Virtual Exchange Guidebook (VEG)

Lessons learnt from the “Climate University for Virtual Exchanges” (CLUVEX) project in 2023-2026

Version 3.0

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This document is the 3rd version (28th February 2025) of the Virtual Exchange Guidebook (VEG) - "Guidebook for Virtual Exchanges – Lessons learnt from the Virtual Exchanges (CLUVEX) project". The document has been written and updated by the CLUVEX teams of the University of Helsinki (UH, Finland), University of Copenhagen (UCPH, Denmark), now Odessa I.I. Mechnikov National University (ONU, Ukraine) /formely Odessa State Environmental University (OSENU, Ukraine)/, Taras Shevchenko National University of Kyiv (TSNUK, Ukraine), Yerevan State University (YSU, Armenia), and the Bioart Society, Finland.

This document is the 3rd version of a e-living document / interactive document, which will be expanded in a cumulatively manner by the CLUVEX teams based on experiences of the CLUVEX Virtual Exchanges (VEs) for moderators (5 CLUVEX Trainings for moderators) and students (5 CLUVEX Virtual Exchange Weeks for students).

Moreover, new updates to e-living document as Deliverable 2.5 "e-Living Annex to the Virtual Exchange Guidebook" to be included after each completed VE Week for students, based on received feedback from participants.

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1. INTRODUCTION

"***Virtual Exchange (VE)*** *is a practice, supported by research, that consists of sustained, technology-enabled, people-to-people education programmes or activities in which constructive communication and interaction takes place between individuals or groups who are geographically separated and/or from different cultural backgrounds, with the support of educators or facilitators. Virtual Exchange combines the deep impact of intercultural dialogue and exchange with the broad reach of digital technology*" https://evolve-erasmus.eu/about-evolve/what-is-virtual-exchange.

The possibilities of VE and remote teaching were awakened in connection with the global COVID-19 pandemic as the only alternative for education. Although the role of VE in education may increase in future, the Massive Open Online Courses (MOOCs) offered from the last years may confuse and demotivate students into fully virtual education formats. Because of that, VE education should be carefully planned to develop advantages (e.g., guided education, integrative and reachable for broader range of students' situations, international networking, actualized and scientific based knowledge) and minimise inconveniences or challenges (e.g., online active participation, technological-internet resources, language barrier).

This Virtual Exchange Guidebook (VEG) is an e-living document that uses "Climate University for Virtual Exchange" (hereinafter, CLUVEX), as reference for lessons learnt during planning and execution of VEs. As it is a living document, the content will be modified and updated according to the experiences of facilitators/moderators (teachers, lecturers, researchers, experts; thereafter, the "moderators") and students participating in the CLUVEX VEs Weeks for students, at least, during the CLUVEX project lifetime.

CLUVEX is a three-year project (1 Jul 2023 – 30 Jun 2026; https://www.atm.helsinki.fi/cluvex), funded by European Commission (Erasmus+ programme). CLUVEX is coordinated by the University of Helsinki (Finland) and implemented in cooperation with CLUVEX Partner universities: University of Copenhagen (Denmark), Odessa State Environmental University/ Odessa I.I. Mechnikov National University (Ukraine), Taras Shevchenko National University of Kyiv (Ukraine), Yerevan State University (Armenia), and Bioart Society, an art & science non for profit association based in Finland. CLUVEX thematic areas are the following: "climate action, environment and nature protection", "environment and climate change", and "green skills". CLUVEX project trains climate competences to university students (at BSc, MSc, and PhD levels of education as well as including PostDocs) from different countries and multidisciplinary topics. In addition, CLUVEX develops and researches on how distance education and a VE concept can be developed further to motivate students to continue learning in MOOCs.

At the current ongoing planning stage of VEs for students as the VE Weeks (5 such events are expected to take place in Autumn and Spring semesters of 2024-2026), this guide especially

describes challenges and key questions to consider when planning the implementation of VEs for international, multicultural and multidisciplinary students and educators.

1.1. The importance and challenges of Virtual Exchange (VE) in climate education and training


Education is an essential factor in the ever more urgent Global Grand Challenges like the global fight against the Climate Change (CC). VE enables a larger number of students to access the latest knowledge, for example, on CC, than the traditional, face-to-face, on-site education. VE enables education and interaction, and especially for students with low international mobility possibilities due to different reasons. In case of climate action, new climate related knowledge and competences help students to better understand and tackle the consequences of global warming and biodiversity loss, encourages them to change their behaviour, and helps them to adapt to what is already a global emergency. CC is a global problem with local dimensions, also affected by local economical and socio-political situations. Sharing the different experiences of success/failed climate actions and circumstances, will enable students to see climate problematic from new perspectives, and may inspire them with new alternatives for climate mitigation and adaptation actions more applicable in their circumstances.

VE also has a transnational dimension. VE can be used for wider distribution and piloting of climate competences in Europe, in Neighbourhood East countries or globally, not only for the university students but also for other audiences and communities at schools and training and knowledge centres. The VE in CLUVEX emphasis on transformative climate action in building competences on environmental sustainability. Transformative action refers to activities that bring about changes in moral values and lifestyle patterns and green skills shaping practices in society, as well as changes in structures of society and culture.

Beside large positive aspects, organisation of VEs is a challenging task. Realisation and well-functioning of VE involve many practical arrangements, such as selection of technical platforms (for example, Zoom, MS Teams, BlueJeans, Webex, Lifesize, etc.) for communication, attractive calls for participation, registration of participating students and moderators in selected systems with learning environment (for example, DigiCampus https://digicampus.fi, Moodle https://moodle.org, etc.) educational platforms, providing collaboration (for example, Flinga https://flinga.fi, Miro https://miro.com, etc.) platforms that helps teams move faster from idea to outcome, or possible procedures for issued the European Credit Transfer and Accumulation System (ECTS) credits conversion and acceptance in home universities of participating students. There are pedagogical and communication issues to consider in the organisation of VE. In particular, it is important on how to motivate students to be committed, actively study and

participate in a fully remotely teaching and socialising way. Another challenge is a possible language barrier. It is important in advance to take care of supportive approaches and tools needed in group work during VEs. Additionally, it may be also challenging to train moderators for VEs. Moderators play a key role in keeping an integrative and comfortable atmosphere in the group. It is important to find new ways and methods to facilitate effective online learning and communication. For VEs, practical group exercises on Individual and Collaborative "Climate Horizon" for independent and group/teamwork should also be developed and prepared in advance and in such a way that students, having different educational backgrounds and coming from different disciplines, can participate, learn and successfully complete exercises.

Summary of advantages of virtual exchange:

- ✓ Large number of participants from different geographical regions, countries, environments and cultures.
- ✓ The interactive nature of VE with the moderated groups' discussions lowers the barriers to participation compared with that of self-learning based and MOOCs.
- ✓ Enables and supports the faster, more frequent and more efficient networking with students having different backgrounds.
- ✓ Supports thoroughly inter- and multidisciplinary education and dialog, compared with that on the onsite interexchange programs designed for the same study discipline.
- ✓ Networking for low mobilisation possibilities and limited funding for travelling, in CLUVEX case, bridging students from European and Neighbourhood East universities.
- ✓ Interdisciplinary people-to-people learning: to engage students having different educational backgrounds with climate-relevant competences and green agenda together with interdisciplinary, green and soft skills.
- ✓ Practical climate solutions, locally applicable: to map different climate and environmental problems and interchange different potential solutions that can be locally applicable in students' home environment.

Summary of challenges of virtual exchange:

- ✓ Technical challenge: since teaching and interchange occur fully online, it is needed to guarantee software and hardware equipment e.g., computers, stable internet access, virtual communication tools, systems with learning environment, and others for all students participating in VE
- ✓ Language barriers.
- ✓ Organisational issues like conflicting of VE schedules with home university programs and other courses when organising the VE events (e.g., course, workshop, training, school), transferring and accepting of obtained credits at home universities.
- ✓ Making compatible planned VEs with home studies.
- ✓ Motivation and commitment of students for fully remote interchange.
- ✓ Equity guarantees: how to solve equity in gender/culture/religion/political situation/ and technological resources.

1.2. CLUVEX project, a reference for the lessons-learnt on VEs

CLUVEX project was elaborated during COVID-19 pandemic time when possibility of face-to-face communications between different countries and organisations was very uncertain due to frequently implemented restriction measures, lockdowns, and guidelines. In addition, sustainability and carbon neutrality is one of the main CLUVEX´s discipline and discussion topics, thus travelling is highly questioned. CLUVEX was built on the Climate University (CU) online learning education with the idea that students, at first, participating in the CLUVEX VE Weeks could further join also some CU´s online courses (https://climateuniversity.fi). The CU was developed and hosted by the University of Helsinki and has already been piloted, since 2018, in 25 higher education institutions in Finland.

CLUVEX aims to bridge students from European and Neighbourhood East universities, enhancing international collaborations, and engaging them with climate competences, e.g., different ideas of adaptation and mitigation to CC and the green agenda together with interdisciplinary and soft skills. The project's main activity is to organise the VE Weeks for students as interactive online courses including traditional education materials in a way that students and moderators (teachers, lecturers, researchers, experts) will work together in small groups online. During the project lifetime, CLUVEX aims to educate up to 2500 students from Higher Education Institutions (HEIs). The half of the participants will be recruited by the universities of Denmark and Finland, and the other half by the universities of Ukraine and Armenia as Neighbourhood East countries. All the CLUVEX Partners bring their technical tools together with pedagogical expertise for designing new VE.

CLUVEX project also uses its national and international networks like the Una Europa, an alliance of 11 European universities; World Meteorological Organization's (WMO) Global Campus initiative; UArctic Network of Universities; Nordic University Teachers Network; Climate University Network in Finland; Black Sea Universities Network; INTENSE International Doctoral School Network; Pan-Eurasian Experiment program; Digital Belt and Road Program; and others in Europe and Neighbourhood East to attract other participants, both students and moderators on a diversity basis.

Thus, the VE cooperation complements and compensates for opportunities of physical mobility for students interested in CC. CLUVEX Partners in Ukraine and Armenia have an especially important role at a global scale. By the end of the project, all the CLUVEX educated the "Climate Messengers" i.e., all students who attended and successfully passed the CLUVEX's VE Week, could provide a much-needed expertise in labour markets. The major outcome of VE is nurturing the generation of young people with competencies and skills of the Climate Messengers who will be competent in building climate awareness and sustainability strategies in their home countries, home organisations and future work life.

CLUVEX overall aims

- ✓ **International education**: to educate 500 students in 1 Virtual Exchange (VE) Week (5 VE weeks in total); 2500 students in total during a 3-year project.
- ✓ **Awakening climate expertise interest in multiple disciplines as background**: for 3 years to educate as Climate Messengers all 2500 students coming from different background disciplines.
- ✓ **Digital and global-working skills**: students will get training course materials, new digital tools to be used in their future careers.
- ✓ **Promoting the VE concept**: continue networking beyond the CLUVEX project lifetime.
- ✓ **Promoting global dialogue**: CLUVEX will work with small groups that need to work together, to think in a common task, listen to each other's opinions and circumstances, and outcome with an equally-group-design project.

