Higher Education for Sustainable Development – Universities and Transformative Science

Transformative Research and Development in Urban and Regional Environments
The Roles of Science, Methods, and Transdisciplinarity
Free University of
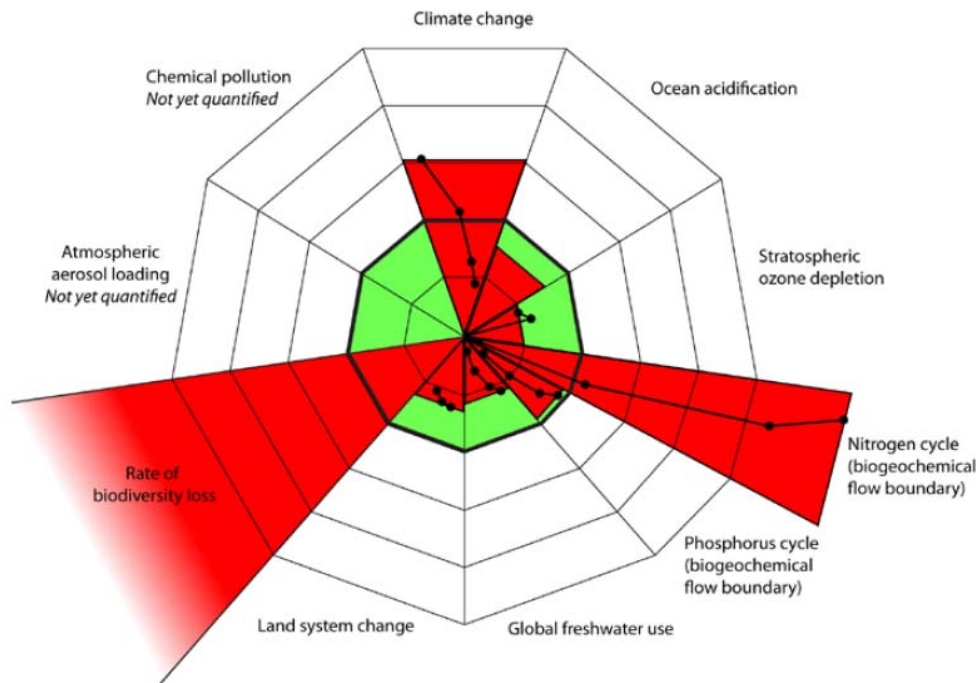Bozen – Bolzano, Italy
September 1–3, 2016

