Sustainable Development and Universities: Theory and Practice

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Abstract

This article is dedicated to the analysis of the interconnection between higher education and sustainable development. Key roles performed by higher education institutions regarding sustainability issues are highlighted. Modern trends in education for sustainable development are singled out, and key features of different countries' approaches to the issue (and Ukraine in particular) are studied. New types of learning which emerge within education for sustainable development, together with key elements of sustainability competence, are outlined. Essential university functions and capabilities for inoculation and adoption of the principles of sustainable development in wider society are summed up.

Keywords: education for sustainable development, sustainable development, university, sustainability competence.

Introduction

Humankind has experienced ambivalent periods of slow, but sustainable development, and periods of revolutions and breakthrough, which usually have a dramatic impact on society. In today's increasingly competitive, interdependent and unpredictable world which nevertheless offers much more opportunities to an overwhelmingly greater number of people, practically everywhere on the planet, the notion regarding the necessity to change the very paradigm of social order has appeared and became perpetuated. The main reason for that is the understanding of the need to shift from the «brown» economy to the «green» one[3] within the necessity to address global issues such as climate change, pollution, poverty, armed conflicts, etc. (Note 1). That is why the heads of states and governments and high-level representatives of the countries participating in the 2012 Rio+20 Summit, renewed their commitment to sustainable development (SD) and to ensuring the promotion of an economically, socially and

[3] United Nations (2012a), From Rio to Rio: A 20-year Journey to Green the World's Economies, p. 13. Retrieved on 28th June, 2014 from: http://www.thegef.org/.

environmentally sustainable future for our planet and for present and future generations[1].

> **Note 1.**
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> UN experts note that «40% of all food produced in the United States goes uneaten», and 25% of the food brought home is then thrown away by Americans[1]. And each time food is wasted, all the resources used to produce it go to waste too and this happens in almost every country. In terms of non-food waste, an estimated 11.2 billion tonnes of solid waste are collected worldwide[2]. This is probably why the analysis of Earth Ecological Footprint showed that by 2050 humanity will be using resources and producing waste at 2.6 times the rate at which they can be renewed or sequestered[3]. So by 2030 we will need one more Earth to cover consumption demands.

There are many **definitions** of SD. The most known and widely supported one is the 1987 definition presented in the United Nations World Commission on Environment and Development (WCED) in the report 'Our Common Future'. According to it, «sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future»[2]. Also, in the Commission's words: «.. sustainable development is .. a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with the future as well as present needs»[3]. Sustainable development is also defined as «maintaining a delicate balance between the human need to improve lifestyles and feeling of well-being on one hand, and preserving natural resources and ecosystems, on which we and future generations depend»[4]. According to the Centre for International Sustainable Development Law, SD is based on a long-term approach which takes into account the inextricable nature of the environmental, social and economic dimensions of

development activities. **Education for Sustainable Development** (ESD) is defined with regard to that as the knowledge, skills, understanding and values to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life without damaging the planet of the future[5]. Now, during the last year of the Decade for Education for Sustainable Development (DESD, 2005-2014) declared by the UN in 2002, it is quite pertinent to review the role of universities for SD.

Throughout history, universities as core societal institutions engaged in educating and developing future inventors and academics, decision-makers, the leaders of countries, entrepreneurs and citizens of the nation, region and the world, play a crucial role in transforming societies and forming the current condition the world finds itself in. The need to shift to SD in a sense that it is committed to hindering and redressing environmental-ecological degradation within an integrated value framework of generational and global equity[6] affects all participants of global society one way or another. The role of education in fostering SD was firstly mentioned in chapter 36 of the Agenda 21[7]. And the systems of higher education of countries represented by the higher education institutions (HEI) are undergoing a lot of changes at present. Namely, HEIs face the challenging trends of globalization of higher education, growing competition, spreading of mass education (due to ICT developments, online learning and MOOCs) etc. The need to go with the times by introducing ESD into their practices appeared to be one more challenge for universities around the world. ESD-related educations include: environmental, peace, human rights, consumer, development, health, HIV/AIDS, biodiversity, gender, inclusive, multi-cultural, holistic, global, citizenship, disaster risk reduction, climate change and food security. But to a great extent, sustainability in universities is at an early stage of the learning process[8] in which

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[1] United Nations (2012b), Report of the United Nations Conference on Sustainable Development — Rio de Janeiro, Brazil, p.1. Retrieved from: http://www.uncsd2012.org/content/documents/814UNCSD%20REPORT%20final%20revs.pdf.

