

Part 1. Introduction and key Concepts

1. Introduction

Scholars and policy makers are becoming increasingly interested in the processes that lead to transformations toward sustainability. Through their pivotal and influential role in society, universities are key stakeholders in achieving a sustainable future (Cortese, 2003). As respected thought leaders, universities have opportunities to elevate the importance of sustainable development (SD) through scholarly and public discourse. In addition, universities have the opportunity to provide their communities with graduates who have the knowledge and skills necessary to help transform their workplaces and live as responsible global citizens (Ferrer-Balas, et al., 2008).

Universities around the world are responding to these opportunities and beginning to engage in activities related to SDGs, whether through campus “greening”, development of special courses on sustainability, or offering collaborative research opportunities.

The ongoing debate around how universities can benefit from engaging in the SDGs, and actively contribute to this mandate, has occupied academics and researchers for the past few years. Accordingly Pharos university has taken the initiative to implement a project “Sustainability Transformations In Pharos University” for transforming Pharos university to be a sustainable university as part of compliance of Pharos university to implementation of the UN-SDGs and Egypt 2030.

2. About the Project

The main goal of the project is to mainstream sustainable development ideas and sustainability science into education and research in Pharos university, with tuning of academic functions, including “the changing of paradigm from industry-market driven research and learning process to the one that is backboned by sustainability. The specific objectives are:

- Developing new approaches and methodologies of teaching and education at all levels must be developed in the field of sustainability science.
- Exploring research and education practices at Pharos university and infuse the Sustainability science component
- Moving sustainability knowledge into actions across full range of scaled of disciplines, and
- create learning opportunities for students, and practitioners in the field of sustainability to meet the need required to comprehensively address sustainable development as a new way of running the university.

In literature, the Key characteristics of a sustainable university are:

- Transformative education rather than merely transmissive education to prepare students capable of addressing complex sustainability challenges.
- Rather than being a one-way process of learning, it must be more interactive and learner-centric with a strong emphasis on critical thinking ability (Sterling, 2005; Wals and Corcoran, 2006).
- A strong emphasis on effectively conducting inter and transdisciplinary research and science (see, e.g. Max Neef, 2005; Van Dam, 2006).
- Societal problem-solving orientation in education and research through an interaction through multiple interfaces to be pertinent to societal goals. As a result, students must be able to deal with the complexities of real problems and the uncertainties associated with the future.
- Networks that can tap into varied expertise around the campus to efficiently and meaningfully share resources.
- Leadership and vision that promotes needed change accompanied by proper assignment of responsibility and rewards, who are committed to a long-term transformation of the university and are willing to be responsive to society's changing needs (Lozano, 2006).
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According to the above, the project “Sustainability Transformations In Pharos University ” focuses on awareness of sustainability and sustainability science , use of Education for Sustainable Development (ESD) as a tool for new teaching and learning delivery mechanisms, a diffusion of channels to market, and stakeholder expectations for increased impact and implementing sustainability in research areas of combined perspectives e.g. innovation and social-ecological-technological systems interactions, patterns of transformation, and change agents for transformation. Education for sustainable development has to do with not only scientific knowledge but also is aligned with the development of personal and social aptitudes leading to responsible citizenship.

The project recognizes that higher education must do more than simply pay ‘lip service’ to sustainable development and should focus more on learning on issues of relevance facing society. As this is heavily interdisciplinary and related to values, there is a need to re-examine the goals of higher education with the sustainable development goals with emphasis on goal “quality education”.

For fulfilling the above goals, the project is planned to be implemented in 3 phases, which are:

Phase 1. Awareness phase:

This phase focuses on an awareness and campaigning process which is required to comprehensively address sustainable development through series of lectures and workshops (See [Appendix 1](#) for details)

that allow some restructuring of the academic functions and learning process such that the education become culturally appropriate and locally relevant. It also includes designing educational contents and methods which the learner should acquire.

This phase will be implemented throughout the academic term of the university in the form of series of interactive lectures and workshops

Phase 2. Preparation phase.