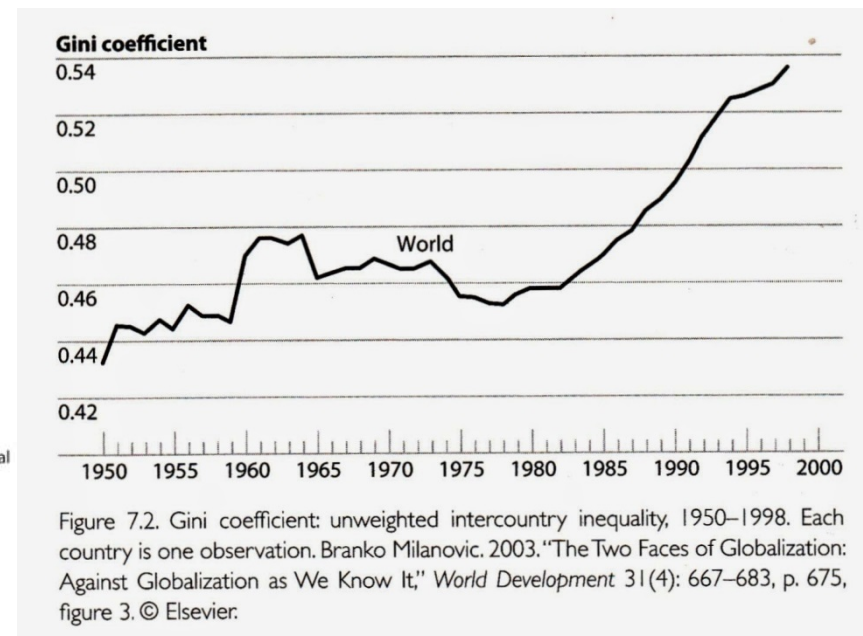**Prof. Dr. Marco Rieckmann**

Department I - Education

Need for transformation

Rockström et al., 2009

Figure 7.2. Gini coefficient: unweighted intercountry inequality, 1950–1998. Each country is one observation. Branko Milanovic. 2003. "The Two Faces of Globalization: Against Globalization as We Know It," *World Development* 31(4): 667–683, p. 675, figure 3. © Elsevier.

Contributions of universities to sustainable development

