

[Introduction](#) | [Table of Contents](#) | [Acknowledgement](#) | [Copyright](#)

THE LIVED EXPERIENCE OF SUSTAINABLE LEARNING: THE LECH-E OER PROJECT BRIDGING FORMAL AND NON-FORMAL LIFELONG LEARNERS

*António Teixeira, Paula Nicolau, Sandra Caeiro, Universidade Aberta, Portugal,
Lieve Dams, Katholieke Universiteit Leuven, Belgium, Kees-Jan van Dorp, European Association of Distance
Teaching Universities – EADTU, The Netherlands, Gordon Wilson, Open University, United Kingdom*

The Erasmus-funded *Lived experience of climate change: e-learning and virtual mobility* (LECH-e) project is developing learning resources on the topic of climate change that will be openly accessible on the web for higher education institutions and the wider world public to use and adapt. Institutions are free to integrate the resources into their formal programs and non-formal courses. A description of the project is provided in a short prologue. In this paper we depict the open learning strategy implemented by the LECH-e partnership and how it can contribute to widening participation in environmental, and specifically climate change, education.

Prologue – The LECH-e project: the lived experience of climate change

The [LECH-e project](#) is an interdisciplinary e-module development and virtual mobility project which concerns education and lifelong learning in relation to climate change, aiming to contribute to an informed and active European citizenry and to inform EU policy on this major current challenge.

The project involves collaboration of nine European institutional partners led by The Open University (UK) and funded by the European Union Erasmus Programme. It includes University of Derby, (UK), FernUniversität in Hagen (Germany), Universidad Nacional de Educación a Distancia (Spain), Open Universiteit Nederland (Netherlands), Universidade Aberta (Portugal), European Association of Distance Teaching Universities (Netherlands), Katholieke Universiteit, Leuven (Belgium) and Wageningen University (Netherlands).

The project is designing innovative teaching modules and a virtual learning space, to create a European community of scholars, students and citizens who collectively may contribute to the United Nations decade on education for sustainable development. The programme is pitched at a Masters level and complements other existing postgraduate programmes in the area. The learning modules being created may be exploited either as open educational resources (and used for student support and general interest without assessment or accreditation) or as formally assessed and accredited modules (building up a degree along with other modules of the partner institutions). The consortium partners are free to use and/or adapt the contents within their own programmes, through their own accreditation processes. The modules and other educational resources are stored in a virtual learning space which also provides for learning communities and virtual mobility across the institutions.

The project is producing four sets of learning materials, of which the modules will, after a pilot phase of testing, become Open Educational Resources OER):

- Teaching module 1: An introduction to climate change in the context of sustainable development,
- Teaching module 2: The lived experience of climate change in a North-South comparison,

- Teaching module 3: Interdisciplinary research methods for investigating the lived experience of climate change,
- A Masters dissertation package, based on the virtual learning space containing a repository of suggested dissertation topics, hyperlinks to existing projects on climate change and their databases (at local, national and regional levels), and a repository of Masters' dissertations in the area.

Additionally the project is disseminating research and teaching issues that arise as the project progresses.

A last mention should be made of another expected LECH-e outcome –the virtual mobility package, which is based on the virtual learning space with a moderated virtual classroom for students and tutors, a moderated virtual café (thus expanding access to citizens and organisations who might be the subject of dissertation projects, and allowing for a dialogue on climate change between citizens and academia), and on-going monitoring of the package.

All of these outcomes – as a group – are expected to fulfil the aims of the LECH-e project and contribute into policy and to the European dialogue in meeting the challenge of sustainable development.

E-learning for sustainable development

One valuable outcome of the 1987 World Commission on Environment and Development was to define sustainable development to encompass the entire range of human values: "... development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This definition recognizes that sustainable development is not just a trade-off between competing present-day values, or between material wealth and the well-being and respect for nature of a more intact ecosystem, but is also a temporal trade-off between short-term economic gains and long-term economic and environmental concerns (Ascher, 2007).

The United Nations Decade of Education for Sustainable Development (DESD, 2005–2014) aims to integrate the principles, values and practices of sustainable development (SD) into all aspects of education and learning. Many educational institutions, universities in particular, are today actively striving to fulfil these aims into their activities at all levels of formal, informal and non formal education. There is no doubt that universities can play a significant role in contributing to a more sustainable world by addressing sustainability through their major functions of education, research and outreach (Fadееva and Mochizuki, 2010).

