

# LONGITUDINAL STUDY ON LEARNING RESULTS OF AN INNOVATIVE ESD STUDY MODEL –

## A Mixed Methods Research Design

RQ: Which effects has the broad integration of sustainability into university teaching on affective attributes and (planned) behaviour for SD of students? What are Drivers and Barriers for Learning?

### Design of Longitudinal Study

- Quantitative census survey, combined with group interviews
- Cohort 1: Start October 2012 (=T<sub>0</sub>)
- Cohort 2: Start October 2013 (=T<sub>0</sub>)
- n ~ 1600 students (each)
- Response rates ~40%
- 2 x 6 group interviews @ T<sub>1</sub>

### Points and types of measurements and data generation:

Quantitative Online-Questionnaire (Cohorts Leuphana, census survey)	Quantitative Control Groups (other universities)	Qualitative Study (Group Interviews, Cohorts Leuphana)
T <sub>0</sub> : Experiences, Expectations, previous knowledge	T <sub>0</sub> : „Light“-version of questionnaire	T <sub>1</sub> : Reflexion of Leuphana Semester, Processes of Learning; Motivations for Acting Sustainably
T <sub>1</sub> : Evaluation „Science bears Responsibility“	T <sub>2</sub> : Light“-version of questionnaire	T <sub>4</sub> : occupational/professional biography; Motivations for Acting Sustainably
T <sub>3</sub> : Evaluation Choice Minor	T <sub>6</sub> : „Light“-version of questionnaire	
T <sub>6</sub> : professional orientation		

**T<sub>0</sub> - T<sub>6</sub>: Affective Attributes and reported/planned behaviour**

### Understanding of Sustainability (example)

Question: Which aspects do you associate with sustainability? (22 items)

- n<sub>T0</sub>=481/n<sub>T1</sub>=575
- α<sub>ecological</sub>=.78;
- α<sub>soc.-cul.</sub>=.86;
- α<sub>economic</sub>=.68;
- α<sub>sceptis</sub>=.69
- p < .001 \*\* (Wilcoxon signed-rank test)
- r<sub>ecol</sub>=.33; r<sub>scep</sub>=-.19; r<sub>econ</sub>=.37

### Quantitative Study (extract)

- Attitudes
  - Sustainability Attitude (Shepard, Kuskova & Patzelt 2009)
  - Responsibility of actors (own scale)
  - Effectiveness of options to act (for SD) (own scale, I vs. others / high cost – low cost)
  - (Future-Orientation, anticipation (own scale))
- Reported and/or intended Action (own scale)
- Self reported Motivation to act for SD (degree) (Shepard 2008)
- Self-Efficacy (locus of control) (Kovaleva, et al. 2012)
- Knowledge & Understanding
  - Character of sustainability knowledge (Stahl, Bromme 2008)
  - Understanding of Science (Inter- & Transdisciplinarity, Ethics (Special Eurobarometer 2010)
  - Understanding of Sustainability (SD, own scale, 4dim)
  - (Problem Knowledge, perception)
- Tolerance of complexity (Raddant, Dalbert 2007) (Processing of information)
- Social-competencies

### Literature

Shepard, K. (2008). „Higher education for sustainability: seeking affective learning outcomes“. International Journal of Sustainability in Higher Education 9, No. 1 (2008): 87–98.  
 Special Eurobarometer 340 "Science and Technology" (2010), Q05 / 7, Q08  
 Stahl, E. und R. Bromme. „The CAEB: An instrument for measuring connotative aspects of epistemological beliefs. Learning and Instruction 17, No. 6 (o. J.): 773–785.  
 Shepard, Kuskova, & Patzelt (2009): Sustainable Development Value (SDV) Scale – German Version.  
 Kovaleva, A., Beierlein, C., Kemper, C. J., & Rammstedt, B. (2012). Eine Kurzskaala zur Messung von Kontrollüberzeugung: Die Skala Internale-Externale-Kontrollüberzeugung-4 (IE-4) (GESIS Working Papers 2012/19). Köln: GESIS.  
 Raddant, M. & Dalbert, C. (2007). The dimensions of the Complexity Tolerance: A synopsis of personality construct 10. Europäischer Kongress für Psychologie, Prague.

### Qualitative Study (extract)

- Discussion of Options to act sustainably / engage for SD
  - e.g. Confrontation with quantitative study results
- Discussion of Motivations to act sustainably / engage for SD
  - Drivers and Barriers for Motivations
  - Types and Forms of Motivations
- Further development, specification and validation
  - Discussion of Actor Responsibilities for SD
  - Discussion of positive and negative learning-situations
  - Discussion Role of Tutors and Teacher for Learning
  - ...

### Case – The „Leuphana Bachelor“

CP = Credit Points

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