Sustainability

Inter- and transdisciplinary teaching related with sustainability

Inter- and transdisciplinary sustainability research

University

Sustainability management

University as part of the region / social responsibility

Reflection, Value Discourse, Transformation

Marco Rieckmann

02.09.2016

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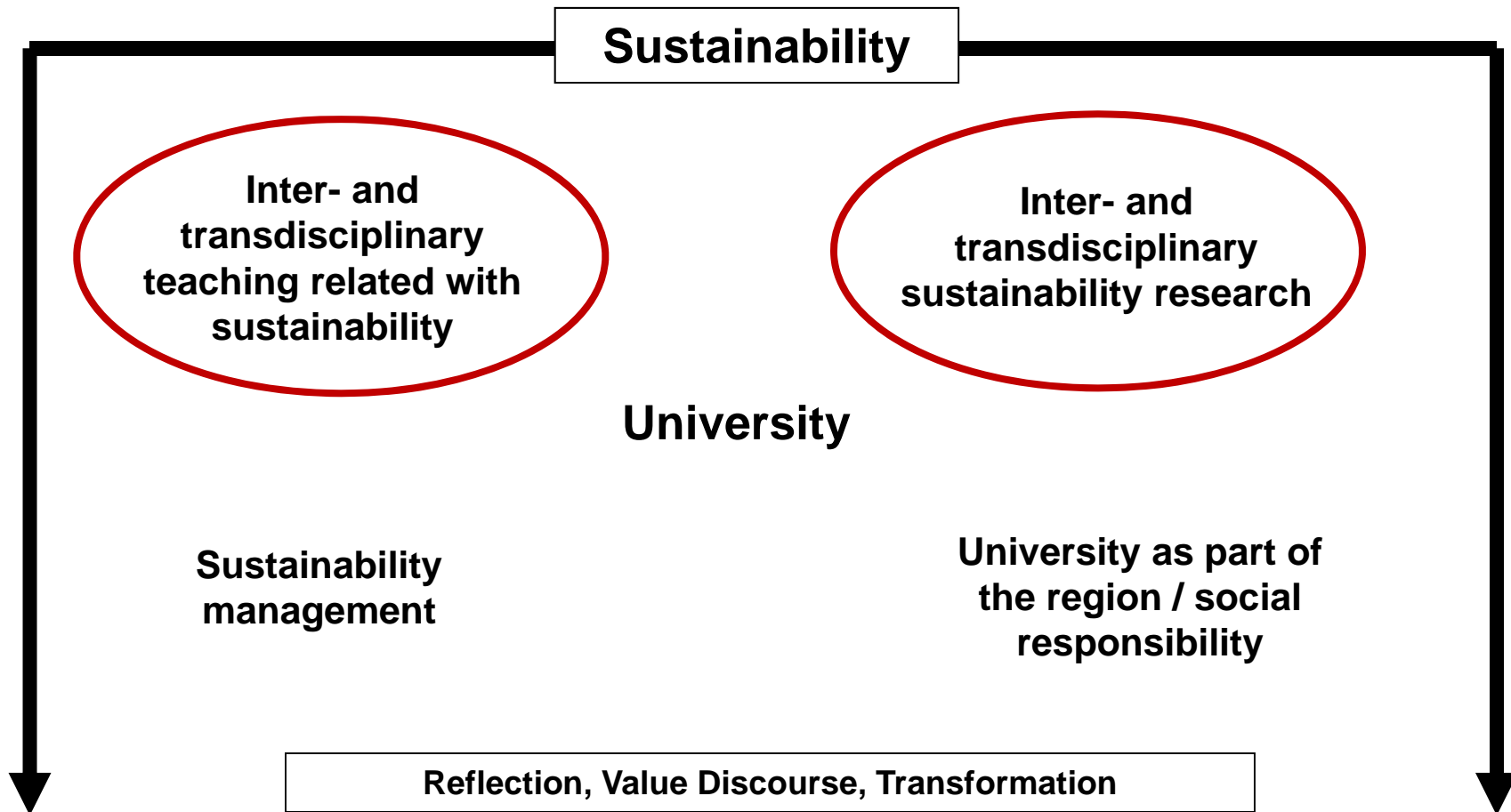
Staged social and educational responses to sustainability

