



The Role of University Education in Fostering Sustainable and Responsible Development

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Introduction

As affirmed by United Nations, education is a human right and the primary agent of transformation towards sustainable development, increasing people's capacities to transform their visions for society into reality. Education teaches people to be better individuals, family members, community members and citizens.

Quality education is holistic and a prerequisite for education for sustainable and responsible development. It upholds and conveys the ideals of a sustainable world. It takes into consideration the social, economic and environmental context. Quality education is locally relevant and culturally appropriate. It is informed by the past and relevant to the present, and prepares individuals for the future.

In recognition of the importance of Education for sustainable and responsible development the United Nations General Assembly declared 2005-2014 the "UN Decade of Education for Sustainable Development" while UNESCO was requested to lead and to develop an "International Implementation Scheme for the Decade". The main objectives of the UN Decade are to: facilitate networking linkages, exchange and interaction among stakeholders in Education for sustainable and responsible development; foster increased quality of teaching and learning in ESD; help countries make progress towards and attain the Millennium Development Goals through ESD initiatives; provide countries with new opportunities to incorporate education for sustainable and responsible development into their education reforms.

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Universities and scientific research organizations should find their engagement in fostering sustainable and responsible development within such an internationally framework. By fully exercising their independent powers, universities may in fact choose to actively engage in providing timely and effective understanding of the problems facing humankind and the planet, and in suggesting how to address them.

Fostering sustainable and responsible development through new paradigms

Universities are aware that according to a growing consensus our current paradigms are inadequate for addressing the long term needs of a sustainable future, and that it is then necessary to update strategies and procedures to accommodate the resilience required to progressively adapt to changing physical, historical and social conditions to play an active role in shaping a more sustainable future. To do so universities should encourage new thinking within the educational system to be implemented, as follows:

New models of economic growth consistent with sustainable development

The unbalanced exploitation of natural non-renewable resources, which were once considered an almost free commodity, has resulted in scarcity of the resource and, a growing cost and expense to consumers. More importantly this exploitation has led to increasing damage to the environment, the escalation of global warming and the potential for social unrest. This has led to wide global political interest and support for a subject which was once the province of scientific bodies.

More recently, the severe economic downturn has shown that social-economic relations can be significantly damaged at a global level, calling into question the functioning of current financial models and adding momentum to the discussion on sustainable development. In particular, the models used appear to have created behavior of suspect moral fortitude, which has begun to erode the trust on which socio-economic systems are based. In addition many of the models used by economists for assessing viability of decision making can work to the disadvantage of a long term sustainable view by discounting future events. If this is the case then new economic models and paradigms are required which reflect a new set of values related to human well-being beyond financial reward.

The role of the Universities to research, develop and communicate through education the new paradigms cannot be overestimated if the world is to embrace the concept of sustainable development. It is also important that business models also incorporate the new paradigm and engagement with the business sector is an important aspect of the University education remit.

A focus on the interdependence within ecosystems

All aspects of our living environment are composed of elements, chemicals and raw materials that originate in nature. A depleted planet will result in considerable restrictions

to growth. In addition the way we behave through our social systems, the decisions we make in one sector impacting on another and the effect of our technologies on climate change are resulting in complex systems which have a high degree of inter-dependence. Exploring and teaching society the nature of this interdependence is critical to establishing the ecosystems which impact on sustainable development. For example, an understanding of the origins of the components of our urban environment can result in more careful utilization of nature and natural resources.

Improving awareness of sustainability includes such issues as the life-cycle impacts of human activities on Earth systems, control of greenhouse gases, land and energy use, consumption patterns, pollution and transport, all of which have direct connections to education for sustainable and responsible development . There is a high degree of inter-dependence between all these factors. An understanding of these matters through education contributes to building the skills and attitudes needed to question the way we think, the values we hold and the decisions we make in the context of sustainable development. It seeks to enable individuals to take informed and responsible decisions and actions, now and in the future by also realizing the impacts of their decisions on others.

In addition education is recognized as an essential element in disaster risk reduction strategies. Major disasters such as the tsunami and the major earthquakes have major impact on sustainable development. This requires more education of all sectors of society on disaster reduction practices based on the application of scientific and technical advances and management practices. Education for disaster reduction is a transdisciplinary exercise aimed at developing knowledge, skills and values which will empower people of all ages, at all levels, to assume responsibility for building a safer and sustainable future.

New approaches to sustainable energy

Energy and all other non renewal resources (water, land, air, soil, etc.) form the basis of the entire living process in the present and in the future. The focus should not merely be on preventing over-exploitation of existing resources or on limiting the growing excesses of pollution but to provide alternatives which have a positive impact rather than negative. Sustainable science suggests that it is mandatory to take a more active and responsible investment in alternative energy even though this may not be currently profitable, as its continued development would be an important gift to future generations.

