

## Workshop:

# Tools for ESD design

*(ESD = Education for Sustainable Development)*

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Duration : 1½ hours

**Niko Roorda, PhD**

Avans University

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### Abstract

Several tools have been developed in the Netherlands to (re)design study programs in such a way that sustainable development (SD) is integrated in the curricula, thus creating or improving education for sustainable development (ESD).

During the workshop, five such tools will be explored: an ESD checklist, the assessment tool AISHE, a tool that uses a tree as a metaphor, an SD Competences Matrix, and an SD Curriculum Scan.

After a short orientation, the participants will apply the tool of their choice to their own university. The workshop ends with a discussion in which the experiences are compared, and conclusions are drawn about the applicability of the various tools.

### The tools

1. ESD Checklist
2. AISHE (ESD Assessment)
3. ESD Tree Tool
4. RESFIA+D, the SD Competences Matrix
5. SD Curriculum Scan

### Source

Niko Roorda: "Sailing on the Winds of Change. The Odyssey to Sustainability of the Universities of Applied Sciences in the Netherlands". PhD Thesis, Maastricht University, October 2010

### Workshop setup:

#### 1. Orientation on tools (ca. 30 min.)

- Short introduction by Workshop leader
- Orientational discussion of all tools (groups of ca. 5 persons)

#### 2. Application of tools (ca. 30 min.)

- Regrouping, based on preference of tool to study
- Application, based on own experiences & working environment of participants (5 groups)

#### 3. Feedback (ca. 30 minutes)

- Discussion of experiences (plenary session). Main questions:
  - "Which of these instruments might be of use in your university?"
  - "Is it possible to think of a plan to actually do this?"
- Conclusions



## Tool 1: ESD Checklist

*The Checklist model:*

<b>The checklist: characteristics of Education for Sustainable Development</b>		
<b>Principles</b>	<b>Characteristics</b>	<b>Details</b>
Connectivity, complexity	Systems thinking	Connecting parts, subsystems or aspect systems. Connecting an analytic with a holistic approach; the small with the large; and the local with the global.
	Multi-, inter- or transdisciplinary	Connecting disciplines and stakeholders. Balanced regarding Triple P; balanced with disciplinary aspects.
	Life-cycle approach	Connecting phases in the lifecycle. Regarding lifecycles of people, products, companies, habitats, cultures, designs, paradigms, etc.
	Intercultural, international	Connecting people, (sub)cultures, regions, nations. Openness for values and perspectives of others.
	Future orientation	Connecting the past, the present and the future. Concerns both long-term and short-term targets, based on visions of sustainable future developments.
Innovativity	Openness to changing conditions	Flexibility of mind; capability of dealing with uncertainties
	Openness to new solutions	Creativity, non-linearity, out of the box thinking, acceptance of the unexpected.
	Function orientation	Stimulating creative thought and design processes by zooming out from actual products or services to underlying functions or needs, aiming at finding alternative ways of fulfilling them.
Action learning, social learning	Application of knowledge	Acquisition and application of knowledge, either sequentially or simultaneously (learning by doing). Aiming at finding useful solutions to real problems.
	Multi-methods	E.g. just-in-time lectures, art, discussions, drama, games, etc.
	Real-life situations	Context-embedded learning, either in simulated or actually existing situations.
	Commitment	Personally engaged towards objectives of sustainable development.
	Cooperation	Teamwork within student groups; cooperation with experts, professionals.
Reflexivity	Learning to learn	Reflection on own learning process, aiming at continuous improvement. Lifelong learning.
	Responsibility	Responsibility for own learning process, and for the definition of learning goals (up to a certain level). Also: responsibility for results of professional activities (stakeholder approach).
	Value-driven	Aware of the relevance and the relativity of embedded values and opinions
	Critical thinking	Critical attitude towards questions, tasks, methods, answers, own functioning
	Robustness of information	Awareness of level of certainty of knowledge, data, conclusions: subjective, intersubjective, objective (opinions, theories, facts)

*Source: Roorda (2010). Based on: Agenda 21 (UNCED, 1992), Orr (1992), De Haan & Harenberg (1999), De Haan (2002), Sterling (2004), UNESCO (2004, 2005a), UNECE (2005), Martens (2006), Van Dam-Mieras (2007), Dyball, Brown & Keen (2007), Barth & Burandt (2008), Dieleman and Juárez-Nájera (2008), and more.*

An example:

<b>Illustration: a study program of Avans University</b>			<b>2nd M2</b>	<b>1st M2</b>
<b>Principles</b>	<b>Characteristics</b>	<b>Second M2 program (1994) compared with 1<sup>st</sup> program (1991)</b>		
Connectivity, complexity	Systems thinking	Realized intensively through PBL and PE	++	++
	Multi-, inter- or transdisciplinary	Extensive multidisciplinary, no (intentional) interdisciplinarity	+	(+)
	Life-cycle approach	Strong emphasis on product lifecycles: e.g. source orientation, integral chain management, design for recycling, lifecycle assessment (LCA)	++	++
	Intercultural, international	Not much attention	+	-
	Future orientation	Explicitly present, e.g. through attention to innovativity at several levels and time spans	++	+
Innovativity	Openness to changing conditions	Theoretical and simulated approach in PBL; exercised during PE and internships	++	+
	Openness to new solutions	Creativity, non-linearity, out of the box thinking: all strongly stimulated and exercised, esp. in the integration modules	++	++
	Function orientation	Thorough treatment in PBL; exercised in PE and internships	++	++
Action learning, social learning	Application of knowledge	Primarily present in PE, internships and graduation projects, and to some extent in PBL	++	+
	Multi-methods	A systematic and highly appreciated curriculum structure with a variety of methods	++	-
	Real-life situations	Simulated in PBL; fundamental in PE, internships and graduation projects	++	+
	Commitment	High sustainability engagement with both the teachers and the students	++	++
	Cooperation	Teamwork within student groups in all study years; during PE also intensive cooperation with professionals and experts	++	+
Reflexivity	Learning to learn	Practiced throughout the curriculum, being one of the cornerstones of PBL and PE	++	-
	Responsibility	Practiced throughout the curriculum	++	+
	Value-driven	Explicit fundament in the Brundtland principles	++	++
	Critical thinking	Practiced throughout the curriculum	++	+
	Robustness of information	Practiced throughout the curriculum	++	+
<b>Overall</b>			<b>++</b>	<b>+</b>

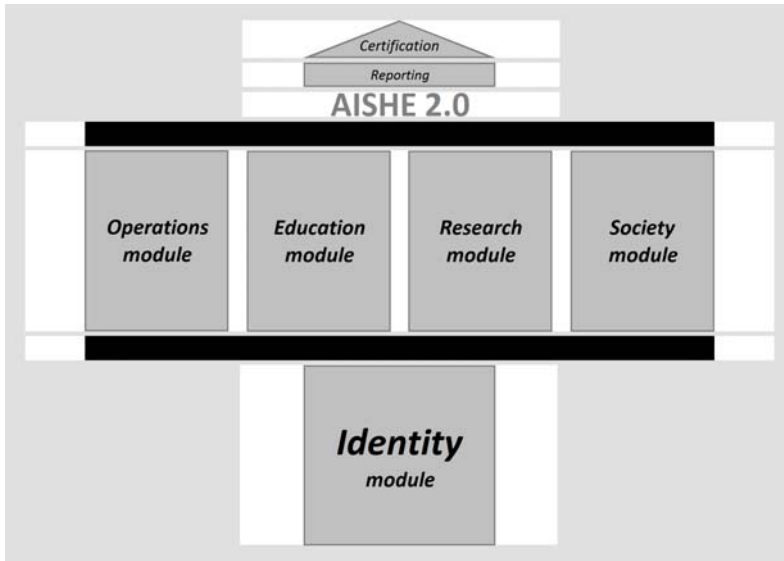
*The exercise:*

Please, take in mind one or more study programs within your university. Try to fill in the 2 empty columns. While you do it, discuss it with the other members of your group (who probably have another university in mind).

