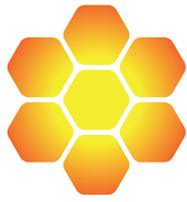


Learning and collaborating within sustainability transitions – transformative formats in university-business cooperation



CASE
Competencies for a sustainable socio-economic development

Petra Biberhofer^{1*}, Antje Disterheft², Claudia Lintner³, Johanna Bernhardt⁴, Marco Rieckmann²

^{1*} Institute for Ecological Economics, Regional Centre of Expertise on Education for Sustainable Development Vienna, Vienna University of Economics and Business, Austria, E-mail: petra.biberhofer@wu.ac.at

² Faculty of Educational and Societal Sciences, Department of Education, Higher Education Development, University of Vechta, Germany

³ Faculty of Education, Free University of Bolzano, Italy

⁴ Terra Institute GmbH, Bressanone, Italy

Theoretical Framework: Learning and collaborative dimensions in sustainability transitions

Sustainability Challenges

Society currently faces fundamental sustainability challenges in various domains, such as energy supply, water scarcity, transportation and agriculture (Markard et al., 2012).



Sustainability transitions

Sustainability transitions belong to the category of socio-technical transitions that include changes in institutional and cultural structures and differ thereby from merely technological transitions (Markard et al., 2012).

They overlap with characteristics and objectives of societal transitions (Holtz et al., 2015), but add the focus of a “fundamental transformation towards more sustainable modes of production and consumption” (Markard et al., 2012).

Learning within sustainability transitions

Of particular interest is double and triple loop learning hence continuous reflection about underlying values and assumptions. This is also called higher order learning referring to new actions resulting from processing new values.

We emphasize collective learning processes supported by cross-sector partnerships between university-businesses-civil society aiming to organize the transition area.



Collaborating within sustainability transitions

Multi-stakeholder collaboration often focus their direct interventions on specific local or regional contexts (Forrest et al., 2014), and are characterised by inter- and transdisciplinarity (Mausser et al., 2013; Walter et al., 2007).

Rather recently, particularly in science-society interfaces, some new trends can be observed: a shift from traditional expert-driven knowledge transfer to an open dialogue and the co-creation of knowledge (Biberhofer and Rammel, 2017).

Research Questions

How can learning in sustainability transitions in general and sustainability-driven entrepreneurship in particular be fostered? How can innovative collaboration forms between higher education institutions and businesses be created and implemented in order to accelerate sustainability transitions?

Research design and methods

Specific setting

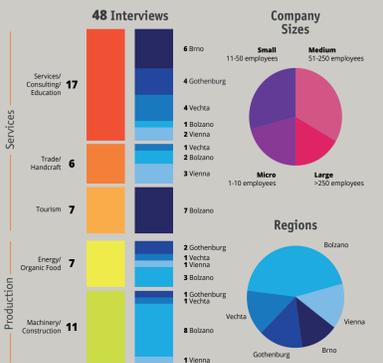
Erasmus+ Knowledge Alliance project CASE (Competencies for a Sustainable Socio-Economic Development) funded by the European Union, 2015-2017, ten partners from five European countries (Austria, Czech Republic, Germany, Italy, and Sweden)

Table 2: Case study characteristics

FORMAT REGION/COUNTRY	CONTEXT	FACTS	CHALLENGES	OUTCOMES
UNIVERSITY COURSE SUSTAINABILITY CHALLENGE VIENNA/AUSTRIA	Inter- and transdisciplinary university course about sustainable development. Service Learning partners and students tackle project coached by university teachers	Participants: 60 students/a Organisation: 4 universities and RCE Vienna Partners: 10 service learning partners/a Graduates: 543 (since 2010)	Yearly preparation, funding acquisition, changing service learning partners, securing high quality coaching despite time restrictions of all participating stakeholders	92 service learning projects (since 2010) in collaboration with 54 business partners, NGOs and other initiatives
MASTER IN ECO-SOCIAL DESIGN BOLZANO/ITALY	Inter- and transdisciplinary university Master of Arts focusing on potentials of local communities and economies. Eco-Social Design striving for good life with less material goods	ECTS credits: 120 3 years Course Language: Italian, German, English Places available: 20 EU + 2 non-EU Tuition fees: €1.343,50 per year	Developing transdisciplinary projects able to approach today's issues effectively, co-designing concrete practices and visions for tomorrow. The overarching challenge: Good life for all – empowered and facilitated by excellent design	Interdisciplinary and transdisciplinary projects created by the students and presented as final thesis of two-years Master
EKO-CENTRUM GÖTTEBORG/SWEDEN	Independent non-profit foundation offering environmental and Corporate Social Responsibility training courses and permanent exhibition on 'Sustainable City – Sustainable Society'	Environmental education and lectures are given to several hundred companies and organizations each year. Unique concept of 'walking lectures' through exhibition. 80% visitors attend courses on lectures: 1/3 public sector, 1/3 private sector, 1/3 students	The overall challenge: a sustainable world and good life for everyone. How do we make a change? How do Ekokentrum reach more people? How do we empower the participants at our short courses to make a real change at their workplaces	Over 14.000 visitors from business, departments and organizations per annum. Cooperation and collaboration with different partners from private and public sector, academy and NGOs.