Sustainability transition	Response	State of sustainability	State of education
1 Very weak	Denial, rejection or minimum	No change (or token)	No change (or token)
2 Weak	‚Bolt-on'	Cosmetic reform	Education *about* sustainability
3 Strong	‚Build-in'	Serious greening	Education *for* sustainability
4 very strong	Rebuild or redesign	Wholly integrative	Sustainable education

Sterling, 2004

Higher Education for Sustainable Development

- Universities as important actors for shaping the future of the world society in terms of sustainable development "by addressing sustainability through their major functions of education, research and outreach" (Fadeeva/Mochizuki, 2010: 250)

- *Higher Education for Sustainable Development* should promote the development of such key competencies / generic skills which enable individuals to contribute to sustainable development (cf. Barth et al., 2007; Rieckmann, 2012; Wals, 2010; Wiek et al., 2011).

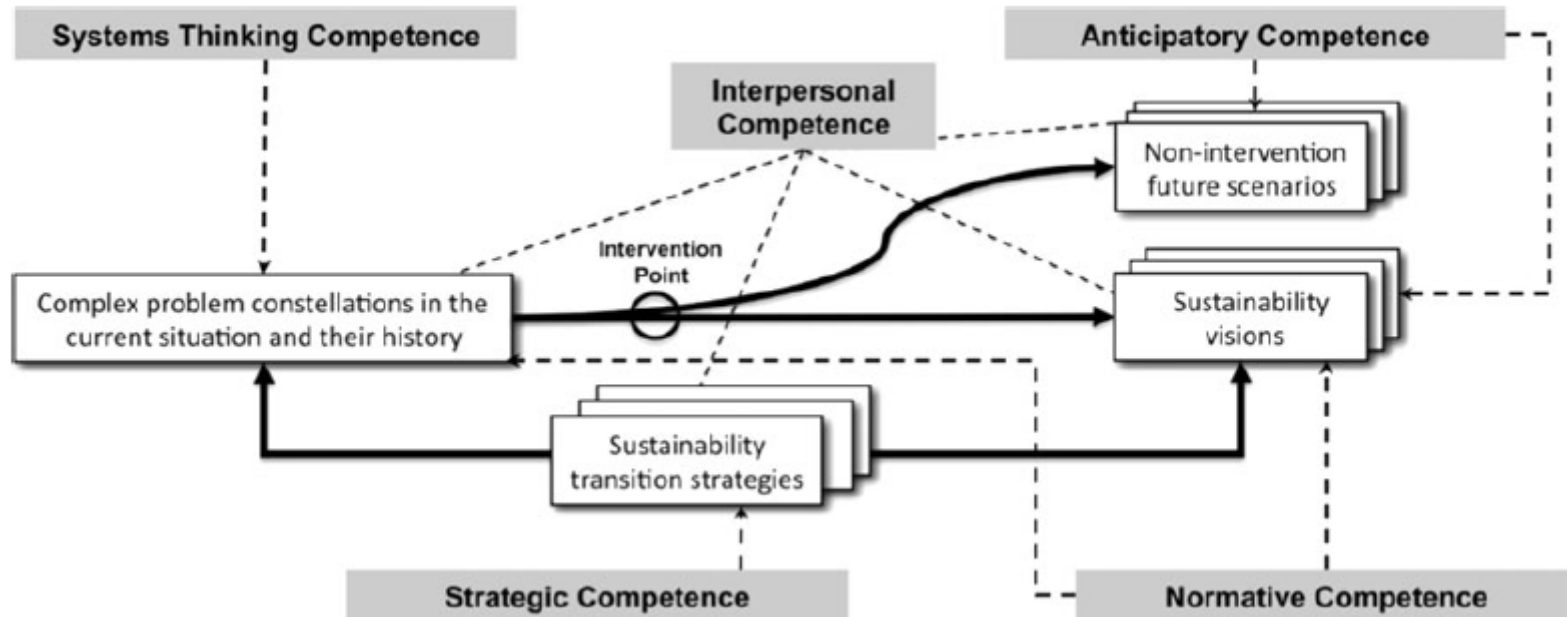# Sustainability Key Competencies

Results of the Delphi Study - twelve key competencies crucial for sustainable development:

- Competency for systemic thinking and handling of complexity
- Competency for anticipatory thinking
- Competency for critical thinking
- Competency for acting fairly and ecologically
- Competency for cooperation in (heterogeneous) groups
- Competency for participation
- Competency for empathy and change of perspective
- Competency for interdisciplinary work
- Competency for communication and use of media
- Competency for planning and realising innovative projects
- Competency for evaluation
- Competency for ambiguity and frustration tolerance

Rieckmann, 2012

Key Competencies in Sustainability

Wiek et al., 2011

How can sustainability competencies be developed?

- Competencies cannot be taught, but have to be developed (cf. Weinert, 2001).

- Teaching and learning approaches are needed which are learner-centred and facilitate competence development (cf. Vila et al., 2012; Schaeper, 2009; Barth et al., 2007).

- Universities need a shift from teaching to learning

How can sustainability competencies be developed?

- Universities should create teaching and learning settings which facilitate:
    - Self-organised learning
    - Experiential learning
    - Active learning
- Possible teaching and learning approaches:
    - Project-based learning
    - Service learning
    - Research-based learning
    - Inter- and transdisciplinary learning
   - …

- Opportunities for transformative research and development

Linking teaching and learning with transformative research

Course "Outside the Box – Participatory research with people from the region" at the University of Vechta

The EnRRICH project

- Enhancing Responsible Research and Innovation (RRI) through Curricula in Higher Education (EnRRICH)

- Horizon 2020, 2015-2017

- To improve the capacity of students and staff in higher education to develop knowledge, skills and attitudes to support the embedding of Responsible Research and Innovation (RRI) in curricula by responding to the research needs of society as expressed by civil society organisations (CSOs)

