such as Github, Google Sheets, Dropbox, Figma. Also, it summarizes the activity in most-viewed docs. Therefore, Wikis can use as discussion templates, blogs, and templates.

**GroupMap** is a real-time online brainstorming tool for workshops, and further, it facilitates meetings, conferences, classrooms, and different events. There are several advantages of the GroupMap tool, such as quickly creating activities suitable for workshop activities and setting the rules of engagement, access to a wide range of features that boost the facilitation toolbox and drive decision quality, capture and sharing ideas, comments, votes, scores, images, and files to create rich dialogue and drive evidence-based decisions. Further, GroupMap gives everyone a visual space to share and prioritize ideas in a safe and secure environment, face to face or online. Also, it provides real-time results and gives everyone more time to focus on meaningful conversations. However, it takes a lot of time to synchronize the participants' schedules, which decreases its efficiency.

**Perusall** is a social e-reader platform designed to promote reading and engagement for all classes. Perusal facilitates blogs, research, and webinars by supporting the insertion of images, hyperlinks, and tagging of people. In addition, Perusall fosters a space for students to share questions, reflections, ideas, and connections with the instructor. Also, Perusall includes an auto-scoring feature for instructors who wish to incorporate it into participation grades. However, digital textbooks access issues arise for students who rely on the library and support office copies.

**G Suite** basic edition is a suite of collaborative productivity apps that offers professional email, shared calendars, online document editing and storage, video meetings, etc. The G suite gives the entire company access to Gmail accounts and the suite of office products. The primary G Suite tools include Gmail, Drive, Docs, Sheets, Slides, Forms, Calendar, Google+, Sites, and Hangouts. Data protection capabilities are available in the G Suite. Further, easy collaboration and sharing can be seen and accessed anywhere. However, G Suite has to deal with privacy concerns.

## 1.4   Face-to-face driver model in blended learning

The face-to-face driver model is the closest to a traditional classroom structure. However, learners log into a webinar or meeting session instead of the session taking place in a physical classroom, like a Zoom Meeting. The learning happens online, with assignments being set afterward. This blended learning model is quickly delivered using an LMS. The training sessions and sharing assignments can be done with learners before or after the session.

**Zoom Meetings** is a proprietary videotelephony software program developed by Zoom Video Communications. Zoom's secure, reliable video platform powers the communication needs, including meetings, chat, phone, webinars, and online events. Zoom is a video and web conferencing platform that allows authorized users to host online meetings. The main features are One-on-one meetings, Group video conferences, screen sharing, and recording. ZOOM platform supports large audiences, stream meetings/webinar on Facebook, can use for free, support google calendar, and is easy to use. However, it has too many subscriptions and add-ons, lack of comment control, no standard HD video, the need to download the app, and inconsistency of cloud file sizes.

**Webex by Cisco** is an American company that develops and sells web conferencing, videoconferencing, unified communications as a service, and contact center as a service application. Webex has several advantages such as recording meetings and making it available for offline use, easy to join discussions: Join from the desktop, browser, video, or mobile device, available in both IOS and Android versions, easy desktop sharing option, having the opportunity of HD video and audio, less utilization of internet data, stream live meetings on social media, and having the ability to create break out rooms. However, several disadvantages also appeared, such as security issues, significant memory usage, the need to download the application, and the inability to control comments and chat properly. Also, the website version is weaker as compared to the app version. However, the number of audiences that can be joined for Webex is higher than ZOOM.

**Microsoft Teams** is another popular tool for IT professionals and is a Microsoft Office 365 product. It simply means to host meetings, chat, share files, and use every Microsoft Office app using Teams. One of the best features Teams comes with is the Class Notebooks from One Note. Class Notebooks resemble individual student notebooks (physical) but come with additional features and ease of use. For example, the teachers can assign personal notebooks to students and provide real-time feedback. Furthermore, the exams, handouts, quizzes, and homework can be distributed instantly to the students. Also, the students can use excellent tools within Teams for taking notes and highlighting important things. This helps the students engage more and enjoy learning. Overall, Teams can reduce the staffing and completely replace paper use. It is yet another fantastic tool that ensures effective education online.

## 1.5   Flipped model in blended learning

This blended learning model allows trainers to prioritize active learning during class time by giving learners the training materials and presentations before the actual class. Then, the trainer can share the content via a learning management system (LMS), email, or however training is delivered.