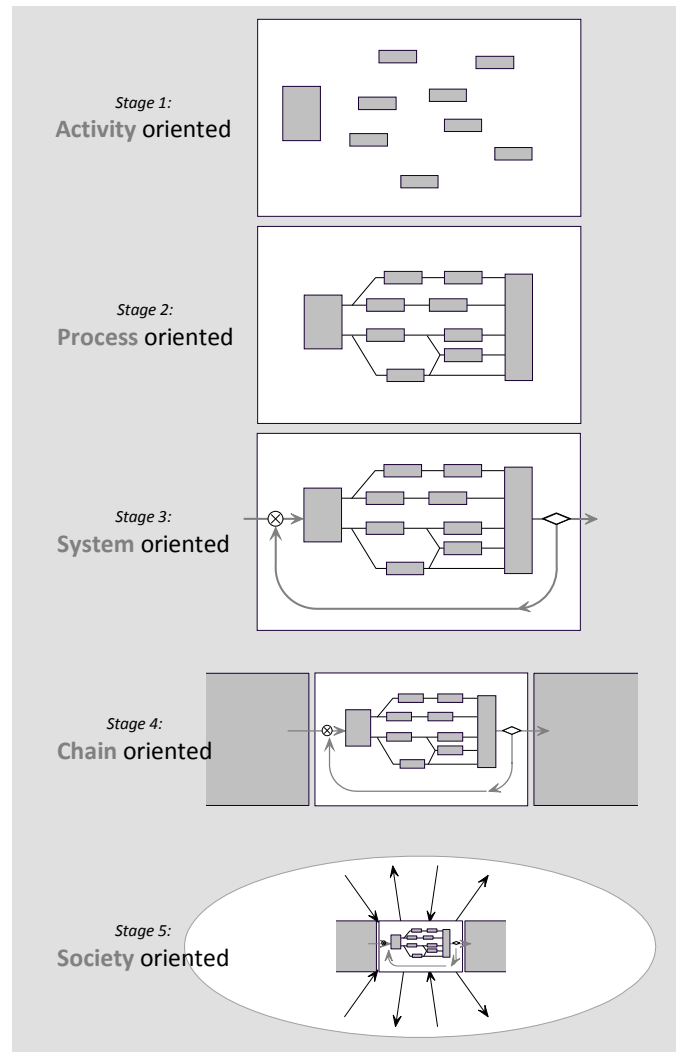
ESD Evaluation form. Program name:			Score
Principles	Characteristics	Present situation	
Connectivity, complexity	Systems thinking		
	Multi-, inter- or transdisciplinary		
	Life-cycle approach		
	Intercultural, international		
	Future orientation		
Innovativity	Openness to changing conditions		
	Openness to new solutions		
	Function orientation		
Action learning, social learning	Application of knowledge		
	Multi-methods		
	Real-life situations		
	Commitment		
	Cooperation		
Reflexivity	Learning to learn		
	Responsibility		
	Value-driven		
	Critical thinking		
	Robustness of information		
Overall			

# Tool 2: AISHE (ESD Assessment)

The AISHE model:



The modules of AISHE 2.0



The five stages of AISHE

<div style="text-align: center;">                     Certification                      Reporting  <b>AISHE 2.0</b> </div>					
	Operations	Education	Research	Society	
<i>CHECK</i>	Quality Assessment	Output Assessment	Output Assessment	Impact Assessment	<i>ACT</i>
<i>DO</i>	Humanity	Interdiscipl. Integration	Interdiscipl. Integration	Connecting	
	Ecology	Thematic Integration	Thematic Integration	Thematic Involvement	
	Economy	Awareness & Basics	Awareness & Basics	Awareness & Learning	
<i>PLAN</i>	Physical Structure	Methodology	Methodology	Methodology	
	Goals	Goals	Goals	Goals	
<b>Identity</b>					
<i>CHECK</i>	Transparency & Accountability				<i>ACT</i>
<i>DO</i>	Coherence				
	Expertise				
	Communication				
<i>PLAN</i>	Leadership				
	Vision & Policy				

*The exercise, using 2 example criteria:*

Please, take in mind one study program within your university. Compare the stage descriptions of the 2 example criteria with the actual situation in this program. For each, fill in a score (0 .. 5) and a comment. While you do it, discuss it with the other members of your group (who probably have another university in mind).

### E-1. Goals

The [graduate profile](#) determines the end goals of the education, i.e. the characterization of the professional who leaves the educational program and enters the professional field. Various terms are used for the graduate profile, e.g.: “educational program goals”; “professional profile”; “academic qualifications”, “professional competencies”. etc.

