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SUSTAINABLE DEVELOPMENT IN HIGHER EDUCATION

Maria-Magdalena IORDĂCHESCUL[1], Mohammad JARADAT[2], Teodor Cezar NIŢĂ-BĂLĂŞESCU[1]
[1]Valahia University of Târgoviște, Bd. Unirii, no.18-24, Târgoviște, 130082, Romania
[2] Bogdan Vodă University of Cluj-Napoca, Str. Grigore Alexandrescu, nr.26 A
E-mail: imariamagdalena@yahoo.com

Abstract
This article shows the relationship between sustainable development and higher education. Universities must work as places of research and study for sustainable development. Higher education must provide leadership by practicing what they have learned through sustainable procurement, investments and facilities are integrated with teaching and learning. Higher education should emphasize the experimental, based on research, solving the problems, interdisciplinary system approach and critical thinking. Curriculum needs to be developed, including materials and tools, such as case studies and identify best practices (UNESCO, 2004). „The future of a nation is determined by the way it prepares its youth",. said Erasmus, the great Dutch humanist. By the sustainable development strategy is replaced by the value of material with the value of knowledge. Education should help students to develop a set of values it now makes future. The relationship between sustainable development and education can be better understood in the context of wider political debate about globalisation.

Key words: individual learning, sustainable development, higher education, objective of universities.

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1. INTRODUCTION

In response to the emergence of environmental issues and natural resources crisis, the Conference on Environment in Stockholm since 1972 to recognize for the first time global that human activities contribute to environmental damage, putting into danger the future of Earth.

1.1Defining sustainable development education

There are different interpretations and different concepts to the definition of education for sustainable development. For the UK government sustainable development is:
-Social progress which recognizes the needs each person,
-Effective protection of the environment,
-Prudent use of natural resources,
-Maintenance of high and stable levels for growth and employment (www.sustainable-development.gou.uk/what is sd.htm).

Sustainable development is the process of development which answer the needs of present, without compromising future generations to meet their own needs. It contains two key concepts: concept of "needs" in particular the essential needs of the world's poor which should be given top priority, and the idea of limitations imposed by the state of technological and social organizations environment on the ability to respond current and future needs (WCED, 1987:43).

For Sterling emphasis is on sustainability - ability to support. One aspect of this capacity is the responsibility - ability to respond, that education can be encouraged. In Sterling's view education should be transformed. In relation to education for sustainable development: responses could range from no response, to accommodate the lack of durability, to reform or transform eventually, when there is a profound recognition the need to restructure the world system (Sterling, 2004 by S.Brown et al, 2007).

Sustainability education involves four factors:
- Educational thinking and practice: support, defense, health and sustainability (J.Blewitt, et al, 2004).
-Support, help to support people, communities and ecosystems,
-Defense, ethically is defensible, working with integrity, justice, respect,
-Health is an adaptive system, viable, including and nurturing healthy relationships and the emergence of systems on different levels,
-Durability, function quite well in practice to keep the system.

Sustainability education has had many achievements in less than three decades. Despite a degree of fragmentation and dispute of nomenclature, it is internationally recognized, as a very important approach in education. It decided that the time 2005-2010 Decade of Education to Sustainable Development and it will be considered an important step forward. Sustainability education needs to take deeper criticism of mechanistic culture, modernism and instrumentalism which largely inform educational policy. At the same time, it must be done greater coherence and conviction by adopting a deep learning potential developing ecological and systemic paradigm already affecting the sustainability discourse and practice in wider society serving higher education.

1.2. Individual learning in higher education

Learning is conceived as having three forms (S.Gough, W.Scott, 2007):
-Information. It is understood that the student is developed already own experience or previous educational interventions, appearance is compatible with sustainable development, given that new information provided and are understandable. For example, staff at procurement, he is usually quickly in the institutionalization practices more sustainable on clearly saving money.
-Communication. This involves a process two-way exchange. It is very likely to succeed where existing knowledge of student are compatible in principle with the news, to deepen knowledge, but in particular, in context - specific details should be developed or clarified. University's leaders, for a sustainable future, have worked to facilitate this communication by establishing and maintaining the statement Talloires, facilitating exchanges on how to fit the principles of sustainable development to local circumstances among the over 320 signatories, in more than 40 countries.
-Mediation. Learning about sustainable development it may involve juxtaposition of multiple perspectives, which are apparently inconsistent or contrary knowledge in the context of uncertainty or incomplete. It is a mediated learning is essential, if the challenge for "positioning", to be implemented in higher education, as a means of social transformation. An example is the activity at the Royal Academy of Engineering. Interesting lessons are those that be learned from case study 4, that the work of the Funding of Higher Education in England (HEFCE).

