Sustainable Development and Greener Universities

Alice Cannone, Michela Pellegrino, Chiara Grillo, Linde Mollers, Anda Baumerte, Berit Koop, Eleni Efthymiou, and Lisa Kirschner

1. Introduction

In polls and surveys, which regularly investigate the public opinion on the world's most serious problems, environmental issues are always present: people are concerned with climate change, pollution, waste disposal, biodiversity, etc. And this is constantly increasing.

The aim of this paper is not to describe any environmental issues, but to give concrete answers to the lack of engagement for sustainable development. On the long run, the aim is to prevent our environmental system from collapsing by introducing new ways of thinking and behaving. Sustainable development shows us the way to achieve this goal.

In fact, the environmental resilience – the capacity of an ecosystem to go back to its original status after being inappropriately exploited – cannot be precisely measured, nor can we foresee how or whether new technologies will allow us to replace all the non-renewable resources. Therefore, the ecological component needs to become an essential part of our society's development, and not only an add-on. Sustainable development must stop being depicted as an annoying obstacle to economic growth or - on the other hand - as an easy way to improve a company's outer image. The current environmental crisis highlights many structural problems of our western societies, characterized by a cross-cultural and international dimension. In other words, the crisis cannot be solved within a single country, as it involves the humanity as a whole. Our environment and the use of its resources are deeply linked to the economical and political systems. Therefore it raises fundamental questions about what priorities should be taken in the next decade.

1.2 What links sustainable development to universities

A rise of awareness about environmental issues cannot be accomplished without changing or modifying values and habits. Moreover, a serious analysis of the environmental issues must necessarily have an interdisciplinary character. In fact, other than a scientific approach to the problem, which is certainly essential to any concrete action plan, we cannot forget the cultural and social dimension that is part of any change.

It therefore becomes evident how universities represent an ideal place to start the (r)evolution. Today's students are tomorrow's workers, and therefore future's parents, professors, doctors, governors, European and world citizens.

Educating students and stimulating their active involvement equals promoting a "cheap" and successful 10 to 20 year programme: an opportunity we cannot afford to waste.

2. Historical development of sustainable development

The role of universities is to contribute to a global social progress and advancement of knowledge. Universities are therefore expected to impart the moral vision and technical skills needed to ensure a high quality of life for future generations. Sustainable development is the context in which higher education must focus its mission, and as soon as possible. In this chapter we give an overall picture of the development of sustainable development over the years. Moreover, this chapter aims at emphasising the way in which higher education has already tried to approach this issue.

2.1 From Stockholm to Johannesburg

In 1972, the *United Nations Conference on Human Environment* was held in Stockholm. At this conference the importance of environmental management and the use of environmental assessment as a management tool was recognized (DuBose et al. 1995). In this event, indications about the need to change our economic development policies emerged strongly. A major attempt to integrate environmental issues and development into a unique term came from the *International Union for the Conservation of Nature* (IUCN). The IUCN formulated the *World Conservation Strategy* in 1980. Even though the term "sustainable development" did not appear in the text, the concept of sustainability was highlighted by the use of the phrase "sustainable development" for the first time in an international forum. A few years later, the report of the *World Commission on Environment and Development* (WCED) was issued. The report defines sustainable development as "**development that meets the needs of the present without compromising the ability of future generations to meet their own needs**" (WCED 1987).

This definition underlines the strong linkage between poverty alleviation, environmental improvement, and social equity through sustainable economic growth. According to Holmberg (1994), by 1994 there were more than 80 different definitions and interpretations sharing the core concept of this definition. In June 1992, The *United Nations Conference on Environment and Development* (UNCED) was held in Rio de Janeiro (the "Earth Summit"). Governments from around the world agreed to an "Agenda 21". This workplan identifies what

needs to be done by all of us to achieve sustainable development in the 21st century. Chapter 36 of the *Agenda 21* deals specifically with education. It states that: "Education [should achieve] ethical awareness and [promote] behaviour consistent with the sustainable use of natural resources and sustainable development. To be effective, it should deal with the dynamics of the physical/biological environment and human development, be integrated in all disciplines, and employ all formal and non-formal methods and adequate means of communication"[1].