The second phase is aimed at developing the scientific and educational base necessary to address key environment and sustainable development priorities, including ecosystems management; climate change adaptation; management of the world’s freshwater and marine resources; and responses to disasters and risks, sustainable energy sources, green cities, etc. In this phase formulation of focal groups from each faculty ([Appendix 2](#)) were identified to work on evaluating the sustainable development content of curricula in each faculty using different tools available, followed by mainstreaming sustainable development and sustainability science in the curricula.

The time allocated for this phase is 6 months.

Phase 3. Sustainability in practice.

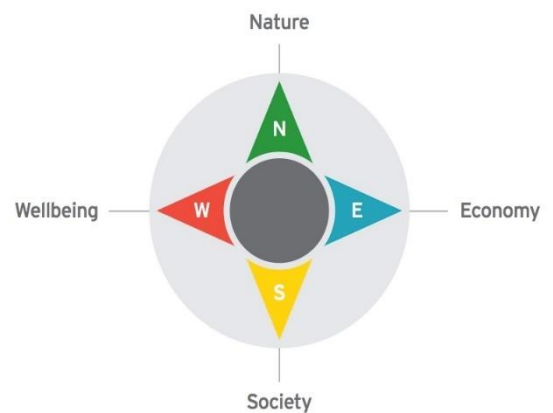
This third phase focuses on the implementation of a change project for sustainable development in practice articulating a global vision in local terms. This phase addresses sustainable development goals and ways towards their achievements through small case projects in the different faculties of Pharos University. It will be implemented by students and young researchers to demonstrate Institutional development activities (e.g. policy development / green campus development / student initiatives etc.)

The time allocated for this phase is 12 months

This report puts forward points of view of each of the faculty members from the focal group that has participated in the project and addresses concerns in science education.

3. Sustainability Framework and Sustainable Development Goals (SDGS)

Sustainability Compass as a framework and as a tool provides a general overview, a methodological introduction, and stakeholder process guidance. It has been adopted for many uses including a classroom teaching and curriculum planning tool for educators. The Sustainability Compass, both as a symbol and as a category framework, is almost self-explanatory. A compass helps mapping the whole territory, and find our direction. This Compass takes the ordinary English-language directions -- North, East, South, West -- and renames them, keeping the same well-known first letters.



N is for Nature - All of our natural ecological systems and environmental concerns, from ecosystem health to resource consumption and waste.

E is for Economy - The systems by which we use nature, together with our own work and ideas, into goods, services, money and jobs.

S is for Society - The institutions and structures that organize our collective life as human beings, from government agencies to school clubs, as well as the cultural values underpinning them.

W is for Well-being - Individual health, happiness, and quality of life, which also includes the health and happiness of our families and others close to us, and our relationships to them.

Those four categories are not accidental. They correspond to categories created by prominent sustainability theorists, going back to the 1970s. The fact that the words line up so well with the four directions of a compass was a happy coincidence, discovered in 1997 by Alan AtKisson at an international meeting on indicators of sustainability, sponsored by the Dutch government. Since then, the Sustainability Compass has spread around the world.

These four category descriptions are general, but they can (and really must be) extended and elaborated with specific topics, depending on the specific use of the Compass. For example, the Sustainability Compass for business is quite different from the Compass for school use. But the four “Compass Points” still retain the same essential meanings.

Specifically and concretely, the Compass framework can be used to do the following:

- Explain sustainability to audiences of all kinds in clear, simple language
- Train and teach sustainability in a whole-system way
- Provide a unifying symbol for sustainability and sustainable development efforts
- Convene stakeholders and manage their involvement in sustainability initiatives, and ensure that you do not leave out any important perspectives
- Develop sustainability indicators and performance indices for an organization, company, city, or school
- Perform sustainability assessments and gap analyses for companies and other organizations

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

Here are the icons of SDSs

Sustainable Development Goals



These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another. academic institutions have a much broader responsibility and role to play to reach the wide-ranging SDGs.

3.1. How can universities contribute to the success of the SDGs?

The ultimate function of an academic institution is to provide youth with quality education. Therefore, universities play an essential role in teaching the younger generation about the wide spectrum of social, economic and environmental global challenges the world is currently facing. Moreover, as universities tend to hold the responsibility to advocate the importance of SDGs and play their part in fulfilling the SDGs in the following ways:

Research: Provide research knowledge, innovations and solutions towards achieving the SDGs. As universities tend to receive private and public research funds to directly and/or indirectly solve world issues, universities are responsible for providing the in-depth academic and vocational training needed to achieve the SDGs.

