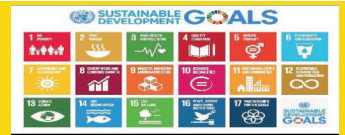




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# A COMPREHENSIVE SET OF PERFORMANCE INDICATORS FOR HIGHER EDUCATION LEARNING AND TEACHING IN SUSTAINABLE DEVELOPMENT (HELTSD)

**Theodor Leiber**

Evaluation Agency Baden-Wuerttemberg, Mannheim, Germany

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## Introduction

The **sustainable development and preservation of life forms and non-living matter** is one of the crucial issues of our time to secure the existence of the biosphere

(cf. e.g. Agbedahin, 2019; Bellina *et al.*, 2018; Hickel, 2019; Kendall, 1992; Leiber, 2002; Meadows *et al.*, 2004; Rieckmann & Bormann, 2020; Ripple *et al.*, 2017; Shrivastava *et al.*, 2020)

UNESCO's understanding is adopted that

'to create a more sustainable world and to engage with issues related to sustainability as described in the **Sustainable Development Goals (SDGs)**, **individuals must become sustainability change-makers**. They require the **knowledge, skills, values and attitudes** that empower them to contribute to sustainable development. [...] [**Higher Education for Sustainable Development [HESD]** is particularly needed because it empowers learners to take informed decisions and act responsibly for environmental integrity, economic viability and a just society, for present and future generations'

(UNESCO, 2017, p. 63).

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## Introduction

Accordingly, there are **several basic dimensions of ESD** that should be considered and their improvement towards fostering sustainable development must be dealt with intensively:

- **Learning contents**
- **Teaching competences and learning competences** (pedagogy, didactics)
- **Learning outcomes and learning gain**
- **Learning and teaching environment**

UNIVERSITY • **Societal transformation**

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## Introduction

- Learning contents

For example, the following **critical issues of the Anthropocene** have to be integrated into the curricula: **climate change, biodiversity, disaster risk reduction (DRR), and sustainable consumption and production (SCP)**.

- Teaching competences and learning competences (pedagogy, didactics) and learning and teaching environment

Learning and teaching has to be designed **in interactive, learner-centred** ways enabling **exploratory, action-oriented and transformative learning** (Transformative and Holistic Continuing Self-Directed Learning: THCSDL; cf. Du Troit-Brits, 2018; Leiber, 2019a).



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## Introduction

- Learning outcomes and learning gain

Learning and **cross-sectional learning and teaching** core competences have to be stimulated and promoted more, such as **critical and systemic thinking, collaborative decision-making, and taking responsibility** for present and future generations.

- Societal transformation

Learners of any age, in any education setting, have to be **empowered to transform themselves and their societies** by contributing to the transition to **greener economies and societies**; ‘equipping learners with skills for “green jobs”’; ‘motivating people to adopt sustainable lifestyles’; ‘empowering people to be “global citizens” who engage and assume active roles, both locally and globally, to face and to resolve global challenges, and ultimately to become proactive contributors to creating a more just, peaceful, tolerant, inclusive, secure and sustainable world’ (UNESCO, 2014, p. 12).



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## Introduction

Basic assumption:

The related processes of **introducing, implementing, testing, evaluating and improving higher education learning and teaching for sustainable development (HELTSD) should be based**, among other things, **on relevant and reliable performance indicators** that adequately grasp the basic dimensions of (H)ESD listed above and their respective sub-dimensions.



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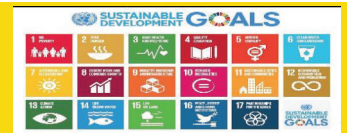
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## Leading questions and methodology

**Sustainability declarations, sustainability codes as well as impressive numbers of sustainability assessment tools and sustainability-related achievement and performance indicators for higher education have been established worldwide**

(Agbedahin, 2019; Albareda-Tiana *et al.*, 2018; Bellina *et al.*, 2018; Caeiro *et al.*, 2020; German Council for Sustainable Development, 2018; Findler *et al.*, 2018; Owens, 2017; Rieckmann & Bormann, 2020; Stafford-Smith *et al.*, 2017; Tapia-Fonllem *et al.*, 2017).

