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Innovation in the Teaching of Sustainable Development in Europe: The Case of ISLE Erasmus Network

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Abstract

Sustainable Development (SD) is one of the most widely used terms during the last years. It is a multidisciplinary concept, which applies mostly to life sciences but is not limited to them. Even though the short survey conducted by the authors revealed that there are only a few cases of Higher Educational Institutes (HEIs) around Europe that provide programs dedicated to SD, it is obvious that there is a constant raise in the need for implementing courses related to SD in existing programs. This paper discusses the case study of I.S.L.E., an Erasmus Academic Network, which aims to use the existing knowledge and tools in the context of teaching sustainable development topics in Universities and HEIs around Europe as a basis, and elaborate further by introducing an innovative approach towards the improvement of teaching SD in HEIs, based on the current needs as they are identified by the actions of the Network.

Keywords: sustainable development, Erasmus networks, training curriculum, good practices, sustainability

1. About Erasmus Academic Networks

According to the Education, Audiovisual and Culture Executive Agency's (EACEA) web site (http://eacea.ec.europa.eu/llp/erasmus/erasmus_networks_en.php), Erasmus academic networks are

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networks that aim to promote the co-operation between European Higher Educational Institutes (HEIs) of Europe and the innovation in specific thematic areas. These networks mainly focus on the improvement of the quality of teaching in higher education, the definition and development of a European dimension within a given academic discipline, study area, or furthering the innovation and good practices on other aspects of higher education development. A crucial factor towards achieving these objectives is to ensure the close of co-operation of all stakeholders (e.g. HEIs, university faculties and departments) within a specified network. In order to ensure the widest possible penetration of the networks, their outcomes and products, these networks should also involve actors outside the boundaries of the universities, such as academic and other associations and societies (e.g. students' organizations), enterprises and professional bodies within the educational context, as well as other partners of socio-economic importance in both the public and private sector. In addition, apart from the development of outcomes and products through the network collaboration, these should also be disseminated to all stakeholders outside the network and additional measures should be taken towards their valorization, exploitation and sustainability in order to ensure a lasting and widespread impact on higher education institutions across Europe in the field concerned (EACEA, 2012).

The Erasmus networks tend to focus on some particular areas of interest such as field mapping, quality assurance, cooperation and the promotion of synergies between teaching and research in order to bring together the public and private sector, scientific and professional bodies, and also contributing to Europe's innovative capacity (EACEA, 2012).

1.1. ISLE Network

The ISLE Network (Innovation in the Teaching of Sustainable Development in Life Sciences in Europe – www.isle-project.eu) is an academic network, co-funded by the Erasmus programme of the Lifelong Learning Programme of the European Commission (EC). It is a 36-months project, which started in October 2010 and its consortium currently consists of 40 institutions coming from 31 European countries. The majority of the participating institutions are agricultural universities; however, the ISLE consortium also includes universities of management and economics, food and environmental sciences, medical and life sciences, applied sciences, technical and technological sciences, philosophy and forestry are all working together for a same goal the enhancement of Sustainable Development (SD). This was expected, as sustainable development is interdisciplinary and can be applied to various scientific fields. As a result, the ISLE network members have different fields of expertise but they are all focusing in the theme of sustainable development and its application in their fields of expertise.

The aim of the ISLE network is to bring together stakeholders from Europe that have either already introduced Sustainable Development courses and programs in their curricula and wish to transfer their knowledge to the other partners of the network, or wish to introduce the concept of Sustainable Development in the curricula of their institutions. In order to achieve this, the ISLE network aims to collect and use specific tools (including a Good Practices Compendium and the experimentation on innovation) and devices (benchmarking protocols and diagnostic grids), which will be blended with previous experience and new innovative approaches in order to come up with a concrete set of outcomes. The education system and more specifically higher education, through training, will improve these approaches and attitudes by adapting and reusing what already exists and by inventing new solutions. In this direction, the ISLE network aims to fulfill the following objectives:

- To identify the existing situation of teaching Sustainable Development in the HEIs around Europe and develop a State of the Art report, summarizing this information.
- To identify the needs of HEIs regarding the integration of Sustainable Development courses/programs based on the report.