The e-learning system is essentially a teaching and learning process that allows flexible learner-centred education. Since it draws on a diverse information system based on the World Wide Web, it potentially provides an inter-disciplinary approach to teaching and learning which is a key facet of education for sustainable development and in our project is the basis of climate change education (Wilson et al, 2011).

E-learning is a system independent of time and place (Lee and Lee, 2008; Garrison, 2000). When compared to traditional face to face adult learning, it is claimed that e-learning can bring new dimensions and increases the motivation to learn about sustainability issues, allowing new ways of exploring and solving environmental problems in an interactive way. Moreover, it may increase the readiness to learn if students are allowed to move into new social roles through their study (Eneroth, 2000). Also, there is a direct benefit, where e-learning has the potential to reduce the environmental impacts that are found in face-to-face systems (Roy et al, 2008; Pérez, 2008). These include: potential resource savings in the use of time, space heating and ventilation, transportation, paper and generation of waste. Eneroth (2000) demonstrates that e-learning has high potential for ESD at all levels of the adult education process.

All of these advantages of e-learning can be claimed for the LECH-e project. Above all, however, the e-learning in this project is designed to enable international virtual mobility of students. Further, specific activities in the curriculum workbooks are designed for group simulations which tap into this rich source of virtual mobility to deliver transboundary competence (Wilson, et al, 2011). Given the highly contested nature of climate change such competence, defined as the ability to engage and work across deep differences in perspective and cultural boundaries, is considered essential both for sustainability in education and addressing climate change policy itself (see also "The Sustainability of the LECH-e e-Learning Project" section below).

OER: widening participation in environmental education

However, addressing the lifelong learner throughout different disciplines and domains can be a challenging task as many higher education institutions in Europe are discovering. In fact, many universities are not sufficiently open to providing courses for students in later stages of life, and tend to offer the same courses to the same age groups. They fail to open up to other types of learning and learner groups. Of course, this has potential risks, namely the possible fall of enrolment rates in view of demographic change, a possible declining average level of education, and last but not least the long-term devaluation of a skilled labor force.

Open and flexible learning can apply its strengths in this area, as it can lever years of experience with non-traditional target groups. Flexible learning universities, such as Open Universities, may forward Open Educational Resources (OER) for these learners, and can make a strong contribution to the realization of lifelong learning (LLL) potential. With a major focus on research in lifelong open and flexible learning, a critical mass and European coverage can be met, and a sustained pedagogically-rich content with distance facilities can be supported: such universities are able to create an internationally recognized brand for OER.

In this respect, OER has the strong potential to support the largely missing component in the European higher education system: OER for widening participation and the inclusion of lifelong learning for the 25+. The lack identified here, is particularly due to the unclear institutional strategies of traditional universities, and still more important, the deficiency of sustainable OER models for LLL for these important target groups. Two particular aspects need to be taken into consideration for successfully widening participation, and will be achieved within the Lech-e project:

- Increased accessibility of content for users, through self-learning models which are emerging as key elements in successful widening the participation.
- More rapid (re)production of content, facilitated by the new generation licenses such as Creative Commons which stimulate the propagation and sharing of content.

Within the Lech-e Consortium, OER is therefore designed in a way to increase participation in LLL through providing open access for people of (mostly) all ages, including those with special needs and disadvantaged groups, regardless of their socio-economic background. OER created within Lech-e particularly stimulates the adoption of pedagogical, technological, organizational frameworks for strategic implementation by individual institutions, as well as by collaborative international partnerships. Key for widening participation through the Lech-e project is that the starting point for each institution within the Lech-e Consortium, is to connect properly with one's own development stage that is already in place: awareness raising - strategy building - the design of pedagogical, technological, organizational models.