**HELTSD activities often focus on individual elements and temporary projects** (e.g. specific programmes in sustainability studies, innovative teaching formats, inter- and transdisciplinary courses, ...)

Most, if not all, tools of sustainability assessment and benchmarking in higher education institutions that were developed so far were **developed before the UNESCO's learning goals of ESD** (UNESCO, 2017) were published



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## Leading questions and methodology

Simultaneously, at many higher education institutions sustainability reporting and evaluation in the core fields of action – research, learning and teaching, operations, transfer, governance – **still seem to be in an early development stage** (Berzosa *et al.*, 2017; Findler *et al.*, 2018; Fischer *et al.*, 2015; Lozano *et al.*, 2015).

Therefore, 25 years after the first formal recognition of the relevance of ESD in Agenda 21 of the UN Conference on Environment and Development in Rio de Janeiro and after the UN Decade of ESD from 2005-2014, it is still relevant and timely to question and analyse the elements and quality of HE(LT)SD.



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## Leading questions and methodology

How can pursuing the goal of Education for Sustainable Development (ESD) be **more successfully implemented** in higher education?

How can ‘**more valid indicators of pro-sustainable actions**’ of students (Tapia-Fonllem *et al.*, 2017, p. 12) be considered?

How do the UNESCO ESD learning objectives translate into operable/operational performance **indicators** for learning and teaching in higher education?

In addition to students’ self-reports, which **data sources for assessing pro-sustainable knowledge, attitudes and behaviour** can be used?

To approach these questions, **narrative**, i.e. **story-telling, mainly qualitative, formative performance indicators** are defined that **introduce** the Sustainability Development Goals (SDGs) **directly into the quality development of universities** thus contributing ‘to truly transform the University, making ESD more robust and implementing the SDGs in higher education’ (Albareda-Tiana *et al.*, 2018, p. 489).



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# An integrative set of performance indicators for HELTSD

## Characteristics of narrative performance indicators

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In clear distinction from ‘purely’ quantitative performance indicators, the definitional characteristics of **narrative performance indicators** are the following:

- **What are the purposes and goals of the performance indicator?** What domain does it belong to?
- **What exactly does the performance indicator measure, and how is it measured? Where does the data and information come from?**
- Who is responsible, which organisational units are involved and who are additional affected stakeholders?
- What is the reporting period?
- How are benchmarks defined for the performance indicators’ comparative assessment?



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# An integrative set of performance indicators for HELTSD

## A selection of HELTSD performance indicators

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Around 90 selected HELTSD performance indicators from full comprehensive list of around 1,300 HELTSD indicators (SQELT-HELTSD-PI, 2021) (themselves based on a comprehensive list of more than 800 general performance indicators for higher education learning and teaching)



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# An integrative set of performance indicators for HELTSD

## A selection of HELTSD performance indicators

**Table 4: Small selection of HELTSD performance indicators for the performance area of learning outcomes and learning gain and their assessment** (see also SQELT-HELTSD-PI, 2021)

Performance types	Performance sub-types	Performance indicators and their measures/performance measurement methods
Student learning gain with respect to HELTSD competences	SDG13-related competences ('Climate Action')	MEASM1* with respect to 15 SDG13 competences (see Table 4a) Students' learning outcome and/or learning gain with respect to 15 SDG13 competences (see Table 4a) that could be assessed by MEASM2
		Students' learning outcome and/or learning gain with respect to 15 SDG13 competences (see Table 4a) that could be assessed by MEASM3
		Students' learning outcome and/or learning gain with respect to 15 SDG13 competences (see Table 4a) that could be assessed by MEASM4
		Students' learning outcome and/or learning gain with respect to 15 SDG13 competences (see Table 4a) that could be assessed by MEASM5