Education can support sustainable and responsible development by training, educating and encouraging human behavior toward a reduction of energy consumption and by supporting the science and technology that will provide an answer to the increased loss of non-renewable energy sources. Most of the fuel consumed since the industrial revolution has come from within the earth in the form of fossil fuels. Transport, food production, industrialization and the built environment have a significant impact on energy consumption.

The development of alternative energy systems is a crucial issue at a global level. The last two decades have seen the exploration of virtually every avenue that might contribute

to greater self-sufficiency for communities including feasibility studies, demonstration projects and commercial development of a range of energy sources including hydropower, wind turbines, ocean waves, solar and geothermal energy, municipal solid waste and biogas. In many cases, progress in these alternative developments has fallen short of expectations. Shortfalls between hopes and accomplishments have been attributed to many factors, including inadequate resource assessments, poorly conceived projects based on unworkable assumptions, and even opposition by environmental and other groups. Education has a part to play in discerning between what is possible and what is appropriate and conveying the emerging knowledge to all generations.

A focus on ethics as a set of incentives fostering sustainable development

Ethics, Economics, and Ecology, provide frameworks, with which to better understand and assess the enormous complexity of negotiations between the present and future generations. In particular, Ethics (the philosophical study of the moral human value of human conduct and the rules and principles that ought to govern it) allows us to better analyze such intergenerational interactions in the critical context of the social, economic and natural Environment. Ethics monitors how the values at the core of our social contracts are evolving and can address the crucial issue of consumption of the present versus the needs of future generations. Economics on the other hand can show how the balance between supply and demand and peoples choices can take place within a market dominated by a particular value system.

Trust, which is at the corner stone of socio-economic systems and is based on the assumption that there are rules and principles distinguishing what is right from wrong, and which are agreed by society. Without trust there can be no sustainable and responsible development but this trust now extends into the future for future generations to make judgments. Education can support and facilitate trust in our present and future societies by providing a common understanding of what is desirable and acceptable behavior from all who are charged with sustainability issues.

One of the major ethical issues for supporting the return of trust and the achievement of sustainable and responsible development is inclusion, which can enable a greater level of trust. Inclusion in this context means being a part of what everyone else is, being welcomed and embraced as a member who belongs, and feels respected and valued. Lack of inclusion can mean that some people may feel outside the changing paradigm, not engaged and therefore not committed. This attitude can often arise from ignorance of the other point of view and Universities can play an important part in making sure that all are informed.

Local cultural identities and values shape the way people live, and determine their responsiveness to educational programs, and the degree to which they feel involved in preserving a better future for generations to come. Building an effective global approach to sustainable development, inclusive of all differences and instances, will need to address people with a local discourse, about their immediate concerns. Indeed, inclusion has recently become a key political priority for many countries, which pragmatically believe that including more people in our economy and society would be beneficial for at least three reasons. Individuals would have a better life, costs for society would be

reduced and economic and business opportunities would increase.

Universities are microcosms of culture and of the society that supports them. As such, they should be bastions of ethical behavior and provide the training ground for students to determine and practice a personal code of ethics that will guide them for the rest of their lives. Universities should provide examples of ethical consideration as well as providing students with education in ethical values, including the underlying concepts, critical intellectual skills to help in decision making, a broad view of universal ethical codes, and a sense of responsibility for others when making personal choices. Each classroom should become a “laboratory” of the process of decision making, and of critically examining choices in the workplace, interpersonal relationships, and personal lives. Instructors should play an important role in assisting students to view ethical choices as a vital part of their future lives, both as professionals and in their daily living.

Approaches to implementation and engagement through the Universities

Science and academic disciplines are naturally endowed with an international vocation. The communities of scholars and researchers have always overlooked the boundaries existing between nations, in order to share and extend the frontiers of knowledge. This enables eminent Institutions that are pioneering reflections on specific issues such as sustainable development to establish an academic rather than a political summit debate and to commit themselves to working together for the common good. Given the size and diversity of the issues to be faced, the following priority areas seem an essential aspects of the education agenda for sustainable development.

Engagement with industry, commerce and the community to promote awareness and innovation of sustainability issues

In more recent years governments and industry have begun to take on board the need for strong policy with regard to sustainable development. Indeed many businesses have seen an opportunity to create new products and processes responding to growing public demand. However there are many firms, which require assistance and further education to engage with sustainability issues and to adapt to the changing paradigm. There is a strong need for the universities to provide the knowledge and approaches which will enable such firms to adapt and respond to the changing environment. Alongside the centres that have been established for this purpose the universities should be providing leadership, courses and advice to industry, commerce and the community.