- http://www.livingknowledge.org/projects/enrrich/

Responsible Research and Innovation
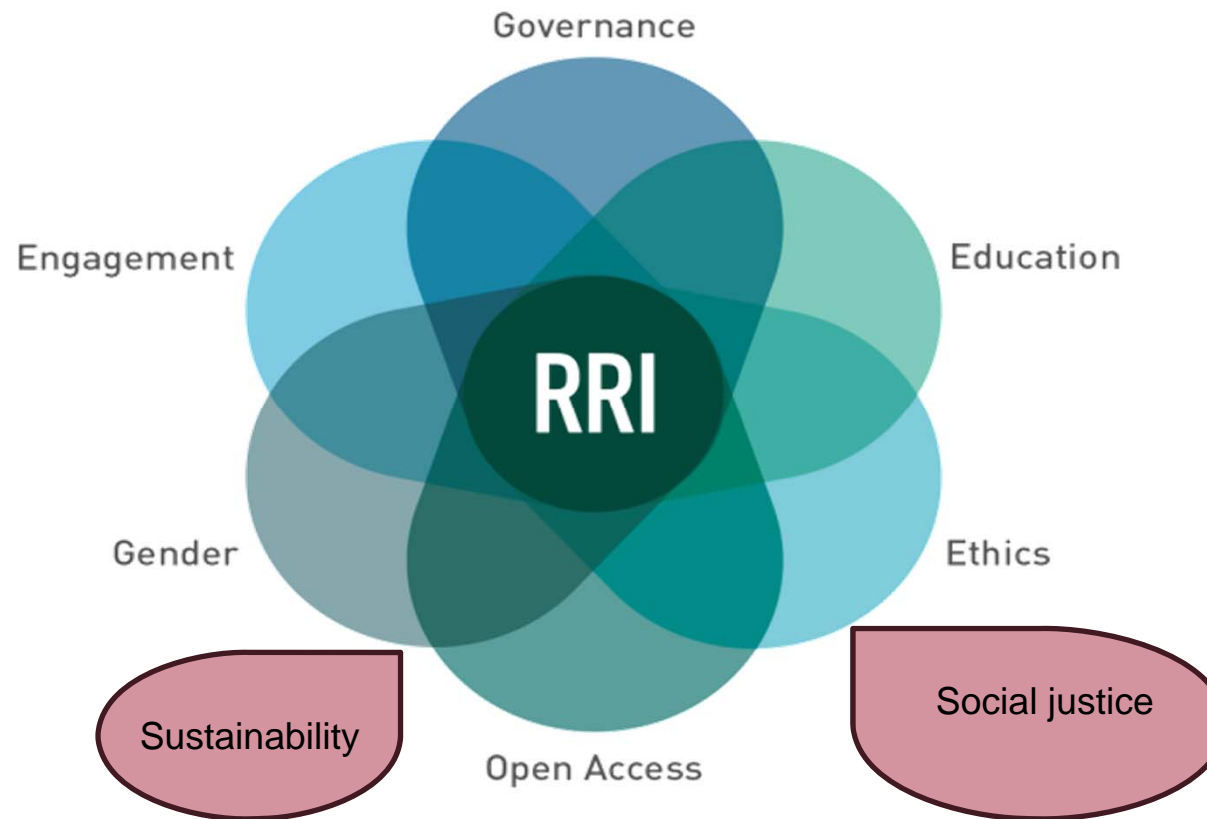
Course „Outside the Box – Participatory research with people from the region"

- Summer term 2016

- Module in General Studies (open for all Bachelor and Master students from all programmes)

- 27 students

- Research-based learning / project-based learning

- 2 phases: theoretical phase ("Responsible Research and Innovation", transdisciplinarity, participatory research, science shops ,…), practical phase with community-based student research projects in cooperation with the Vechta Science Shop and local partners

- Cooperation with local partners (Evergreen Food; Senior Citizen and Nursing Support Point of the District of Cloppenburg; Municipality of Vechta)

Course „Outside the Box – Participatory research with people from the region "

How students' learning is assessed:

- Group presentation of research results
- Group research report with individual reflection on the research and learning process

Course „Outside the Box – Participatory research with people from the region "

RRI keys integrated in the course

- In particular: sustainability and public engagement

- Dealing with questions of regional sustainable development
- Doing research with and for CSO partners, bringing together stakeholder needs with students' own disciplinary and research knowledge

Lessons learned

- RRI, transdisciplinarity,… as concepts are quite abstract for the students

- Community-based research is interesting and motivating for them

- Students can experience the research process

- Dual challenge: doing good research *and* working with partners (limited research skills of the students)