- To adapt existing tools and materials and to develop new ones in order to meet the needs identified.
- To develop a Compendium of Good Practices, which will include examples of Good Practices in the Teaching of Sustainable Development, in order for them to be used as a basis for a model curriculum.
- To exploit ICT tools in order to achieve the maximum penetration in the groups of stakeholders who will benefit from the project's outcomes.
- To ensure the application of the project's outcomes through a series of professionalization events that will involve professional organizations, private companies and related stakeholders, working in the field of sustainable development.
- To ensure the sustainability of the project's outcomes through the collaboration with related initiatives, projects and networks.

During the project, communication activities will be organized regularly, to ensure institutional, local politicians and businesses support in order to use these relays for the dissemination of project results, even after its closure.

2. Sustainable Development Studies around Europe

2.1. About Sustainable Development

Sustainable Development is a complex and a constantly evolving concept, which makes it difficult to define. One of the original descriptions of Sustainable Development is credited to the World Commission on Environment and Development (WCED or Brundtland Commission): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Sustainable development is generally considered to have three dimensions: environmental, social and economic, which are closely related and affect one another. As shown in Fig. 1 below, the relationship between society and the environment must be bearable, that between the environment and the economy must be viable, and that between the economy and society must be equitable in order to attain sustainability. The well-being of these three areas is intertwined, not separate. For example, a healthy, prosperous society relies on a healthy environment to provide food and resources, safe drinking water, and clean air for its citizens. The sustainability paradigm rejects the contention that casualties in the environmental and social realms are inevitable and acceptable consequences of economic development.

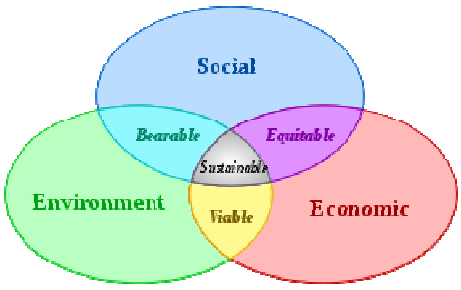

Fig. 1. The three dimensions of sustainable development (Adams, 2006)

A further problem was that of communication. The message and imperative of sustainable development had not been effectively communicated to key actors and the public at large. Levels of public awareness and debate remained low and meant that citizens were less likely to support policy makers and politicians making difficult decisions in support of sustainable development. While public understanding and commitment were generally low, the private sector was increasingly active. Companies often used the language of sustainable development to support policies of corporate responsibility that amounted to little more than public relations.

The problem perceived in communication rather than in education, it can be argued that environmental education in Europe contributes to the problems of realizing sustainable development. While there are strong European mandates supporting environmental education these are not binding on member states. Over 6 million ECUs were spent supporting over 100 environmental education projects from 1993 to 1997 but the majority of these focused on the science of environmental management and pollution control and the development of sound environmental attitudes and behavior. Environmental education in Europe has been slow to shift its focus to sustainability and governance, incorporate the social sciences and social education, and engage with community development (Huckle, 2001).

Education is an essential tool for achieving sustainability. People around the world recognize that current economic development trends are not sustainable and that public awareness, education, and training are the key into moving society toward sustainability. Education for sustainable development is the use of education as a tool to achieve sustainability. The nature of education for sustainable development is to give people knowledge and skills for lifelong learning and help them find new solutions to their environmental, economic, and social issues (McKeown, 2002).