[2] Report of the World Commission on Environment and Development: Our Common Future (1987), p. 39. Retrieved on 7th July, 2014 from: http://www.un-documents.net/our-common-future.pdf.

[3] Ibid, p.17.

[4] Sustainable Development Law and Legal Definition, USLegal Home. Retrieved on 7th July, 2014 from: http://definitions.uslegal.com/s/sustainable-development.

[5] Bourn, D. (2014) Development Education, Education for Sustainable Development and Global Perspectives within Higher Education. Development Education research Centre, Institute of Education, p.5. Retrieved on the 7th June, 2014 from: www.heacademy.ac.uk.

[6] Lafferty, W.M. (2004) Governance for sustainable development. The challenge of adapting form to function. Edward Elgar, Cheltenham, p.15.

[7] Agenda 21. (1992) United Nations Conference on Environment and Development. - Rio de Janerio, Brazil. — 1992, p. 320. Retrieved on 28th June 2014 from: http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf.

[8] Mulder, K., Segalas, J., Ferrer-Balas, D. (2012) How to educate engineers for/in sustainable development: Ten years of discussion, remaining challenges. *International Journal of Sustainability in Higher Education* 13 (3), pp. 211—218.

much must be learned for SD to become fully implemented and for higher education to become a true leader in sustainable development[1] and contribute to it.

Many experts have dedicated their research to the question of the interrelationship between universities and the idea of SD, including Chrystalbridge, M., Dale, A., Desha, C.J., Hargroves, K., Hesselink, F., Hopkins, C.A., Jickling, B., McKeown, P., Mieg, H.A., Newman, I., Rizi, A., Scott, W., Tilbury, D., Vare, P., Van Kempen, P.P., Wals, A.E.J., and Ukrainian scientists Maslovska L.T., Nepeyina G.V., Paton, .E., Sadovenko A.P., Sereda V.I., Vusotska O.E. and others (table 1). On average 92% of publications on SD address both universities and sustainable development, but the trend is the growth from 84% in 2007 to 95% in 2014.

Sustainable development has already been a concern for several decades; and the interest of universities in participation in it is on the rise as a response to social demand. On the other hand, we cannot say that the idea of sustainability is peculiar to a specific sector like academia, or any other. The very idea of sustainability, due to its

complexity, claims joint efforts in order to attain the very least result. So, it is **cooperation** between international organizations like United Nations, the private sector and the academic society (HEIs) which generates the most progress on the issue.

The concept of Triple helix puts universities as equal partners with the government and industry which could generate economic development in knowledge-based society[2]. Universities enrich people with competencies and nations with intellectual capital.

Taking into account contemporary literature review on universities and sustainable development, as well as the role of universities in fostering sustainable development at regional level[3], we have come up with an analytical framework of 'universities in the sustainable development paradigm' (fig.1). It is the basis of our review and it could serve other researchers as a basis for further analysis.

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[1] Waas, T., Verbruggen, A.,Wright, T. (2010) University research for sustainable development: definition and characteristics explored. *Journal of Cleaner Production*, 18, pp. 629-636.

[2] Leydesdorff, L. (February, 2012) The Triple Helix of University-Industry-Government Relations. Retrieved from: http://eprints.rclis.org/16559/1/The%20Triple%20Helix%20of%20University-Industry-Government%20Relations.Jan12.pdf.

[3] Sedlacek, S. (2013) The role of universities in fostering sustainable development at the regional level. *Journal of Cleaner Production,* 48, pp. 74-84.

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Table 1

NUMBER OF PUBLICATIONS ON UNIVERSITIES IN SD AT SCIENCEDIRECT DATABASE*

Year	Full text search	Keyword search		
	«sustainable development»	«sustainable development»	«universities» + «sustainable development»	«education» + «sustainable development»
2014*	21611	220	210	24
2013	27003	271	257	25
2012	22131	235	218	12
2011	18092	223	212	3
2010	14841	164	148	11
2009	12871	157	146	9
2008	11030	122	112	3
2007	9521	121	102	1
Total	**204719**	**2160**	**2002**	**110**