- Managing expectations is important

- Reflection is crucial: Individual reflection on the research and learning process

Linking teaching and learning with transformative development

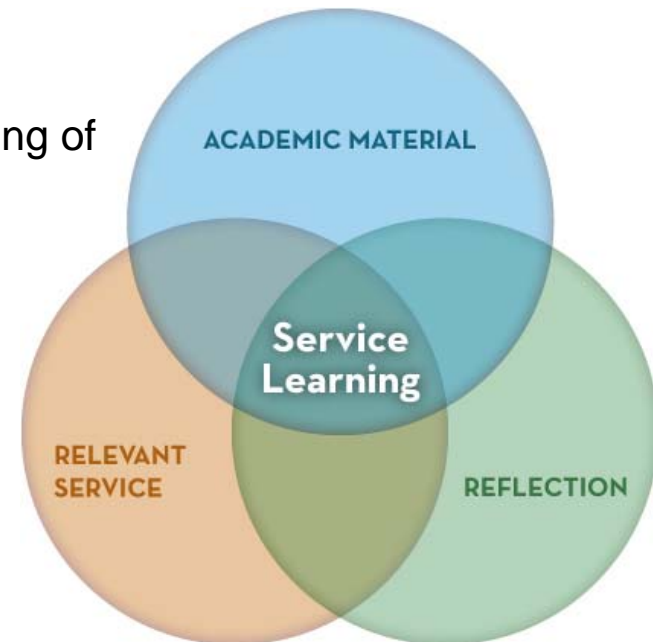## *Course "Sustainable Development" at the University of Vechta*

The CASE project

- "Competencies for A sustainable Socio Economic development" (CASE)
- EU Erasmus+ Knowledge Alliance / 2015-2017

- To support the development of competencies for a sustainable socio-economic development
- To develop and test new methods for inter- and transdisciplinary teaching and learning via regional pilot projects
- To develop a curriculum, for a "Joint Master Programme of Sustainability Driven Entrepreneurship"

- http://www.case-ka.eu/

Service-learning

- Service-learning engages students in active, relevant and collaborative learning.

- Service-learning is "a seminar-based, credit-bearing, educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way to gain further understanding of seminar content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility" (Bringle / Hatcher, 2000: 112).

Project-based courses with a service learning approach

	Sustainable development in Vechta	Cooperate Sustainability Communication
Period	Winter term 2014/15	Summer term 2015; winter term 2015/16
ECTS	5 CP	5 CP
Students	29	24 / 18
Semesters	3-6	2-6
Programme	Bachelor, General Studies	Bachelor, General Studies
Partners	Local environmental NGO (BUND)	Local enterprises (Lebensbaum; Piepenbrock)

Course „Sustainable Development in Vechta"

- Winter term 2014/15

- 29 students

- Service-learning / project-based learning

- Cooperation with an environmental NGO

- 2 phases: theoretical phase, practical phase with student projects

- projects: board game, waste separation, regional products, bycycle mobility, cloth bags at the weekly market

Project work

- Project work for promoting sustainable development in Vechta
- In cooperation with the BUND (environmental NGO)

