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## VIRTUAL LEARNING NETWORKS FOR SUSTAINABLE DEVELOPMENT

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### SHORT DESCRIPTION

Sustainable development is a participatory, multi-actor process. Virtual learning networks can support this process in at least two important ways. In higher education, virtual mobility networks can provide learning environments for the development of the competences needed to participate effectively in such a process. In the practice of sustainable development, lifelong learning networks can provide the tools to support learning in this process.

### SUMMARY

Sustainable development is a participatory, multi-actor process. In this process, learning plays a major role as participants have to exchange and integrate a diversity of perspectives and types of knowledge and expertise in order to arrive at innovative, jointly supported solutions. Virtual learning networks can support these processes in at least two important ways. In higher education, virtual mobility networks can provide effective learning environments for the development of the competences needed to participate effectively in such processes. In practice, lifelong learning networks can provide the tools to support learning in these processes. This paper presents examples of virtual learning networks of both types. Virtual mobility initiatives in higher education, such as virtual campuses, can provide international, multi-disciplinary learning environments. These learning environments foster the development of 'transboundary competence', i.e., the competence of academic professionals to think, communicate, learn and collaborate across the boundaries between different perspectives. In the practice of regional sustainable development, social learning networks offer great potential to bring universities and public and private sector actors together to develop sustainable solutions to complex regional problems. Major challenges are the blending of physical and virtual network activities, the facilitation of true interactivity between scientific experts and practitioners and the engagement of large numbers of citizens that are stakeholders in the issue.

### INTRODUCTION

The thrust of sustainable development is to achieve progress without shifting the costs to another domain, social group, area or future generation. This implies that in decision making on development issues, not only economical, but also ecological and social aspects must be considered, as well as effects at different spatial and temporal scales. To deal with this complexity, the development of sustainable solutions requires the integration of knowledge from different disciplines and types of expertise. Moreover, implementation of these solutions will not be successful without the collaboration and support of the many different stakeholders involved in the issue. These stakeholders are more likely to support a solution when their perspectives and interests have been taken into account, or, in other words, when they have co-constructed the solution. Integrating a diversity of perspectives from different scientific disciplines, areas of expertise and stakeholder groups in the planning process may also enrich the problem definition and broaden the range of options considered, which is

likely to result in better solutions. Therefore, sustainable development processes are often shaped as participatory, multi-actor processes, involving a diversity of scientific experts, practitioners, administrators, policy makers and societal stakeholders (Hisschemöller et al., 2001).

To generate adequate, widely supported solutions with such a diverse group requires intensive and effective communication and collaboration across the boundaries that divide the different perspectives. These are boundaries between different scientific disciplines, between scientific and practical knowledge, between different cultural or national points of view, between local and global perspectives, between short and long-term views et cetera. Such cross-boundary communication and collaboration often results in mutual learning, at the level of the individual participants as well as at group level. Individual participants can learn from one another about the perceived causes of the problem and about potential solutions, about interests at stake or the importance of different values and goals. At the level of the group, changes in the perspective of the participants on the problem ('what actually is the problem') and its solutions ('what are effective and acceptable solutions') may begin to converge. This process of convergence is often called 'social learning'. It ideally results in the collective development of new and wider problem definitions ('reframing'), solutions that maximize joint gain ('win-win solutions'), and a basis of support for concerted action and implementation (Van de Kerkhof, 2006).

In this paper, we will focus on two major needs that stem from the central role of multi-actor processes in the development of sustainable solutions to complex societal problems. The first is the need for competence development and the second for the development of support tools. Promoting the development of the competence to communicate, learn and collaborate across the boundaries dividing perspectives, is an important objective of the Virtual Campus for Sustainable Europe network. The design and development of ICT-tools to support learning in transdisciplinary multi-actor approaches to sustainable development is a major focus of the Lifelong Learning Network for Sustainable Development project. Both initiatives will be explained in the following sections.

## **VIRTUAL CAMPUS FOR A SUSTAINABLE EUROPE**

The Virtual Campus for a Sustainable Europe (VCSE, [www.vcse.eu](http://www.vcse.eu)) is a network of more than 15 European universities with a particular interest in higher education for sustainable development (HESD). HESD aims to prepare students explicitly for making an effective contribution to sustainable development in their professional life. This involves the development of competences for sustainable development in addition to domain-specific and general academic competences such as critical thinking.