* ScienceDirect database. Data as of July 2nd 2014. (Retrieved from: http://www.sciencedirect.com/science/search).
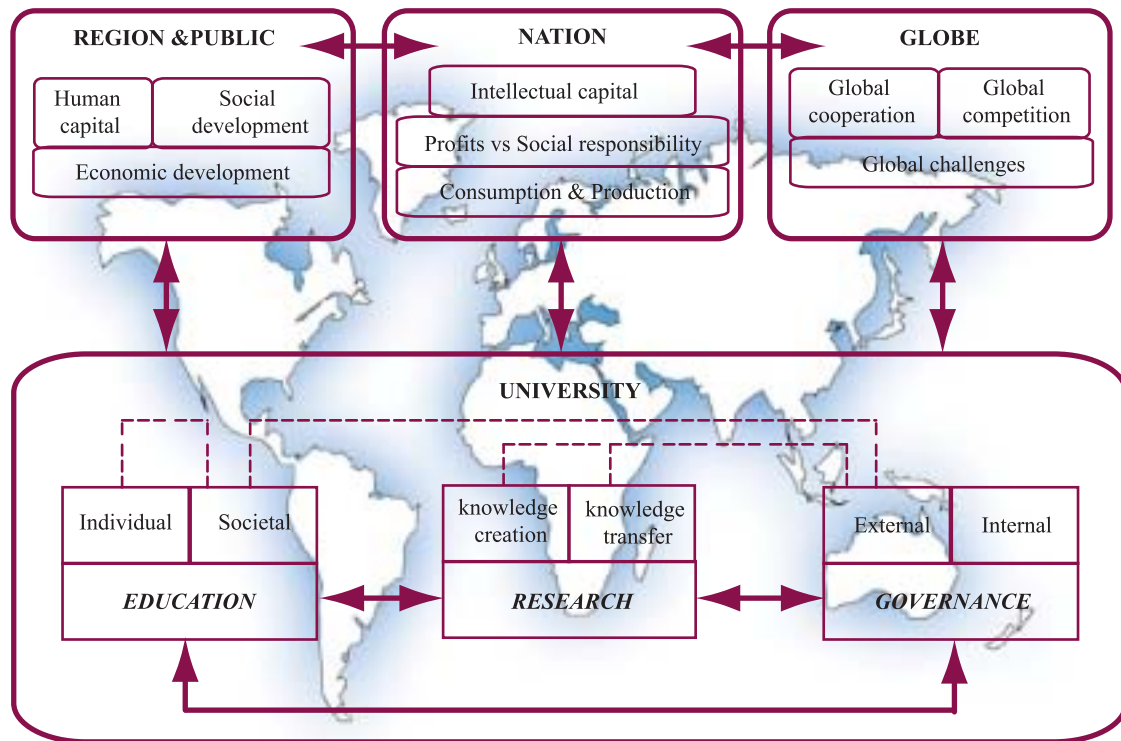
Figure 1. Analytical framework for universities in sustainable development paradigm

ESD at the national level

According to the first report of the Decade, ESD was finding its place in education communities: nearly 100 countries across the world had set up national coordinating bodies, viewing ESD as a relevant approach to global problems. In some cases, ESD was evoked as a theoretical framework without the evidence of inclusion in the curricula; out of a sample of 50 countries 26 countries reported no evidence of ESD in 2008, but by 2012 16 of them no longer fell into that category. We can perceive an estimated increase of 34% from 2008 to 2012[1]. From the UNESCO survey data, 59% of countries have already implemented actions on Biodiversity education, and these actions are included at almost every educational level. From those countries, 95% include it in primary education, 100% in secondary education, 83% in higher education, and 85% in teacher education[2]. Also, SD is not just an obligation, but also a big business opportunity (Note 2).

In the United States of America much attention is paid to Climate Change education. Collective efforts by state and local authorities, universities, schools and non-governmental organizations are essential complements to federal programs that educate the public regarding climate change. State agencies concerned with environment and energy issues provide education and training for teachers, and that is often carried out together with universities and local utility companies. At the middle and high school levels, local school systems are adopting climate change curricula and activities; and the universities with the support from non-governmental organizations educate staff and students about the importance of energy efficiency. Apart from that, a variety of non-governmental organizations (wildlife conservation groups, science-based and education organizations) are making efforts, by conducting programs and surveys, producing brochures, writing media articles etc. on establishing public awareness about the importance of sustainable development, and in particular — about the science underlying, impact of, and possible solutions to climate change[3].

EU approaches SD on a wide perspective, so their sustainable development policies include climate change and clean energy, sustainable transport, sustainable consumption   and production, conservation and

[1] UNESCO (2012) Shaping the Education of Tomorrow. 2012 Report on the UN Decade of Education for Sustainable Development, Abridged, p.12. Retrieved from: http://unesdoc.unesco.org/images/0021/002166/216606e.pdf.
[2] UNESCO (2012), p. 18.
[3] Ibid.

management of natural resources, public health, social inclusion, demography and migration, global poverty and sustainable development challenges. The European Commission's «Updated strategic framework for European cooperation in education and training» is to guide cooperation in education for sustainable development till 2020, and the «Lifelong Learning Programme 2007-2013» was a prime tool for developing the role of education and training systems. Meanwhile, many papers deal with sustainable development in various EU countries and many of them address academic freedom as an internal principle for managing universities, like in Sweden[1], Portugal[2], France[3], the Czech Republic[4] or region of Central and Eastern Europe[5].