\*MEASMn = Measurement method n, not explicated here

# SUSTAINABLE DEVELOPMENT GOALS





# An integrative set of performance indicators for HELTSD

## A selection of HELTSD performance indicators

**Table 4a: HELTSD learning goals and competences, respectively** (adopted and cited from UNESCO, 2017, pp. 12ff.)

<b>SDG13-related competences ('Climate action')</b>	<b>Cognitive</b>	The student knows about and understands 'the greenhouse effect as a natural phenomenon caused by an insulating layer of greenhouse gases.'
		The student knows about and understands 'the current climate change as an anthropogenic phenomenon resulting from the increased greenhouse gas emissions.'
		The student knows about and understands 'which human activities – on a global, national, local and individual level – contribute most to climate change.'
		The student knows about and understands 'the main ecological, social, cultural and economic consequences of climate change locally, nationally and globally and understands how these can themselves become catalysing, reinforcing factors for climate change.'
		The student knows about and understands 'prevention, mitigation and adaptation strategies at different levels (global to individual) and for different contexts and their connections with disaster response and disaster risk reduction.'



# An integrative set of performance indicators for HELTSD

## A selection of HELTSD performance indicators

**Table 4a: HELTSD learning goals and competences, respectively** (adopted and cited from UNESCO, 2017, pp. 12ff.)

<b>SDG13-related competence ('Climate action')</b>	<b>Socio-emotional</b>	The student 'is able to explain ecosystem dynamics and the environmental, social, economic and ethical impact of climate change.'
		The student 'is able to encourage others to protect the climate.'
		The student 'is able to collaborate with others and to develop commonly agreed-upon strategies to deal with climate change.'
		The student 'is able to understand their personal impact on the world's climate, from a local to a global perspective.'
		The student 'is able to recognize that the protection of the global climate is an essential task for everyone and that we need to completely re-evaluate our worldview and everyday behaviours in light of this.'







# An integrative set of performance indicators for HELTSD

## A selection of HELTSD performance indicators

**Table 4a: HELTSD learning goals and competences, respectively** (adopted and cited from UNESCO, 2017, pp. 12ff.)

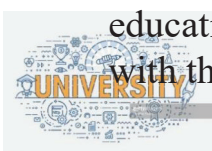
SDG13-related competences ('Climate action')	Behavioural	The student 'is able to evaluate whether their private and job activities are climate friendly and – where not – to revise them.'
		The student 'is able to act in favour of people threatened by climate change.'
		The student 'is able to anticipate, estimate and assess the impact of personal, local and national decisions or activities on other people and world regions.'
		The student 'is able to promote climate-protecting public policies.'
		The student 'is able to support climate-friendly economic activities.'



## Implications and conclusions

The suggested comprehensive set of narrative performance indicators for HELTSD

- Contributes to meeting the need to develop **more coherent performance indicator sets** to facilitate operationalisation, comparability, standardisation and efficiency when evaluating HELTSD.
- Gives indications how (H)ESD can be **integrated into the various academic disciplines, subjects and teaching formats** because certain learning goals are definitively related to certain disciplines and sometimes also teaching formats while other learning goals are explicitly of interdisciplinary or transdisciplinary character.
- Defines a **common starting point** is defined from which individual higher education institutions can develop their specific HELTSD concept in accordance with their strategies, mission statements and portfolio of study programmes.





## Implications and conclusions

- The **German Sustainability Code for Higher Education Institutions** (German Council for Sustainable Development, 2018) should be **supplemented** by the comprehensive HELTSD performance indicator set (SQELT-HELTSD-PI, 2021).

One of the great challenges of contemporary higher education is to embed and integrate **HELTSD across 'traditional' study programmes** to put HELTSD on a broad basis and exploit the educational possibilities of higher education institutions as much as possible. The mention of around 1300 mostly qualitative complex (narrative) performance indicators for HELTSD learning and teaching (SQELT-HELTSD-PI, 2021) is just one explicit indication of the complexity of this task.



## Limitations of study/ open questions for future research

- Further work required to **check the SDG-based learning goals for consistency, coherence and possible redundancies** to minimise the number of narrative performance indicators for HELTSD
- **Compare** list of proposed **HELTSD performance indicators** with various – around 27 – **before-UNESCO-learning-goals performance indicator sets** suggested in different tools of sustainability assessment and benchmarking in higher education institutions (cf. Caeiro *et al.*, 2020, pp. 4ff.)
- Strategic SWOT analysis of HELTSD (and its) performance indicators