Institutional culture: Advocate for faculty members to help students set up networks, campaigns and projects to promote the importance of being an active member of society. Students need to take an active role in implementing their own research projects and recognizing opportunities to help attain the SDGs.

External leadership: Universities are responsible for raising awareness about the SDGs, whether through public lectures, community events or forums. Universities need to collaborate with other institutions and work with policymakers and leaders to identify problems and potential solutions to create a more sustainable, inclusive and innovative world.

Education for Sustainable Development (EDS) is a two-way street. It is evident that the UN's SDGs are ambitious and difficult to attain without an education sector that empowers future leaders to make responsible decisions that positively contribute to economic viability, environmental integrity and societal growth.

4. Education for Sustainable Development (ESD).

Embarking on the path of sustainable development will require a profound transformation of how we think and act. To create a more sustainable world and to engage with sustainability-related issues as described in the SDGs, individuals must become sustainability change-makers. They require the knowledge, skills, values and attitudes that empower them to contribute to sustainable development.

Education, therefore, is crucial for the achievement of sustainable development. However, not all kinds of education support sustainable development. Education that promotes economic growth alone may well also lead to an increase in unsustainable consumption patterns. The now well-established approach of Education for Sustainable Development (ESD) empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society for present and future generations.

ESD aims at developing competencies that empower individuals to reflect on their own actions, taking into account their current and future social, cultural, economic and environmental impacts, from a local and a global perspective. Individuals should also be empowered to act in complex situations in a sustainable manner, which may require them to strike out in new directions; and to participate in socio-political processes, moving their societies towards sustainable development. ESD has to be understood as an integral part of quality education, inherent in the concept of lifelong learning. Thus, ESD does not only integrate contents such as climate change, poverty and sustainable consumption into the curriculum; it also creates interactive, learner-centered teaching and learning settings. What ESD requires is a shift from teaching to learning. It asks for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinary and the linking of formal and informal learning. Only such pedagogical approaches make possible the development of the key competencies needed for promoting sustainable development.

Education for Sustainable Development means including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behavior and take action for sustainable development. Education for Sustainable Development consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way. Education for Sustainable Development requires far-reaching changes in the way education is often practiced today. UNESCO is the lead agency for the UN Decade of Education for Sustainable Development (2005-2014) that was extended for another decade. As we get closer to the 2030 SDG agenda, it has become clear that achieving the UN SDGs is far from possible without the education sector's significant involvement in the cause. Education for Sustainable Development (EDS) has been recognized as an integral contributor to achieving several SDGs.

5. Mapping and System Thinking

One of the most useful and easily adopted tools to use in teaching and the study of complex sustainable development issues are the concepts system thinking and curriculum mapping concepts. These concepts are especially handy in higher education when used to clarify the shared understanding and multidisciplinary and transdisciplinary issues in education and research, and joint cooperation of members of a working team or study circle. In most cases, concept mapping can help participants to understand and clarify not only their own knowledge building but also the constructions of knowledge by other members of the study group. With this digital tool for concept mapping one can, it is possible to share information and understanding with others and find put subtle connections among courses and applications. In the current project, the concept of curriculum mapping has been used a specialized tool called Unit-based Sustainability Assessment Tool (USAT). USAT This sustainability assessment tool was developed for use in the Swedish/Africa International Training Programme (ITP) on 'Education for Sustainable Development in Higher Education', and complements the UNEP Mainstreaming Environment and Sustainability into African Universities (MESA) 'Education for Sustainable Development Innovations Programmes for Universities in Africa' materials

(available on www.unep.org/training/mesa/toolkit.asp). It is designed to assess sustainability at universities. The tool focuses on the different functional units in a university (e.g. departments, research units, management units etc.), and how they are integrating sustainability concerns into their core functions of teaching, research and community engagement and university management operations. Using a unit-based assessment tool allows for 'building the picture' of the whole, as well as concentrating on specific units as required (e.g. concentrating on one department etc.). This framework allows for the integration of sustainability thinking across the different units of the university and creates possibilities for sustainability issues to be managed within functional units, as well as through a broader systemic framework. (details in Appendix 3).