> ### Note 2.
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> The global waste market, from collection to recycling, «is estimated at 410 billion USD a year». Recycling is a sector which is likely to grow steadily; for example, the 'Waste to Energy' market was worth 19.9 billion USD in 2008 and expected to grow by 30% by 2014. Recycling is the way to substantial resource savings. Thus, «every tonne of paper recycled, 17 trees and 50% of water can be saved»4. But sustainable development is far more than just recycling; it involves a lot of approaches, both economic and social development, and environmental protection.

[1] Sammalisto K. & Brorson T. (2008) Training and communication in the implementation of environmental management systems (ISO 14001): a case study at the University of Gavle, Sweden, *Journal of Cleaner Production*, Volume 16, Issue 3, February 2008, pp. 299-309, http://dx.doi.org/10.1016/j.jclepro.2006.07.029.

[2] Ferreira S., Cabral M., da Cruz N.F., Marques R.C. (2014) Economic and environmental impacts of the recycling system in Portugal. *Journal of Cleaner Production*, Available online 27 May 2014. http://dx.doi.org/10.1016/j.jclepro.2014.05.026.

[3] Gombert-Courvoisier, S., Sennes, V., Ricard, M., Ribeyre, F. (2014) Higher Education for Sustainable Consumption: case report on the Human Ecology Master's course (University of Bordeaux, France). *Journal of Cleaner Production,* Volume 62, 1 January 2014, pp. 82-88. http://dx.doi.org/10.1016/j.jclepro.2013.05.032.

[4] Labodova, A., Lapčik, V., Kodymova, J., Turjak, J., Pivko, M. (2014) Sustainability teaching at VSB — Technical University of Ostrava. *Journal of Cleaner Production*, Volume 62, 1 January 2014, pp. 128-133, http://dx.doi.org/10.1016/j.jclepro.2013.03.019.

[5] Adomssent, M., Fischer, D., Godemann, J., Herzig, Ch., Otte, I., Rieckmann, M., Timm, J. (2014) Emerging areas in research on higher education for sustainable development — management education, sustainable consumption and perspectives from Central and Eastern Europe. *Journal of Cleaner Production*, Volume 62, 1 January 2014, pp. 1-7. http://dx.doi.org/10.1016/j.jclepro.2013.09.045.

In Norway, the Partnership for Education and Research about Responsible Living, an international network of experts, researchers, teachers and policy-makers, coordinates actions on encouraging people to contribute to constructive change through the way they choose a lifestyle. This network also develops values-based, holistic, interdisciplinary, personal and practical educational approaches[6].

But it is not only developed countries that are taking actions related to ESD. In the Philippines, the National Environmental Education Action Plan (2005-2014) mandated the integration of environmental education in the school curricula at all levels; an integrated system for teacher training was established too. Overpopulated India and China are also considering ESD. In India, the Centre for Environmental Education has run the campaign «CO2 Pick Right» on climate change and individual lifestyle choices in over 70,000 schools. The result was a partnership between government and a non-governmental institution, and the program made it possible to raise awareness of the importance of choices and daily practices for sustainability. And in Mongolia, UNESCO supports the Government's actions to mainstream ESD in the education system through curricula development and teacher education[7].

ESD in Ukraine

In Ukraine, it was decided to create a new, integrative and inclusive curriculum for ESD, rather than offering additional material for existing school subjects, and to implement it within the current model of state school[8]. Ukrainian educators are used to linking sustainable development with the field of natural science, and that approach is definitely beneficial for ESD students. However, ESD also demands great attention to social aspects, because a sustainable society cannot function without democracy, on-going dialogue and the empowerment of people, and it is only possible when human relationships are based on respect, tolerance and cooperation; these aspects go far beyond natural sciences, from the perspective of the standard school curriculum they are already 'social studies', social psychology or even philosophy[9].