In developing this approach to the sustainable development HEFCE was more concerned more of potential for mediated learning between professionals and professional bodies, institutions. HEFCE found a way to facilitate a process of mediation between the two different perspectives of sustainable development and different views what it means for the university.

1.3. Case Studies

Case Study 1: University Leaders for a Sustainable Future co-sponsoring an interesting exercise in creating international networking in form Halifax Consultation of October 2005. Experts from around the world provided the opportunity to engage exchange of ideas in structured around a particular task (generating a research strategy in higher

education/sustainable development, is also a specific instrument to the network (the process Delphi). Informal outputs of the system, for example, establish a database underway for exchange of ideas seems at least as important as official results.

Case Study 2: Integrating Environment and sustainability African Universities (MESA). The project is very ambitious in terms the connection of institutions across the continent, which have a common understanding on other issues. This network allows implementation in common of institutional capacity (in terms, for example, infrastructure, skills and resources) and sharing of raw materials from other parts of the world. For example, Akpezi Ogbuigwe as one of those who participated to Halifax Consultation and MESA allows the benefits to be shared.

Case Study 3: UNESCO considers the importance of reorientation teachers to address sustainability - the project was focused on creating global network to enable practitioners around the world to obtain insights the successes and difficulties to rely on experts, to create tools for collaborative learning. An example of such an instrument is teaching and learning for a sustainable future a multimedia program teacher-education, using a series of impressive pedagogy.

Case Study 4: Work of the Funding in Higher Education (HECFE) is unusual in that it creates a network that requests stimulate a certain type of activity within a network that already exists. 130 higher education institutions in England, although independent in many ways are connected to each other in a series of networks. For example, Higher Education Academy has academics from across the industry

2. LISBON STRATEGY

You cannot ignore the effects of agenda from Lisbon and its consequences in the behavior of universities, is particularly important to reflect how this affecting higher education governance (J.Huber, Council of Europe staff, 2006). Lisbon European Council (2000) decided to establish objective of making Europe „The most dynamic economy -based knowledge, of the world, capable of sustainable economic growth with more and better jobs and greater social cohesion."

Universitie's task must be made in accordance with strategy of Lisbon which is not new, but it is important to consider these concerns: need to define long-term strategy seems to be particularly important and use one of them.

Bologna process will have a greater role on governance issues to the expectations of universities. The question is: how they deal with higher education institutions changes necessary to meet strategy objectives from Lisbon and Bologna? Something will have to change on governance. The old ways of participation will have to change somewhat. We might compare such english system, with the french. Bologna process and Lisbon strategy, although not necessarily related to one another, should be autonomous, but to supplement each other, a later stage.

3. THE NEED FOR CHANGE IN THE GOVERNANCE OF EUROPEAN UNIVERSITIES

Origins of environment change for European higher education institutions have three characteristics:

- globalization, and scientific and technological progress,
- voluntary policies launched in Europe: initiative was taken in 1998 the Sorbonne by the Ministers of Education France, Germany, Italy and UK to create the European Higher Education Area (EHEA), without limits. Now there are 45 countries participating in the process, but the original objectives have been extended the inclusion of crucial questions the doctoral studies quality assurance and welfare of students. The second set of policies developed is known as the "Lisbon agenda". Lisbon Agenda is a set of initiatives taken the European Union since 2000, aimed at strengthening the European research through

better national integration and European Union research efforts, gave a higher priority research at EU level and new tools: European Research Council.

-challenges inherent in the development of higher education and research sector: sector faces many challenges ("The Economist" 2005; Weber, 2006, by J.Huber, 2006), in particular:

a) that many countries need to respond further the participation rate increasing, some will soon enter a phase post-massification due to the sharp fall the birth rate in Europe;

b) institutions have a challenge recruitment of academic staff to replace the large number which was 1970-1980 to meet demographic needs the most skilled in 1960, and simultaneous participation rate increased;

c) variety and pressure application to higher education institutions is increasing with the ongoing education, configure several specialists in training and degrees, multiple research partnerships;

d) cost of research is growing rapidly sophisticated due to increased scientific equipment;

e) cost of teaching and learning is increasing growing personalization of teaching and learning.

4. UNIVERSITY - CIVIL SOCIETY

In Europe relationship between universities and society was never a simple and easy. Two forces have had an offset: coming of mass democracy and constantly increasing access higher education segments of the population less privileged. Globalisation first and the recent withdrawal a state from direct control, her more freedom for universities in setting its priorities and determine their future, on the other. Germany, for example, is a highly formalized involvement in decision making still bears the marks of the group of universities and its rather complicated structures. In this case, group of universities can be interpreted history as a reaction against the attitude the old anti-democratic oligarchy. The impetus for participatory management exacting in universities in Germany was politically motivated a high degree of control as a means institutional power and of strengthening democratic, vitality of the institution.