As outlined in the introduction, the ability to deal with a diversity of perspectives is crucial in transition processes towards a (more) sustainable society and a key 'competence for sustainable development' will therefore be the competence of academic professionals to think, communicate, learn and collaborate across the boundaries that divide these perspectives, so-called 'transboundary competence' (De Kraker et al., 2007a). According to the 'learning by doing' principles of competence-oriented learning, the ideal learning environment to foster the development of transboundary competence should provide students with actual experience in multi-disciplinary, international or intercultural project work in teams. In a traditional university setting, such a learning environment is difficult to achieve. It would require a high level of international student mobility to bring students from different disciplinary, national and cultural backgrounds frequently together at the same time and in the same place. Virtual mobility, using computer-supported collaborative learning (CSCL) environments, provides an innovative and almost ideal solution to this problem, as these learning environments allow communication and collaboration, independent of time and place, between internationally dispersed student teams at low cost (De Kraker et al., 2007b). An added advantage of virtual learning environments is that they provide better opportunities

for structured group discussions as well as reflection processes, both individually and collectively (Barth, 2007). Thus, although it might seem somewhat counter-intuitive, virtual learning environments appear to be well-suited to develop the transboundary competence required to effectively contribute to sustainable development.

Through a shared virtual campus platform, the universities in the VCSE network open up and offer e-learning courses on sustainable development to each other's students, thus creating international and multi-disciplinary virtual learning environments (Cörvers & De Kraker, 2009). Long-term viability is assured by distributing the responsibilities for operating the virtual campus as much as possible to the level of the individual network members and by sharing staff and resources according to a 'quid pro quo' approach. Both principles minimize dependence on external funding and formal high-level virtual mobility agreements. However, even more crucial for the lasting success of a virtual campus are the interrelated principles of 'educational necessity' and 'interdependence'. With educational necessity, we mean that the educational objectives of a course can better or only be achieved in the international, multi-disciplinary e-learning environment provided by the virtual campus than in regular face-to-face university courses. This applies, as explained above, clearly in case of the development of transboundary competence for sustainable development. The second principle, interdependency, is directly tied to the principle of educational necessity. Universities simply depend on partner institutions in other countries (and vice versa) to create the international e-learning environments needed to achieve the educational objectives. Furthermore, if no or limited external funds are available, the partners strongly depend upon each other's contributions in terms of learning resources and staff time.

## **LEARNING NETWORKS FOR SUSTAINABLE REGIONAL DEVELOPMENT**

The Lifelong Learning Network for Sustainable Development (3-LENSUS) is a project funded by the European Union's Lifelong learning programme (2009-2011). The project consortium consists of five universities representing the VCSE Network and two of the European Regional Centres of Expertise on Learning for Sustainable Development (RCEs): Rhine-Meuse and Graz-Styria. A major focus of the project is the design and development of lifelong learning networks linking European universities with public and private sector actors in the region to promote sustainable development. With learning networks we mean ensembles of actors, institutions and learning resources (in any form) which are mutually connected and supported by ICT, in such a way that the network largely self-organizes and gives rise to effective learning (Koper et al., 2005). Lifelong learning in the context of sustainable regional development includes the acquisition of relevant new knowledge and skills by individual participants in the learning network as well as the co-production of new, transdisciplinary knowledge and solutions by (heterogenous) groups of participants.

Stimulation of such learning is central to the mission of RCEs, which focus on the creation of infrastructures and mechanisms that bring local institutes of higher education and societal stakeholders and citizens together around shared regional challenges, across the traditional divide between scientific experts and non-experts (Fadeeva, 2007). This ambition is shared by the members of the VCSE Network, who aim to enhance the university's contribution to the sustainable development of the region where it is based. Learning networks represent an innovative and potentially powerful means to achieve these ambitions. The characteristic of these networks is that they try to make optimum use of social web-based software applications, also known as web 2.0 technologies, which enable a much more active and interactive way of learning (Dron, 2006). Interactivity is expressed in regular switching of participants in the learning network from the role of 'consumer' (or student) to the role of 'provider' (or teacher). It is also expressed in the joint production of new knowledge by the participants. This interactivity distinguishes learning networks from the more traditional e-learning courses and knowledge exchange platforms. Another important feature of learning networks is the intrinsic openness in terms of access to internet-based learning resources.