The 'National Paradigm for Sustainable Development of Ukraine', published in 2012 by the Institute of Environmental Economics and Sustainable Development of the National Academy of Sciences of Ukraine, defined current trends, strategic issues and perspective approaches of the sustainable development in Ukraine

[6] UNESCO (2012), p. 21.
[7] UNESCO (2012), p. 22.
[8] Ibid, p. 23.
[9] Ibid.

with regard to the global environment, and in accordance with particular goals and the existing potential of the Ukrainian nation. Education is defined both as a fundamental and important way of achieving sustainable development[1], having the most impact on establishing social awareness in such questions as ecology, ethics, formation of values and approaches, skills and behaviors related to sustainable development. Nevertheless, it is mentioned that the time since the proclamation of SD principles in terms of national economic and social realities has shown that the model of market transformation of Ukrainian society appeared to be destructive and led to severe social losses. A middle class has not been established, and democracy, social and political stability as based upon middle class cannot function. That is why several positive achievements such as implementation of education on environment and ecology in a lot of educational institutions, diversification of cultural activities, etc. were shadowed by failures in areas like healthcare, social infrastructure and others[2]. Moreover, the terrorist attacks that took place in 2014 showed the lack of society-wide sustainability ideas.

The main forms of actions aimed at achieving sustainability at universities are various projects performed in cooperation with the private sector, non-governmental and international organizations, and other stakeholders. Besides, some studies show that stakeholders from outside the academic world helped to infuse sustainable development more effectively than if only academic inputs were used[3]. Still, there is no evidence of a large-scale implementation of ESD in the curriculum of HEIs. So, there is a need to rethink the entire approach to ESD in the national education system.

International organizations in ESD

With regard to the problem of sustainable development, and ESD in particular, a great deal of attention to the issue is paid by international organizations. This is no wonder, taking into consideration the global scale of tasks to be resolved, as only joint forces, both intellectual and financial, are needed to accomplish the high goal of shifting to a 'greener' society. International organizations like the UN are devoting a great deal of effort to analyzing the current situation, conducting research, making suggestions and taking dynamic actions to add to sustainability

improvements worldwide. They are also the key agents to track progress in ESD both in individual countries and globally.

International organizations act mainly as a catalyst for real actions. Taking into consideration general trends in ESD worldwide, UNESCO experts have noted a significant pedagogical shift and the evolution of more types of learning. Sometimes ESD is being taught through different types of learning and connect more than one subject area. In the global monitoring and evaluation survey, nine types of learning associated with ESD were distinguished; they are briefly described below[4]:

Discovery learning — when the learners are immersed in a rich context where they encounter some element of mystery; their curiosity is aroused and they begin to make sense of their experience through their own exploration;

Transmissive learning — using didactic skills like presenting, lecturing, story-telling, and supporting materials like workbooks, instruction forms, visuals; a body of knowledge, set of rules or code of conduct is transferred to the learners;

Participatory/collaborative learning emphasizes working together with others and active participation in the learning process, which tends to focus on resolving a joint issue or task;

Problem-based learning is focused on solving real or simulated problems, in order to better understand the issue or find ways to make real-life improvements. Issues are either identified by the learners, or pre-determined (e.g. by teachers, experts, commissioning bodies);

Disciplinary learning — taking questions of a disciplinary nature (e.g., geographical and biological) as a starting point, to better understand underlying principles and expand the knowledge base of that discipline;

Interdisciplinary learning — choosing issues or problems as a starting point, and then exploring them from different disciplinary angles to arrive at an integrative perspective on possible solutions;

Multi-stakeholder social learning — bringing together people with different backgrounds, values, perspectives, knowledge and experience, from both inside and outside the group initiating the learning process, to set out on a creative quest to solve problems that have no ready-made solutions;

Critical thinking-based learning — exposing the assumptions and values that people, organizations and communities live by and challenging their merit from a normative point of view (e.g. animal well-being, eco-centrism, human dignity, sustainability) to encourage reflection, debate and rethinking;

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[1] National Academy of Sciences of Ukraine (2012) National Paradigm for Sustainable Development of Ukraine, Kyiv. - 2012, p. 18.

[2] Ibid, p. 33.

[3] Boman, J. & Andersson, U.P. (2013) Eco-labelling of cources and programs at University of Gothenburg. *Journal of Cleaner Production*, 48. 2013, pp. 48-53.

[4] UNESCO (2012), p. 26.

Systems thinking-based learning — looking for connections, relationships and interdependencies to see the entire system and recognize it as more than the sum of its parts; and to understand that an intervention in one part affects other parts and the entire system.

Other forms of learning have also been defined: philosophical enquiry at all ages, exploring values, self-learning, experimental learning, community-based learning, action-based learning and others. It is also noted that ESD can never consist of only one form of learning; it is always a blend of types, which has to fit the group of learners (their age, knowledge, interests etc.), the learning context and the resources available[1].