The aforementioned issues, among others, are a proof that Europe does not currently have the necessary means to deploy and promote sustainable development. Concentrations of economic, political and cultural power in capitalist society generally act against the majority interest in sustainable development and any realistic form of education for sustainability will need to critically examine the limits to the ‘greening of capitalism’. Such activity should be part of a reformed and revitalized citizenship education in Europe’s schools that allows future citizens to begin to reflect and act on different models of democracy and governance and their potential to balance the rights and responsibilities of workers, consumers, the ecosystem, and future generations, against the rights and responsibilities of private corporations, and states at local, national and regional levels. Modern systems of education designed to further the economic and political interests of nation states must now become postmodern systems that incorporate education for European and global governance and citizenship (John-Steiner and Mahn, 1996).

2.2. Higher Education studies in Sustainable Development

A number of European universities, educational institutions and centers have developed or adopted courses that are addressed to Sustainable development. A number of examples of these educational courses are displayed as follows:

London South Bank University's (http://www.lsbu.ac.uk) Education for Sustainability Program offers post-graduate courses from continuing professional development to masters’ level, aimed at providing personal and professional development for anyone involved in communicating sustainability. The qualification is Masters of Science (MSc) in Education for Sustainability and it comprises eight modules plus dissertation. It also offers three other qualifications, namely University Certificate (two modules), Postgraduate Certificate (four modules), and Postgraduate Diploma (eight modules). The university offers a choice of study modes, namely fulltime through self-supported study at the University, part-time through distance learning, and a mixture of both.

Another example is the Swedish International Centre of Education for Sustainable Development (SWEDESD - www.swedesd.se) which is mainly funded by SIDA, the Swedish International Development Cooperation Agency. SWEDESD's programs and activities are being developed gradually and in close cooperation with national and regional institutions in Sweden and elsewhere in the world. SWEDESD is designing, developing and implementing a number of thematic education and training programs and capacity development projects. This is done with the purpose to facilitate and support education and action competencies for sustainable development. Other activities include research and development and knowledge exchange projects with a variety of outreach events attached.

The Frederick's University in Cyprus (www.frederick.ac.cy) graduate studies program with the title "Education for Environment and Sustainable Development" provides people of different disciplines with an opportunity to indulge in type of theoretical and practical issues related to education, environment and sustainable development for a situation to develop relevant scientific, professional and research activity. The knowledge and skills offered by the program can be used within the framework of both formal education and other professional sites can contribute to lifelong learning society. The program is addressed to teachers of all levels of formal education, to executives in the public sector working on issues of environmental policy, environmental awareness and education, as well as to staff of environmental centers and organizations, professionals from private sector, non-governmental organizations and the media space who are actively involved in the area of sustainable development. The program offers 16 courses (6 mandatory and 10 elective courses), of which the student can choose 6. Courses on environment and Sustainable Development, Teaching Methods, Techniques and Methodology, Approaches to Education for the Environment and Sustainable Development, Designing Educational Programs for the Environment and Sustainable Development in School, Biodiversity in Education, Environmental Communication and Media are included in the course program.

Another example of sustainable development education in Europe is the example of the Danish Institute for Study Abroad (www.dis.dk). The program gives the opportunity to the student to examine the concepts and philosophies of sustainability. The role of individuals, communities, businesses and government in shaping sustainable development with an emphasis on Danish and European cases plays a very important role. The program is designed for students of environmental studies, environmental science, public policy, and students generally interested in environmental affairs. The core course is Sustainable Development: Environmental, Political and Social Issues. This course is enhancing the understanding of the divergent goals and complex processes associated with sustainable development from a European perspective. Specific focus is given to the interplay between social, political and economic issues and environmental concern. The student is introduced to a broad range of Danish and European stakeholders currently shaping the sustainability agenda, and encouraged to identify his own values and strategies for a sustainable future.