Stage 1: Activity oriented	Stage 2: Process oriented	Stage 3: System oriented	Stage 4: Chain oriented	Stage 5: Society oriented
- The graduate profile contains some <a href="#">clearly recognizable aspects</a> of sustainable development.	- Sustainable development is mentioned explicitly in the graduate profile. - Within the own disciplinary context, the profile contains <a href="#">all or most</a> relevant aspects of sustainable development.	- With its education, the organization demonstrably contributes to sustainable development on the level of adaptations and improvements. - Sustainable development in the profile is explicitly based on the vision of the organization about sustainable development. - Systematic evaluations and adjustments of the profile take place. - The profile explicitly demands <a href="#">multidisciplinary</a> capacities.	- With its education, the organization demonstrably contributes to sustainable development on the level of sustainable innovation. - <a href="#">The professional field</a> is actively involved in the determination, evaluation and improvement of the sustainable elements in the profile. - The profile explicitly demands <a href="#">interdisciplinary</a> capacities.	- With its education, the organization demonstrably contributes to sustainable development on the level of <a href="#">systemic change</a> . - <a href="#">Society</a> is actively involved in the determination, evaluation and improvement of the sustainable elements in the profile. - The profile explicitly demands <a href="#">transdisciplinary</a> capacities. - Compared with comparable institutions the organization fulfils a leading role with respect to the determination of the profile.
Score (0 .. 5):	Comment:			

**Graduate profile:** Usually, an individual educational institution cannot determine a profile of the graduate in complete freedom: often directions exist on a national level, either from the government or from educational or professional organizations. Nevertheless, the organization itself takes part in the determination of the profile, in two ways:

- formally: by determining the free space that usually exists, because not all 100% is determined on a national level but only e.g. 70%;
- informally, because there will always be opportunities for interpretation or for coloring the nationally determined norms.

**Clearly recognizable aspects:** Score only if the involved aspects are clearly interpreted in a sustainable way. (The literal term ‘sustainable development’ does not have to be mentioned in stage 1.)

**All or most:** According to the assessed organization itself, or to an external forum (e.g. an advisory board from the professional field). This can only be scored if either the organization itself, or the involved external forum possesses the expertise to make such a judgment, and if it has enough knowledge and insight about the education of the assessed organization. If such a judgment has not yet been made, it may be done during the assessment.

[\(Etc.\)](#)

### E-4. Thematic integration

Throughout the curriculum, subjects related to sustainable development are treated. Most of them will have a strong relation with the discipline, although other subjects may be present too.

Stage 1: Activity oriented	Stage 2: Process oriented	Stage 3: System oriented	Stage 4: Chain oriented	Stage 5: Society oriented
Some aspects of sustainable development that have a direct relation with the own discipline are studied as a part of the curriculum.	<a href="#">Many aspects</a> of sustainable development that have a direct relation with the own discipline are studied, spread across the curriculum in a carefully designed way.	- Sustainable development in the curriculum is explicitly based on the graduate profile. - <a href="#">All aspects</a> of sustainable development that have a direct relation with the own discipline are studied in a systematic way.	- Representatives of the professional field contribute significantly to the disciplinary study of sustainable development.	- Representatives of society contribute significantly to the disciplinary study of sustainable development.
Score (0 .. 5):	Comment:			



## Tool 3: The ESD Tree Tool

### *The Tree Model:*

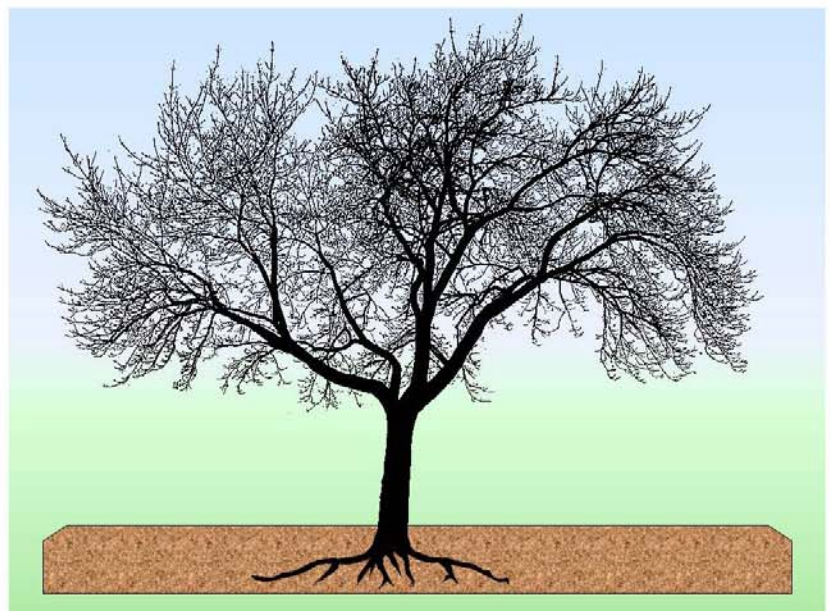
The curriculum of an education program may be drawn as shown in the top image on the right. The 'floors' in the education 'building' indicate the consecutive years of the program (with the first year as the ground floor). The 'rooms' represent the education units or subjects.