CLUVEX specific aims and indicators for achievement as a reference

Obj-1 to bridge and bring together students from European and Neighbourhood East countries universities and engage them with climate competences and soft skills

- ❖ **Obj-1 issue/challenge/gap does the project aim to address**: There is an urgent need to educate the climate competences of the academic youth and make them "Climate Messengers". Especially, the climate related political decisions of Neighbourhood East countries are and will be affecting the atmospheric composition in their regions but will also have a global scale impact on the future development of mankind. VE would enhance sharing of science-based knowledge and climate competences among young academics and would be used for the first time at this scale and volume of climate education. There is also a know-how gap in the soft skills of academics. Joint research across different geopolitical regions is needed to solve global challenges and soft skills, like cooperation, trust, assertive communication, problem-solving and self-evaluation are especially relevant skills in the future research collaboration in the field of climate change research.
- ❖ **Obj-1 indicators for measuring achievement**: a unit of measurement: number of students participated and passed the VEs as VE Weeks for students
- ❖ **Baseline value**: 0 >> **Target value**: 2500

Obj-2 to develop and design a new, tailored VE concept for climate education and training

- ❖ **Obj-2 issue/challenge/gap does the project aim to address:** There is no existing concept and/or materials where in the e-education, communication and interactions are such strongly addressed as a part of virtual learning related to the Earth sciences and CC.
- ❖ **Obj-2 indicators for measuring achievement**: a unit of measurement: Guide for VE and Guide for climate literacy are ready
- ❖ **Baseline value**: no existing materials >> **Target value**: 2 Guides

Obj-3 to educate new moderators with climate competences and soft, digital, VE skills

- ❖ **Obj-3 issue/challenge/gap does the project aim to address**: There is a limited number of specialised teachers, lecturers, researchers, experts as moderators who have been also

trained in soft skills, digital skills, and VE skills.

- **Obj-3 indicators for measuring achievement**: a unit of measurement: number of educated moderators
- **Baseline value**: 0 >> **Target value**: min 50 in total, min 10 per CLUVEX Partner organisation

Obj-4 to educate university students to act as Climate Messengers in society

- **Obj-4 issue/challenge/gap does the project aim to address**: To implement Climate Literacy Virtual Exchanges and International online courses, to select and compile the best VE practices of the CLUVEX Partners and Climate University
- **Obj-4 indicators for measuring achievement**: a unit of measurement: number of students participated in the VE Week (as online course), passed tailored VE exercises, and awarded the CLUVEX "Climate Messenger" certificate
- **Baseline value**: 0 >> **Target value**: 2500

Obj-5 to upscale and distribute information on VE as a powerful tool bring students together from across wide geographical distances

- **Obj-5 issue/challenge/gap does the project aim to address**: Students are not involved in international activities on climate and ecology, because the majority of international courses/schools/joint activities require fees and, therefore, exclude economically disadvantaged students
- **Obj-5 indicators for measuring achievement**: a unit of measurement: number of education / research networks / universities contacted / international students' collaborations in Europe and Neighbourhood East countries
- **Baseline value**: 0 **>> Target value**: 20

2. PLANNING AND IMPLEMENTATION OF VE

2.1. Key considerations and aspects for planning VEs

There are several issues to consider when making a detailed implementation plan for organising VEs. As a first plan, and considering CLUVEX as a reference project for lessons-learnt, there are several aspects and key considerations detected are listed (see below in Table 1) in this plan of implementation, and developed in more detail in the following subsections.

Table 1: Key Considerations and aspects for planning the implementation of VEs. Study case: CLUVEX project.

Consideration	Key aspects for planning
#2.2.1. Work Organization	1. Selecting equative working tools available for all CLUVEX Partners 2. Equative distributing the preparatory work between the CLUVEX Partners. 3. Establishing the collaborative working environment, inter-collaborations.

#2.2.2. Education	1. Determining learning outcomes for VEs. 2. Elaborating joint practical group exercise for students for VEs. 3. Preparing VE program for VEs including plenary talks and group/teamwork, topics and questions for joint discussions on the group exercises. 4. Preparing materials like Virtual Exchange Guidebook (VEG), Climate Literacy Guidebook (CLG), Climate Messenger Code of Conduct (CMC), and other instructions for students participating in VEs
#2.2.3. Students	1. Planning the Call-for-Virtual-Exchange-Week events, e.g., advertising materials like flyers, promoting benefits for participants (knowledge transfer, VE certificates, ECTS credits), integration into university curricula and academic programs. 2. Setting up and opening the online registration web-form for students planning to attend VEs. 3. Developing and establishing basic principles, criteria and procedures for selecting students to VEs, e.g., gender balance, promoting diversity, inclusivity and equity. 4. Integration of ECTS credits into curricula at the participating universities. 5. Organization of the Climate Messenger certificate for all the students who participated in the VEs.
#2.2.4. Moderators	1. Organising the Call-for-Moderators. 2. Educating moderators for planned VE Weeks, including the technical skills (using Zoom, DigiCampus, Miro), soft skills (handling challenges and conflicts effectively) and content, e.g., group exercise-based issues; ensuring ethical and responsible behaviour online.
#2.2.5. Technical e-setups	1. Selecting and installing the e-platforms and e-tools (e.g., DigiCampus, Zoom, Miro). 2. Selecting approaches and technical tools to overcome language barriers 3. Recruiting technical staff during the VEs in support of making stable and effective technical connections and communication channels.
#2.2.6. Evaluation, assessment, studying and developing the VE concept	1. Gathering feedback from the participated students and moderators. 2. Studying the learning outcomes with different methods (e.g., questionnaires, interviews, etc.). 3. Using assessed data/results for further program improvement of VEs (e.g., including updating CLUVEX developed VEG, CLG, and CMC, publishing peer-reviewed articles).
#2.2.7. Science Communication, and Scaling up	1. Effective communication tools (website, social media) and strategies for climate science topics. Strategies for scaling up the VE concept and VE Week programs. 2. Promoting VE outcomes and networking beyond the CLUVEX lifetime. 3. Ensuring long-term sustainability and university/ institutional support. 4. Fundraising and resource allocation.

2.2. CLUVEX implementation plan and lessons-learnt

2.2.1. Work organisation

To organise a collaborative working environment between all the CLUVEX Partners, there is a need to select software tools available for all the collaborators. CLUVEX project established a common e-platform, as intranet Google Drive, for members of the consortium. It allows organising project documentation and enabling online editing of joint documents. For public, the CLUVEX website was established for disseminating information about the project: main aim, objectives and activity (e.g., VEs), implementation, networking, outcomes, workpckages (WPs), deliverables, milestones, timetable, partners, expert and student advisory boards, collaboration, project materials, contacts. For the communication, CLUVEX Partners also organise monthly online meetings. Each Work Package (WP) has a WP Leader and co-Leader. The CLUVEX VEs workflow is shown in Figure 1.

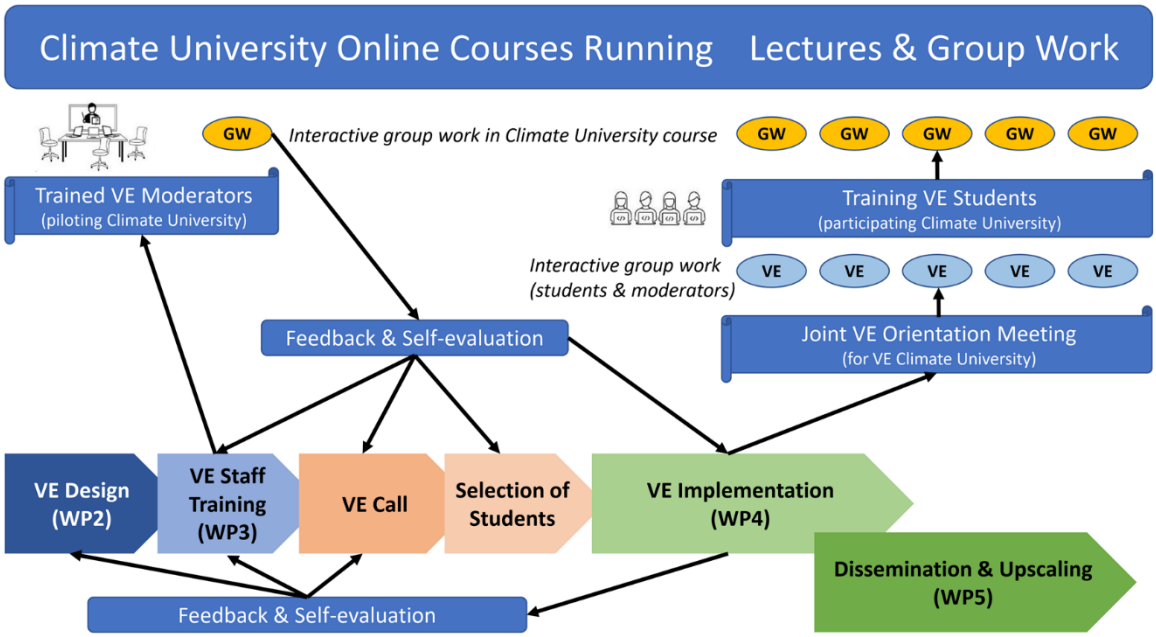


Figure 1: *The CLUVEX project VEs workflow showing interconnections between WPs including Calls for VE Weeks for students for VEs, training of moderators and students in VEs, feedback and self-evaluation, and group work.*

For the lessons-learnt, a summary e-living document was created to follow up and keep track of the challenges for planning and executing the VE Weeks. At start, in the first planning the following key questions were included to consider (as seen in Table 2).

***Table 2*:** *Lessons-learnt from the CLUVEX VEs for moderators (online Trainings) and for students (online for VE Weeks), and course materials vs. considerations and proposed solutions.*

Planning subject	Considerations	Proposed solutions
Moderators	Universities' teachers, lecturers, researchers, experts & students from SAB (Student Advisory Board)	Both are welcome
	Trainings for moderators – working hours	45+ h for fixed work (up to 3 h per day/ 5 online trainings for moderators and self/independent education)
	Training for students (during VE Weeks) – working hours	60+ h for fixed work (up to 3 h per day/ 5 days in each of 5 VE Weeks for students)
	Compatibility with work/ studies	to be mapped (moderator's personal interest, commitment, decision)
	Equipment/ software availability	to be mapped (for CLUVEX – DigiCampus, Zoom, Miro)
	Motivation	awarded CLUVEX Certificate and 3 ECTS credits (on obtained competences and skills, and moderating group of students); added as educational activity/ teaching to personal CV
Students	Compatibility with studies	Videos/slides of plenary talks/ lectures and demonstrations of tools are pre-recorded & available in DigiCampus area for registered students
	Timing for VE Weeks	12+h for fixed work (3h per day/ 5 days during 1 VE Week)
	Equipment/ software availability	to be mapped (for CLUVEX – DigiCampus, Zoom, Miro)
	Motivation	Pre-questionnaire
	Dealing with enrolment into VE Weeks	Simply to get the CLUVEX Certificate of the Climate Messenger, and/or 1 ECTS credit vs. Too much work is expected although high expectations
Course materials	Multiple background	Teaching material as general understanding for expertise/ non expertise (Natural/ Climate sciences); Compensation with activities (applicability for every day's life)
	Motivation for online platform	Activities planned to interact actively and self/independent work
	Language barriers	Supported by home universities

2.2.2. Education

2.2.2.1. Determining learning outcomes for VEs

The proposed below list of learning outcomes (LOs) and obtained skills (OSs) for the CLUVEX VE Weeks for students was determined during the project hybrid kick-off-meeting (30-31 October

2023; see a sumup of the meeting at https://peexhq.home.blog/2023/11/07/cluvex-hybrid-kick-off-meeting-in-helsinki) and might be further refined and updated.

After the VE Week, student will be able to:

1. Basics of the atmosphere, biosphere, hydrosphere and anthroposphere interaction and feedbacks.
2. Basics of climate change based on latest science: Planetary boundaries concept, Last methodological tools used in observing the Earth System.
3. Understanding of the human role from different perspectives like ethical, social, different cultural backgrounds in climate change, adaptation, and mitigation advances.
4. Critically reflect owns views on climate change, sustainability, and create new visions.
5. Reflect different international and intercultural perspectives on climate change and sustainability.
6. Reflect about global versus local challenges in finding adaptation and mitigation solutions.
7. Work together in different online working environments.
8. Work and be part of an international teams and manage small joint projects.
9. Communicate and present their work in English.
10. Learning basic study skills such as use of open data, literature search, critical reading and thinking.