One of the latest meetings that debated the issue of sustainable development was the *World Summit on Sustainable Development*, which took place in Johannesburg in September 2002.

2.2 The Evolution of Sustainability Declarations in Higher Education

The synopsis of meetings on sustainable development highlights how more and more importance is given to this issue worldwide. What follows briefly summarises the key themes that emerged from declarations on sustainability in Higher Education since the early 1990s.

Talloires Declaration
In October 1990 twenty university presidents, rectors and vice chancellors of universities from all regions of the world raised their concerns about environmental changes. "We believe that urgent actions are needed to address these fundamental problems and reverse the trends". [D. Johnston]

The Halifax Declaration
In 1991, a meeting was held at Halifax (Canada) between senior representatives of the *International Association of Universities* (IAU), the *United Nations University* and the *Association of Universities and Colleges of Canada* (AUCC), joined by 20 university presidents from various parts of the world.

The Swansea Declaration
August 1993 at the fifteenth conference of the *Association of Commonwealth Universities* (ACU) in Swansea, Wales, the discussion focused on the theme: "People and the environment – preserving the balance".

The Kyoto Declaration
In November 1993, the IAU issued a clarion call to its 650 university members in the Kyoto Declaration in its 8th Round Table meeting, held in Japan.

---

[1] From the Report of the General Secretary of UNCED

The Copernicus Charter

The *European Universities Association* (EUA) established an inter-university cooperation programme on the environment called Copernicus, which presented in 1993 in Barcelona the University Charter for Sustainable Development. This instrument expresses a collective commitment on behalf of 231 universities in Europe.

In 2000, four organisations joined together to form the *Global Higher Education for Sustainability Partnership* (GHESP)

•   The association of *University Leaders for a Sustainable Future* (ULSF).

•   The COPERNICUS-Campus, responsible for the *University Charter for Sustainable Development*, signed by over 290 university heads in 36 European countries.

•   The International Association of Universities (IAU), which developed and adopted the Kyoto Declaration (supported by 800 member universities and institutions of higher education.)

•   UNESCO, responsible for the implementation of the Agenda 21 and the International Work Programme on Education of the United Nations Commission on Sustainable Development.

The eagerness of universities to participate in these debates and to identify environmental issues is a very positive starting point. But there is still a manifest lack in the establishment of concrete action plans for universities, even though higher education has a key role in the ongoing processes for change. At the 6th UNICA student conference in Rome (September 2010), we were able to set up an action plan, which can be carried out by all European universities according to their individual situation and needs.

3. What is happening globally in universities

If we take a look at what is happening now globally, many universities have started local actions to grow towards a more sustainable development. The examples below reflect the diversity of things that can be done by universities to become greener.

3.1 What some universities already accomplished

The ETH Zurich (Swiss Federal Institute of Technology) started to work on sustainable development by trying to make a shift towards a more sustainable food demand, supply and consumption on campus. The committee for sustainability at the University of Amsterdam came up with a project, which managed to eliminate all CO2 emissions of a big computer room by building the first climate-neutral computer room in The Netherlands. At

Loughborough University, the university and the Students' Union, capitalizing on the students' competitive spirit, established the *Energy League* – a competition between the halls of residence. The Energy League is set up to determine which student hall manages to reduce their energy consumption and carbon footprint the most. Finally, one of the most innovative examples is the University of Lausanne (Switzerland), which has its entire green areas mown by a herd of sheep. The sheep work for free, are very efficient and moreover fertilize the entire campus by their natural dejections.

This synopsis of examples shows how diverse and numerous universities' actions for sustainability can be. It also shows that, although the problem of sustainability is very complex, there are many ingenious and creative ways to approach it.

3.2 For a "green ranking" of universities

All in all, competition in sustainability seems to be a good way to promote the universities' status. In the United States, a "green university ranking" has been partly introduced in order to raise the visibility of what universities can do to improve their eco-sustainability. This ranking creates also a healthy kind of competition between campuses. The *Princeton Review's Guide* rates up to 286 "green" colleges and universities. The ranking is on a scale from 60 to 99 and the colleges receiving a score above 80 are being profiled in the report. The rankings were based on the universities' ability to excel in the ability to provide students a healthy and sustainable quality of life, and the ability to prepare students for green jobs and responsible green citizenship. It was also based on how well the universities used environmentally responsible policies.