If SD is integrated in the curriculum, it will be an aspect of many of the education units, probably in a variety of ways. In the top image, this is represented by the variety of the 'green' coloring of the 'rooms' in the 'building'.

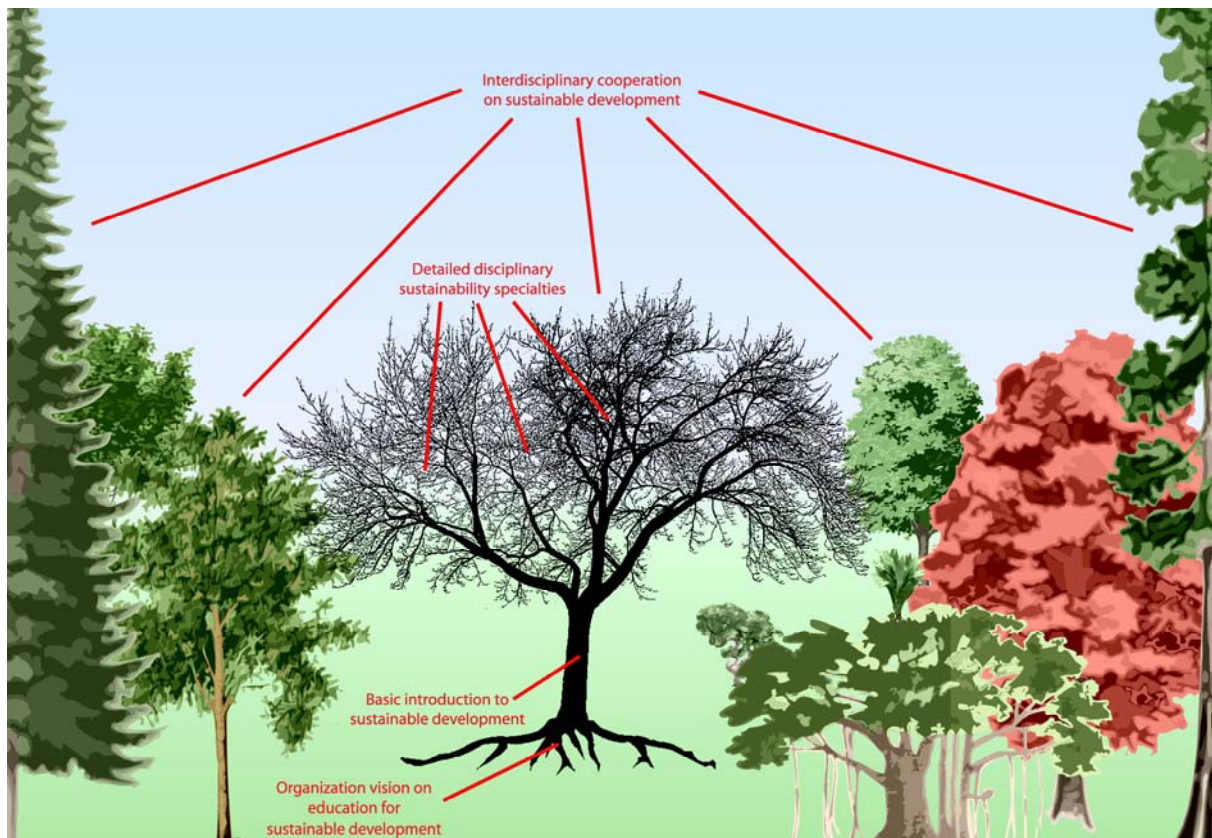
Ideally, early in the curriculum the concept of sustainable development is introduced. In the image this is shown as a 'B' (for 'Basic').

In all cases, the introduction of sustainable development together with the integration of more detailed themes or interdisciplinary aspects of sustainable development throughout the rest of the curriculum together form a tree-like structure, shown in the middle image. This is the 'ESD Tree Model'.

Optimally, the integration of SD is rooted firmly in the graduation profile of the education program, i.e. in its professional competences, its academic profile, or whatever education philosophy is used. Ideally, the graduate profile, the 'roots' in the bottom image, in its turn is based strongly on the vision of the educational, shown in the bottom image as the fundament of the building. Ideally, there is a strong connection between the university vision on SD, the graduate profile, and the integration of SD in the curriculum.







