

Higher Education for Sustainable Development: Developing and Assessing Students' Competencies For Dealing with Complexity and Uncertainty

Education for sustainability is seen as a key element for a transition towards a more sustainable future with both individual and societal learning processes at heart. The discussion of corresponding learning outcomes shows a broad variety of concepts such as skills, literacy, competencies or capabilities. Despite the underlying slightly different connotations, consensus exists about some of the key aspects that need to be addressed. Against the background of globalisation and increasing complexity, Higher Education for Sustainable Development aims at the individuals' competencies not only to collect and generate knowledge, but also to reflect on the complexity and interrelations of behavior as well as decision-making in a future-oriented and global perspective. Taking this into account means re-adjusting academic teaching and offering new learning settings. The aim of such a re-adjustment of existing curricula is to design learning settings which ask for ethically reflected decision-making which bridges disciplinary knowledge and interdisciplinary, problem-oriented approaches and allows for the integration of different types of knowledge for solutions of practical relevance.

Universities play an important role for shaping the future of the world society in terms of sustainable development by generating new knowledge as well as contributing to the development of appropriate competencies and raising sustainability awareness. Within the last decade a number of different initiatives and pilot projects have been initiated that consider sustainable development as an important issue of higher education. Disciplinary fields in the natural sciences as well as teacher education have picked up the overall concept of sustainability, while at the same time new study courses and course specialisations have been developed in which sustainable development is dealt with exclusively. Even so the challenge of a comprehensive implementation in, and a far-reaching change of, the existing curricula persists. Similarly, pilot projects so far have given little information about the impact on learning objectives and thus on possibilities of supporting key competencies that are considered crucial.

Against this background this paper asks:

1. Which individual key competencies are crucial for dealing with complexity and uncertainty and thus should be fostered through university teaching and learning?
2. How can these key competencies be developed through university teaching and learning?
3. Which approaches can be used to assess the students' competence development?

Methodology

The research methods used are:

- a Delphi study in which sustainability key competencies are defined by selected experts from Europe (Germany, Great Britain) and Latin America (Chile, Ecuador, Mexico)
- a case study of the Minor course "sustainability social sciences" at the Leuphana University of Lüneburg

- a literature review of existing approaches for assessing students' competence development

Conclusion / results

The results of the Delphi study show that twelve key competencies crucial for sustainable development and thus for dealing with complexity and uncertainty can be identified; the most relevant ones are those for systemic thinking, anticipatory thinking and critical thinking.

The Minor course "sustainability social sciences" at the Leuphana University of Lüneburg facilitates the development of these competencies through inter- and transdisciplinary, problem-based and project-oriented teaching and learning.

For assessing competencies for dealing with complexity and uncertainty, approaches should be used which not only focus on cognitive dispositions, but also include and operationalise non -cognitive dispositions which are also recognised as crucial parts of competencies.

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