ONLINE TEACHING AND VIRTUAL EXCHANGES – ISIGHTS AND RESULTS FROM ERASMUS PROJECTS

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Keywords: Virtual Exchange, Climate Related Education, Climate Change, Sustainable Development

INTRODUCTION

Distance learning is increasingly complementing traditional teaching. Virtual Exchange (VE) can make online learning more engaging by creating opportunities for interaction among students. *(O'Dowd & O'Rourke 2019; O'Dowd 2021; Schenker 2013*). UHel coordinated 3 European Union ERASMUS+ projects: "*Multilevel Local, Nation- and Regionwide Education and Training in Climate Services, Climate Change Adaptation and Mitigation*" (ClimEd, 2020-2026), "*Climate University for Virtual Exchanges*" (CLUVEX, 2023-2026), and "*UnaEuropa for Virtual Exchanges*" (UnaVEx, 2024-2027). These projects focused on the challenges of climate related education, climate change and sustainable development (*Lappalainen et al., 2025*). The goal of CLUVEX and UnaVEx is to bring a total up to 5000 university students to VEs, and for ClimEd – up to 500 students and professionals per virtual exchange week. The projects support the continuation of on-line studies in the subject area through existing MOOCs and on-line education. The CLUVEX project is based on the Climate University (CU) MOOCs, and the UnaVEx project is based on sustainable development MOOCs of the UnaEuropa network. UHel together with the projects' partners from Europe, Europe Neighbourhood East (e.g., Ukraine, Armenia), and Africa (e.g., South Africa, Republic of Congo, and Kenya) are developing and researching the VE concept as a part of distance learning. Currently, UHel is also involved in 2 other projects: "*Next Generation Workforce – Empowering Young People for Improved Employment*" (REOPEN; 2025-2028) and "*Empowering Climate Services in the Andes*" (EMPOANDES; 2025-2028). These project partnerships build on previous collaboration in distance education and its development in different contexts.

MATERIALS AND METHODS

During the Virtual Exchanges (VEs), university students and early-career teachers and researchers from different countries learn about climate competences, UN Sustainable Development Goal topics, such as climate change and sustainable development. They exchange ideas and work together in online groups. After each VE, participants present their group work (joint Miro boards) and submit reports to earn ECTS credits and project certificates: Climate Messenger (CLUVEX), Climate Advocate (UnaVEx). In the Virtual Exchange projects, topic-specific collaborative exercises were developed: "Climate Horizons" and "Sustainable Climate Action Task." In ClimEd project we educated Climate Professional and . The projects also collect information about participants' motivation before the VEs and their feedback afterwards.

RESULTS

CLUVEX: the VE concept was developed, guidebooks such as VE Guidebook, Climate Literacy Guidebook, Climate Messenger Code of Conduct, and other supporting educational materials were elaborated. A series of 5 trainings for moderators was online carried out about the VE concept and technical skills, MOOCs, soft skills, guidebooks and materials, individual and collaborative Climate Horizon exercises (based on climate utopia pedagogy by *Rajala et al. (2023)*, and web-based tools for climate-related data visualisation, analysis, and interpretation). A series of 5 VE Weeks took place online (1st VE Week during 14-18 Oct 2024, 2nd – 12-16 May 2025, 3rd – 6-10 Oct 2025, 4th – 23-27 Feb 2026, 5th – 20-24 Apr 2026). Starting preparation for the 2nd VE Week the 3 online trainings (so-called the Moderators-Get-Together) were carried out with presentations about basics and improving of VE concept, programme, technical skills to work with education, communication, and collaboration platforms (DigiCampus, Zoom, and Miro-board, respectively), exercises, and questions vs. answers. The materials for trainings and VE Weeks were available in the DigiCampus area for registered participants for self-learning and practicing before the start of each VE Week.

UnaVEx: the preparatory work towards Ves and educational materials, training of moderators, and VE Weeks (as a series of separate 5 VE Days) for students were elaborated. Each VE Week was proceeded by 5 online trainings for moderators (info about lectures, tools, materials, and individual and collaborative Sustainable Action exercise, based on the "Introduction to Sustainability" UnaEuropa on-line MOOC. The 1st VE Week

for students took place online during 5 selected days (24 Feb - 28 Mar 2025), 2nd (13 Nov – 11 Dec 2025), 3rd (3-26 Mar 2026) and the upcoming 4th (10 Nov –19 Nov 2026), 5th (24 Nov – 2 Dec 2026). The same e-tools as in CLUVEX – DigiCampus, Miro-board, and Zoom – were actively utilised by moderators and students listening plenary talks, working online in groups on individual and collective exercises. In UnaVEx we have utilized "head, hands and heart" pedagogy (*Sipos et al. 2008*).

ClimEd: established a competency-based multilevel system of climate-services education aligned with European and WMO practices; developed 90 courses and modules across PhD, MSc, professional-development and open-learning formats; and trained through 7 trainings 380 students and 327 professionals; and strengthened digital and practical teaching capacity and addressed 6 climate-sensitive sectors.

In all these projects, the VEs were advertised and promoted through participating Partners/ Universities, as well as their collaborators, students' local and international various networks, etc. Participants successfully completed the trainings, VE Weeks, or VE days, in addition to earned ECTS credits and certificates, obtained also an opportunity to attend the CU, UnaEuropa, and ClimEd MOOCs related to themes of climate related education, climate change and sustainable development.

SUMMARY

In CLUVEX, UnaVEx and ClimEd, the ground-breaking work was done to develop and implement on practice the VE concept and carry out on practice the trainings. The benefits for moderators who attended and participated in trainings and VEs included not only the projects' certificates and earned ECTS credits, but also a possibility to attend online selected courses; hone online interaction, pedagogy and language skills in international environment; and increase contacts with the projects' universities and contacts.

The obtained skills and learning outcomes by participants/ students of the trainings, VE Weeks and VE Days included not only basic knowledge of atmosphere-biosphere-hydrosphere and anthroposphere interactions, climate change, but also critically reflect owns views on climate change, sustainability, create new visions and reflect different international and intercultural perspectives on climate change and sustainability, global vs. local challenges for adaptation and mitigation solutions. Moreover, participants had also a possibility to work together in different online working environments, to be part of an international teams, manage small joint projects, communicate and present work, learn basic study skills such as use of open data, literature search, critical reading and thinking. The benefits for students included not only the earned projects' certificates and ECTS credits, but also an opportunity to participate in MOOCs courses of CU, UnaEurope, and ClimEd.

During VEs, the pre-questionnaire and feedback forms for moderators and students were arranged and answers/data collected for a science-based analysis of the developed VE concept and pedagogical approach with a goal to publish as a series of peer-reviewed papers (in progress). The results of the VE development work, elaboration of educational materials for students, education of moderators, and achieved steps in arranging and carrying out the trainings, VE Weeks and VE Days are presented.

ACKNOWLEDGEMENTS

The authors are thankful to all members of the teams of the CLUVEX, UnaVEx, and ClimEd who actively participated in the projects and VEs trainings. The authors also acknowledge the enthusiastic lecturers delivered talks and moderators led groups of students working online. The financial support is by the European Union Commission for the CLUVEX (grant #101111959), UnaVEx (grant #101139159), ClimEd (grant # 619285-EPP-1-2020-1-FI-EPPKA2-CBHE-JP) projects.

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