**Moodle** is a free and open-source learning management system developed on pedagogical principles. Moodle is used for blended learning, distance education, flipped classrooms, and other university e-learning projects. With customizable management features, Moodle is used to create private websites with online courses for educators and trainers to achieve learning goals. In addition, Moodle allows extending and tailoring learning environments using community-sourced plugins. Moodle is a free platform that is compatible with any browser. The limitations of Moodle are the unavailability of new features compared to other platforms, complex environments, fragile security, and little internet service downtime to avoid continuous functionality.

**BlackBoard** is a popular teaching tool that comes with numerous capabilities. Teachers can easily administer tests, monitor performance, manage syllabus, and even upload grades. The hassle of writing everything on paper from an aching wrist can be avoided. Students can equally benefit from this tool because they can access all the information upload on the platform, including grades, assignments, and attendance. The best part is that all this comes on one platform. Therefore, multiple applications are not needed to manage it all.

## 1.6   Enriched virtual in blended learning

An alternative to full-time online training allows learners to complete the majority of coursework online and attend webinars for face-to-face learning sessions with an instructor. Attendance is ad hoc and at the learners' discretion, giving them the flexibility to learn at their own pace.

## 2    Resources

Digital tools are efficient for sharing information and resources. **Padlet** is a digital tool that can help teachers and students in class and beyond by offering a single place for a notice board. Students and teachers can use Padlet to post notes on a specific page. The students can post comments and feedback on topics or ideas. Students can use Padlet as a portfolio for a class or program and can use the classroom Padlet wall to post assignments, homework, or active activities for students to complete.

### 2.1    Digital tools

**MindMeister** is to enable individuals to collaborate on a mind map, where everyone can share ideas, comments, and plans, as well as vote on ideas in real-time. It is used to create interactive lesson plans, learn with proven study techniques, and plan group projects and assignments. Once sharing mind maps with other people and providing different access rights, it helps to review the entire change history of mind maps and revert to any previous version if needed.

**Mindmaps** support engaging students, creating dynamic slideshows to present online or in person. Connect mind maps with project boards in MindMeister, turn ideas into actionable tasks at the click of a button; the mind maps can make public and embed them in a website or blog.

**Quizlet** is a web-based application developed to help students study information through interactive tools and games. Quizlet's mission is to help students (and teachers) practice and master what they're learning. Quizlet makes simple learning tools to study anything. It can create multiple custom question sets; question sets help students prepare for tests and exams. Students can have fun exploring by using the game formats that Quizlet offers and great for online and hybrid courses to make the material more engaging.

**Google Classroom** is a free application designed to assist students and teachers connect, working together, organizing, and creating assignments. It enables learning to be paperless. Google Classroom application is easy to use and accessible from all devices and has effective communication and sharing. The app speeds up the assignment process and has an effective feedback system. There is no need for paper. It has a clean and user-friendly interface, a great commenting system, and is easy to use. The collaborations can be boosted, and communication can be fostered. The Google Classroom is available on the web or by mobile app. Also, it can be used with many tools that already use, such as Gmail, Google Docs, and Google Calendar. However, accounts are difficult to manage, and it has limited integration options. Further, Google Classroom is too googlish, and there are no automated updates. Also, automated quizzes and tests cannot be created.

**Trello** is a collaborative tool that supports project-based learning through the digital boards it has. Different boards can be created for assignments, test papers, etc. And in those boards, cards can be created. Furthermore, a particular topic in that card can be discussed. The students can be invited to view that card, and the students can put in comments, doubts, or ask questions and even attach images, videos, etc. Also, students can quickly look at their projects, set deadlines, and track progress online.

# 3   Assessing student learnings through online examinations

The assignment activity module enables a teacher to communicate tasks, collect work, and provide grades and feedback. Students can submit any digital content (files), such as word-processed documents, spreadsheets, images, or audio and video clips. Alternatively, or in addition, the assignment may require students to type text directly into the text editor. An assignment can also remind students of 'real-world' tasks they need to complete offline, such as artwork, thus not requiring any digital content. Students can submit work individually or as a member of a group.

Teachers can leave feedback comments and upload files, such as marked-up student submissions, documents with comments, or spoken audio feedback when reviewing assignments. Assignments can be graded using a numerical or custom scale or an advanced grading method such as a rubric. Final grades are recorded in the grade book. Assignments can be launched using the different online examination digital tools.

Quiz enables a teacher to create quizzes comprising questions of various types, including multiple-choice, matching, short-answer, and numerical. The teacher can allow the examination to be attempted multiple times, with the questions shuffled or randomly selected from the question bank. A time limit may be set. Each attempt is marked automatically, except for essay questions, and the grade is recorded in the grade book.