The 'ESD Tree Model'

*The exercise:*

Please, take in mind a study program or a department within your university. Thinking of ESD implementation, which 'tree element(s)' would you want to focus on, and why? Fill in the table. While you do it, discuss it with the other members of your group (who probably have another university in mind).

**The ESD Tree Tool**

Tree element	ESD	AISHE 2.0	Priority	Comment
Roots	Vision, mission, educational goals	E1		
Biochemistry & physiology	Educational methodologies (e.g. PBL, project education, virtual seminar)	E2		
Trunk	Basic module or introduction to SD	E3		
Branches	Disciplinary integration	E4		
Forest, ecosystem	Interdisciplinary integration	E5		
Fruits	Output: effect on professional field and society	E6		
Growth process	Development and maintenance of the study program	–		

## Tool 4: RESFIA+D, the ESD Competences Matrix

The RESFIA+D model:

<b>The RESFIA+D Model: Professional competences for SD</b>	
<p><b>Competence R: Responsibility</b> A sustainable professional takes responsibility for the own work. <i>I.e.: the sustainable professional can ...</i></p>	<p><b>Competence E: Emotional intelligence</b> A sustainable professional projects him/herself on the values and emotions or others. <i>I.e.: the sustainable professional can ...</i></p>
<b>R1.</b> Make a stakeholder analysis, based on consequence reach and consequence period	<b>E1.</b> Recognize and respect values of him/herself and of other people and cultures
<b>R2.</b> Take personal responsibility	<b>E2.</b> Distinguish between facts, presumptions and opinions
<b>R3.</b> Render personal account to society	<b>E3.</b> Cooperate in an inter- and transdisciplinary way
<p><b>Competence S: System orientation</b> A sustainable professional thinks and works from a systems vision <i>I.e.: the sustainable professional can ...</i></p>	<p><b>Competence F: Future orientation</b> A sustainable professional thinks and works from a future oriented perspective. <i>I.e.: the sustainable professional can ...</i></p>
<b>S1.</b> Think in systems: zoom in and out, i.e. alternately think analytically and holistically	<b>F1.</b> Think in varying timescales; zoom in and out between short and long term approach
<b>S2.</b> Recognize weaving faults and strengths in systems, utilize strengths	<b>F2.</b> Recognize and utilize non-linear processes
<b>S3.</b> Think integrative and chain oriented	<b>F3.</b> Think innovative, creative, out of the box
<p><b>Competence I: personal Involvement</b> A sustainable professional dedicates him/herself personally for sustainable development. <i>I.e.: the sustainable professional can ...</i></p>	<p><b>Competence A: Action skills</b> A sustainable professional acts decisively and competently. <i>I.e.: the sustainable professional can ...</i></p>
<b>I1.</b> Consistently involve sustainable development in the own work as a professional (sustainable attitude)	<b>A1.</b> Weigh unweighable aspects and make choices
<b>I2.</b> Work with passion on dreams and ideals	<b>A2.</b> Deal with uncertainties
<b>I3.</b> Apply the own conscience as the ultimate standard	<b>A3.</b> Act when the time is ripe, not against the flow: 'do without doing'
<b>Plus: Disciplinary competences for sustainable development (varying per education program or professional group)</b>	
Source: Niko Roorda: "Basisboek Duurzame Ontwikkeling" ("Basic Book on Sustainable Development"), 2 <sup>nd</sup> edition, 2011; will also appear in English, 2011, publ. by Earthscan, London	

**Competence levels: general description**

<i>Apply</i>	<i>Integrate</i>	<i>Improve</i>	<i>Innovate</i>
<p>On a practical level, you perform activities belonging to the usual demands or your (future) profession.</p> <p>Your vision, your ideas and your activities are mainly limited to the area of your own discipline, your own working environment and the usual work methods.</p>	<p>During your professional activities you combine and integrate a complex set of subjects, work styles, people and/or cultures. You do this e.g.:</p> <p>beyond the boundaries of your own discipline considering other cultures, value systems, traditions beyond the usual expectations and working methods of your (future) profession in varying roles, e.g. as a manager</p>	<p>You oversee, both at a detail level as at a systems level, your work and the system in which you perform your activities.</p> <p>You judge your own work and the work of others with whom you cooperate critically and estimate its effects in the widest sense. Based on that, you work continuously or regularly on the improvement of the work to which you contribute, and you get proved results.</p>	<p>You apply innovative insights on your work, e.g. considering:</p> <ul style="list-style-type: none"> <li>• the formulated goals</li> <li>• the applied means and methods</li> <li>• the effects of the work</li> <li>• the scope of those effects in space and time</li> <li>• the underlying vision</li> <li>• the relations within and outside of the own working environment or the own discipline, e.g. with society as a whole</li> </ul> <p>These innovations are expressed demonstrably in your professional activities and in their results.</p>

*The exercise, using 2 example criteria:*

Please, take in mind one study program within your university. Compare the stage descriptions of the 2 example criteria with the actual situation in this program. For each, fill in a score (0 .. 5) and a comment. While you do it, discuss it with the other members of your group (who probably have another university in mind).