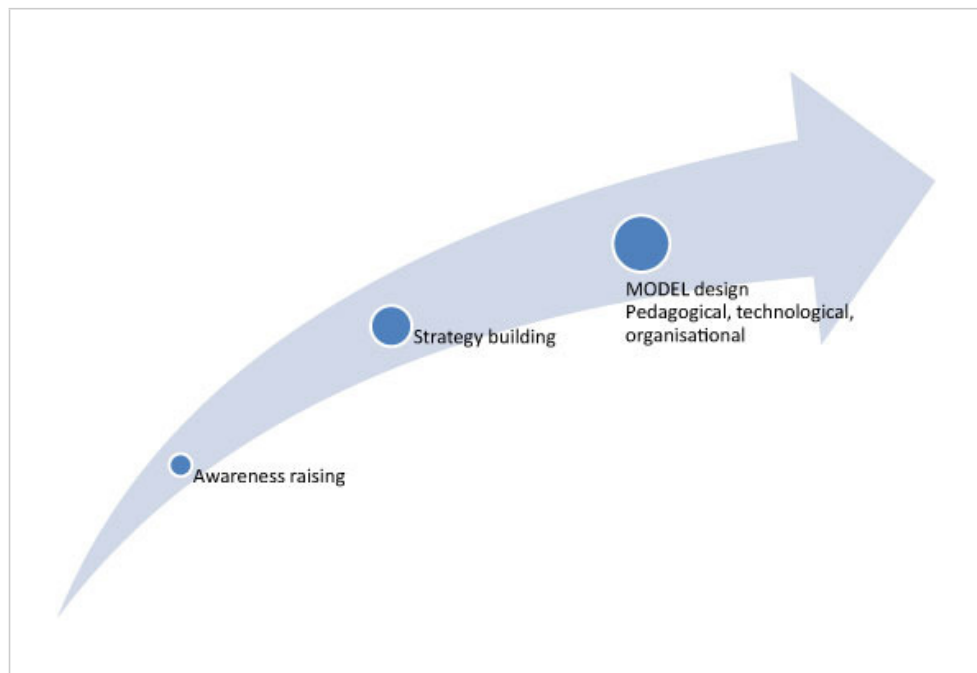


Figure 1 OER development stages

Flexible learning universities seem to be profiling themselves particularly as frontrunners in this area. Many of them being Open Universities, have recently discussed internally new OER strategies and they are exploring with the support of external partners viable OER business models in the area. Innovative aspects are: self-learning pedagogy, ICT innovation, accessibility, sharing and reproduction of content. And, out of recent experience, it is learnt that the expertise of these frontrunners combined with the Lech-e project approach used, can lead to an important impact in diffusion of OER in the domain of sustainable development, and for the Climate Change subject particularly. Synergies are currently harvested in the Lech-e Consortium between individual partners, as well as through dedicated products, which will lead to an increased multiplier effect.

The sustainability of the LECH-e e-learning project

Given its objectives and being a fixed-term and externally funded initiative, the sustainability of the results is a very significant challenge for the LECH-e project. In fact, the professional ethos of the team members means that they want the materials that they produce disseminated and exploited as widely and sustainably as possible. Just as climate change is a global challenge, so too is education at all levels in relation to it.

Following this, the project conducted an initial survey of its partners, out of which four strategic priorities were formulated. To:

1. Develop e-learning learning modules that have content, level and scope required for accreditation and/or integration into existing/proposed postgraduate programmes I.
2. Develop a sustainable virtual learning space.
3. Develop a sustainable system for delivery, maintenance and regular updating of the teaching modules as OER.
4. Develop a sustainable system for maintenance and regular updating of the project's Masters dissertation package and the LECH-e research repository.

The following is an account of the challenges of sustainable exploitation facing the LECH-e open e-learning project and how we've addressed them.

E-learning materials that can be accredited

The LECH-e curriculum resources are designed to complement and/or to be embedded into existing/proposed Masters programs on climate change and related subjects organized by the participating universities.

Although the credit systems of the participating universities differ, most refer to the European Credit Transfer and Accumulation System (ECTS). Therefore, and to give the sizes of the modules clear definition, it was agreed to set each module at 4 ECTS points, corresponding to 100-120 hours of study.

The general design of the teaching modules is based on giving students maximum flexibility in their use. Because students will have academic backgrounds from a variety of disciplines which might be based in either the natural or social sciences, the text-book model offers them the opportunity to study only the contents in which they are interested or with which they are not yet familiar. They may then only read the narratives while others will also use the exercises and self-assessments that are provided in the workbooks.

Formalization of accreditation and hence tutoring is the responsibility of each partner institution, thus overcoming the difficulties associated with gaining joint accreditation across institutions. Some participating universities are already ready to accredit the modules and/or to integrate them into accredited programs for Master students. Another possibility is that Universities do not accredit but their students use the modules as resources for their Masters study, just as they would use a reading list that is provided to them. Producing these modules ultimately as OER keeps all of these options open.

The sustainable Virtual Learning Space

The Virtual Learning Space (VLS) is a key feature of the project. In particular it is the medium for guaranteeing virtual mobility within the project and developing the key skill of transboundary competence – the ability to engage and negotiate with others who may have very different perspectives on climate change. Sustaining the VLS beyond the project poses a particular challenge, but an essential one to meet as it would guarantee continuous mentoring and updating into the future.