- Identifying a field of action for sustainable development
- Definition of the target group and communication objectives
- Reflecting theory
- Development of a communication concept
- Practical test of the communication concept
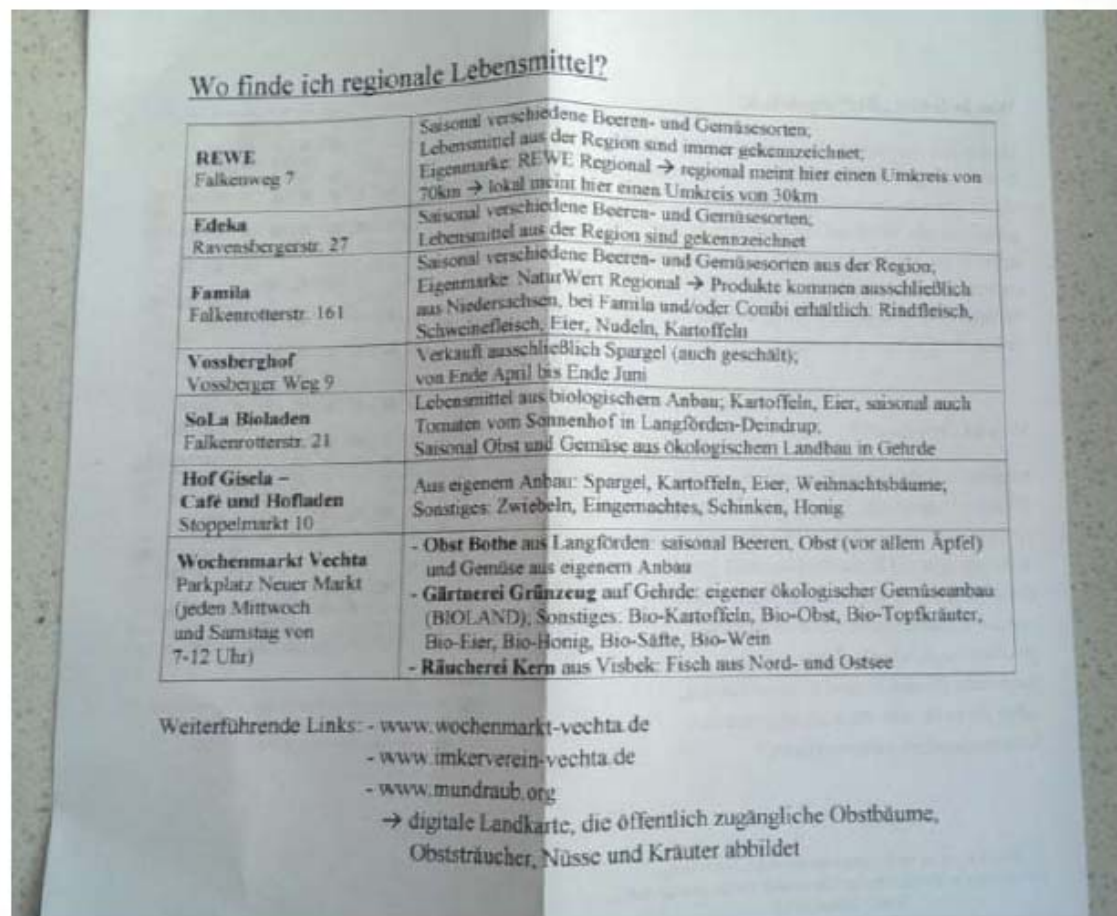- Discussion of results
- Presentation of results
- Report

- Financing: 100 € / project

Projects

Projects

Projects

More recently: Summer Term 2016

- Project-based course „Sustainable development in the region ‚Oldenburger Münsterland‘: Solving problems with innovative projects"

- Sustainability-driven Entrepreneurship, change makers and sustainable start-ups: projects for facilitating sustainable development

- Using the YooWeeDoo-ChangeMaker platform (http://www.yooweedoo.org/lernprogramm)

- Inputs from actors from the region (environmental NGO, farmers' association, common economy group,…)

Lessons learned

- Implementing service projects is interesting and motivating for the students

- Real and adequate tasks are needed

- In order to develop a good service students need guidance from the partners

- Reflection is crucial: Individual reflection on the cooperation and learning process

Conclusion

- Higher Education for Sustainable Development as a key driver for change
- Development of sustainability competencies

- Research-based learning and service-learning as vehicles for transformative research and development *(linking teaching and learning processes with research and development)*
- Contribution to science-society dialogue and transformation at the local level *(integrating partners from civil society in transformative research and development)*

- Teachers as facilitators / students need a lot of guidance
- Good partners are needed

Thank you very much for your attention!

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