In doing this the universities need to understand the motivations and needs of industry and commerce in a way which has not always been apparent in the past. They should understand business objectives and seek to engage in dialogue which will enable the transition to the new paradigm relating to sustainable development to be achieved with the minimum of pain without compromising the sustainability agenda.

Inclusivity to provide a seamless web of knowledge development

Inclusivity should be a major thrust of university's action. This inclusivity should be applied across all sectors of the population but two key but neglected areas could be those people found within the pre-school age group and those associated with the ageing society.

Preschool education is for children before the commencement of statutory education, usually between the ages of two and five. Allowing preschool aged children to discover and explore freely is the foundation for developmental learning and this could be applied to sustainable development. Publicity and promotion of the idea of an appropriate sustainable practice for preschool education, has been advanced there is still much more to be done. Universities have a potential role to spread the message of sustainable development among preschool educators so that they may be aware of developmentally appropriate practice to put into practice in the class room .

The current shift in demographics around the world, with increasingly ageing and shrinking populations in the developed world, presents a major challenge to societies and companies alike. Both of the above are areas in which several universities, in accordance with "i2010", the EU Policy Framework for the Information Society and Media are already engaged. For example in promoting the positive contribution that Information and Communication Technologies (ICT) can make to the economy, society and personal quality of life and by using Information and Communication Technologies (ICT) to meet the needs of an ageing population (health, work, quality of life and assistance).

The addressing of these issues through the lens of sustainable development will address the current and the perceived future needs of a differently structured society. Future generations will expect such groups to have been included in an understanding of what is sustainable and by including them it is possible to develop a seamless web of continuing education from cradle to grave responding to the needs of the sustainable development agenda.

Research to provide input of cutting-edge knowledge

The focus of the G8 Summit for Universities is to address the role of education but the link between research and education cannot be overlooked. Sustainability science is relatively new and the body of knowledge in the area is emerging, evolving and enthusing many of the worlds leading thinkers. Like all new emerging areas the knowledge is not well structured, is not robust and has yet to be developed into an established set of theories and practice.

The G8 Summits, the United Nations and other international organizations have already launched a number of initiatives addressing various aspects of sustainability, such as a low-carbon society, a resource-circulating society, and a nature-harmonious society. However, the development of a truly comprehensive vision of sustainable society will require new scientific knowledge, restructured to reverse past tendencies toward stratification and fragmentation in research, and to foster an integrated holistic approach to decision making and problems solving.

Sustainability science has been recognized as a branch of science by the National Academy of Science in the USA since 1999, and grew from the recognition that in order to deal with the complexity of human-nature interactions, a decisive change is needed in the way that science is undertaken. It is concerned with studying the interactions between nature and society. It is a transdisciplinary science in that it draws on many scientific disciplines across the natural and social sciences, as well as other knowledge systems (e.g. indigenous knowledge and tacit practitioners' knowledge) in order to study the dynamic interactions within social-ecological systems. Finally, it is an arena for co-evolution, co-production and co-learning under the umbrella of complex systems thinking.

This new science recognizes the need for dialogue between science and society in a context of rapid social and technological development and uncertainty about both the impact of these developments, and the ability of science to accurately predict the outcomes of actions and processes such as global change. It recognizes the need for new cooperative understandings between science and society in order to strengthen science for the benefit of society. Scientists need to be responsive to the changing needs and concerns of society; and society, in turn, needs to understand and support the positive role of science. The above have clear implications for scientific and professional ethics, the integrity and accountability of science, and ideals of universal accessibility to knowledge, as well as the role and responsibilities of science and scientists in society.

The role of science in the twenty first century is to provide guiding tools for the pursuit of sustainable and responsible development. Sustainable development is internationally recognized as a dynamic process, which engages all aspects of the complex human-nature system. It requires an understanding of the relationships between different complex factors and a 'holistic' approach that would integrate all related impacts taking into account multiple viewpoints and objectives, and addressing the significant linkages in the system, including ecological, technical and institutional systems.

If universities are to play a role in educating for sustainable development then they must be close to the research which is being undertaken in order to understand sustainability more fully. The knowledge will change, priorities will emerge and new thinking will develop. To be not connected with leading research would mean that the education would be out of date, possibly irrelevant and almost certainly inadequate.