About 100 Regional Centers of Expertise (RCE) on Education for Sustainable Development as UN University initiatives from various countries have formed a global network to address local sustainable development challenges through research and capacity development. RCEs aim to bring together educational institutions, strengthening communication, coordination and collaboration among these stakeholders with the aim of promoting education for sustainable development[2]. This is one of the major international contributions to local development with university initiatives. Still, SD is the problem of personal, regional and national development, and an international and global challenge too.

University competencies in ESD

HEIs are beginning to reorient their education, research, operations and community outreach activities towards sustainability. This shift is taking place despite economic pressures and educational reforms pushing for more efficiency and cost effectiveness, which can stand in the way of this reorientation. Some universities are using sustainability to organize and profile themselves in a new way. HEIs are also beginning to advance systemic thinking by examining connections, relationships and interdependencies. According to UNESCO experts, there are indications that some universities are developing and introducing new forms of interactive, integrative and critical learning that can help people to understand and engage in sustainable development. Teaching and research are placing a new emphasis on real-world challenges to sustainability in the communities that surround campuses. This new focus is dissolving boundaries and fostering intellectual dialogue between traditional institutions and citizens.

It is also noted that HEIs are contributing to the development of sustainability competence within and beyond the higher education community through their courses, professional development programs, community outreach activities, etc. In order to be effective, 'education on sustainability' must be based upon a systems approach, be immense, focus on more than knowledge, and consider students' values and behaviors in order to improve their problem-solving abilities[3]. There is no doubt that all the changes in programs and curricula should be based upon a 'values' approach, and be supplemented by holistic, trans-disciplinary approaches, supported by the usage of a competences strategy.

The Generic Sustainability Competence was defined on the base of the ideas of *Gestaltungskomptenz,* developed in Germany[4]. According to their definition, it consists of several competences, as outlined in Figure 2.

Lambrechts et al.[5] suggested that a balance should be made between the already integrated competences (for example, of responsibility and emotional intelligence) with those related to a systemic, future outlook, and action skills. It was concluded that the definition of sustainable development competences should be reviewed periodically, in order to analyze and mark progress and to report on the evolution of approaches to sustainability as incorporated into universities' systems[6]. So universities should be encouraged to report to the public and engage public discussion of the topic.

ESD is increasingly perceived as a catalyst for innovation in education, and it is often at the heart of new, creative multi-stakeholder configurations involving schools, universities, communities and the private sector[7]. In addition, though more research is needed to document that, there is no doubt that ESD is quality education, as it is related to academic gains as well as boosting people's capacities to support sustainable development.

Nevertheless, it was documented that, in general, universities fall behind companies in helping societies become more sustainable[8]. The

[1] UNESCO (2012), p. 28.

[2] Sedlacek (2013), p. 80.

[3] Pappas, E., Pierrakos, O., Nagel, R. (2013) Using Bloom's Taxonomy to teach sustainability in multiple contexts. *Journal of Cleaner Production*, 48, pp. 54-64.

[4] UNESCO (2012), p. 45.

[5] Lambrechts, W., Mula, I., Ceulemans, K., Molderez, I., Gaeremynck, V. (2013)The integration of competences for sustainable development in higher education: an analysis of bachelor programs in management. *Journal of Cleaner Production*, 48, pp. 65-73.

[6] Ibid.

[7] UNESCO (2012), p. 5.

[8] Lozano, R., Lukman, R., Lozano, F.J., Huisingh, D., Lambrechts, W. (2013) Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *Journal of Cleaner Production*, 48, pp. 93-100.

analysis of texts of eleven declarations, charters, and partnerships developed for promoting sustainable development in HEIs showed that they could be used to augment university systems in the context of ESD by adding such elements, as: collaborating with other universities, fostering transdisciplinarity, making SD an integral part of their institutional framework, creating on-campus sustainable development life experiences, and providing education and training for teachers. The documents challenge university leaders and their faculties to ensure that sustainable development is the 'Golden Thread' throughout all university systems[1]. Lee et al.[2], having analyzed the experience of Australian universities, concluded that if a commitment to ESD in a university (and in the higher education system in general) is not stated as a publicly espoused value, then the organization's commitment for ensuring that SD is enacted is doubtful.