The design of learning networks for sustainable regional development is not so much a matter of development of ICT tools but rather of choosing the right combination and configuration of tools for the objectives of the network. A key aspect is also the inclusion of mechanisms that encourage interaction and active participation of the participants in the network. Therefore, it is crucial to know what the needs and ambitions of the intended users are. A needs assessment regarding learning networks among representatives of five European RCEs yielded a number of key requirements, such as 'open and accessible', 'high quality and practical knowledge', 'variety of functionalities, accommodating individual, mutual and collaborative learning', 'active matching of knowledge users and providers', and 'theme-based, for defined target groups'. It was also concluded that a regional learning network should be a blend of face-to-face and on-line interactions. The major challenges the group identified concerned the quality assurance of the knowledge provided and produced in the network, the continuity of the interactions within the network and the incentives for knowledge sharing and participation in knowledge production.

A concrete case that may serve well to illustrate the needs and challenges for a regional learning network for sustainable development, is the SUN-project initiated by the RCE Rhine Meuse. SUN (Sustainable Urban Neighbourhoods) is a European Interreg project for the euregion Rhine Meuse, comprising parts of the Netherlands, Belgium and Germany ([www.lemma.ulg.ac.be/research/SUN](http://www.lemma.ulg.ac.be/research/SUN)). The project aims to start a learning process across borders, between local government officials, neighbourhood inhabitants, professionals in neighbourhood renovation and scientific experts in sustainable urban development. The end goal of this euregional learning process is to enhance the sustainability and liveability of the most deprived neighbourhoods of the region. The participants and topics in the learning process range from inhabitants of neighbourhoods acquiring a sense of euregional awareness through intercultural exchanges to local government officials learning from scientific experts about integrated approaches to urban neighbourhood renewal. A series of on-the-ground activities and events is combined with an internet-based platform for exchange of knowledge and information. For a learning network designed to support this euregional learning process, two of the major challenges mentioned above appear to have been addressed adequately: quality assurance is explicitly defined as a role of the academic partners in the project and there are clear incentives for participation stemming from either a professional need or from a direct benefit as inhabitants of the neighbourhoods included in the project. Several important challenges still remain, however. First of all the issue of integration of face-to-face events and the 'virtual meeting place'. The learning network should support a truly blended approach with continuity between and after face-to-face events, instead of just providing announcements and reports of these events on a web site. A second issue is the interaction between scientific experts and practitioners. The learning network should support a dynamic two-way interaction or co-creation of knowledge and solutions, instead of a unidirectional transfer of academic knowledge. Finally, the third issue concerns the engagement of the inhabitants of the neighbourhoods. The learning network should support a substantial upscaling in terms of number of inhabitants involved, as compared to the relatively limited number that will be able to engage in on-the-ground events. These needs and ambitions call for innovative solutions that make the most of what current social network applications have to offer, based on the principles of self-organisation. However, with the development of effective and efficient solutions, learning networks can be expected to contribute to sustainable regional development in a significant way.

## CONCLUSIONS

Sustainable development processes are often shaped as participatory, multi-actor processes. In these processes, learning plays a major role as participants have to exchange and integrate a diversity of perspectives and types of knowledge and expertise in order to arrive at innovative, jointly supported solutions. Virtual learning networks can support these processes in at least two important ways. In higher education, virtual mobility networks can

provide effective learning environments for the development of the competences needed to participate effectively in such multi-actor, multi-perspective processes. In practice, lifelong learning networks can provide the tools to support learning in these processes. This paper presents examples of virtual learning networks of both types. In the VCSE project, a virtual campus provides international, multi-disciplinary learning environments. Important success factors for such a virtual campus are educational necessity and interdependence among the partners in the network. The 3-LENSUS project, the potential of virtual lifelong learning networks is explored to bring universities and public and private sector actors together to develop sustainable solutions to complex regional problems. Major challenges are the blending of physical and virtual network activities, the facilitation of true interactivity between scientific experts and practitioners and the engagement in the network of large numbers of citizens that are stakeholders in the issue. Although both approaches to virtual learning networks for sustainable development are functionally distinct, they could probably benefit substantially from cross-fertilization in terms of theories, insights and tools.

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