



www.jates.org

doi: [10.24368/jates.v7i4.13](https://doi.org/10.24368/jates.v7i4.13)
<https://doi.org/10.24368/jates.v7i4.13>

An innovative way in education for sustainable development: e-School4s – e-school for sustainability in the Danube region

Ferenc Mónus^a, Christine Lechner^b

^aUniversity of Nyíregyháza, Institute of Biology, Sóstói út 31/B, Nyíregyháza 4400, Hungary

^bPedagogical University Tirol, International Office, Pastorstraße 7, Innsbruck 6010, Austria

Abstract

The importance of education for sustainable development and environmental sustainability was acknowledged decades ago. Consequently, by joining to several international conventions countries across the world agreed to effectively integrate and implement education for sustainable development (ESD). However, it soon became evident that ESD must be effectively integrated into public education and crucially developed, if we really want to reduce the environmental burden caused by human activities. One possibility for this is to develop modern, interactive, ICT based educational tools which may grab the attention of students today. In this paper we present an inspiring example, the e-School4S (E-School for Sustainability in the Danube Region) Comenius project in the framework of which teachers and NGOs across borders collaborated to build interactive e-learning courses for secondary school students.

Keywords: education for sustainability; interactive; e-learning;

1. Introduction

The concept of sustainability gained attention mainly during the early '90s, after the Brundtland Report of the World Commission in 1987 ("Our Common Future") and the Earth Summit UN conference at Rio de Janeiro in 1992. Participants of these events of worldwide importance drew the attention to education for sustainable development and environmental sustainability (ESD). Thereafter it became clearer and clearer that ESD must be propagated worldwide in different strata of societies in order to protect the environmental equilibrium of our planet or at least to slow down the negative impacts it is suffering due to present-day consumer habits and the intensification of industrial and agricultural production.

Accordingly, ESD has been anchored in various forms in training and education in both developed and developing countries (Ware, 1999; Neal & Palmer, 2003; Dillon, 2014). Nevertheless, the overall social attitude that would effectively enable the reduction of

environmental burdens is very slowly changing, even in the case of simplest, everyday-to-life solutions (Wals et al., 2014). Researches both at international (e.g. Palmer, 2002; Jickling & Wals, 2008; Lechner & Rauch, 2014) and national (Zsóka et al., 2011; Marjainé et al., 2012; Mónus & Császár, 2016) level emphasize that improving the efficiency of environmental education in public education is crucial. Thus, the importance of the new, creative, various forms of environmental education remains indisputable.

Nowadays, for example, the attention of youth of the new generations can be caught only with innovative, “personalized” approaches during their education. These may include interactive learning materials developed in the e-learning environment, the effectiveness of which is unquestionable (Zhang et al., 2006; Liaw, 2008). With this in mind, ten partners (see Fig. 1 and Table 1) from the Danube Region started to realize the e-School4S Comenius project in 2014. The aim of the project was to establish cross-country and multilevel cooperation between the participating educational institutions, schools, teachers and students who develop, test, implement and ultimately extend an e-learning platform for sustainability education and the innovative concept of interactive teaching in the secondary schools of the Danube Region.

This paper aims to shortly introduce the concept, content and some experiences made during implementation and dissemination of the e-School4S e-learning materials. The materials are openly available from the project’s webpage www.eschool4s.eu (direct link to the e-courses: <http://www.elearning-politik.de/eschool4s.html>) for everyone who is intended to learn or teach about environmental sustainability.



Fig. 1 Geographic situation of the partner organizations implementing the e-School4s project. See explanation of the codes (P1-P10) in Table 1.

Table 1. List of partner organizations implementing the e-School4s project

code	country	name of partner organization
P1	Germany	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
P2	Germany	Landesakademie für Fortbildung und Personalentwicklung an Schulen
P3	Austria	Pädagogische Hochschule Tirol
P4	Hungary	University of Nyíregyháza
P5	Slovakia	Academia Istropolitana Nova
P6	Slovakia	e-code
P7	Croatia	Aquilonis d.o.o.
P8	Serbia	University of Belgrade
P9	Bulgaria	73 SOU „Vladislav Gramatik”
P10	Romania	TERRA Mileniul III Foundation

1.1. Project information

The e-School4S is a transnational e-learning platform for collaborative learning on sustainability. It is a networking project in the Danube Region uniting ten partners from Germany, Austria, Hungary, Slovakia, Croatia, Serbia, Bulgaria, and Romania (Fig. 1; Table 1). Each partner is specialized in different relevant fields of expertise. They were brought together to pursue a common goal – bring sustainable development and European integration to schools.