The list of European Universities that provide courses on topics of SD could be really long and constantly increasing, mostly due to the rise of the interest in SD during the last years. However, the previous paragraphs provide an overview of the main issue in the teaching of sustainable development among the various European universities: It is obvious that there is no common basis on the number or the type of courses included in an educational program related to SD, nor any minimum or standard curriculum that could be used in teaching topics related to SD. Harmonization at the level of courses or curriculum is one of the most important aspects towards a solid educational approach regarding these topics. In addition, through the harmonization, the evaluation and validation of the corresponding courses and curricula will be facilitated, leading to enhanced experience for the end users of this process, them being students of HEIs or lifelong learners in general.

3. The contribution of ISLE

The ISLE project is based on a well-defined set of complementary work packages, each one of which is using the outcomes of the previous one in order to initiate a new set of outcomes. In this direction, the first step towards the identification of the issues raised in the context of teaching SD topics in HEIs around Europe is to identify and record the current status in the form of the "State of the Art". Then, based on this, the next step would be to start building a model educational program in the form of a compendium of good practices in the teaching of SD in the HEIs involved in the project. Then, this compendium, along with other outcomes of the project will have to be evaluated, as other teaching programs related to SD; therefore, the ISLE network will work on the design and development of a Quality Label that could ensure that the "ISLE Good Practices Compendium", as well as other educational programs, meet specific quality criteria. The following paragraphs present an overview of the work done or ongoing in the aforementioned tasks by the ISLE consortium members.

3.1. State of the art in SD teaching in European universities

One of the main objectives of the ISLE network is the development of a model curriculum containing a number of Good Practices from the network partners. However, the first step of this process would be to identify the current status of teaching sustainable development topics in the HEIs around Europe. The state of art aim was to determine what already exists in the 31 LLP partner countries and the "third countries" in socio-political terms in the field of sustainable development at National level by sectors: Higher Education political bodies, enterprises, NGOs etc. in this direction, ISLE project partners were asked to provide a short paper describing the current situation of the Sustainable Development in the higher education in their countries. A template including the basic structure and guidelines were provided to the project partners in order to facilitate the procedure.

In addition, in order to further investigate the current status in each country and further support the results collected by the partners, a questionnaire was prepared using the appropriate survey software (Limesurvey - www.limesurvey.org) and circulated among stakeholders, being university professors, students and academic staff through the project partners in each of the consortium institutions in order to assess the state of the art towards sustainable development in their establishments especially in terms of teaching.

The papers prepared by the project partners provided information about the SD national policies (e.g. legislation), policy of HEIs/Universities/Research (e.g. funding options) related to SD, HEIs involved in the teaching of SD (including courses, programs, activities etc.), good practices related to SD followed at national level (e.g. conservation of resources) as well as possible future actions. In addition, the guidelines provided a definition of SD and a definition of Life Sciences (by providing an extensive list), to which SD topics, courses or even programs could be applied.

The results of the feedback received by the project partners revealed that in Europe there are few universities that have studies of Life Sciences directly related to SD. However, there are many universities that have subjects/topics or individual courses related to SD. Therefore it can be concluded that SD is a very common concept that is included in many studies of the Life Sciences field. This is due to SD is general and interdisciplinary concept for many of these studies. However there are few countries with compulsory basic cross contents of SD in their studies of Life Sciences.

The feedback received also revealed that the disciplines that usually integrate topics and courses on SD are Environmental Sciences, Agronomy and Agricultural Engineering, as well as Health Sciences.

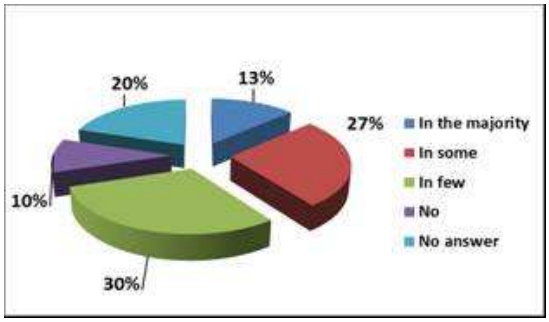

Fig. 1. Percentage of countries that have HEIs with Life Science Studies about SD

One of the most interesting aspects of the feedback received was the barriers for the integration of SD in the teaching of Life Sciences, as they were identified by the project partners. In most cases it was obvious that these barriers were due to existing national legislation and educational structure, lack of specialist that could take over this part and insufficient training of the existing staff as well as lack of awareness of the stakeholders due to insufficient information about the importance of SD in the Life Sciences.