The concept of sustainable development should be included in the university's mission and profoundly integrated within its educational programs and courses. It should also be integrated with all other activities performed by a university, such as research and commercialization of knowledge and research results (Fig. 3). Taking into consideration the modern functions of a university, its core roles — education, research and governance — they are being transformed too. Apart from the traditional role of educating, universities are becoming learning institutions by serving the needs of society. Thus, universities fulfill a central role in a sustainable development processes since they are key players in both the individual as well as the social or collective learning systems[3]. In terms of research function, having a notable effect on the regional development, universities are able to cope with the need for a mixture of basic and applied research and the need for multiple transdisciplinary research; having all necessary organization and tools, they can detect and identify the directions in which change is needed and to guide decision-makers[4].

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[1] Lozano (2013), pp. 93-100.
[2] Lee, K.-H., Barker, M., Mouasher, A. (2013) Is it even espoused: An exploratory study of commitment to sustainability as evidenced in vision, mission, and graduate attribute statements in Australian universities. *Journal of Cleaner Production*, 48, pp. 20-28.

[3] Sedlacek (2013), p. 76.
[4] Kemp, R. & Martens, P. (2007). Sustainable development: how to manage something that is subjective and never can be achieved? *Sustainability: Science, Practice & Policy*, 3 (2), p. 13.

Elements of a Generic Sustainability Competence

Competence to think in a forward-looking manner, to deal with uncertainty, and with predictions, expectations and plans for the future.

Competence to work in an interdisciplinary manner.

Competence to see interconnections, interdependencies and relationships.

Competence to achieve open-minded perception, trans-cultural understanding and cooperation.

Participatory competence.

Planning and implementation competence.

Ability to feel empathy, sympathy and solidarity.

Competence to motivate oneself and others.

Competence to reflect in a distanced manner on individual and cultural concepts.

Figure 2. Elements of a Generic Sustainability Competence
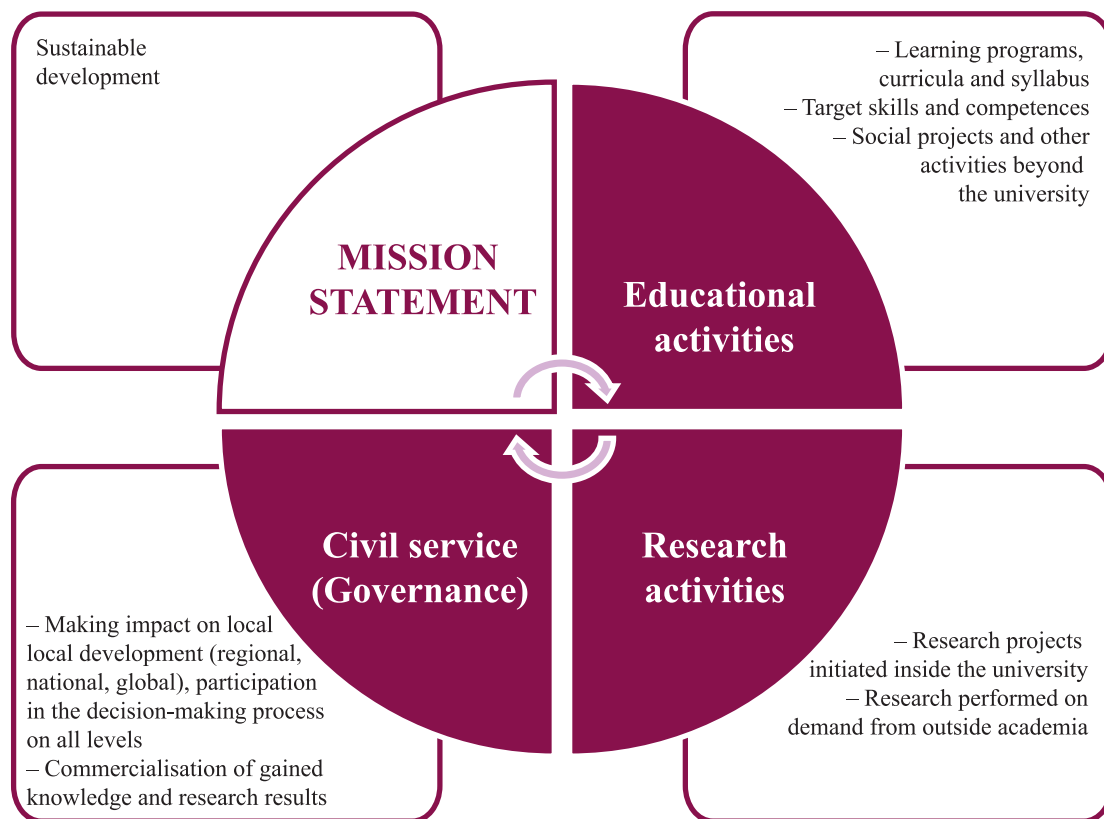
Source: UNESCO (2012).