E-School4S has designed an operational e-learning platform for cooperation and exchange of information and experiences in the field of Education for Sustainability and Sustainable Development (ESD). The consortium has developed interactive web-based teaching and learning concepts to cover cross-border issues in the fields of sustainable development and European integration. The approach brings together decision-makers, (in-service) teacher training institutions, schools, and students across the Danube Region to raise their ecological awareness and to promote inclusion of these issues into the school curricula of secondary schools. Through using the platform students and teachers learn to which extent there is interdependence between social, economic, environmental, and political development of a country. The learning objective is that students will understand why the balanced interplay of the development dimensions is a condition for sustainable development at national, regional and European level. They improve their cognitive competences, communication as well as soft skills.

The e-School4S was a project within the framework of the EU program "Lifelong Learning Programme" (LLP), Comenius-Multilateral Networks. It was recognized as an official project in the priority area nine "Investing in people and skills", within the framework of the EU Strategy for the Danube Region (EUSDR).

The e-School4S strategic objectives as follows, are in line with the Life Long Learning and the Comenius Programmes:

- raise awareness of decision makers, and other crucial stakeholders about the relevance of ESD;
- initiate and strengthen regional network cooperation on ESD topics and e-learning;
- motivate and enable teachers to use innovative teaching methods;
- raise students' and teachers' awareness about the importance of sustainability and EU integration as well as of the creative and critical use of Information and Communication Technology (ICT) and
- enable students to acquire further computer, communication and soft skills.

2. Results and discussions

The project implementation ran from 01.01.2014 to 31.12.2016. Following initial network establishment a baseline study was compiled (finalized in May 2015), which gives a comprehensive overview of the current status of innovation in the fields of ESD and ICT in the Danube region.

The design of web-based classrooms and the development of e-learning courses on SD in the Danube region were implemented from December 2014 to December 2015 within the framework of the Moodle platform, which is a widely used open source course management system (Cole & Foster 2008). Considering the findings of the baseline study and technical insights of the project partners, the following relevant topics were identified for the e-learning courses:

- Danube – River of united Europe,
- What is Sustainable Development,
- Water,
- Climate Change,
- Sustainable Consumption,
- Social Inclusion.

The partners designed and elaborated, thus, six comprehensive courses including 22 diverse lessons on the aforementioned topics. Additionally, a teachers' corner was created within the e-School4S Moodle platform. This area was designed considering particular needs of educators.

Thereafter, Moodle platform and courses were steadily optimized in three steps: 1.) Based on the insights of the teachers participating in a training (June 2015) for teachers and tutors, 2.) after the first (from January to March 2016) and 3.) after the second (from March to October 2016) trialling phase of the e-School4S web-based classrooms all e-learning materials were tested by teachers and students in all partner countries, and then optimized based on their feedback. In total, 25 teachers and over 250 students participated in the testing phases and implemented the e-learning materials in their classrooms with great diligence resulting in a highly functional e-School4S e-learning platform.

The e-learning platform was then propagated in eight countries. Initial partners identified 30 associated partners who are committed to the project approach and the implementation of network activities beyond project end, and further 46 stakeholders (NGOs, teacher training organizations, school advisers, decision-makers at national/regional government institutions in the education sector) who are also expected to act as multipliers. All these organizations will spread the message of European integration and sustainable development and strengthen the network of stakeholders the e-School4S consortium has initiated. Press releases, several e-media, regular e-School4S newsletters, the project official home page (www.eschool4s.eu), Twitter and three annual conferences during the funded period were used to disseminate the idea and the freely available e-learning platform to the general public.

The official presentation and launch of the main project's contribution, namely the innovative e-School4S e-learning platform which addresses cross-border issues in the fields of sustainable development and European integration in the Danube Region took place at the 3rd Annual Conference on the 17th November 2016 in Stuttgart.

Project partners were strongly committed to support the sustainability of the network and further networking activities after the completion of the Comenius project. Accordingly, the e-School4S network consisting of founding project partners, associated partners and further interested stakeholders will continue to exist after lifetime of the project. In the framework of

future networking activities network members should discuss the further dissemination of the project approach, related lessons learnt or possibilities of implementing other related initiatives together.

A detailed manual on how to organise, implement and evaluate e-School4S web-based classrooms has also been prepared by the eSchool4S partners. It can be used by future operators of the e-School4S Moodle courses and other interested stakeholders. It will allow successful further implementation of web-based classrooms in different contexts in the future considering the lessons learnt during the testing phases and the implementation of the e-School4S.

2.1. Main innovative characters of the e-School4S web-based classrooms

The e-School4S Moodle platform, which can be found at <http://www.elearning-politik.de/eschool4s.html>, is an inspiring example of how teachers and colleagues working in NGOs can work together across borders to build e-learning courses together. There are six open courses available covering the following topics: ESD, Climate Change, The Danube, Social Inclusion, Sustainable Consumption and Water.

The courses are constructed upon a common framework and thus all provide a general overview of the topic on hand including basic information leading to further factual details and activities. The information is given in different formats from purpose-written texts to video sequences. The activities are also varied ranging from knowledge checks to opportunities for in-depth thought and communication with students in other countries. Each course opens with an explanation of the learning outcomes for teachers and students.