Moreover, students attended and successfully passed the VE Week will be awarded (see Figure 2) a list of bonuses.

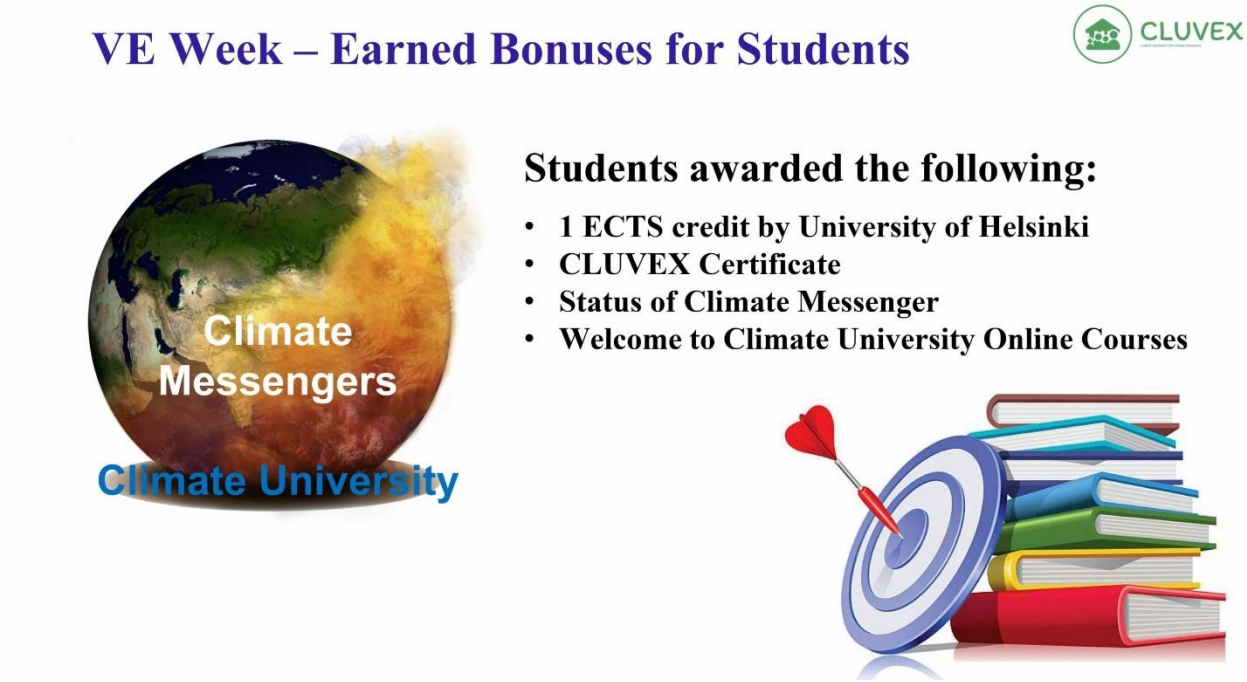


***Figure 2**: Earned bonuses for students who successfully completed the VE Week.*

2.2.2.2. Elaborating joint practical group exercise for students participating in VEs

We developed joint and practical activities where it is required active participation of all students (see following sections).

2.2.2.3.Preparing VE program for VE Week for students

Preparing VE program for VEs including plenary talks and group/teamwork, topics and questions for joint discussion on the groups exercise
In CLUVEX the implementation and the timeline of the Calls for students to attend the VE Weeks will be adjusted to the annual schedule of the CU online MOOCs' courses. All the current CU online courses are continuously carried out at UH during the following teaching periods: 1st period in September – October, 2nd in November – December, 3rd in January – February, and 4th in March – May. Typically, one online CU course module lasts 1-2 periods, and the courses are evenly distributed throughout the year. Currently, there are, at least, the following courses:

- ✓ Sustainable.now (5 ECTS) - 1st period
- ✓ Climate.now (2 or 5 ECTS) - 2nd period
- ✓ ClimateComms.now (2 ECTS) - 3rd period
- ✓ Leadership for sustainable change (5 ECTS) - 3rd period
- ✓ SystemsChange.now - 3rd-4th periods
- ✓ Solutions.now - 4th period once every year

CLIMATE UNIVERSITY
https://climateuniversity.fi

During the CLUVEX project lifetime, in total, 5 Calls for VE Weeks for students will be announced (in particular, for Spring and Autumn semesters, and the 1st Call starting from Autumn 2024). In each VE Call, up to 500 students will be invited from the CLUVEX Partners' Universities as well as other collaborating Universities in European and Neighbourhood East countries (i.e., 250 students from Finnish and Danish Universities and other EU countries universities as well as 250 students from Ukrainian and Armenian Universities and other Neighbourhood East countries).

The planned VE Weeks for students (see Table 3 for tentative content and schedule) will last for 5 days, from Monday to Friday, with 3+ hours per day of online (in Zoom) work - with lectures on climate change (CC) related topics, demonstrations of tools for climate related data analysis, brainstorming, discussions and group/teamwork on the Individual and Collective "Climate Horizon" exercise in break-out-rooms. In addition, during VE Week all students will have extra 5 hours of independent work, to have in total 20 working hours (corresponding to 1 ECTS credit). The pre- and post-questionnaire with practical and motivational questions will be sent in advance to the students registered to participate and attended the VE Week. This material and feedback will be used also for improving and refining the developed VE concept.

The CLG guidebook serves as pre-material of the VE Week. It includes explanatory short tasks to understand the planned online teamwork. CLG has a set of lectures/ tutorials about CC related topics and about web-based tools for climate related data analysis. These tools are used by students for Individual and Collaborative Climate Horizon exercises. The ERA-5 Past Climate Explore tool (https://era5.lobelia.earth) is for Environment and Data Visualization & Mapping

Past and Present. The SSPathways tool (https://data.worldbank.org/indicator & https://tntcat.iiasa.ac.at/SspDb) is for Socio-Economic Drivers of Climate Change & Mapping Past and Drafting Future. The Intergovernmental Panel on Climate Change (IPCC) Atlas tool (https://interactive-atlas.ipcc.ch) is for Climate Scenarios & Mapping the Future.
These lectures and tools will help the students to investigate the causes for current CC situations at their home/environments, and design a roadmap for a better (their own) dream of future(s) related to CC. From the first day (Monday; see Figure 3) students, after introduction in their own groups, will discuss reflections from lectures, what they can learn from each other, and will propose ideas for the Climate Horizon exercise.

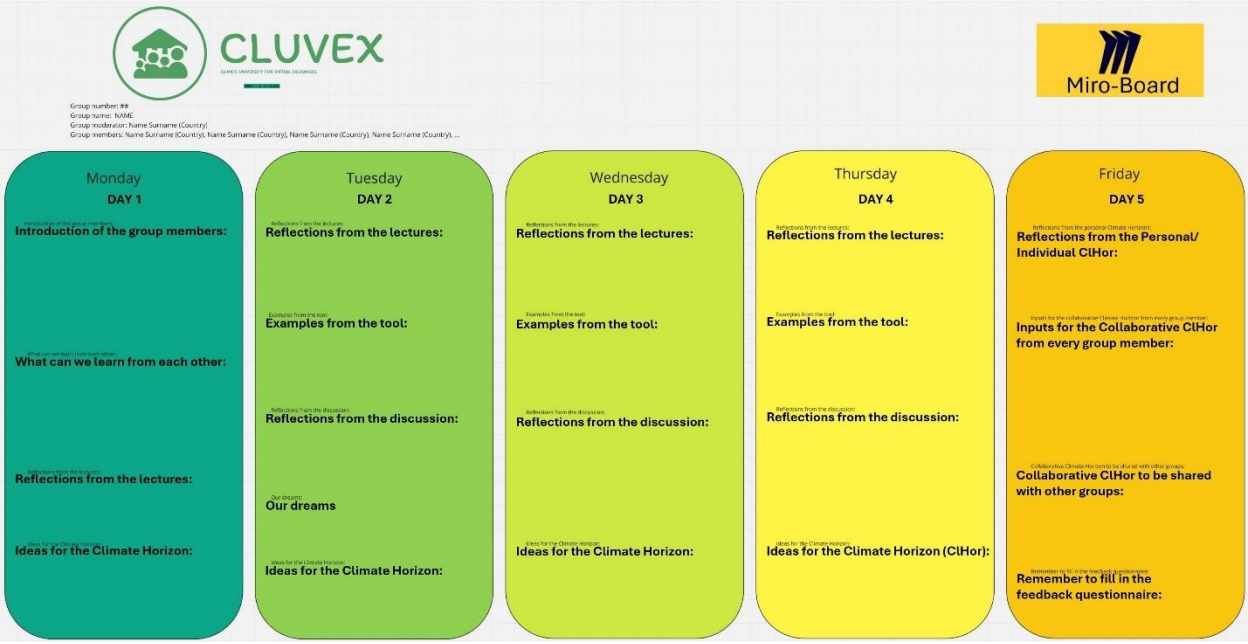


***Figure 3**: Daily (from Monday till Friday; during VE Week) online work of groups of students with moderator in own group area in Miro-board with individual reporting, leaving notes and comments, adding figures and tables, etc.*

During next 3 days, after demonstrations of web-based tools, they will continue work in own groups by discussing reflections from lectures, own dreams, and discussions, practicing and working with demonstrated tools, and continue working on Individual/Personal and proposing ideas for Collaborative Climate Horizon own group exercise. The Present, Past and Future scenarios of CC of each student will be mapped filling a joint Collaborative "Climate Horizon" group exercise. On the last day (Friday), students will work in a common Future, chosen by each group. The main idea is that students will experience the complexity of local and global environmental and climate changes, and discussions for a common future, and will share own developed Collective Climate Horizon with other groups (Figure 4). At the end of the VE Week, students will be asked to give feedback on the VE Week.

***Figure 4**: An example of Miro-board area for Collaborative Climate Horizon group exercise (shared on Friday with other groups).*

Table 3. *Tentative content and schedule of VE Week for students (all times are given in EET i.e., in Finnish time).*

❖ **1st Day**: 14 October 2024 (10:00 – 13:00, 3h online) 10:00 - Welcome words (Hanna K. Lappalainen, Laura Riuttanen UH) L1: Navigating Planetary Boundaries: Blueprint for a Sustainable Future (Inna Khomenko, ONU/OSENU) L2: Climate Change, Disasters, Carbon Neutrality and UN SDGs (Alexander Baklanov, UCPH) L3: Climate Change Impact on Water Resources (Sergiy Snizhko & Olga Shevchenko, TSNUK) L4: Nature hazards – Floods (Valeriya Ovcharuk, ONU/OSENU) L5: Impacts of Climate Change and Future Outlook (Hasmik Movsesyan, YSU) L6: Climate Change: Mitigation and Adaptation Strategies (Hasmik Movsesyan, YSU) L7: Artistic Research and Critical Thinking at the Intersection of Art, Science and Society (Yvonne Billimore, BioArt Society) L8: Towards Sustainable Futures: Pedagogy of Concrete Utopias (Antti Rajala, UH) 12:00 - Breaking 500 students into 50 small groups (1 moderator + 10 students in each group) Introduction round in groups & pre-task sharing (1 hour) 13:00 – End of the day
❖ **2nd Day**: 15 October 2024 (10:00 – 13:00, 3h online) 10:00 - Tool for Environment and Data Visualization | Past & Present | (Alexander Mahura, UH) 10:30 - Breaking into same small groups (1 moderator + 10 students in each group) Working on Group Exercise "Climate Horizon" – Mapping Past & Present 13:00 – End of the day
❖ **3rd Day**: 16 October 2024 (10:00 – 13:00, 3h online) 10:00 - Tool for Socio-Economic Drivers of Climate Change | Past & Future | (Stefan Fronzek, SYKE) 10:30 - Breaking into same small groups (1 moderator + 10 students in each group) Working on Group Exercise "Climate Horizon" – Mapping Past & Drafting Future 13:00 – End of the day
❖ **4th Day**: 17 October 2024 (10:00 – 13:00, 3h online)

10:00 - Tool for Climate Scenarios | Future | (Risto Makkonen, FMI/UH) 10:30 - Breaking into same small groups (1 moderator + 10 students in each group) Working on Group Exercise "Climate Horizon" – Mapping Future 13:00 – End of the day
❖ **5th Day**: 18 October 2024 (10:00 – 13:00, 3h online) 10:00 – Breaking into same small groups (1 moderator + 10 students in each group) Finalizing work on Group Exercise "Climate Horizon" Discussing & Sharing Collaborative Climate Horizon exercises by Groups Questionnaire with feedback about VE Week 12:00 – Wrap up & Closing the VE Week (Hanna K. Lappalainen, UH) 13:00 – End of the VE Week for students

2.2.2.4. Educative material for VEs

Educative material should include the topic material, and in the CLUVEX case it means regarding to climate change. There is also a need in instructions of soft skills needed during the VE week (how to behave and participate in the online discussions) and beyond the project lifetime, as climate competent person (the Climate Messenger). And of course, to evaluate and develop VEs and virtual education, it is also important to commonly develop this document, the VEG.