For example, recently, the economic downturn has started to shift the paradigm from "development" to "resilience". Resilience is the capacity of a system to absorb disturbance, undergo change and still retain essentially the same function, structure, identity. Feedback as well as adaptability and transformability systems related to resilience seem to provide a potential foundation to study the dynamics of social-ecological systems to establish sustainable development policy and practice. In fact a study of resilience in social systems has the added ability to anticipate and plan for the future. The economic recession that the world is currently experiencing is testing the capacity of today's social ecosystem's to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes, to withstand shocks and rebuild itself when necessary. It is a true sustainability issue.

A governance for strategic development

Education for sustainable development should also have a role to play in the development of policy both in informing the policy makers and in promoting and implementing the policy once established. Policy makers need education and research to ensure that they are developing policy principles which are based on sound knowledge and sound science. They will be informed by scientific studies and measurements which provide evidence for the action to be taken. The tools for assessment and measurement have often emerged from the university research and passed on to the students through the education system. This can also be extended to continuing professional development so that laymen and experts alike can be informed by the results and the methods which have been adopted for monitoring and assessing.

Universities have a role for developing the assessment methods and developing the human resource, through education, which will teach others to adopt the assessment methods created. In particular, universities and scientific research organizations play a crucial role in developing a new generation of metrics. These new metrics should be able to capture social and political issues, as well picture economic situations, and act as media to communicate the progress towards sustainable and responsible development to the local communities and other stakeholders involved. In this area, the role and responsibilities of universities and scientific research centers is crucial also in training and providing capacity building.

Equally important is the contribution of universities toward the development of good governance, based on new participative, multi-scale, polycentric and non-hierarchical approaches to policy making and public administration, regulation and law. This is an important and increasing area of research and training which reflects the need to build up public consensus over critical issues that include controversial interests. The democratization of decision making is a key element of decision making in sustainable development but this requires an educated and informed population who can constructively deal with the complex issues involved.

Appropriate networks

Essential to Sustainable development science is the implementation of the “Network of networks” (NNs), launched at the “2008 G8 University Summit”, which is able to link the various discipline-specific research networks already in place, thereby utilizing and augmenting their respective strengths and knowledge bases. In fact, if Education for a Sustainable and Responsible Development is to be an effective tool for engaging people in negotiating a sustainable future, making decisions and acting upon them, it must first address the way communities think about sustainable development and the role education can play.

The NNs provides a common platform and meeting space for the sciences and practice together with public policy innovation by enhancing interdisciplinary cooperation among universities and research centers in different nations through such initiatives as student exchange, faculty exchange and joint research projects. Each of the universities participating in the G8 University Summit plays a prominent role in its part of the world

and is connected to networks related to their own interest. Models developed by these universities in different areas to address common issues, reflect each region's economic, social and cultural conditions. Together they can provide the components for a global model that incorporates regional diversity.

The Network of Networks (NNs) should be capable of addressing the broad and complex range of sustainable and responsible development issues through training and research activities such as holding research network conferences and building consensus on sustainable and responsible development objectives. The NNs operate as a platform for science and public policy innovation, improving cooperation with universities and research institutes in developing nations through joint research and education programs, and to provide support as needed. They work actively within our universities' and surrounding communities to develop social models for sustainable and responsible development. Campuses offer an opportunity to serve as experimental venues where the knowledge captured can be put into practice as a good role model.

Built upon the Network of Networks, a Global Research Centre on sustainable and responsible development should develop to act as an integrated yet autonomous virtual research centre relying on the full cooperation from all disciplines covered by each university's activity. Its aim would be to elaborate the amount of information gathered by the Network of Networks, proposing a new data-mining approach to such information to help research in different field for the pursuit of sustainable and responsible development.

Conclusion

In today's critical socio-economic and natural environment, universities are facing a challenging responsibility. Many are experiencing the global reality of shrinking public spending for education, but universities should continue to educate the leaders of tomorrow by: addressing the issues raised above and by encouraging work across disciplinary boundaries in order to produce a holistic approach to the problem. This includes. bringing more sensitivity to ethics in economics so that financial markets will not experience again the catastrophic impact of the 'credit crunch' as seen in the last year; decreasing the complexity of urban conglomerates; exploring the growth of innovation and the up-stepping of production and consumption cycles that highlight the dangerous upward trend in energy needs; forming institutional partnerships and building links with business and industry to foster enterprise innovation and the growth of GDP for the benefit of mankind; bridging campus and community; to define lines of intervention on issues that are crucial for the survival of the planet and of humankind.

The above discussion has outlined the important role that education has to play in developing and implementing a sustainable development agenda. The subject is complex and vast in its scope. However through the leading universities working together then universities have the potential to collaborate and contribute a significant change in the sustainability agenda for the benefit of humankind.