The teacher can choose when and if hints, feedback, and correct answers are shown to students.

Quizzes may be used as course exams, as mini tests for reading assignments or at the end of a topic, as exam practice using questions from past exams, to deliver immediate feedback about performance, and for self-assessment.

## 3.1   Online examination digital tools

**FlexiQuiz** is a powerful online test and quiz maker that can create, send, and analyze tests, quizzes, and assessments. Multiple question types and different formatting options are available. Test trails can be published privately to a select group or open to everyone with a single link and registration page. Further, the FlexiQuiz instantly marks and grades the tests. The reports allow performing in-depth analysis across all responses.

**Socrative** is a quiz-based, formative assessment tool with multiple features that can enrich teaching and learning. That is a formative assessment tool that helps teachers and learners to assess understanding and progress in real-time in class using quizzes, questions, and reflection questions. Socrative is a free, fast tool that can access from mobile and tablets via a web browser. It is available in IOS and Android. Immediate interactions can be launched in Socrative. Creating quizzes is easy and can be shared easily between teachers too. The results can be exported, and students do not need to be registered. However, there are no multiple response questions, and the task has to be limited to fifty students per course. The license is not free, and the language is English.

**Eklavvya** platform provides the option to conduct online exams on the student's mobile phone. While the student is attempting an online exam on a mobile phone, the phone's camera continuously streams the activity/face of the user to the exam proctor. Therefore, the exam proctor can ensure that candidate is not using any means or taking help from books, notebooks, or talking to another person while the exam is happening.

**Kahoot** is a game-based learning platform that brings engagement and fun to students. It uses to create a learning game or trivia quiz on any topic, in any language, and deliver training, presentations, meetings, and events in-person or on any video conferencing platform.

**Typeform** can use to create a multiple-choice test or online exam and inspire learning in a fun and engaging way. In addition, it can be used for making tests and quizzes.

**ClassMarker** is a professional web-based quiz maker which is an easy-to-use, customizable online testing solution for educational assessments with tests & quizzes graded instantly, saving hours of paperwork. Time limits, instant feedback, adding media to questions, accurate grading, the option to charge for examinations, and many more settings that help collect

accurate results are the advantages of the ClassMaker. Further, the ClassMarker Team manages the downloads, software requirements, and regular maintenance.

**The questionnaire module** allows constructing surveys using a variety of question types to gather data from users. Google Forms uses to easily create and share online forms and surveys and analyze responses in real-time. It is not only for questionnaire surveys, but it can also further be used for tests and quizzes for students.

**SpeedExam** is an online exam system for all the testing needs for assessment, recruitment, selection, and certifications. SpeedExam can be used for instant exams, created, and served in one minute. In addition, the tool has the option of quickly uploading all types of questions and candidate lists from Excel or Word file for online testing and analyzing exam results, creating instant reports and certificates. However, the number of users is limited, and the functionality of each license is different in SpeedExams. Furthermore, the teacher faces the difficulty of finding specific questions. However, the tool can be used for creating & delivering exams and managing question feedback.

**PaperShala** tool helps to conduct online examinations and helps to analyze students. Question banks can be created, and paid examinations and online exam practice tests can be created. The dynamic question bank library allows to upload of all the questions by the admin panel and gets automatically added to the question bank library offered by the software. The admins can reuse the questions from the library as per their needs and requirements. The examinations can be set for a particular date; therefore, scheduled examinations can be created. PaperShala automatically saves all the answers given by the student and pauses a test if it detects any network issues. Students can resume their tests once the problem is fixed. Further, instant results of students can be collected; therefore, the admins get the sole right to make all decisions regarding result declaration. Additionally, the Admins can disable the access rights of a student once they leave the institute.

**Proctorio** secures the online exams using lockdown settings, remote proctoring, identity verification, originality verification, and content protection. Proctorio has the facilities of assessment management, automatic grading, live proctoring, and LMS integration. Further, multi-language options, multiple authentication methods, online tests, question library, reporting/analytics, screen recording, test/quiz creation, text similarity detection, and violation tracking are features in Proctorio. Instructors control the level of security, and suspicious behavior is automatically reported in Canvas. However, Proctorio has several limitations. Video tracking options based on eye/head focus and movement will flag students with a visual impairment (instructors will need to ignore these "false positives" when reviewing exam recordings). Also, the system pre-checks and instructions in pop-up windows do not offer audio prompts. The use of the Text-To-Speech feature requires a specific screen reader, and shortcuts need to be enabled in high visibility mode, but the text-to-speech option is unreliable.