Sustainable
development

– Learning programs,
curricula and syllabus
– Target skills and competences
– Social projects and other
activities beyond
the university

**MISSION
STATEMENT**

**Educational
activities**

**Civil service
(Governance)**

**Research
activities**

– Making impact on local
local development (regional,
national, global), participation
in the decision-making process
on all levels
– Commercialisation of gained
knowledge and research results

– Research projects
initiated inside the university
– Research performed on
demand from outside academia

Figure 3. Sustainable development: a university's key dimensions.

For the purposes of SD a transition to more integrative science is needed, and that requires a re-orientation of research agendas which earlier were traditionally defined by academics and now are defined in a multi-stakeholder environment in order to solve various multidisciplinary societal needs and problems. And in terms of governance, there is no doubt that the university faculty and administrators are important actors for regional development processes because they participate and provide their expertise, contributing to economic and human well-being[1]. But, since the scale and complexity of these universities' activities have increased a lot, the need arose to improve the governance system so that it could cope with these complexities, and that is an additional challenge for modern universities.

A study at universities in the USA, Latin America, and China in 2013 suggested that inclusion of the resource management topics in designing academic programs is the most preferred approach in all three regions for the promotion of sustainable development, followed by development of programs that could cover topics in areas of human capital development, human systems design and sustainable economic development and prosperity[2]. The Chinese are very active at promoting the «green university» idea, as it is very close to their tradition[3].

With the declared priority for SD, the universities are able to influence communities, social and economic development, thereby transforming regional development in one way or another. Moreover, the impact of HEIs grows as they become more active agents on the global arena, cooperating

[1] Goldstein, H.A. (2009) What we know and what we don't know about the regional economic impacts of universities. In: Varga, A. (Ed.), Universities, Knowledge transfer and Regional development. Geography, Enterpreneurship and policy. Edward Elgar, Cheltenham. 2009, p.11-35.

[2] Khalili, N.R., Duecker, S., Ashton, W., Chavez, F. (2014) From cleaner production to sustainable development: the role of academia, *Journal of Cleaner Production*, Available online 28 February 2014, http://dx.doi.org/10.1016/j.jclepro.2014.01.099.

[3] Yuan, X., Zuo, J., Huisingh, D. (2013) Green Universities in China — what matters?, *Journal of Cleaner Production*, Volume 61, 15 December 2013, pp. 36-45, http://dx.doi.org/10.1016/j.jclepro.2012.12.030.

with the private sector, and sometimes guiding corporations towards more social responsibility. Having full potential to affect wider society, through performing their three main functions (as illustrated in Figure 3), universities are that linchpin between globally-initiated priorities and their inoculation in real life practices.

Conclusion

A more sustainable university is defined as the one which: strives for academic excellence; tries to embed human values into all aspects of people's lives; and promotes and implements sustainability practices in teaching, research, community outreach, waste and energy management, and land use planning through continuous sustainability and monitoring[1]. Only by fulfilling at least these tasks can the HEI become more sustainable.

Modern society experiences a worse environment than a century ago, but the future could be even worse if we do nothing. We have in mind not only ecology, but weapons and healthcare, economies and societies that could destroy the Earth and its population. Anyone who can change the world should act. Universities face the need for ESD in various aspects that are theoretically and practically developed at different levels.

SD in learning activities is vital due to the massive impact of alumni who do change the world we all live in. Still, much should be done, as even in one of the best world-class universities — Harvard — there is no «sustainable development competence»; one can find only that of «sustaining productive customer relationships» in the Harvard University Competency Dictionary.

Congruity with the sustainability principles in research activities should be a must checkpoint before their results get into the commercialization path and even before the start of the experiments which could potentially be harmful, like those that could be treated as weapons.

SD in a university's business activities and bureaucracy should come before profits, so societies, local communities and individuals can benefit in the long run.

A modern university cannot become a world-class university or a 'flagship' university without being actively involved in ESD. In times when the primary goal of higher education is shifted from gaining information and knowledge to gaining skills and competences needed to process that information, make decisions, deal with uncertainty etc., the mission of HEIs falls behind education, as the higher education system in contemporary environment has to teach values. This mission is now not only educating a highly skilled labor force, but also 'growing' global citizens mindful of their individual actions and the repercussions of their actions, and ready to sacrifice short-term profit for the future greater value. That is why universities, possessing the necessary tools and potential to address societal needs, are key institutions to affect the implementation, inoculation and adoption of the principles of the SD in society at large.

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