The VLS accompanies the students during their academic studies and comprises two virtual learning communities. One is restricted to students studying the modules, their supervisors and other relevant academic staff. The second extends this concept to those who might be the objects of dissertation research (individuals, community groups, etc.) The pilot, running from March 2011 until April 2012, is very important for establishing the VLS.

Once established, the VLS cannot be a static space which is left unattended. To gain and maintain a critical mass of active, engaged users and to ensure the sustainability of the VLS, special care has been taken of the search for synergy with the "Virtual Campus for a Sustainable Europe" (VCSE). VCSE is a platform that surpasses the gates of academia. It makes it possible to invite a wider public of relevant academic, political and societal actors to a public dialogue about dealing with the complex issue of sustainable development, and in our case, climate change.

A sustainable system for Open Educational Resources (OERs)

The LECH-e project will promote the sharing and use of the produced e-learning learning materials. To allow free use and modification in academic institutions and other organizations (in European and other countries), the materials will be registered under a creative commons licence.

For long-term sustainability it important to gather evidence of the impact of the OERs through tracking of their use and versioning. It will be part of the pilot to examine ways to capture and structure user commentaries on the material. Inviting users to update and adapt the OER is one way to keep open resources updated, and might be termed the 'Wikipedia' model. Another way is to promote accreditation so that institutional staff and resources will be committed to update the materials. We intend to use a creative commons licence which includes a 'share-alike' clause, so that materials updated or adapted by accrediting institutions will also be obliged to appear as OER. The two ways – the Wikipedia model and updating via accrediting institutions – are complementary.

To improve accessibility for formal and informal learners in European and other countries there is an agreement to provide the texts in different formats and file sizes to avoid problems for those with slow internet connections (which is often the case in many developing countries), and also examine possibilities for funding for translation from English later.

A sustainable system for the Masters dissertation package and Research Repository

The e-learning learning materials are designed to combine knowledge of the global mechanisms of climate change with local experiences of impacts. The promotion of the development and sharing of Masters theses on the topic of the 'Lived experience of climate change' is therefore a major issue. These theses themselves form an important data set for a) advocacy with policy makers on climate change; b) further research into this under-studied topic. Master theses can be written in the students' first language accompanied by a summary in English.

Special care will be taken to search for synergy with the European Regional Centres of Excellence (RCE) networks and with other local bodies who work on climate change, and who are most likely to benefit from the knowledge produced. To invite them to suggest Master dissertation topics is one way to involve them at an early stage and to encourage them to become active stakeholders for external exploitation.

In this sense we strongly believe our approach at OER contributes to disseminate a wider and more inclusive notion of environmental education. It is one which is much more socially sustainable, because it manages to involve formal, informal and non formal learners in the production, reproduction, dissemination and preservation of knowledge on Climate Change.

References

1. ASCHER (2007). Policy sciences contributions to analysis to promote sustainability. In *Sustain Sci* [2007] 2, (pp. 141–149)
2. ENEROTH, C. (2000). *E-Learning for Environment. Improving e-Learning as a Tool for Cleaner Production Education*. Licentiate Dissertation. Lund University.
3. FADEEVA, Z.; MOCHIZUKI, Y. (2010). Higher education for today and tomorrow: university appraisal for diversity, innovation and change towards sustainable development. In *Sustain Sci* [2010] 5 (pp. 249–256)

4. GARRISON, R. (2000). Theoretical Challenges for Distance Education in the 21st Century: A Shift from Structural to Transactional Issues. *International Review of Research in Open and Distance Learning*, 1 [1], (pp. 1-17)
5. LEE, J; LEE, W. (2008). The relationship of e-Learner's self-regulatory efficacy and perception of e-Learning environmental quality. In *Computers in Human Behavior*, 24 (pp. 32–47)
6. ROY, R.; POTTER, S.; YARROW, K. (2008). Designing low carbon higher education systems. Environmental impacts of campus and distance learning systems, In *International Journal of Sustainability in Higher Education Vol. 9 Issue 2, April* (pp. 116-130)
7. PÉREZ, S. (2008). *Online onderwijs en duurzaamheid: een groene inktvlek*, School of Science, Open Universiteit Nederland
8. WILSON, G.; ABBOTT, D.; DE KRAKER, J.; PÉREZ, S.; TERWISSCHA VAN SCHELTINGA, C.; WILLEMS, P. (2011). 'The lived experience of climate change': creating open educational resources and virtual mobility for an innovative, integrative and competence-based track at Masters level. In *International Journal of Technology Enhanced Learning*. (In press).