The courses can be used in a flexible way meaning that there is potential across the curriculum from Citizenship & Global Studies Education to Economics, Geography and Biology. Since all are in English as a lingua franca the courses are accessible to secondary school students in different countries and would be very useful material for CLIL (content and language integrated learning) lessons.

One fascinating aspect of the platform is that the courses were designed within one of the nine e-School4S partner countries and trialled in the other countries in the Danube region. We hope that there will now be interest in other regions.

2.2. We encourage pupils and teachers to integrate e-School4S in their classrooms because

- **Pupils** will learn to understand the interrelatedness of economics, social, cultural and environmental issues at national, regional and European level
- Intercultural exchange will make **pupils** aware of culture and language diversity and will help create a sense of European identity
- **Pupils** will acquire several communication and soft skills (commitment, tolerance, foreign language use, ability to give/receive criticism, teamwork), those which are necessary for their personal development, for future employment and for active European citizenship
- **Teachers** will learn basic competencies on how to use and integrate e-learning materials into their classrooms
- **Teachers** receive a ready-to-use tool which can enhance the transfer of knowledge, motivate and raise the attention of the pupils during their classrooms
- **Schools** will be encouraged to strengthen existing and to establish new partnerships and cooperation between schools.

2.3. Our expectations

The target groups for the project products are secondary school students in the Danube Region. The language of the e-learning material is English due to the international nature of the project, so it can be used primarily in secondary school classes where students have reached a B1 to B2 levels in English. The e-lessons thus allow and, for some tasks require, that students interactively share their impressions on the lessons with other students from remote secondary schools (preferentially students from different countries). Beside the interactivity of many parts of the e-lessons these social relationships may also motivate students and help them to receive a more complex image from environmental and social issues concerning sustainability.

In the secondary schools mainly dedicated teachers and pupils are expected to use the platform and profit from it. Study groups, and teachers interested in biology, geology and in environmental and social issues may be the ones profiting the most from the courses. The main intention was for the platform to be used in subject lessons; however, the lessons may also provide possibilities for English language teachers to make their classes more interesting and more diverse.

Finally, the e-lessons could be also used in higher education. Some teachers may profit from the e-School4S lessons as they are suitable to make a course more diverse, more colourful and more interesting. The e-lessons may be especially useful in B.Sc. and M.Sc. courses for teacher education, water engineering and civil engineering.

Acknowledgements

The authors are very grateful to every project partner for the successful implementation of the e-School4S project, and for their valuable contribution to the public part of the final report of the project which was a starting point for this paper. The e-School4S project was supported by a Comenius EU grant 539075-LLP-1-2013-1-DE-COMENIUS-CNW, and was lead by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Stuttgart.

References

- Cole, J., Foster, H. (2008). *Using Moodle – Teaching with the popular open source course management system*. O.R. Media, United States of America.
- Dillon, J. (2014). *Environmental Education*. In: Lederman N.G. & Abell S. K. (eds.) *Handbook of research on science education*. Vol.II. Routledge.
- Jickling, B., Wals, A.E.J. (2008). Globalization and environmental education: looking beyond sustainable development. *Journal of Curriculum Studies*, 40(1), 1-21.
- Lechner, C., Rauch, F. (2014). Quality criteria for schools focussing on Education for Sustainable Development (ESD). *Promoting Change through Action Research*. SensePublishers, pp. 65-76.
- Liaw, S. S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. *Computers & Education*, 51(2), 864-873.
- Marjainé S.Z., Zsóka Á., Széchy A. (2012). *Környezettudatosak-e a középiskolások? In: Fenntartható fogyasztás? Trendek és lehetőségek Magyarországon*. OTKA 68647 kutatás eredményei. AULA, Budapest, pp. 226-259.
- Mónus F., Császár E. (2016). Középiskolás diákok környezettudatosságának változása az iskolai évek alatt két megyénkben. *Edu Szakképzés,-és Környezetpedagógiai szakfolyóirat*, 6(1), 47-53.
- Neal, P., Palmer, J. (2003). *The handbook of environmental education*. Routledge, London
- Palmer, J. (2002). *Environmental education in the 21st century: Theory, practice, progress and promise*. Routledge, London
- Zhang, D., Zhou, L., Briggs, R.O., Nunamaker, J.F. (2006). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information and Management*, 43(1), 15-27.
- Zsóka Á., Marjainé S.Z., Széchy A. (2011). A környezeti nevelés szerepe a fenntartható fogyasztás és életmód kialakításában. In: Csutora M., Hofmeister-Tóth Á. (eds.): *Fenntartható fogyasztás?* Budapesti Corvinus Egyetem, Aula Kiadó, Budapest.
- Wals, A., Brody, M., Dillon, J. Stevenson, R. (2014). Convergence between science and environmental education. *Science, Education Forum* 344, 583-584.
- Ware, S.A. (1999). *Science and environment education views from developing countries*. The World Bank, Washington D.C.