CLUVEX project also developed the Climate Literacy Guidebook (CLG), which includes the latest research findings on climate research and links to useful tools used by climate expertise; and the Climate Messenger Code of Conduct (CMC) , which summarises the code of conduct during and after VEs for participants.
CLG includes aspects on how to use the guidebook, VE Week (programme, lectures, tools, group exercise, questionaries), lectures' short description, tools for visualisation and analysis of climate related data, climate change related concepts and terminology , as well as appendixes (incl. recommended reading, environmental data visualization tools and databases, description of the CLUVEX VE Week – as a course, and Climate University online courses).
CMC includes aspects of the CLUVEX Climate Messenger's education material and exercise, code of conduct during Climate Messenger education, instructions for interaction and communication during the VE Week, instructions for unexpected situations, code of conduct as Climate Messengers after CLUVEX project completed.

2.2.3. Students

2.2.3.1. Planning the Call-for-Students

Plan for advertising materials like announcements and flyers, promoting benefits (basic and advanced knowledge transfer, CLUVEX VE "Climate Messenger" certificates, ECTS credits, opportunity to attend free of charge selected CU online courses) for students as participants of the VE Week, integration into university curricula and academic programs, etc. had been

continuously in progress (these have been discussed at the CLUVEX online monthly meetings of the Partners'/ Teams/ WPs leaders and co-leaders with involvement of the SAB members) with improvements and updates from the 1st VE Week to the 2nd VE Week, and so on, until the end of the project. Such promotional materials are publicly available at the "Project materials"-section of the CLUVEX public website.

More details about developed CLUVEX course are given APPENDIX 3 of the Climate Literacy Guidebook (CLG). The CLUVEX course title is the "Climate University for Virtual Exchanges", and it is delivered during VE Weeks for students. In the above-mentioned APPENDIX 3, there is additional information about the course code and level, scope of the course in credits (1 ECTS), list of teachers coordinating the course, course learning outcomes and content, additional information, completion methods, assessment practices and criteria, and grading, activities and teaching methods in support of learning, target groups , teaching period when the course is offered, recommended time or stage of studies for completion, prerequisites, description of prerequisites, and field of study. For this course it is atmospheric sciences/ multidisciplinary.

(a) ***(b)*** ***(c)***

Figure 5: *CLUVEX certificates (a) for students who attended VE Week; (b) for moderators who attended and successfully completed trainings for moderators; and (c) for moderators who attended and moderated successfully the VE week.*

The integration and amount of ECTS credits were discussed between all CLUVEX Partners/Universities, and it has been decided that credits will be awarded to participants after fulfilling all basic necessary requirements to successfully complete the VE Week and submit individual report to the DigiCampus area for students. It has been decided that 1 ETCS credit will be granted by the University of Helsinki - Open University. The CLUVEX certificate will be issued by the CLUVEX project to all participants (students, Figure 5a & moderators, Figure 5b,c) who attended the VE Week.

An example of the elaborated and distributed announcement of the Call for 1st VE Week for

students is given in Annex 5.1. In addition, it includes also tentative content and schedule of 1st VE Week for students (shown in Table 3). Each CLUVEX Partner distributes Call in their own Universities and networks as well as collaborating ones. The Partners from Ukraine (TSNUK, ONU/ OSENU) and Armenia (YSU) also distribute Call translated in their national languages.

2.2.3.2. Setting up and opening the online registration web-form for students planning to attend VEs

CLUVEX Partners/ Universities will open the online registration system to the CLUVEX VE Weeks for students and access to materials and program. Currently, the Climate University courses are designed in a way that university students coming from different scientific disciplines can participate. The Partners will involve students from the Bachelors, Masters and Doctoral programs at their universities having a great pool of potential students to be involved into CLUVEX VEs.

Size and scope of the CLUVEX Universities

✓ **The University of Helsinki** (UH, Finland), 31600 students, runs several relevant Masters / Doctoral programs: The Master's Programme in Atmospheric Sciences (ATM-MP), Masters Programme in Forest Sciences Study, Environmental Change and Global Sustainability (ECGS), Nordic Master Programme in Environmental Changes at Higher Latitudes (EnCHiL), Doctoral Programme in Atmospheric Sciences (ATM-DP).
✓ **The University of Copenhagen** (UCPH, Denmark), more than 37000 students, runs the Climate Change (CC), Impacts, Mitigation and Adaptation (CCIMA), which is an interdisciplinary MSc programme at UCPH, combining natural and social science approaches to the study of CC, its causes and effects, how to deal with it and adapt to it. CCIMA draws on staff from a range of internationally leading research groups and centres at UCPH.
✓ **The Odessa State Environmental University** (OSENU, Ukraine), about 1400 students, offers both full-time studies (BSc, MSc and PhD programmes) and distance learning facilities. Within the core field of Earth Sciences, the specialisation on Meteorology and Climatology is provided. The relevant MSc programme includes research into the climate system components, issues on climate dynamics and modelling, assessment of the CC impact on the society and economy, as well as development of adaptive mitigation measures. ✓ **The Odesa I.I. Mechnikov National University** (ONU, Ukraine) was founded in 1865. The strategic aim of ONU is the creation of an attractive human-centered educational and scientific environment through the development of one's own potential, achieving leadership in the region and international recognition for the training of competitive, innovation-oriented specialists and a high-quality scientific product. 12 faculties handle the education process at the ONU. BA programs – 53; MA programs – 60; PhD programs

– 26. Number of students – more than 8000, international students – more than 200. The professional staff of ONU: Dr.Hab – 159; Profs. – 130, PhD – 459 (ONU is #1 in Ukraine by PhD staff / whole staff ratio by QS data); Assoc. Profs. – 442. The community of ONU will achieve the strategic goal together with all educational stakeholders interested in its sustainable development. One of the strategic priorities is the Internationalization of activities: Internationalization of educational programs, international projects, International students, English for everyone, Coordination, Educational and scientific embassy.

✓ **The Taras Shevchenko National University of Kyiv** (TSNUK, Ukraine), more than 26000 students, is the main university in the country, with a powerful multi-sector diversified educational and research complex. Approx. 1645 PostGraduate and 125 PhD students are working for higher qualifications at TSNUK. The Meteorology and Climatology Department at Faculty of Geography of TSNUK offers BSc and MSc programmes on Meteorology and PhD programme in the field of Earth Sciences (with Meteorology and Climatology specialisation). The courses related to weather, climate and CC issues are also studied by students of different specialties of the Faculty of Geography, as well as students of the Institute of Biology and Medicine of TSNUK. Among the main areas of the research of the department's staff are CC, CC impact on water resources, economic meteorology, economy of CC, climatology of heat waves and tropical nights, simulation of urban climate and human thermal comfort conditions, air pollution, which are extremely relevant nowadays.

✓ **The Yerevan State University** (YSU, Armenia), about 20000 students, has 19 faculties. The educational process is conducted by more than 1600 highly qualified specialists and experts (207 professors, 581 associate professors, 375 assistants, 453 lecturers). CC education at YSU may take the form of both formal, informal, and non-formal learning and teaching approaches, including nature-immersive field projects, international case studies and higher degree research, among others. Literary analysis of university education on CC and sustainability has reflected a gradual shift globally over the past decade away from a narrow preoccupation in curricula on environmental protection toward broader objectives and creative educational approaches. These initiatives include corporate social responsibility, multiculturality and ethics.

To ensure that the critical number of students will be involved in the VEs (VE Weeks for students) the CLUVEX Partner universities distribute the Call to their national as well as international networks.

Examples of the networks to be used to distribute the Calls-for-Virtual-Exchanges

● **Climate University network** in Finland consists of the following higher education institutions: University of Helsinki (lead), Aalto University, Haaga-Helia University of Applied Sciences, Häme University of Applied Sciences, University of Eastern Finland, University of Jyväskylä, LAB

University of Applied Sciences, University of Lapland, LUT University, Laurea University of Applied Sciences, Metropolia University of Applied Sciences, University of Oulu, Hanken School of Economics, University of Arts Helsinki, Tampere University, Turku University of Applied Sciences, University of Turku and University of Vaasa. These institutions have a cross-study agreement to enable students to take Climate University courses from each others' curricula.

● **UNA Europa**, https://www.una-europa.eu, One of the forerunners in renewing European universities, Una Europa is made up of 11 leading European universities who 'share a new vision for the university of the future'. In addition to UH, Una Europa includes Freie Universität Berlin, Università di Bologna, University College Dublin, University of Edinburgh, Universiteit Leiden, Jagiellonian University i Krakow, KU Leuven University, Universidad Complutense de Madrid, Université Paris 1 Panthéon-Sorbonne, Universität Zürich. UH leads a pilot work on Micro-Qualification in Sustainability, consisting of MOOCs and other formats of online teaching that are available for Una Europa students since Autumn 2022 and later for everyone (L. Riuttanen). UH will actively promote the virtual exchange and MOOCs into the joint degrees in Una Europa as well as for use by Una Europa partners in their own curricula (INAR-UH as a network partner).

● **Nordic University Teachers network Atmosphere-Biosphere Studies** (ABS) is a pioneering project in multidisciplinary environmental education covering the aspects of physics, chemistry, meteorology, biology, geosciences, sustainability sciences and environmental anthropology. The education is based on internationally recognized top research. ABS contributes to the Nordic-Baltic cooperation in environmental education, utilises the idea of lifelong learning, enhances student and teacher mobility, and serves as a forum for exchanging experiences and best practices in education.

● **UArctic Network** of Universities, colleges, research institutes, and other organisations concerned with education and research in and about the North and involving students from 200 universities (INAR-UH a network member).

● **Black Sea Universities Network** (BSUN) This network (bsun.org) includes more than 120 member universities from the 12 member states of the Black Sea Economic Cooperation Organization as Albania, Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Moldova, Romania, Russia, Turkey, Ukraine, and Serbia. BSUN has the status of Sectoral Dialogue Partner to Black Sea Economic Cooperation (BSEC), is in close cooperation with the Parliamentary Assembly of the Black Sea Economic Cooperation (PABSEC), is a member of the European University Association (EUA), and is a founding member of the UN "Academic Impact" Initiative. BSUN has signed collaborative agreements and collaborates closely with the Eurasia Universities Association, the Caspian Universities Association, the Baltic Sea Cooperation Program, and the Mediterranean network of schools of engineering (RMEI). BSUN also signed a strategic partnership with ENEA from Italy to cooperate in developing joint activities in education and research on the green economy, sustainable development, and renewable energy sources. (OSENU is a network member).

