Chapter 28
Education for Sustainable Development

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Abstract Education is to play an essential role for sustainable development (SD). The chapter dedicated to "Education for Sustainable Development" (ESD) explains why and how this can be done.

First of all, a distinction is made between several levels of organizational change within a university, varying between minor changes and all-out transformation processes, leading to a state of "System Integration of Sustainable Development" (SISD). In such a process, not only the main aspects and activities of a university are transformed but even the very identity of the institution. In order to achieve this, a university has to act as a "learning organization," as is described using the concrete example of a Dutch university for applied sciences.

The key role of a university toward sustainable development is its education, as is argued. In order to describe which elements the transformation of the education consists of, the so-called Tree Model is used.

The "roots" of this tree represent the educational goals, i.e., a description of the type of professional the university wishes to deliver to the society and the professional fields. For this purpose, a tool is available called "RESFIA+D," which offers a method to develop or improve the professional competences of study programs, making use of a description of a number of levels of competence.

Another set of tools is described to develop the "trunk of the tree," i.e., a general introduction to sustainable development for all academic disciplines, consisting of a textbook and a website offering accessories, e.g., exercises, serious games, video clips, etc.

Other elements of a tree are used to describe more aspects of ESD, such as the branches, which represent the disciplinary integration of SD within modules and topics throughout the curriculum.

Finally, the chapter describes a way to raise the expertise of the teaching staff, which is quintessential to achieve the desired ESD transformation. Together with an integration of this development with the quality management, making use of ESD assessment tools such as STARS (Sustainability Tracking, Assessment & Rating

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System) or AISHE (Assessment Instrument for Sustainability in Higher Education), the goal of SISD can be reached.

Keywords Education • System integration • Transformation • Competences • Assessment

1   Levels of Change: From Minor Additions to System Integration of SD

Education is an essential contributor to sustainable development (SD). This is expressed in many sources, e.g.:

> Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. […] Education [is] indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making. (UNCED 1992: Agenda 21, §36.3)

In order to contribute to SD, education will have to change drastically. The science that investigates this change process is "Education for Sustainable Development" (ESD).

When educational institutions start ESD activities, this usually initially leads to minor changes, in which SD elements are added, "bolted-on," to the education without deeply changing the existing. In an ESD assessment instrument, AISHE (Roorda 2001; Roorda et al. 2009), this development stage is described as "stage 1: activity oriented." As the development proceeds, the institution may enter stage 2, "process oriented," in which SD becomes more and more integrated into the curriculum and in the institutional vision, policy, and operations.

A crucial next stage is "system oriented." If a university or school reaches this stage on a wide range of criteria, it realizes a state of "SISD": *System Integration of Sustainable Development*. This stage is described as:

> SISD not only means a systematic integration of sustainable development into an educational organization (or a functional unit within it, e.g. a faculty, a school, or a study program), but also, and even primarily, at integration at a systems level. The latter implies that sustainable development has become a part of the fundamental characteristics of the organization, of its very identity. If this is the case, it will be observed that sustainability has become a part of all or most activities, or at least of the thoughts and philosophies behind those activities. (Roorda 2010, p. 138)

> **Question**
> Consider your own university, or a university that you are familiar with. If you were to express the present state of this university as a percentage of a full SISD, what percentage would you choose? Do you think that everybody would roughly agree with your estimate?
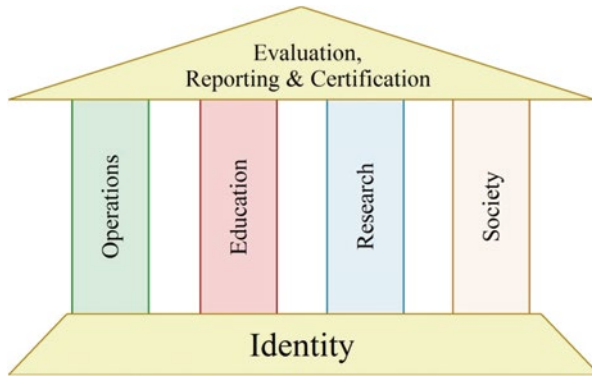
Fig. 28.1 The main functions of an educational institution

The development stages of AISHE show resemblance to the levels of change defined by Sterling (2004). A comparison can be found in Roorda (2010, p. 139).

Thorough ESD integration will have consequences for all four main functions of a university (Velazquez et al. 2006), as Fig. 28.1 shows, i.e., on its operations (Clugston and Calder 2000), its education, its research, and its community outreach (Megerle and Megerle 2000). More fundamentally, realizing SISD has consequences for the identity of a university and on its quality management and public reporting.

Some aspects of SISD are (Roorda 2001; Roorda et al. 2009):

> The organization visions itself as a key player for sustainable development […]. Staff and students are actively involved in the continuous development and improvement of the vision and policy on sustainable development. The organization can be characterized as a *learning organization*. (AISHE 2.0, criterion I1: *Vision and policy*, stage 3)

> SD is implemented systematically in the entire curriculum, in accordance with the graduate profile. (AISHE 1.0, criterion 4.1: *Curriculum*, stage 3)

> All environmentally related topics are part of an integrated environmental management system (EMS). This EMS is fully functional within all parts of the organization. The environmental reporting is an integrated part of the annual reporting of the organization. (AISHE 2.0, criterion O4: *Ecological sustainability*: stage 3)

Details about the application of AISHE are described below.

> Avans University hosts 27,000 students, over 100 study programs, and 2200 employees. Its ambitions regarding sustainability can be summarized in two statements:
>
> Avans post-graduates contribute actively to sustainable development by combining entrepreneurial spirit with sustainable awareness and engagement.
>
> Supported by its knowledge of and engagement with society, Avans participates in solving major societal issues.

In order to realize this, the university board has formulated its vision, mission, and goals regarding ESD in a vision document. The main targets are also agreed with the Dutch Ministry of Education as a legal contract.

In 2012 Avans took off to meet its ambitions by installing several multidisciplinary groups of lecturers to enhance and sustain the process.

One group received targets to develop educational materials for SD to be used in all study programs: basic materials to be used as an introduction to SD in the first year and building blocks covering specific SD issues, e.g., C2C, circular economy, sustainable finance, bio-based energy, and scenario thinking.

Another group was trained in using assessment instruments (described below), such as RESFIA+D for the educational goals, the C-scan for the curriculum contents, and AISHE for the overall ESD strategy. In these assessments all stakeholders of Avans are represented: students, lecturers, management, and the professional field.

In 2013, the various initiatives are integrated into an all-encompassing program to implement SD, both in the curricula and the organization. The aim is to evoke awareness and build commitment for SD, with clear goals and quality indicators for competences of staff, students, and organization.

If all ambitions prove to be successful, around 2018 Avans will have realized SISD in all aspects: its education, operations, research, community outreach, and – last but not least – its identity.

2 The Learning Organization

The organization development of a university toward SISD can hardly be described as a project or a program, as the final goals cannot be described and planned conclusively right from the beginning. A better qualification is an explorative journey, or an adventure, in which the goals and the strategy are redefined continuously, in an iterative process. Therefore, in order to realize SISD, an institution has to behave like a *learning organization* in which the SISD development process is performed as action research, with the institution itself as its object of study. This implies

> … a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities. (Reason and Bradbury 2001)

The complexity of the SD concept and of an educational institution, as well as the fact that ESD is not value-free but has the ambition to achieve societal improvements, requires a new scientific paradigm for this kind of action research. One such paradigm is "transdisciplinary science" (Roorda and Rachelson 2016).