In addition, the feedback provided a number of good practices followed at national level by HEIs and other stakeholders in SD. These practices focused mostly in sustainable use of resources and resources conservation methods, preparation and dissemination of educational and informational material related to SD aiming to raise the awareness of the general public, organization of related events such as guided tours, exhibitions and other voluntary activities related to SD.

Finally, based on the issues identified as well as the existing good practices in each country, the project partners suggested a list of future actions that could be implemented at national level in order to meet the needs for SD teaching and dissemination mostly in HEIs. In this direction, the most common feedback received suggested the collaboration between various actors involved in SD (such as academics, researchers, students and professionals with policy makers, public and private sector), the development of quality criteria and policies, application of existing indicators and active participation of all stakeholders.
The feedback collected and processed for the “State of the Art” work package of the ISLE project was used by the team working on the “Compendium of Good Practices” work package as a basis for requesting more specific and refined information.

3.2. Development of a Compendium of Good Practices

The ISLE network identified the already existing and available through the project partners or other channels applicable good practices and will develop a “Good practice compendium”. The analysis required for this task was based on the outcomes of the State of the Art survey and corresponding report elaborated at national level, for each country, by the project partners; also the stakeholders (professors and institutions) answers collected in the direct surveys have been analyzed to identify further good practices. Network members have been asked to provide their Good Practices, deriving from their experience in their own institutions and from a direct collection of information at national level. Any Good Practices were described using a “case study form” previously defined by an internal working group. The Case study form was structured to collect the following information:

Promoter details: information about the Leading organisation, the country, the sector of activity

General information: information about the Funding Organization, the Level of Implementation (local; regional; national; international), the Time Frame, the Area of Interest (Policy, Institutional activity, Teaching, Practical experience)

Case description: objectives and implementation of the activity / project

Thematic focus: information about the type of activities covered with reference to the three SD pillars (environmental, social, economic); field of the activity referring to the Life Sciences ((i.e. agronomy; anatomy; animal science…)

Evaluation: a judgment and information on the established criteria of evaluation, description of the results, impacts and success factors or awards

Further information: website, publications, other source of information useful for in-depth examination of the case study.

The geographical areas of reference of the collected good practices are the 30 European countries represented in the ISLE project.

The topic of HESD was considered in a broader sense, starting from characterisation of the political and institutional framework. Ultimately single formal and informal learning experiences in HE institutions were identified. The Good Practices were classified into 4 areas:

Policies: Good Practices that concern the creation of the institutional framework for HESD at National or Regional Authorities level with the objective of facilitating and strengthening education for SD; examples are National Agencies or Awards, Public Guidelines, Action Plans, Consortia for improving the SD.

Institutional activities: Good Practices that concern the management and other non teaching activities of the Higher Education institutions directed to SD; in this area initiatives like Sustainable Campus, Sustainable Food Procurement, SD education activities for the administrative staff, Environmental and CSR certifications are included.

Teaching: Good Practices concerning "formal learning", i.e. "learning that occurs in an organised and structured context and follows a particular structured design" (GHK et al, 2008). We can identify different levels of SD Teaching: integration of SD in disciplinary lessons; modules about SD definition and concepts; holistic teaching in relation to sustainable development activities; promotion of a SD mindset; improving the framework for teaching SD.

Practical experiences: Good Practices concerning "non-formal" (planned activities that are not explicitly designated as formal learning, but which contain an important learning element) and "in-formal" or experiential learning (learning about SD as a result of daily life activities) that involves HE students or is promoted by HE institutions (GHK et al, 2008). Examples are: student involvement in protected areas or urban gardens management, rural and traditional villages management, and sustainable agriculture.