● **INTENSE International Doctoral School Network** consists of academic institutions from

Ukraine, Mongolia and Vietnam (intense.network/intense-school/intense-international) and is supported by INTENSE e-services (http://intense.network/e-services). Such activities, as joint co-supervision, physical and credit mobility, joint research, joint events, and prioritised partnerships are envisioned in the INTENSE network. (OSENU is a founding member).
● Academy of Finland, **Finnish Flagship "Atmosphere and Climate Competence Center** (ACCC; https://www.acccflagship.fi) consists of UH, Tampere University, University of Eastern Finland and the Finnish Meteorological Institute. ACCC works to address two of the most urgent global Grand Challenges: CC and deteriorating air quality. ACCC brings together the top-level science of the research partners and the needs and expertise of key stakeholders to co-create knowledge-based solutions. Mission is to contribute toward achieving carbon neutrality in Finland, EU and global societies, as well as to contribute to mitigate air pollution to sustain a healthy atmosphere. ACCC contributes to the solutions that help businesses reach the Paris climate targets, to mitigate and adapt to CC, and thus support the EU Green Deal commitments and the UN Sustainable Development Goals (SDGs).
● **CRiceS**. Networking community of the Horizon 2020 project "Climate Relevant interactions and feedbacks: the key role of sea ice and Snow in the polar and global climate system" (https://www.crices-h2020.eu). Project focuses on improving model predictions of the role of polar processes in the climate system that consists of the oceans, ice and snow cover, and the atmosphere. The CRiceS project brings together 20 international research teams, from Europe, Canada, South Africa, and India, at the forefront of polar and global climate research. The CRiceS research project aims to enhance the modelling of the impacts that these regions have for the global climate.
● **FOCI**. Networking community of the Horizon Europe project "Non-Co2 Forcers and Their Climate, Weather, Air Quality and Health Impacts" (https://www.project-foci.eu). FOCI project develops new regionally tuned scenarios based on improved emissions to assess the effects of non-CO2 forcers. Mutual interactions of the results and climate services producers and other end-users will provide feedbacks for the specific scenarios preparation and potential application to support the decision making, including climate policy.
● Finnish Atmospheric Science Network (FASN)
● Fudan University & its Nordic Center (Shanghai, China)
● Swiss School for International Studies (Geneva, Switzerland)

2.2.3.3. Setting up principles, criteria and procedure of students selection for VEs

The procedure to select students for VEs is oriented to quality and successful VE fulfilment. Students' selection involves evaluation of basic knowledge, skills, and motivation. The process includes:

- ✓ gender balance
- ✓ promoting discipline diversity
- ✓ inclusivity
- ✓ equality
- ✓ equity.

*) Note that by applying, the candidate would be also expressing their consent to transfer their contact information data to the organisers/ hosts of VEs.

Definitions:

- ✓ **gender balance**, both males and females will have equal opportunities to participate in educational VEs and to access new knowledge transfer
- ✓ **diversity**, students with different backgrounds, identities and experiences will be recognized, respected, and welcomed to participate in VEs
- ✓ **inclusivity**, students will be encouraged to retain their uniqueness, and have a sense of belonging and being valued
- ✓ **equality**, students will be treated the same, treated fairly and having the same opportunities
- ✓ eq**uity**, students with varying types or levels of support might be required, depending on individual need, will take full advantage of equal opportunities.

2.2.3.4. Integration of the credits into curricula at the participating universities

Tentative plan is that the student would need to participate, in a minimum to 1 VE Week, Climate University - VE-enhanced courses and pass the course assessment successfully.

University of Helsinki is responsible to provide the credits as a separate VE document and 1 credit point of ECTS. All the participating students will register themselves to the UH system (DigiCampus) for the credits. The credit in the curriculum for the student outside of the University of Helsinki will be implemented by the students' home universities.

The Climate CU MOOC's credits vary from 2 to 5 ECTS. The Bologna declaration, ratified also in Neighbourhood East countries in 2003, the Partners develop curricula in line with the European standards and norms, providing students with opportunities of academic mobility and issuing European Diploma Supplement and ECTS Transcript of Records.

2.2.3.5. Organization of the CLUVEX certificate for all the students participated in VEs

Students (BSc, MSc, PhD, PostDocs) who participated in the CLUVEX VE Weeks and became the Climate Messengers will get the CLUVEX "CLIMATE MESSENGER CERTIFICATE". The certificate will include information about the competencies on learning outcomes and obtained skills. A record about such awarded certificate can be included in students' personal CVs.

2.2.4. Moderators

2.2.4.1. Planning the Call-for-Moderators

In planning of VEs we have to consider also the challenges in recruitment of potential moderators among teachers, lecturers, researchers, experts, and students as well as challenges in designing the VE content, required tools and timing.

We outlined the following items to consider for Calls:

- ✓ Volunteers in the CLUVEX Partners Universities and collaborating universities - staffs and students are welcome to become moderators
- ✓ Students, members of CLUVEX Student Advisory Board (SAB), are also welcome to act as moderators
- ✓ Student moderators will be granted 2 credits (motivation)
- ✓ Moderators will get certificate including info on working hours, competencies developed, and skills obtained (motivation)
- ✓ Dealing with motivation to get certificate and credits vs. not interested to be involved vs. required workload
- ✓ Dealing with online teamwork on educational e-platform as useful experience for the future
- ✓ Ensuring ethical and responsible behaviour, when working online
- ✓ Handling conflicts and issues effectively

Example of a Call-for-Moderators

An example of the elaborated and distributed announcement of the Call-for-Moderators for 2nd VE Week for students is given in Annex 5.2. Because all trainings for moderators were completed during May-Sep 2024, the new coming persons will need to self/individually educate themselves using all materials in the DigiCampus area for moderators (available after registration). Only 3 trainings for moderators, before the start of the VE Weeks (2nd, 3rd, 4th, and 5th) will take place with focus on: TR1 – CLUVEX VE concept, project overview, and technical skills; TR2 – Individual and Collaborative Climate Horizon exercise; and TR3 – "Moderators-Get-Together" with orientation for the VE Week for students and questions/answers.
Note, that each CLUVEX Partner distributes Call-for-Moderators in their own Universities and networks as well as collaborating ones. The Partners from Ukraine (TSNUK, ONU/ OSENU) and Armenia (YSU) also distribute such Call translated in their national languages.

2.2.4.2. Education of moderators

Education of moderators for VEs included 5 online trainings to cover topics of the CLUVEX project overview, VE concept developed, elaborated program for VE Weeks for students, technical skills (Zoom, DigiCampus, Miro), overview of the Climate University (CU) MOOCs, soft skills like handling challenges and conflicts effectively and contented, guidebooks for VEs, climate literacy

and code of conduct, ensuring ethical and responsible behaviour online, tools for climate related data analysis, and individual and collaborative "Climate Horizon" exercise.

Moderators' education program includes 5 VE trainings (TR) hosted by UH (up to 3 hours per training topic):

- **TR1: CLUVEX project and VE concept overview, VE Week program & Technical skills**

This training introduces moderators to the Erasmus+ CLUVEX project and elaborated VE concept to CU online courses, providing basic knowledge on CU that moderators can encourage students after completing the online VE Weeks to participate in CU MOOCs.
(1) **CLUVEX project and VE concept overview**: *basic info, partners/ teams, general aim, online learning - future of education, project stages in workflow for VEs, dissemination, upscaling, and international networking; project staff members; acting as a CLUVEX moderator, 1st VE Week for students, CLUVEX moderators' training programme - 5 events/trainings; what moderators will gain; CU online courses - as bonus for students (BSc, MSc, PhD, PostDocs) who have participated in CLUVEX VE Weeks and became the Climate Messengers are encouraged to take the CU online courses; next steps to follow.*
(2) **Program of VE Week for students**: *approach; outlined programme; preparatory materials - 3 guidebooks (VEG, CLG, CMC) – as a pre-task; 8 lectures on climate related data; 3 web-based tools for visualisation, analysis and interpretation for climate related data; work in groups on "Climate Horizon" exercise; learning outcomes (competencies and skills obtained); earned bonuses for students; welcome to CU online courses, relevant to CLUVEX project*.
(3) **Technical Skills** (**Registration & DigiCampus for materials)**: *main opening page; how to register for Open University and on DigiCampus for: (i) students from Finnish Universities/ educational institutions (through Haka), and (ii) foreign students, physically residing in other countries (open new account); assessing course (VE Week for students); materials - downloadable and include lectures, tools, exercises, supporting materials; getting ECTS credits for students and moderators.*
(4) **Technical Skills** (**Managing Zoom):** how to use Zoom for moderating the discussion in a break-out rooms; several rules - keep it simple, practise in advance, and invest in good audio; using chat, screen sharing, moving to another room. Practice - act as a speaker, act as moderator/host with guest speakers.

- **TR2: Climate University (CU) MOOCs**

This training introduces to CU online courses, providing basic knowledge on CU that moderators can encourage students after completing the online VE Weeks to participate in CU MOOCs.
(1) **Climate University MOOCs**: *CU and Partners of CU; mission 2023-2027 including CU values; CU for VEs (link to CLUVEX); CU course online learning materials, solid pedagogy, multidisciplinary*

collaboration and reflective; examples of CU courses; who can take the courses; content of CU MOOC courses such as Climate.now, Sustanable.now, Biodiversity.now; examples of activities on online courses (independent study, teacher-led sessions, peer-reviewed exercises, and group work).
(2) **DigiCampus for moderators:** *welcome area, list of trainings; switching roles between student and moderator; announcements and moderators' discussion forum; credits for moderators; additional training materials: video-recordings and slides of lectures and web-based tools for climate related data analysis, guidebooks*.

❖ **TR3: Soft skills**

This training assists to moderators on how moderators can support multicultural group working; language barriers and supporting software; other plans and instructions for the moderators carrying out the VE-enhanced education and discussions.
(1) **Soft skills in facilitating online classroom:** *introducing Reflection Exercise; how to prepare; beginning of a session; how to give Instructions; oral activation; facilitating free flow conversation; taking and giving space; the end of a session; what to do if there is a problem; navigating English as a foreign language; trust the process; Reflection Exercise summary.*
(2) **Soft skills for the VE week**: *basic definitions; soft skills for the VE Week for students: communication, leadership, teamwork, creativity, time management, adaptability problem-solving, work ethic, critical thinking, conflict management, emotional intelligence.*
(3) **Procedure for unexpected situations**: *time matters; targeted instructions on different alerts and algorithms of actions; importance of obtaining accurate information, applications of receiving operational information; rules of conduct, what not to do in situations of military threat; how to survive in a crisis and stay calm; tips for getting out of a stressful situation.*

❖ **TR4: CLUVEX handbooks & materials**

This training introduces moderators to the developed CLUVEX educational materials, which will be provided to registered students in DigiCampus as "pre-materials" (e.g., handbooks, lectures, webpages, other materials, etc.) before their participation in the VE Weeks.
(1) **Virtual Exchange Guidebook (VEG)**: *aspects on importance and challenges of VE in climate education and training, CLUVEX project as a reference for the lessons learnt on VEs, planning and implementation of VEs, incl. key considerations for planning VE (incl. work organization, education, students, moderators, technical e-setups, evaluation, assessment, studying and developing VE concept, science communication and scaling up).*
(2) **Climate Literacy Guidebook (CLG)**: *aspects on how to use the guidebook, VE Week (programme, lectures, tools, group exercise, questionnaires), lectures' short description, tools for visualisation and analysis of climate related data, climate change related concepts and terminology , as well as appendixes (incl. recommended reading, environmental data*

visualization tools and databases, description of the CLUVEX VE Week – as a course, and CU online courses).
(3) **Climate Messenger Code of Conduct (CMC)**: *aspects of the CLUVEX Climate Messenger's education material and exercise, code of conduct during Climate Messenger education, instructions for interaction and communication during the VE Week, instructions for unexpected situations, code of conduct as Climate Messengers after the CLUVEX project completed.*