The fate of the democratic reform movement of 1960 is well known: reached more or less the daily routine university administration and the struggle to resolve the situation between the number of students growing and the relative decline financial resources to address this growth. German experience offers interesting analogies after 1989, situation in Eastern Europe after the fall of communism. Generally, universities have played an important role the overthrow of the old political system. During the first 15 years transformation of universities in Eastern and Southeastern Europe, they were not seen as a driving force for democratization.

5. GLOBALISATION AND DURABILITY - GLOBAL PERSPECTIVES AND EDUCATION SUSTAINABLE DEVELOPMENT IN HIGHER EDUCATION

In the United Kingdom global perspectives and education sustainable development can be seen as development of political education, civic and their most recent forms under the term 'citizenship education'. Education plays an important role not only in developing functional knowledge and skills within and beyond the subject of education in terms of students, but should allow them to develop a set of values it now makes future so as to challenge and change deep issues that they face in society that will work (S.Brown et al, 2007).

Finland's national objectives are sustainable, economic and social development balanced. Employment of high-level, productivity and competitiveness are key factors. The high quality in higher education and measures to increase research and technological development plays an important role in trying to achieve national development objectives.

The main features of higher education in Finland are the following (P.Pillay, 2010):
-A comprehensive dual-sector in higher education system which includes 20 universities and 29 polytechnics, geographically across the country,
-Participation rate is high in higher education generally, including people in the feminine and mature age students,
-Stability in higher education: structure is transparent and functions of the two sectors are clearly defined,
-A relatively high proportion of funding for institutions of higher education is given by the public purse
-A high percentage of research is conducted in public research institutions,
-Private investment in research has increased more rapidly than public investment in recent decades,
-Relative- rate university research funding for external sources increased,
-A marked expansion of training in quantitative research, combined with the introduction of a school graduation,
-A more integrated system of higher education with few barriers related to recognition of credit transfer between institutions,
-Relatively few foreign students,
-A decentralized system for university admission.

In "Values in Higher Education" (Robinson, 2005 by S.Brown et al, 2007), Fryer remind the objective of universities:
-To inspire and enable people to develop skills the highest potential throughout their lives, thus grow intellectually, to be well prepared for work, can contribute effectively to society and achieve personal fulfillment,
-To increase knowledge and understanding and to encourage their application for the benefit economy and society,
-To serve the needs of an adaptable economy, sustainable, local knowledge, regional and national,
-To play a major role in shaping a democratic, civilized society.

Universities should play a central role in education and development of citizens and broadening social inclusion, especially in the lives of those who may have expectations in a civil society.

Case Study: Nokia

What role did Nokia innovation system in Finland? Here this innovation system refer to operations and interactions between universities, research institutions, other public sector organizations and private businesses influencing the creation and dissemination, use a guide of know-how. Nokia has been instrumental in both directions the Finnish innovation system. On the one hand Nokia uses resources the innovation system. At the same time, company produces innovative resources reaching outside the company. In Finland, Nokia has benefited from innovation resources the education system, employment qualified and Tekes funding, Research and Development. Finland has benefited from Nokia. The latest knowledge in the field have been of universities to Nokia and know-how has spread to partners Nokia because of its policies network. International research projects of Nokia have gained importance because of how global operating company.

Nokia impact was highly significant domestic product in the Finnish (approximative 3%), increase GDP (third in 2000), exports (approximative 25%) and expenditure on research and development (approximative third of total and half of private sector Research and development expenditure). On the other hand, its effect on employment is less significant. His employees are just over 1% of the total Finnish workforce. In addition to this direct effect, Nokia has indirect influence on employment.

The importance of position Nokia in the Finnish economy is special even by comparison internationally. Although relatively few large companies, in other small countries, they tend to face with different circumstances. Usually, these large companies operating in low technology industries. In Finland, Nokia operates in a

field of technology intensive requiring large investments in research and development.

Tekes (National Technology Agency) is a subordinate organization Ministry of Labour and Economy that government support technological development. In the 1990s, Tekes finance companies in the industry ICT. Nokia has received public funding considerable for research and development. Growing importance of his research Nokia has tightened collaboration with universities and research institutions. Increasing need for labor highly qualified, Nokia has tried to influence level and direction in the higher education.

The role of Nokia in educational policies has become more efficient, because the need for qualified personnel on the increase in 1990. The Federation of Finnish Electrical through and Electronics Industry, Nokia has tried to grow number of places in universities in electronics, telecommunications and ICT.