A European green ranking could provide information on the types of actions that could be undertaken by European universities and give a great global visibility for the actions, which have already been set up within the EU. Moreover, a ranking makes it possible for future students to choose their future university, not only for the quality of education, but also on the basis of the universities' commitment towards sustainability. In addition, by making such a ranking, universities will be urged to invest more time and financial resources into their sustainability strategies, which will only benefit them in the long run. We therefore highly recommend a *Green University Ranking* to be established among European countries, too.

4. Action plan for a Greener Europe

Having outlined corporate as well as individual initiatives taken by universities worldwide, this part aims to provide answers to the question: how can European universities become greener and incorporate sustainability in their development? The question has been approached with a European perspective, since the creation of this paper is a result of the

discussions held at the UNICA student conference in Rome, in 2010. At this conference, our group led intense discussions on sustainable development for universities, and came up with a first draft of an action plan for Europe which will be outlined and explained in what follows.

We, students of Europe, believe that it is the duty of all universities to raise awareness and to make people more responsible and critical through higher education. Sustainable development must become a central part of the education system, as was also underlined by the UNESCO. All universities should have the objective to initiate and support green behaviour and to integrate a sustainable way of thinking into university life. In the next chapters, we put forward some answers and suggestions, separated into three different action levels: the European level, the university level and student's level.

4.1 At the European level

Within the EU, education policies are part of the competence of each of the Member States. Therefore, the only possibility for the EU to contribute to the development of higher education is by encouraging a greater cooperation between states. The EU has the authority to support and encourage actions, while fully respecting the legitimacy of the Member States in matters of teaching and in the organisation of educational systems. Article 165 of the *Treaty on the Functioning of the European Union* (TFEU) details the possibilities for EU actions in the field of education, which are among others "to encourage mobility of students and to promote cooperation between educational establishments". Moreover, an exchange of information and experience should be made possible. With no legally binding measures available it might seem impossible to stimulate sustainable development in universities from a European level. However, a number of European initiatives have already been adopted with the help of organisations and associations (not only universities from the EU but also from other European countries). This provides for an even broader scope of action. The best-known European document is the Copernicus Charter (The University Charter for Sustainable Development, 1997) as mentioned in chapter 2.2. In the framework of the Bologna process, the aspect of sustainable development has played and still plays an important role. Within the scope of the EU, the environmental management system, based on the *Council Regulation on Eco-Management and Audit Scheme* (EMAS - Regulation (EC) No 1221/2009), offers universities the possibility to evaluate, manage and continuously improve their environmental performance. One of the benefits for universities is that the EMAS-scheme promotes "transparency and an open dialogue with the public". This European wide scheme should be further supported to attract more universities and be extended to countries outside the EU. Several initiatives are suggested that will stimulate further cooperation among universities to incorporate sustainable development.

First, an exchange of good practices should be possible through a common European network of universities. On the one hand, universities could easily gather possible actions and receive creative input. On the other hand, a European network would also have the advantage to enable the evaluation of progress after a certain period of time. Thus, networks like UNICA or websites like the *Virtual Campus for a Sustainable Europe*[2] may be very useful for this project. Most importantly, this network should include a variety of different university users, not only professors, but also students and other representatives.

Secondly, as exposed in chapter 3.2, the EU should establish a *Green University Ranking*, in order to foster more actions for sustainability among universities.

Thirdly, it is essential that universities shall receive financial support for the accomplishment of green actions. This funding policy could be implemented by the EU, as well as by each of the European states.

In conclusion, we propose to create a "European Sustainability Vision for Universities". We urge the EU to create official guidelines addressed to all European universities. Although the Talloires Declaration and the Copernicus Charter have very clear directives and objectives, they remain rather vague as to how they should be applied. We therefore ask for the creation of a document that would present officially detailed and practical guidelines on how to become more sustainable, based on studies and concrete examples of what has been done and can be done by our universities. These guidelines can be created based on models like the *Green Building Programme* GBP. The GBP provides guidelines (and "modules" for each energy service) such as "Financing", "Energy Audit" and "Energy Management" (*Improved Energy Efficiency for Non-Residential Buildings*, 2010).