❖ **TR5: CLUVEX Climate Horizon exercise and tools for analysis of climate related data**

This training introduces moderators to the CLUVEX Individual and Collaborative "Climate Horizon" exercise for personal and joint work of students in groups/teams online in the break-out-rooms in Zoom; discussions, questions-answers, feedbacks between students and trained moderators during VE Week for students.
(1) **Climate Horizon exercise and role of moderator**: *based on an approach of Utopian pedagogy; what does this mean for you as moderators; guidelines for discussions; work with* ***Miro collaborative tool****; Individual/Personal Climate Horizon vs. Collaborative Climate Horizon group exercise (multidisciplinary approach and based on the group members' own Climate Horizons) and options for implementation.*
(2) **Instructions for Climate Horizon exercise**: *how to work on the Climate Horizon exercise during VE Week; progressing on a day-by-day basis; individual/personal (own student work) and common/collaborative (group/ teamwork) Climate Horizons; reporting on Individual and on Collaborative Climate Horizon exercises*.
(3) **ERA-5 Past Climate Explore (PCE) tool**: *demo on how to visualize historical climate statistics for any geographical location around the world (https://era5.lobelia.earth/en); interactive map; user-friendly menu for selecting location on a globe, meteorological parameter, and calculating statistics on aggregated period - average year or month.*
(4) **Shared Socioeconomic Pathways (SSPs) tool**: *demo on global scenario framework used in exercises on socioeconomic trajectories for describing past and future socio-economic trends of chosen countries; scenarios for climate change research and need for scenarios (using https://data.worldbank.org/indicator, https://tntcat.iiasa.ac.at/SspDb).*
(5) **Intergovernmental Panel on Climate Change (IPCC) Atlas tool**: *demo for interactive, flexible spatial and temporal analyses of observed and projected climate change information (https://interactive-atlas.ipcc.ch); explore global and regional observed data and model simulations and helps to investigate the effects of climate change in specific regions, to assess changes in mean climate at regional scales, in particular observed trends and their attribution and projected future changes*.

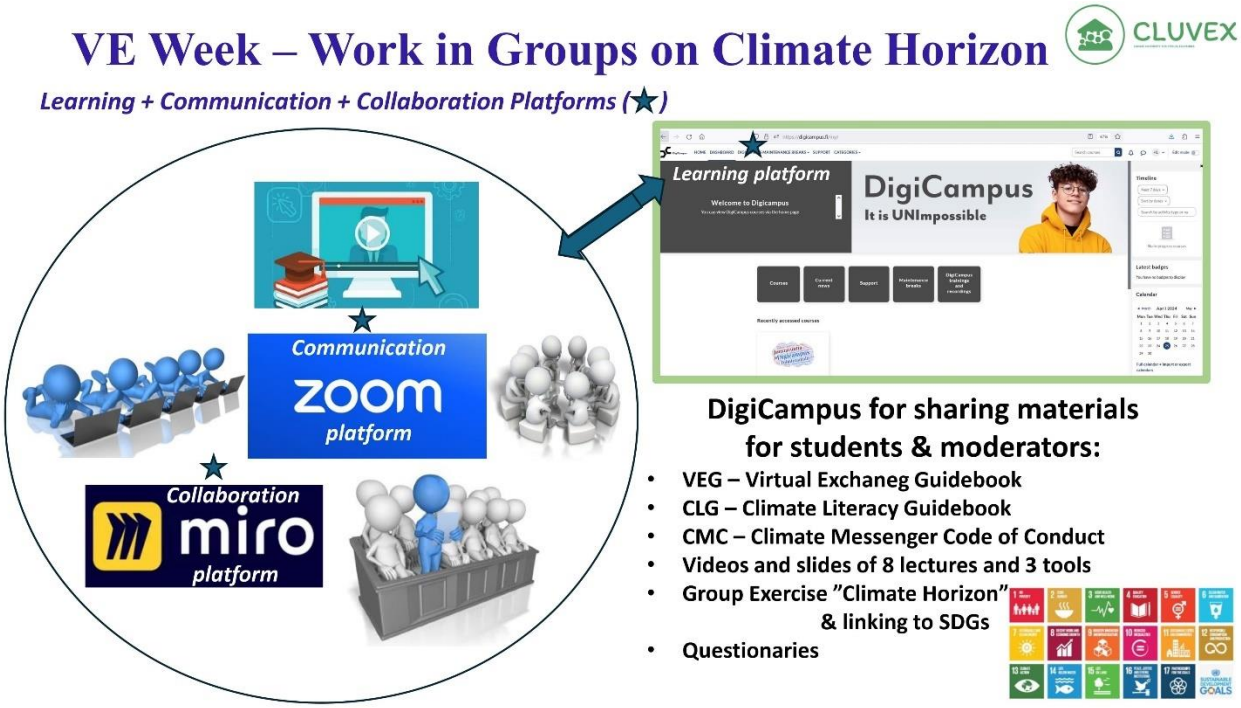
See more details about five CLUVEX Trainings-for-Moderators in the CLUVEX Del 3.1 on "Set of Online Tutorials. Recordings for CLUVEX trainings & course modules". Direct link is: https://www.atm.helsinki.fi/cluvex/wp-content/uploads/2024/12/Del3.1_Set_Online_Tutorials_vf1.pdf

2.2.5. Technical e-setups

2.2.5.1. Selecting and organisation of the e-platforms and e-tools

Selecting appropriate technology platforms

- ✓ **Zoom** (as communication platform)
- ✓ **Miro** (as collaboration platform)
- ✓ **DigiCampus** (as educational platform), a shared learning environment for universities, courses (www.digicampus.fi). At the moment courses include independent learning at the online platform, but also teacher interaction and group work.
- ✓ **English language skills** of the participating students from Neighbourhood East countries might be a limiting barrier for communication, and hence, it is especially important to find existing and new technological solutions, in this case, translators to help students in their VE communication.



2.2.5.2. Selecting approaches and technical tools to overcome language barriers

The principles, criteria and procedure of technical tools' selection was discussed, elaborated and agreed by the CLUVEX consortium. The project Steering Group will select the students to courses and ensure the diversity, non-discrimination of participants and all other relevant aspects (as the number of students per Partner/ University was indicated in the CLUVEX proposal) are in balance. Some level of English language proficiency will be required to participate in VEs, but participants to be introduced to online translating tools and welcome to use these, such as:

- ✓ Microsoft Translator https://translator.microsoft.com
- ✓ Google Translate https://translate.google.com
- ✓ Yandex Translate https://translate.yandex.com
- ✓ Youtube Translator to work on joint exercises/assignments

Moreover, small group discussions will be formed in a way that each such group, led/ coordinated by moderator, has, at least, one student fluent in English and in one of the languages of the CLUVEX Partners from the Neighbourhood East countries.

2.2.5.3. Recruiting technical staff

In addition to educated moderators, there is a need to have during the VE Weeks, at least, 2-4 persons as technical staff to successfully carry out online such long-term event. These persons should be well familiar with used communication (Zoom), collaborative (Miro) and educations (DigiCampus) e-platforms. The stable communication in Zoom is very crucial. Instructions on handling such issue are given in the CMC.

Note, as a max capacity of Zoom provided is 500 participants. There is another possibility of hosting 2 "parallel lines" with 250 students in each (and 25 moderators) plus tech. staff to support zoom communication and DigiCampus educational platform (for both students and moderators). In case of 2 lines, the number of VE Weeks as well as the working load in hosting the VE Weeks is increasing by factor of 2.

2.2.6. Evaluation, assessment, studying and developing the VE concept

2.2.6.1. Gathering feedback from the participated moderators and students

Gathering feedback for VEs in climate education and training is crucial for evaluating the effectiveness of the program and identifying areas for improvement. Here are some recommendations for gathering feedback:

Surveys and Questionnaires: Design surveys or questionnaires for both students and moderators to assess their experiences, learning outcomes, and satisfaction with the VE. Include both quantitative and qualitative questions to gather comprehensive insights.
Focus Groups: Organise focus group discussions with participants to delve deeper into their experiences and perceptions. This can provide more nuanced feedback and allow for interactive discussions.
Pre- and Post-Program Assessments: Conduct assessments before and after the VE program to measure changes in knowledge, attitudes, and skills related to climate education.
Regular Check-ins: Schedule regular check-ins or feedback sessions during the VE program to monitor ongoing experiences and address any issues promptly.

Feedback Forms: Provide feedback forms after specific sessions or activities within the VE program to gather immediate reactions and suggestions for improvement.
Peer Feedback: Encourage peer-to-peer feedback among students to foster reflection and collaborative learning.
Instructor/Moderator Feedback: Collect feedback from instructors or moderators on their experiences facilitating the VE, including challenges faced and support needed.
Analysing Participation and Engagement: Use analytics tools to track participation rates, engagement levels, and interaction patterns in online platforms used for the VE.
Follow-up Interviews: Conduct follow-up interviews with a sample of participants after the program's completion to gather in-depth feedback and long-term impacts.
Feedback from External Stakeholders: If applicable, gather feedback from external stakeholders, such as partner organisations or experts involved in the VE program.

It's important to ensure that the feedback process is anonymous and confidential to encourage honest and constructive responses. Additionally, clearly communicate the purpose of the feedback and how it will be used to improve future VE programs.

To effectively gather feedback for VEs in climate education and training, it's important to align the forms of feedback with appropriate channels. Here's how you can bring the feedback forms into correspondence with channels:

Surveys and Questionnaires: Utilise online survey platforms (e.g., Google Forms, SurveyMonkey) to distribute and collect responses. Share the survey links via email, VE platform, or social media channels used for the program.
Focus Groups: Conduct focus group discussions through video conferencing tools (e.g., Zoom, Microsoft Teams) or in-person if feasible. Schedule these sessions in advance and invite participants via email or the VE platform.
Pre- and Post-Program Assessments: Administer assessments through the VE platform or a learning management system (LMS) where the program is hosted. Alternatively, use online survey tools and share links via email or the VE platform.
Regular Check-ins: Schedule regular check-in sessions using video conferencing tools or through discussion forums on the VE platform. Announce these sessions via email or the platform's announcement feature.
Feedback Forms: Provide feedback forms through the VE platform or as online forms (e.g., Google Forms) after specific sessions. Share the form links immediately after the sessions via the VE platform or email.
Peer Feedback: Facilitate peer-to-peer feedback through discussion forums, collaborative documents (e.g., Google Docs), or peer review features in the VE platform or LMS.
Instructor/Moderator Feedback: Collect feedback from instructors or moderators via email, online forms, or through the VE platform's feedback feature.
Analysing participation and Engagement: Use analytics tools integrated into the VE platform, LMS, or social media channels to track metrics. Review the data regularly to assess participation and engagement.

Follow-up Interviews: Conduct follow-up interviews using video conferencing tools or telephone calls. Schedule these interviews post-program and reach out to participants via email to invite them.
Feedback from External Stakeholders: Gather feedback from external stakeholders through email surveys, online forms, or video conferencing meetings. Engage with them directly through the channels they are most active on.

By aligning the above-mentioned forms of feedback with the appropriate channels, it is possible to ensure that the feedback process is efficient, accessible, and effective in capturing valuable insights for the improvement of the VE program in climate education and training.