Transfer of know-how to other companies

The most important channel in the Finnish innovation system Nokia is cooperation with other Finnish companies. Nokia cooperate both in production and research – development with many companies and in 2000 were approximately 300 companies with Nokia network partners. There were between 18,000 and 20,000 employees in these companies, who worked with the products delivered to Nokia. The most important cooperation with companies aimed production and manufacturing operations. In recent years cooperation has been extended to operations related research and development.

Dissemination of know-how in universities

Nokia cooperation with universities in Finland focused mainly on technological universities and natural sciences. Exchange of information had two major parts: many projects know how were released from universities by Nokia and vice versa. Nokia has an important position the Finnish information and group communication system innovation. Nokia operates within the group both the user and producer innovation resources.

With the innovation system, main partners of Nokia are universities, research institutions, other public sector organizations, Nokia suppliers and client companies. Key factors in the innovation system are the transfer of know-how, learning and search for innovation. If the system works well, interaction of these factors reflects on the economy as employment, exports, profit business income tax in the public sector.

6. SUSTAINABILITY AND INTERDISCIPLINARITY

On sustainability, problems are growing the national and international agenda media reports almost every day -Systemic links between energy consumption, climate change, biodiversity loss and poverty have become more obvious. The need for multiple perspectives and integrated approach to problems become more acceptable, as reflected in common language of "connected thinking".

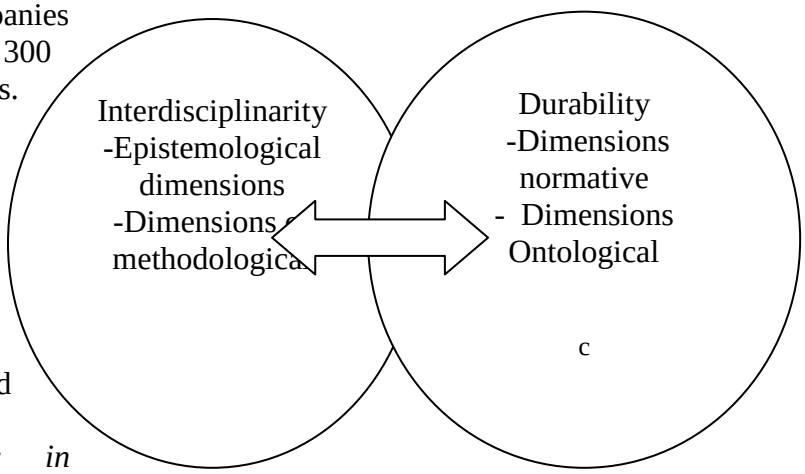

Figure 1: The relationship between interdisciplinarity and sustainability

Hence, Donella Meadows suggests:

"The world is a complex system, interconnected, finite, ecological and social-psychological and economic. I treated him as

if it were, it would be divisible, separable, simple and infinite. Our problems are persistent, intractable, worldwide arising directly from this mismatch" (Meadows, 1982, p.101 by P.Jones et al, 2010).

Universities have played a critical role in educating future generations, in disseminating information about sustainability, by training leaders, with the skills to solve local and regional from a global perspective and interdisciplinary (G8 University, Summit, 2008 by P.Jones et al, 2010).

7. CONCLUSIONS

Education is an essential tool for achieving sustainability. People around the world recognize that economic development trends current not sustainable and public awareness, education and trening are essential the movements of society to sustainability. People argue term sustainable development and whether or not feasible. They have different views on sustainable society will look like or as may be (D.Tilbury, 2002).

If durability is real more significant, and mass phenomenon, rather devalued and marginalized, education in all forms, in any field plays an important role. This requires fundamental changes in education. We need a broad vision, revitalized, deliberate education as a whole. Any person acting the "leader of learning" at some level and capacity (Meadows et al, 1992 din J.Huckle, et al, 1996).

8. REFERENCES

Books:
[1] S.Gough, W.Scott, Higher education and sustainable development: paradox and possibility, Routledge, 2007
[2] J.Huber, Council of Europe staff, Higher Education governance between democratic culture, academic aspirations and market forces, Council of Europe Publishing, Strasbourg, 2006
[3] S.Brown, E.Jones, Internationalising higher education, Routledge, 2007
[4] J.Blewitt, C.Cullingford, The sustainability curriculum: the challenge for higher education, Earthscan, 2004
[5] P.Pillay, Linking Higher Education and economic development: implications for Africa, Chet, 2010
[6] P.Jones,et al, Sustainability education: perspectives and practice across higher education, Earthscan, 2010
[7] D.Tilbury, Education and sustainability: responding to the global challenge, IUCN, 2002
[8] J.Huckle, S.R. Sterling, Education for sustainability, Earthscan, 1996
References sourced via the world wide web:
[9] www.comunitate durabilă.ro
[10] www.sustainable-development.gou.uk/what is sd.htm