We recommend the future European guidelines for more sustainable and greener universities to extend the scope to a much wider range of sectors: e.g. waste disposal and recycling, water supplies, heating and cooling systems, green research, food supplies, eco-friendly means of transportation, etc. In fact not all universities within the EU do have the same priorities and needs regarding sustainability. Consequently, all universities should have a central role in the implementation of these guidelines. We propose the election of an official committee for sustainable development in every university. The role of this committee will be to adapt the European guidelines to the specific situation and needs of their university. The committees should be composed of at least one specialist in sustainable development and should be accessible to teachers, assistants, students and the staff responsible for building maintenance.

---

[2] http://www.virtualcampuses.eu/index.php/Main_Page

We strongly believe that the creation of such institutionalised committees and, further, the sharing of their knowledge through a European network of universities is at the core of the progress towards a more healthy and profitable development for all.

4.2 At the University's level

Becoming greener and more sustainable

Creating greener universities requires that measures should be taken for energy efficiency, air-quality, water and resource management, toxic-free materials, waste recycling and many other areas. And there are many ingenious ways to find solutions in each of these areas. For instance, the *Environmental Protection Agency* (EPA) has listed very detailed suggestions on how to improve the performance of a building and daily actions (Green Building, 2010). In the US, green school designs are based on the Green Building Council's *Leadership in Energy and Environmental Design* (LEED), which is the national consensus green building standard (Kats, 2006). In Europe, design standards vary from country to country (Yudelson, 2008). Several EPA and *European Commission* (EC) programmes have introduced product labelling, such as "Energy star".

A common practice is technical solutions, such as brining in more light with windows, whilst the most effective prove to be zero-energy and passive housing methods, which include improving the insulation and renewable energy use. Water use reduction has reached 32% and very significant is greenhouse gas reduction in green schools. These are valuable lessons, as the building sector contributes 40% of world's greenhouse gas emissions which source is mainly energy use (Kats, 2006).

From EC Directive 2002/91/EC and EC *Green Building Programme* (GBP) the main structure of an energy-efficient building commitment can be drawn. The programme aims to improve energy efficiency in non-residential buildings on a voluntary basis and realising cost-effective measures; participants join the GBP by submitting the application form. The GBP provides guidelines (and "modules" for each energy service) to achieve this goal, such as "Financing", "Energy Audit" and "Energy Management" (Improved Energy Efficiency for Non-Residential Buildings, 2010). The assessment and improve of environmental performances must be carried out in audits by independent experts.

The importance of these audits is also stressed and explained in the Annex II of Regulation No. 1221/2009/EC. One of the key approaches for evaluating a project or an action is the *Cost-Benefit Analysis* (CBA), also applied in the study of Kats (2006). CBA, similar to the *Environmental Impact Assessment* (Directive 2001/42/EC), can be applied to environmental assessment procedures, to include Precautionary and Assessment principles.

Overall, an assessment of the eco-situation of each university needs to be done by specialists in order to find out what can be done for further improvement. This assessment should include the measurement of the carbon footprint of each university and direct solutions on how it could be significantly reduced (Schoenaker, 2010). Moreover, every university member should be familiar with the global environmental situation and the reason why some action needs to be taken soon.

Therefore, one of the universities' main achievements will be to manage to become greener and more sustainable on the one hand, and to make these actions visible to the university community on the other hand.

Education and visibility

As mentioned in several of the above chapters, university has a key role in the education of tomorrow's citizens. This "education" process can take place on several levels.

On an institutional level, universities can set up classes, seminars and conferences on "how to be green" open to all the students, academic staff and employees. This would be the cornerstone for education and the providing of information to the university community. By providing this kind of education, the university will stay updated for every evolution in the field of sustainable development.

On an academic level, university should be innovative by taking some serious measures to allocate its funding in the support of scientists and the development of research. The latter comprises fields from green chemistry and technologies to any academic project related to sustainable development. That way, sustainability will be taught and practiced while pushing forward the process of change.