A specific working group worked on the methodology first, and then on the integration, elaboration and selection of the collected Good Practices.

A voting tool has been elaborated following the criteria of:

- Transferability
- Pertinence
- Capacity Building
- User Friendless
- Innovation
- Partial / Global Approach
- Networking
- Interdisciplinarity

A group of referees, trough a voting procedure, at a later stage will determine the more useful and appropriate ones that will consist the Compendium of Good Practices. The updated, final results will be available through the ISLE website (www.isle-project.eu) as well as through the ISLE Course Management Platform (http://isle.moleportal.eu) by the end of the project.

3.3. Validation/Quality label

By combining the data collected by the Compendium of Good Practices and additional outcomes coming from work related to evaluation of public policies and the correlation of the academic aspects of the network with the needs of the professional stakeholders of the sustainable development area, ISLE network aims to complete the following tasks:

- Adjust the good practices previously identified;
- Create a diagnostic grid for HEIs outside the ISLE network to evaluate teaching programmes;
- Present and exchange curricula;
- Define guidelines for the teaching of sustainable development;
- Develop and award a label of quality;

The outcomes of these tasks will be analyzed and combined with the results of a survey on the innovative practices used by the network members, so that innovative aspects on both the content and the pedagogical methods used in the teaching of sustainable development will be proposed, leading to the development of an “Innovation Practices Compendium”.

In order to ensure the quality aspect of its outcomes and promote the teaching of SD topics, the ISLE consortium aims to develop a label for quality in teaching SD in Life Sciences across European HEIs. The label will act as a tool for recognizing and evaluating the performance of HEIs in teaching and implementing the concept of sustainability. This will enhance the quality, transparency and readability of the of the related study programmes.

The SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis (Jyothi et al., 2008) of the Quality Label by ISLE identified the following, strengths, weaknesses, opportunities and threats:

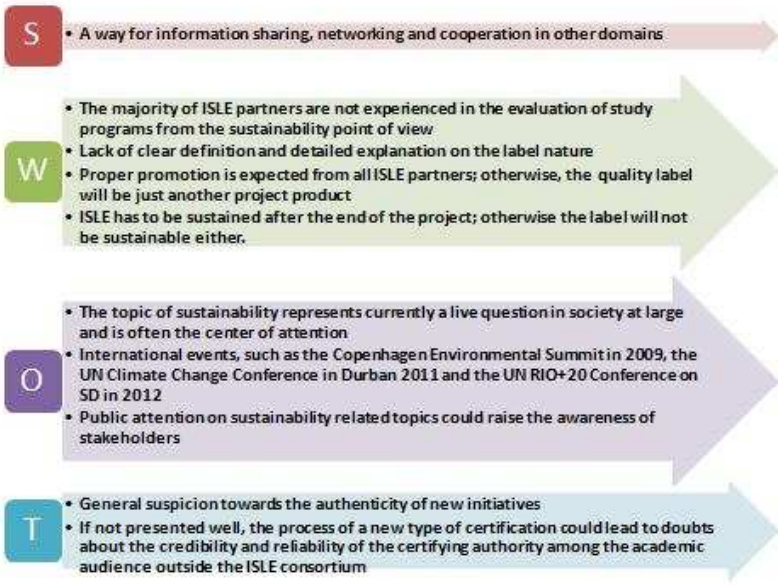

Fig. 2. Outcomes of the SWOT analysis regarding the development of ISLE Quality Label

A number of related tools have been developed for the evaluation of the progress made in terms of SD by HEIs. One of these tools is the Auditing Instrument for Sustainability in Higher Education (AISHE) has been introduced by the European Foundation for Quality Management (EFQM - www.efqm.org). This tool consists of a set of criteria that measure the compliance of a HEI against five stages of compliance. Another tool, Sustainability Tracking Assessment and Rating System (STARS - https://stars.aashe.org), is self-reporting framework for colleges and universities to measure their sustainability performance. Not only it ranks HEIs in North America based on a benchmarking between different HEIs but it also allows the exchange of good practices. Participation of HEIs outside US and Canada is only available through the STARS international pilot. These tools, along with other tools and related initiatives will be taken into consideration during the planning and implementation of the ISLE Quality Label, which is currently an ongoing task. ISLE aims to integrate the experience collected by the aforementioned tools and develop the Quality Label of ISLE to be awarded to HEIs around Europe.