2.2.6.2. Study the learning outcomes with different method

Studying the learning outcomes of VE program in climate education and training is essential for assessing its effectiveness and identifying areas for improvement. Here are some recommendations for studying the learning outcomes using different methods:

Questionnaires: Design questionnaires to assess the knowledge, skills, and attitudes gained by participants. Include both closed-ended questions for quantitative analysis and open-ended questions for qualitative insights. Distribute the questionnaires before and after the VE program to measure changes.
Interviews: Conduct individual or group interviews with participants to gather in-depth feedback on their learning experiences. Use semi-structured interviews to explore specific learning outcomes and how they were achieved.
Pre- and Post-Tests: Develop pre- and post-tests to evaluate the acquisition of specific knowledge or skills related to climate education. Analyse the results to measure the improvement in participants' understanding.
Portfolio Assessment: Encourage participants to create portfolios showcasing their work and reflections throughout the VE program. Review the portfolios to assess the development of skills and competencies.
Observation: If possible, observe participants during the VE activities to assess their engagement, interaction, and application of learned concepts. Use observation checklists or rubrics to standardise the assessment.
Self-Assessment: Ask participants to self-assess their learning progress and achievements using self-assessment forms or reflective journals. This can provide insights into their perceived growth and areas for further development.
Peer Assessment: Implement peer assessment methods where participants evaluate each other's contributions and learning outcomes. This can foster collaborative learning and critical thinking.
Case Studies: Use case studies to assess participants' ability to apply learned concepts to real-world scenarios. Analyse their responses to evaluate their problem-solving and decision-making skills.
Learning Analytics: Utilise learning analytics tools to analyse data from the VE platform, such as participation rates, engagement levels, and quiz scores. This can provide objective measures of learning outcomes.

Feedback from External Stakeholders: Gather feedback from external stakeholders, such as industry experts or partner organisations, on the relevance and applicability of the learning outcomes in real-world contexts.

By employing a combination of these above-mentioned methods, it is possible to comprehensively study the learning outcomes of the VE program in climate education and training and make informed decisions for its enhancement.

To effectively implement the recommendations for studying learning outcomes in the VE program, it's important to have a structured administrative and organisational plan. Here are some steps to consider:

Form a dedicated team: Assemble a team responsible for evaluating learning outcomes, including educators, administrators, and technical support staff. Ensure that the team has clear roles and responsibilities.
Develop a comprehensive evaluation plan: Create a detailed plan outlining the methods and tools to be used for studying learning outcomes. Include timelines, data collection procedures, and analysis methods.
Train the team: Provide training for the team members on the evaluation tools and methods to ensure consistency and accuracy in data collection and analysis.
Communicate with participants: Inform participants about the evaluation process, including the purpose of studying learning outcomes and how their feedback will be used to improve the program.
Integrate evaluation into the VE program: Incorporate evaluation activities, such as pre- and post-tests, questionnaires, and reflection sessions, into the program schedule. Ensure that these activities are seamlessly integrated into the learning experience.
Collect data systematically: Use digital tools and platforms to collect and organise data efficiently. Ensure that data collection is aligned with data privacy and ethical standards.
Analyse and interpret data: Use statistical and qualitative analysis methods to interpret the data collected. Look for patterns, trends, and areas for improvement in the learning outcomes.
Report fundings and make recommendations: Prepare a comprehensive report summarising the findings of the evaluation. Use the report to make evidence-based recommendations for enhancing the VE program.
Implement improvements: Based on the evaluation findings, make necessary adjustments to the program to improve learning outcomes. This may involve revising content, changing instructional strategies, or enhancing support services.
Monitor and integrate: Continuously monitor the impact of the changes made and collect ongoing feedback from participants. Use this feedback to make further refinements to the program.

By following these above-mentioned administrative and organisational measures, it is possible to effectively study and enhance the learning outcomes of the VE program in climate education and training.

To implement each specific point for studying learning outcomes in the VE program, here are some administrative and organisational measures to consider:

Questionnaires: Develop a set of questions that align with the learning objectives of the VE program. Use online survey tools to create and distribute the questionnaires. Schedule the distribution of pre-program and post-program questionnaires. Collect and analyse the responses to identify changes in knowledge, skills, and attitudes.
Interview: Prepare a semi-structured interview guide with questions related to the learning outcomes. Select a sample of participants for interviews based on criteria such as diversity, engagement level, and performance. Conduct interviews using video conferencing tools or in person if possible. Record and transcribe the interviews for analysis.
Pre- and Post-Tests: Design tests that cover key content areas and skills targeted by the VE program. Administer the tests online or through the VE platform at the beginning and end of the program. Analyse the test results to assess improvements in participants' understanding.
Portfolio Assessment: Provide guidelines and templates for participants to create their portfolios. Set deadlines for portfolio submission and allocate time for review. Evaluate the portfolios against a rubric or set of criteria related to the learning outcomes.
Observation Develop observation checklists or rubrics that focus on engagement, interaction, and application of concepts. Plan observation sessions during key VE activities. Record observations and use them to complement other forms of assessment.
Self-Assessment: Create self-assessment forms or reflective journal prompts that encourage participants to reflect on their learning progress. Integrate self-assessment into the VE program schedule. Review self-assessments to gain insights into participants' perceptions of their own growth.
Peer Assessment: Establish guidelines for peer assessment, including criteria for evaluating contributions and learning outcomes. Facilitate peer assessment sessions or incorporate peer assessment into group activities. Use peer assessment feedback to encourage collaborative learning and self-reflection.
Case Studies: Select or develop case studies relevant to the VE program's content and learning objectives. Incorporate case studies into the program and provide instructions for analysis. Evaluate participants' responses to assess their problem-solving and decision-making skills.
Learning Analytics: Utilise the VE platform's analytics tools to track participation rates, engagement levels, and quiz scores. Set up regular intervals for data collection and analysis. Use the analytics data to identify trends and areas for improvement in the learning outcomes.
Feedback from External Stakeholders: Identify relevant external stakeholders, such as industry experts or partner organisations. Develop a feedback collection method, such as surveys, interviews, or focus groups. Analyse the feedback to assess the relevance and applicability of the learning outcomes in real-world contexts.

By implementing these above-mentioned measures, it is possible to effectively study the learning outcomes of the VE program and use the insights gained to enhance the educational experience for participants.

2.2.6.3. Using assessment data for program improvement

Using assessment data for program improvement is crucial for enhancing the effectiveness of VE programs. Here are some recommendations for leveraging assessment data to improve your program:

Data Analysis and Interpretation: Analyse the assessment data collected from questionnaires, interviews, tests, and other methods to identify trends, strengths, and areas for improvement. Interpret the data in the context of the program's learning objectives and outcomes.
Identify Key Insights: Look for patterns in the data that indicate successes or challenges in the program. Identify specific aspects of the program that contributed to positive learning outcomes or areas where participants struggled.
Develop Action Plans: Based on the insights from the data, develop action plans to address areas for improvement. This may include revising content, modifying instructional strategies, or enhancing support services. Set clear goals and timelines for implementing the improvements.
Update Program Materials: Use the assessment data to inform updates to program materials such as the Virtual Exchange Guidebook (VEG), Climate Literacy Guidebook (CLG), and Climate Messenger Code of Conduct (CMC). Ensure that the updates are aligned with the identified needs and learning objectives.
Incorporate Best Practices: Identify best practices from the program that led to successful learning outcomes and consider how these can be integrated into other parts of the program or future VEs.
Stakeholder Engagement: Share the assessment findings and proposed improvements with stakeholders, including participants, instructors, and partner organisations. Seek their feedback and input on the planned changes.
Pilot and Iterate: Pilot the improvements in a smaller scale or a controlled environment before fully implementing them in the program. Collect feedback and make further adjustments as needed.
Monitor and Evaluate: Once the improvements are implemented, continue to monitor and evaluate the program using assessment data to ensure that the changes are effective in enhancing learning outcomes.
Document and Share: Document the process of using assessment data for program improvement and share the findings and lessons learned with the broader educational community. Consider publishing peer-reviewed articles to contribute to the field.
Continuous Improvement: Establish a culture of continuous improvement within the program, where assessment data is regularly used to inform and enhance program design and delivery.

By following these above-mentioned recommendations, it is possible to effectively use assessment data to drive continuous improvement in the VE program, ensuring that it remains relevant, effective, and aligned with the learning needs of participants.

Implementing the recommendations for using assessment data for program improvement within a consortium requires a coordinated and structured approach. Here are some administrative recommendations on how to do it on a point-by-point basis:

Data Analysis and Interpretation: Assign a dedicated team or working group within the consortium to analyse and interpret the assessment data. Ensure that this team has representatives from each partner institution. Use standardised data analysis tools and methods to maintain consistency across the consortium.
Identify Key Insights: Organise regular meetings or workshops among consortium members to discuss the findings from the data analysis and identify key insights. Facilitate collaborative discussions to ensure that diverse perspectives are considered.
Develop Action Plans: Create a joint task force within the consortium to develop action plans based on the identified insights. This task force should include experts in curriculum development, instructional design, and program evaluation. Ensure that the action plans are aligned with the overall goals of the consortium and are feasible for implementation by all partners.
Update Program Materials: Establish a process for updating program materials collaboratively. This could involve setting up working groups for each key document (e.g., VEG, CLG, CMC) that include contributors from each partner institution. Implement a review and approval process for the updated materials to ensure that they meet the consortium's quality standards.
Incorporate Best Practices: Share best practices identified from the assessment data across the consortium through newsletters, webinars, or online forums. Encourage partner institutions to adopt and adapt these best practices in their own VE programs.
Stakeholder Engagement: Develop a communication plan to engage stakeholders across the consortium in the improvement process. This could include regular updates, feedback surveys, and opportunities for input on proposed changes. Create a centralised platform or repository where stakeholders can access information and contribute feedback.
Pilot and Iterate: Select a few partner institutions to pilot the proposed improvements before rolling them out across the consortium. Collect feedback during the pilot phase and make necessary adjustments before full implementation.
Monitor and Evaluate: Establish a consortium-wide monitoring and evaluation system to track the effectiveness of the implemented improvements. Use standardised indicators and metrics to ensure comparability of data across partner institutions.
Document and Share: Create a knowledge management system within the consortium to document the process of using assessment data for program improvement and to share lessons learned. Consider publishing joint articles or reports to share insights with the broader educational community.
Continuous Improvement: Foster a culture of continuous improvement within the consortium by setting up regular review cycles for the VE program and encouraging ongoing collaboration and learning among partners.

By following these above-mentioned administrative recommendations, the consortium can effectively use assessment data to drive program improvement in a coordinated and collaborative manner, ensuring that the VE program remains responsive to the needs of participants and achieves its educational objectives.

2.2.7. Science communication and scaling up

2.2.7.1. Effective communication tools

The CLUVEX project has established a public website (https://www.atm.helsinki.fi/cluvex), where the project relevant information is available including news (Figure 6a), partners, collaborators, materials (Figure 6b), etc. The announcement of the Call-for-VE-Week for students will be published at the CLUVEX project official website (hosted by UH) in English, as well as at the Partners' websites in national languages (Ukrainian and Armenian). Such announcements will be also distributed through students' local networks in universities as well as through network of the Bioart Society. Moreover, announcements – Calls-for-Moderatos & Calls-for-Students – will be distributed through national and international networks.

(a) *(b)*

Figure 6: *CLUVEX project (a) website with main webpage presenting recent news in a chronological order, and (b) promotional poster targeted for students to join VE Weeks.*

2.2.7.2. Strategies for scaling up VE concept

Previous collaboration of the CLUVEX partners UCPH, with World Meteorological Organization's (WMO) Global Campus and regional centres provides a baseline for a global upscaling and the development of an international standard for training of young scientists.