At a more global level, every action that is undertaken at the institutional or at the academic level can have an educational impact if it is made visible to the university community. For example, if a university puts up photovoltaic cells on the roof of a building, nobody may notice the change. Whereas posters could be displayed within that building with the message: "did you know that this entire building functions on renewable energy?" Thus, this kind of visibility gives out a positive and educational message to the university community and contributes to raising the awareness about the importance of sustainability.

The actions undertaken at these three levels could stimulate students and staff to a more active involvement and urge them to participate in green actions like cleaning rivers, collecting the garbage, or planting trees on university grounds. Moreover, it could lead the academic community to using more eco-friendly means of transport like the bus or the bicycle, which would therefore participate in educating the overall society, beyond university

grounds. Thus, by following simple action plans, universities can create a healthier and more sustainable quality of life for their community, while contributing to a long-lasting education of the population.

The benefits of sustainability

Many studies have shown that increase in energy-effectiveness can result in fair savings. The study from Kats (2006) approves that the financial savings show an average of $70 per square foot, 20 times as high as the cost of becoming green. According to Kats, financial savings to the wider community are even larger, and include the reduced cost of public infrastructures, lower air and water pollution, and a better educated and compensated workforce. For universities, a particular emphasis should be given to the indoor air quality, as students spend from 85% to 95% of their time indoors. Kats's study documents an improvement of up to 87% in respiratory illnesses from improved air quality. Many simple "green practices" can be learned in order to increase the financial benefits and the performance while reducing the environmental impact. Examples can range from decreasing the number of paper copies to introducing environment-friendly solvents.

Nowadays, several companies choose to rent "green" office spaces because it results in several economic benefits. The company improves its reputation and visibility and attracts more clients. Moreover, other direct benefits can be noticed like the improvement of employees' productivity and health (Eicholtz et al., 2009). Loyal and qualified workforce, reputation and high standards are important also for providing a competitive education, as today consumers' preferences can change drastically. A greener environment or architecture is proven to be more relaxing and refreshing; it therefore also motivates to study (Kats, 2006). Therefore sustainable universities should follow the development path of this type of companies. Through these actions, universities will motivate their students and staff with a sustainable and healthy study environment and a good reputation, while taking advantage of economic benefits involved.

Although the path that the university students of Europe have chosen to follow is not the most convenient, it is far from being impossible. It is widely known and accepted that not all universities are at the same "green level" so far and that means that not all the universities have to follow the same rules: some has to do more and some has to do less. But the most important thing is not the competition between the universities because the aim is common. The principal perception should be that each university, according to its standards and capabilities, and mostly based on its students, should make as many ecological steps as possible as we all know that greening a whole university cannot be achieved in a few days but instead it is a gradual procedure with constant efforts by all the people involved.

4.3 At the Students' level

At the students' level, we encourage the creation of student associations for sustainable development in all universities. These associations must find ways to familiarise the student community with environmental issues and more ecological ways of living and consuming.

In our perspective, students should be an integral part of the university's sustainability efforts. Therefore, raising the awareness of the student community through well-focused information campaigns is a crucial part of this process. Changing the mentality of university members, will eventually lead to spreading these habits to the whole of society. Thus, the role of students is to be creative in developing local actions in order to promote a "greener" way of life. This promotion can be realised through various campaigns, demonstrations, and communication. One of students' main goals should be to separate the concept of "being green" from pejorative ideas, which it is often associated with. Rather, "being green" can also be fun!

In the process of change we cannot only focus on the academic education given, but we have to take into account the great influence of peer-to-peer education. There are many ingenious ways to renew the students' interest for a field that is often seen as "not worthwhile". Therefore, "Green education" needs to be constantly kept up to date. Students could give particular focus on the "three Rs": Reduce, Re-use, and Recycle).

Student associations can also propose interdisciplinary research projects. For instance, a group made up of students in architecture, engineering, historic preservation, environmental sciences and economics could participate in the design, construction and evaluation of buildings on university campus and even in their cities.

In conclusion, these examples demonstrate how diverse and innovative local student actions can be. We are therefore looking forward for the European student community to surprise us with their creativity!