3.4. Tool supporting the curriculum development of ISLE

In order to support the collection, indexing, retrieval and online delivery of the courses that will be included in the ISLE Compendium of Good Practices", a suitable course management platform had to be used. More specifically, MOLE (Multimedia Open Learning Environment – www.moleportal.eu), initially developed by the Laboratory of Distributed Multimedia Information Systems and Applications (TUC/MUSIC) of the Technical University of Crete (www.ced.tuc.gr) and used by a number of EU projects since then, was adopted, adapted and used for storing, indexing, retrieving and delivering online the courses, if necessary.

The platform is aimed to be used for creating and delivering online courses in a defined curriculum, uploading presentations and supporting material for each course, communicating with the students etc. It supports a wide variety of functions such as real-time delivery of presentations, user forums, chat rooms, video conference and instant messages for communication between the members, as well as a fully featured page for each course.

Towards this direction, an instance of the Course Management Platform was adapted and made available for use by the ISLE consortium members (http://isle.moleportal.eu). For the purposes of the I.S.L.E. project, the I.S.L.E. instance of the MOLE platform (Fig. 3) is expected to host learning scenarios/courses on topics of Sustainable Development, along with the aforementioned good practices as they will be developed and delivered by each project member, so that an I.S.L.E. Compendium will be created and presented to various stakeholders. In addition, it would be possible for stakeholders to remotely participate to the courses comprising the ISLE Compendium of Good Practices, either real-time or not.

After the Compendium of Good Practices has been completed, revised and approved, it will be uploaded organized and published through the ISLE Course Management Platform. There, all content (both the Good Practices and any related supporting material) will be described with educational metadata based on an adapted version of the IEEE LOM AP (IEEE, 2002) standard using the integrated metadata editor in the platform (Mylonakis et al., 2011). Since the Compendium should receive the maximum amount of publicity possible, an effort will be made towards the harvesting of the resources from the platform using the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), a protocol already supported by the ISLE instance of the Course Management Platform, that allows the automated exposure of the metadata records created in the platform. It is expected that by providing the OAI-PMH target for the collection stored in the Course Management Platform to related portals and repositories, the ISLE Compendium of Good Practices will be widely available to all stakeholders all over the world.

Fig. 3.Home page of the ISLE instance of the MOLE Course Management Platform

4. Conclusions

The aim of this paper was to present the ISLE Erasmus Network as an initiative that aims to contribute to the context of teaching SD in HEIs of Europe, by providing innovative solutions based on the research of the existing status in the participating EU countries. ISLE Network plans to contribute not only by providing an overview of the existing situation, but it will actually contribute with the development of a compendium of good practices in the teaching of SD and the development of the Quality Label in the same context, among other outcomes of the project. It aims to integrate existing material and tools in a new, revised framework for improving the teaching of SD in HEIs around Europe, by adding the missing parts in this complex interdisciplinary approach. It aims to bring in close cooperation various stakeholders of SD, not limited to HEIs but also professionals, researchers and general audience, in order to provide sustainable solutions to the issues raised.

Since the ISLE project is still ongoing, a part of the development and implementation of its outcomes is still ongoing, too; therefore no solid suggestions can be provided at this time. However, the outcomes delivered so far by ISLE propose a solid basis and will be used in the future in order to support the next steps of the project towards the enhancement of the teaching SD topics in HEIs around Europe.

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