**E1. Recognize and respect values of him/herself and of other people and cultures**

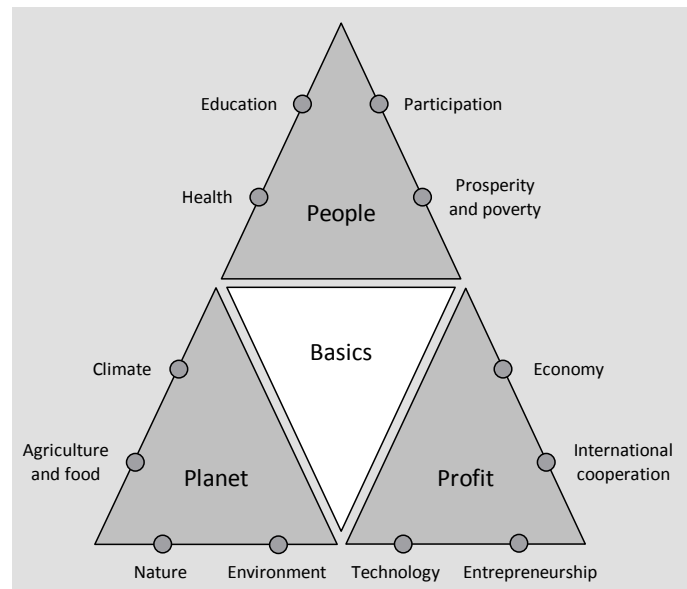
1. Apply	2. Integrate	3. Improve	4. Innovate	Ambition (1 .. 4)	Reality		Priority (1 .. 4) 1 = highest
					Competences (1 .. 4)	Curriculum (1 .. 4)	
<ul style="list-style-type: none"> <li>• You formulate the values from which you think and act as a professional.</li> </ul>	<ul style="list-style-type: none"> <li>• You formulate the values from which others think and act who are involved or have an interest in your professional actions.</li> <li>• You describe the differences and similarities between your values and those of these others.</li> <li>• You communicate respectfully with these others about the differences in values.</li> </ul>	<ul style="list-style-type: none"> <li>• You cooperate with these others, during which you utilize both the similarities and the differences of the values as an enrichment and reinforcement of the quality of your activities.</li> </ul>	<ul style="list-style-type: none"> <li>• You enrich and reinforce the quality of your professional activities by actively expanding the cooperation to people or cultures with other values.</li> </ul>	(1 .. 4)	(1 .. 4)	(1 .. 4)	(1 .. 4) 1 = highest

**I 2. Work with passion on dreams and ideals**

1. Apply	2. Integrate	3. Improve	4. Innovate	Ambition (1 .. 4)	Reality		Priority (1 .. 4) 1 = highest
					Competences (1 .. 4)	Curriculum (1 .. 4)	
<ul style="list-style-type: none"> <li>• You describe the wishes, dreams and ideals you have regarding the work that you do and the results and effects of it.</li> <li>• You openly express these dreams and ideals within your direct working environment.</li> </ul>	<ul style="list-style-type: none"> <li>• You relate demonstrably your professional dreams and ideals to the formulation of the goals and the implementation of your work.</li> <li>• You balance your dreams and ideals concerning your professional activities with those of your private life.</li> </ul>	<ul style="list-style-type: none"> <li>• With your dreams and ideals you inspire others in your working environment.</li> <li>• In doing so, you exert a noticeably positive influence on the work and on its results and effects of you and of the teams you are a part of.</li> </ul>	<ul style="list-style-type: none"> <li>• Your dreams and ideals lead to original, innovative ideas and projects related to your professional activities, you working environment, you discipline or you branch.</li> <li>• With your passion for your dreams and ideals you express an inspiring leadership to a team or organization you are a part of.</li> </ul>	(1 .. 4)	(1 .. 4)	(1 .. 4)	(1 .. 4) 1 = highest

## Tool 5: The SD Curriculum Scan

The Scan model:



The themes of the SD Curriculum Scan

### Aspects of Sustainable Development

The curriculum assessment makes use of the categories in this list, which is no attempt to be complete but rather functions as a source of inspiration.