Participating countries' collaboration with WMO and having a representative of the Global Campus as a CLUVEX Expert Advisory Board (EAB) member enables the conformity of curricula,

for example education staff for climate services to international standards and contribute to improvement of the quality of courses to be created.

Also, the EAB members represent relevant networks like Universities of Arctic for the future upscaling. The CLUVEX' experience in development of innovations and application of the VE e-learning, which will make it possible for the Neighbourhood East part of the consortium to get acquainted with the most relevant and state-of-the-art developments in distance and blended learning.

Examples of the CLUVEX networks

WMO Network of Regional Training Centers, 43 Regional Training Centres in 28 countries around the world, serving to promote, demonstrate, disseminate and provide outreach of project outcomes worldwide, to countries outside the EU. WMO Regional Training Centers. **WMO Global Campus** (public.wmo.int/en/resources/meteoworld/wmo-global-campus) will also be involved (WMO ETR director is a member of CLUVEX Advisory Board). The PI of the UCPH, as a staff member of WMO, is deeply involved in these WMO network activities. UCPH PI leads this collaboration with regional training centres).
PEEX (www.atm.helsinki.fi/peex). Pan-Eurasian EXperiment is a hub (over 40 research units from many countries worldwide including also Neighbourhood East countries and China) for distributing information, especially The PEEX research is interested in land-atmosphere interactions in the boreal and Arctic environments. Program is also motivated by establishing environmental observation systems, which find synergy with citizen science and education activities of the project (network coordinator UH) (INAR-UH leads).
DBAR (www.dbeltroad.org). Digital Belt and Road Program, China (as a stakeholder), provides a network for education collaboration with Chinese universities. DBAR is coordinated by The Aerospace Information Research Institute (AIR), Chinese Academy of Sciences (CAS), which is a scientific research institute, with more than 2000 researchers and collaborates with UH- INAR. (INAR-UH A DBAR-Center of Excellence).
Copenhagen Science City (copenhagensciencecity.dk) is a partnership between the City of Copenhagen, UCPH and various local governmental and business organisations. It is a home to a wide range of educational programmes in the fields of natural science, medicine, health and ICT. It utilises its unique resources in different fields to create a strong knowledge and innovation community and to attract business talent and investment and increase the number of entrepreneurial students and spinouts.
PACES (pacesproject.org). Air Pollution in the Arctic: Climate, Environment and Societies - International initiative co-sponsored by International Global Atmospheric Chemistry (IGAC), Future Earth & International Arctic Science Committee (IASC). (UH and UCPH are involved).
IAMES (www.iamesworld.com). The International Association of Meteorological Education and Sciences was established in December 2020, which was initiated by Nanjing University of

Information Science and Technology (NUIST) and supported by more than 30 colleges, universities and scientific research institutions from over 20 countries. IAMES is a non-governmental, non-profit, academic, and scientific organisation, dedicated to the international promotion and coordination of scientific studies and education on meteorology (atmospheric science, hydrology, environmental science, and other meteorology-related disciplines). IAMES encourages the application of this knowledge to social needs, such as weather forecasts, climate change, mitigation of natural hazards, and environmental preservation. IAMES is established to stimulate meteorological education and research, promote scientific and technological innovation, share high-quality platform resources, provide government policy consultation, and enhance the coordination ability to respond to major scientific issues (OSENU is an Associate member).
INTENSE (intense.network/intense-school/intense-international). The International Doctoral School Network was established on 7 Nov 2019 by OSENU, Kharkiv National V.N. Karazin University, Institute of the Ecology of the Carpathians NANU, National University of Mongolia, Khovd State University, HoChiMInh City University of Natural Resources and Environment, and Hanoi University of Science and Technology by signing an agreement. Such activities, as joint co-supervision, physical and credit mobility, joint research, joint events, and prioritised partnerships are envisioned in the INTENSE network. The agreement provides for access to e-learning, arrangement for joint research training and a range of other academic activities.

2.2.7.3. Promoting VE outcomes and networking beyond CLUVEX lifetime

All partners of the CLUVEX project are obliged to inform the widest circles about the VE activities. They can collaborate with local, state and international organisations, the platforms to which the given partner is connected, and the scope of interest is climate change.

The promotion, dissemination and coverage of information is encouraged, especially at the regional levels, in which the VE beneficiaries will also take an active part and they will already provide for the participants of the next VE weeks.

All the materials and literature of the VE week will be available for various universities and educational institutions, which can get acquainted with the results of the CLUVEX project, VE and also present recommendations, edges of cooperation.

A complete toolkit for dissemination, promotion and coverage of VE information is included in the "Dissemination Strategy" of the CLUEX program adopted by project partners in October 2023.

2.2.7.4. Ensuring long-term sustainability and institutional support

All partners of CLUVEX project are willing to invest human and technical resources for organising the VE week.

Stability can be ensured by well-planned actions in advance, which will ensure positive results of the VE week.

All partners of the CLUVEX project will gain the best experience for implementing similar programs in the future, both with formal and non-formal educational programs, and it will be a good experience especially for organising LLL courses.

Good governance is critical to the success of higher education institutions, with governors charged to ensure the sustainability of their institution. While a focus on financial viability is key, adopting a fuller definition of sustainability to include people and planet is necessary to secure long-term success.

Higher education institutions that take a broader view of investment - by acknowledging the relevance of environmental, social and governance factors - stand to enhance their reputation as leading global institutions and thereby safe-guard the value and performance of their investments in the climate change sphere.

2.2.7.5. Fundraising and resource allocation beyond the project lifetime

In the 21st century, the topic of climate change is relevant and important, it is studied not only by the partners of the CLUVEX project, but all over the world. The experience of CLUVEX project partners will allow them to further study the topic with other partners and educational institutions of other countries, public and state organisations to implement broader and large-scale projects within the framework of various EU grants and so on.

The experience of CLUVEX project and RE will be instructive for creating a digital and green educational environment and it will be an incentive to implement new projects.

Fundraising is strategically critical so that it consistently delivers income upon which services, beneficiaries, and causes rely, as well as being a key part of good charity governance.

There's a responsibility to look after a charity's best interests and to ensure that it can operate at its optimal level. More widely, appropriate investment will deliver continually improved fundraising practice and protect the reputation of the charity sector as a whole.

3. CONCLUSIONS AND RECOMMENDATION FOR VE

This developed document, the VEG, first of all, outlines the importance, advantages and challenges of Virtual Exchanges (VEs) in climate education and training. The CLUVEX project is chosen as a reference for the lessons-learnt on VEs.

The CLUVEX main aims are focused on international education, awakening climate expertise interest in multiple disciplines as background, digital and global-working skills, promoting the VE concept and global dialogue.

The CLUVEX main objectives are: to bridge and bring together students from European and Neighbourhood East countries universities and engage them with climate competences and soft skills; to develop and design a new, tailored VE concept for climate education and training; to

educate new moderators with climate competences and soft, digital, VE skills; to educate university students to act as Climate Messengers in society; and to upscale and distribute information on VE as a powerful tool bring students together from across wide geographical distances.

The VEG guidebook outlines man steps in planning and implementation of VEs, taking into account the key considerations and aspects for planning VEs (for educating moderators & for educating students participating in the VE Weeks). The efficiently and smoothly organized work by the CLUVEX Partners allowed to develop, test and implement the VEs for both moderators (Del 3.1) and students (Del 4.1).

The VEG presents a **set of developed recommendations** for the VE education, students, moderators, technical e-setups, VE concept (evaluating, assessing, studying and developing), and science communication and scaling up.
The **VE education** process requires determining learning outcomes for VEs (in CLUVEX there are 10) and earned bonuses for students (like ETCS credits, CLUVEX certificate, status of the Climate Messenger, opportunity to attend CU online courses free of charge) participated in the VE Week; outlining and preparing detailed VE program as well as educational materials including practical Climate Horizon exercise for the VE Week.
The involvement of **students** requires planning the Call-for-Students, setting up and opening online registration for them, choosing principles-criteria-procedure for their selection, integration of awarded ECTS credits into curricula (at participating universities), and organization of the CLUVEX certificate for all the students registered and participated in VEs (VE Weeks).
The involvement of **moderators** requires planning the Call-for-Moderators, and their education through online trainings about the CLUVEX project and VE concept overview, VE Week program and technical skills (DigiCampus, Zoom, Miro); Climate University MOOC online courses; soft skills; handbooks and materials; Climate Horizon exercise and tools for analysis of climate related data.
The **technical e-setups** require selection and organisation of the e-platforms and e-tools, approaches and technical tools to overcome language barriers, and recruiting technical staff for VE weeks.
The **VE concept** (evaluation, assessment, study and development) requires gathering feedback from participated moderators and students, studying the learning outcomes applying different method, and using assessment data for the VE Week program improvement
The **science communication and scaling up** require effective communication tools, strategies for scaling up VE concept through the CLUVEX relevant networks, promoting VE outcomes and networking beyond CLUVEX lifetime, ensuring long-term sustainability and institutional support; and fundraising and resource allocation beyond the project lifetime.

This VEG document will be updated (when it is necessary) based on feedback and comments from the participants (students and moderators) of the 2nd, 3rd, 4th, and 5th VE Weeks for students to be carried out during 2025-2026.

4. LITERATURE

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CLUVEX Del-2.3 Climate Messenger Code of Conduct (CMC) - https://www.atm.helsinki.fi/cluvex/wp-content/uploads/2024/04/CLUVEX_Del_2.3_CMC_ver1.pdf

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5. ANNEXES

5.1. Example of the Call-for-Students

Figure 5.1: An example of the Call-for-Students for the 1st VE Week (Oct 2024).

5.2. Example of the Call-for-Moderators

Join the Moderators' Training Program for
CLUVEX VIRTUAL EXCHANGE (VE) WEEK

The University of Helsinki coordinates the EU ERASMUS+ project "Climate University for Virtual Exchange", CLUVEX (2023-2027), as a part of Climate University at the University of Helsinki. CLUVEX organizes an interactive, online virtual exchange week, 3 hours per day, on **Climate Change** and **Sustainability Science** topics for students from European and Eastern European universities mainly from Finland, Denmark, Ukraine, and Armenia.

The next CLUVEX virtual exchange week is on **May 12.-16.2025, three hours per day at 2 PM (Helsinki time, UTC+3)**. During the virtual exchange week, we will introduce and discuss the latest scientific knowledge on climate change from **multidisciplinary perspectives, from natural and social sciences and the arts**. The CLUVEX virtual exchange sessions are organized on Zoom with ~500 students. The daily meetings consist of lectures, discussions, and workshopping in small groups of ~10 students and a designated moderator. **The moderator's central role is to facilitate and guide the international and interdisciplinary interactions, workshopping, and learning** in small online groups.

Participating Moderators' training & moderating during the Virtual Exchange Week as a moderator you will…

- get an internship certificate related to your studies
- get 3-5 ECTS, given by Open University at University of Helsinki
- hone your online interaction, pedagogy and language skills in an international environment
- increase your contacts with the CLUVEX network and universities

Moderator Training on-line events on Zoom

TR1 - Introduction	26 March at 14.30 EET/Helsinki time
TR2 - Group exercise	9 April at 14.30 EET/Helsinki time
TR3 - Orientation for the week and Q&A	30 April at 14.30 EET/Helsinki time

The moderator training consist of **three online training sessions** and independent study materials.

Register here:
https://elomake.helsinki.fi/lomakkeet/133241/lomakkeet.html
Registration deadline is 15 March

After filling in the application form, you will receive email instructions on joining the course on the Digicampus online learning platform. Contact person: julia.karhumaa@helsinki.fi

More information about the virtual exchange: https://www.atm.helsinki.fi/cluvex/
Join the moderators' mailing list: https://www.atm.helsinki.fi/cluvex/?page_id=668

Figure 5.2: An example of the Call-for-Moderators for the 2nd VE Week (May 2025).