5. Conclusion and recommendations

What emerged during the research for this paper is, first of all, the great complexity of the issue of sustainable development. The latter involves political, financial, cultural, social and educational sectors. These multiple visions are part of our society and must try and get along, which is not always simple to accomplish. What is certain today is that all of these sectors agree on the fact that environmental problems must encounter feasible solutions in the next decade, in order to preserve the quality of life we have taken for granted until now. Yet, the sectors do not always agree on the type of solutions that need to be implemented.

This paper tried to depict the general situation of sustainable development and how it is deeply linked to our educational systems. Moreover, it offers solutions that may eventually enable all of the involved sectors to come to an agreement. The result of our discussions enabled us to avoid utopian and unreachable objectives. On the contrary, it leads us to propose a concrete European action plan, which can be carried out on several levels, and which should be adapted to the specific needs of each European university.

In conclusion, we quote our forum declaration, as extracted from the students's discussions during the Unica Student Conference that took place in Rome in September 2010:

" We, the students of Europe, demand a common action plan for a sustainable and green development to be implemented in every European university as soon as possible. In order to achieve this goal, we urge for the creation of official European guidelines to support this process. The latter shall consist of several recommendations and concrete examples of how to move towards sustainability and greener universities. We also ask for the election of committees for sustainable development in all universities in order to adapt the guidelines to every individual situation. In a close future, these committees should create a European network and share their knowledge. Most of all, we strongly recommend governments and universities to invest more funds into the research for alternative technologies and better resource management. These short-term investments in sustainability will rapidly lead to financial benefits and to the improvement of general quality of life. We also believe that these investments are central to maintain the efficiency of our education systems. Moreover, universities should stand as examples in raising the student's awareness – and therefore the population's awareness – on environmental issues. We, the students of Europe, challenge the EU and our governments and our universities to transform these ideas into political practice within the next two years. "

References

Osti G., Pellizzoni L., *Sociologia dell'ambiente*, Il Mulino Editore, 2008

Eicholtz P., Kok N., Quigley J.M., 2009. *Why Do Companies Rent Green?,* November 2009, RICS, London, United Kingdom

Kats G., *Greening Americas Schools: Costs and Benefits,* Capital E, October 2006

Biriukova N.A., *The Formation of an Ecological Consciousness*, Russian Education & Society, v47 n12 p. 34-45, December 2005

Hans Van Weenen, *Towards the vision of a sustainable university*, University of Amsterdam, The Netherlands, International Journal of Sustainability in Higher Education, Vol. 1 No. 1, p. 20-34, 2000

Mike Schoenaker, *CO_2 Management in Container Transportation*, Master Thesis, Maastricht University, Netherlands, 2010

European Commission, Regulation No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC

Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings

Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

Yudelson J., *How to follow the new LEED*, Building, [last updated] 16 September 2008
Available at: http://www.building.co.uk/how-to-follow-the-new-leed/3122417.article

Feist W., *Definition of Passive Houses*, Passive House Institute, [last updated] 23.09.2006
Available at:
http://www.passivhaustagung.de/Passive_House_E/passivehouse_definition.html

Internet sources

EMAS, 2010. European Commission Environment, The official website of the European Union, [last updated] 22 September 2010
Available at: http://ec.europa.eu/environment/emas/index_en.htm

Green Building, 2010. United States Environmental Protection Agency, [last updated] 27 September 2010
Available at: http://www.epa.gov/greenbuilding/

Improved Energy Efficiency for Non-Residential Buildings, 2010. Intelligent Energy Europe project GreenBuildingplus, Supported by European Commission and the German Federal Ministry of Transport, Building and Urban Affairs
Available at: http://www.eu-greenbuilding.org/

Introducing the EU Energy Star, 2009. Directorate-General Energy and Transport of the European Commission
Available at: http://www.eu-energystar.org/en/index.html

Rondinara S., *Il significato dei nostri rapporti con la natura*, January 2008
Available at: http://www.disf.org/Editoriali/Editoriale0801.asp

Websites:

http://www.co2mputer.nl/english/index.php
http://www.ecoworks.ethz.ch/
http://www.greenpeace.org/international/
http://www.wwf.org/
http://www.greendot.com.cy/default_gr.aspx
http://www.nationalgeographic.com/
http://www.princetonreview.com/green-guide.aspx