General / Basic	People	Planet	Profit
<p><b>Triple P</b> Brundtland Rio, Johannesburg People, Planet, Profit Profit vs. prosperity Systems thinking Three capitals Balance</p>	<p><b>Education</b> Education in SD ICT Illiteracy Life long learning Right and access to education</p>	<p><b>Climate</b> Climate change Climate compensation Drought Energy use Fresh water consumption Global warming Sustainable energy</p>	<p><b>Economy</b> Economic growth and stability Free market, trade restrictions Globalisation Growth / Green GDP International depth relief International trade Population growth Supply goods Sustainable investment</p>
<p><b>Place</b> Lessons from various world regions Distribution of wealth Human Development Index Millennium goals Transfer of problems International solidarity Equity United Nations &amp; other IGOs</p>	<p><b>Health</b> Availability food Child mortality Environment Eradication of hunger Hygiene Labour conditions Medical care Prevention of HIV/AIDS Safety, liability Right and access to health care</p>	<p><b>Agriculture and food</b> Biological agriculture Biological food Food production Food security Genetic modified food Honest agriculture Sustainable fishing Quality mark</p>	<p><b>International cooperation</b> Bi- en multilateral cooperation Cooperation on internat. development International organisations International treaties National en international law</p>
<p><b>Time</b> Lessons from history Future scenarios Trends, trend breaks Club of Rome Innovation levels Transitions Backcasting Millennium Ecosystem Assessment</p>	<p><b>Participation</b> Civil society Cultural diversity Participation, democracy Equal opportunities &amp; treatment Freedom Gender, emancipation Human rights Minorities Naturalization, integration Unemployedness</p>	<p><b>Nature</b> Biodiversity Deforestation Ecosystems Erosion Extinction of species Pollution (air, light) Quality of water, air and soil Services of nature to people</p>	<p><b>Entrepreneurship</b> Child labour Codes of conduct Corporate governance Corporate Social Responsibility Fair trade products Fortification, corruption Image (window-dressing), reputation Micro credits Report of sustainability Sustainable conduct of business Transparency</p>
<p><b>Ethics</b> Cultural differences Ethical discussions Norms and values Personal responsibility Respect Stakeholder analysis</p>	<p><b>Welfare and poverty</b> Energy use Eradication of poverty &amp; hunger Micro credits Poverty in the Netherlands Sustainable consumption</p>	<p><b>Environment</b> Ecological footprint (Multifunctional) use of space Noise and light pollution Sustainable construction Waste</p>	<p><b>Technology</b> Availability of resources Cradle to cradle ICT Life cycle analysis Recycling Sustainable energy</p>

Example:

SD Curriculum Scan. Program Name: <i>Tourism Management</i>				
	Category: <b>People</b>		Category: <b>Planet</b>	
	<i>Theme</i>	<i>Curriculum content</i>	<i>Theme</i>	<i>Curriculum content</i>
<b>Semester 1</b>	Education		Climate	Climate change Climate compensation Drought Energy use Fresh water consumption Global warming
	Health	Labour conditions	Agriculture	
	Participation	Cultural differences Democracy	Nature	Deforestation Ecosystems Erosion
	Welfare and poverty		Environment	Environment in general and economic terms
<b>Semester 2</b>	Education			

*The exercise, using 2 example categories (people & planet):*

Please, take in mind a study program within your university. Compare the aspects list with the actual curriculum. Fill in the subjects the curriculum possesses, and (using another colour) the curriculum should have (according to you). While you do it, discuss it with the other members of your group (who probably have another university in mind).

SD Curriculum Scan. Program Name:				
	Category: <b>People</b>		Category: <b>Planet</b>	
	<i>Theme</i>	<i>Curriculum content</i>	<i>Theme</i>	<i>Curriculum content</i>
<b>Semester 1</b>	Education		Climate	
	Health		Agriculture	
	Participation		Nature	
	Welfare and poverty		Environment	
<b>Semester 2</b>	Education		Climate	
	Health		Agriculture	
	Participation		Nature	
	Welfare and poverty		Environment	
<b>Semester 3</b>	Education		Climate	
	Health		Agriculture	
	Participation		Nature	
	Welfare and poverty		Environment	