Table 1: Interview sample characteristics

SECTOR	REGION	DISCIPLINARY WORK BACKGROUND	NUMBER OF INTERVIEWS
ACADEMIC	Vienna	Social Science, Entrepreneurship and Innovation, Economics and Social Science, Agricultural Economics, Sustainable Economic Development	5
ACADEMIC	Bolzano	Economics and Management, Education, Design and Art, Science and Technology	5
ACADEMIC	Bmno	Economics and Administration, Social Science, Environmental Studies	5
ACADEMIA	Gothenburg	Fine, Applied and Performing Arts, Social Science, Environmental Science, Economics, Business and Law	5
ACADEMIA	Vechta	Informatics, Economics and Ethics, Law, Environmental and Sustainability Communication, Sustainability Governance	5
SERVICES	Vienna	Trade/Handcraft, Education and Consulting	5
SERVICES	Bolzano	Tourism, Trade/Handcraft, Education and Consulting	10
SERVICES	Bmno	Education and Consulting	6
SERVICES	Gothenburg	Education and Consulting	4
SERVICES	Vechta	Trade/Handcraft, Education and Consulting	5
PRODUCTION	Vienna	Energy/Organic Food, Machinery/Construction	2
PRODUCTION	Bolzano	Energy/Organic Food, Machinery/Construction	11
PRODUCTION	Gothenburg	Energy/Organic Food, Machinery/Construction	3
PRODUCTION	Vechta	Energy/Organic Food, Machinery/Construction	2
ALL	All	All	73



Qualitative interviews and case studies

73 expert interviews with sustainability-driven entrepreneurs and university partners. Three case studies evaluating innovative collaboration formats between higher education institutions and businesses in-depth.

Findings: Transformative Learning Settings and Collaboration Formats

The findings highlight the urgent need to organize the transition arena towards transdisciplinary interaction processes. Sustainability challenges require different roles and new organizational understanding of universities and businesses. Transformative learning settings and collaboration formats have to be implemented at the science-society interface in order to accelerate sustainability transitions.

Table 4: Case study analysis

Format Region/Country	Sustainability transition themes	Unit of analysis	
		Innovative learning setting	Strategies for mutual learning/co-creation
Sustainability Challenge Vienna/Austria	Sustainable urban development	Service learning project approach links university teachers, students and partners from practice such as companies, city departments, NGOs and other organisations	Joint process of developing solutions for concrete challenges encourages epistemic learning for envisioning alternative approaches and possibilities
Master in Eco-social design Bolzano/Italy	Sustainable practices of production, consumption and living	Students collaborate with small-scale farmers, food processors and craftsmen, citizen initiatives, communities, activists and researchers in multidisciplinary projects	A transdisciplinary set of instruments focuses on co-creation of knowledge beyond design from the first idea to an prototype
Ekokentrum Gothenburg/Sweden	Sustainable City – Sustainable Society	Unique permanent exhibition as illustration of various topics, leading and inspiring visitors to look for sustainable solutions/walking lectures concept	Local, regional and national examples of sustainability solutions from Swedish companies are presented to local and international visitors (public and private sector, students)

Table 3: Learning settings fostering university-business collaboration

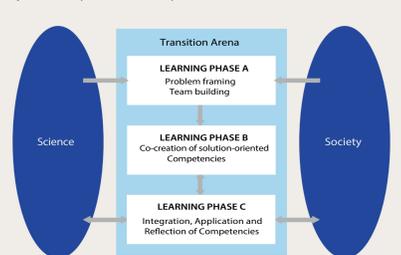
Learning Settings/Methods	Descriptions and Objectives	Benefits for partners involved
Events (Educational, science business dialog, sustainability fairs, exhibitions, market place, key notes etc.)	Network formats for mutual exchange between science and society Starting-point for multi-stakeholder-networks	Universities get to know key-issues of local economy and society and get in contact with key-players. External partners get a rough overview of research-topics at universities.
Excursions / company visits	Guided visits of enterprises with a clear-defined purpose and research-question. Key-success factors are preparation and reflection/evaluation of excursions. Transdisciplinary learning	Students gain first insights in working contexts and challenges of partner-organizations and get in touch with entrepreneurs. For partners it might be the first step into a closer cooperation.
Guest lectures	Practitioners give lectures in academic courses linking theoretical knowledge with experience from practice. Transdisciplinary learning	Academic courses are enriched with practical experiences; Opportunities and boundaries of theoretic models are questioned. External partners are confronted with critical questions and get innovative, new ideas for business.
Vocational trainings or participation of enterprises in academic courses	Transdisciplinary learning. University lecturers give vocational training for enterprises or employees join academic lectures	External partners have opportunity to update their knowledge.
Internship	Real-world learning, based on a clear working-contract and well-guided reflection-phases	Students get in-depth sight and face challenges of daily working-routines and organisational structures. External partners get to know possible future employees.
Service-Learning	Method of experimental learning that connects teaching with local society and business.	Students work highly self-responsible and have the opportunity to address a real-world societal need or problem in the context of an external organisation. Partners receive innovative solutions on focused challenges.
Collaboration-projects (research-projects, master-theses)	Project or problem-based learning. Transdisciplinary team works on a defined question or challenge. Pre-condition are trustful relations between the partners	Students get in depth view of a specific practical case and reflect their research-question against practice. External partners get access to results of science and to international scientific communities
Participation in advisory-boards, juries, etc.	Transdisciplinary learning. Mature form of collaboration, based on trust and deep interest for the working-area of the partner	Both get deep insights in processes of decision-making, future strategies and perspectives of the partner. Opportunity to overtake a mutual role of consultancy or coaching.

Discussion and Outlook

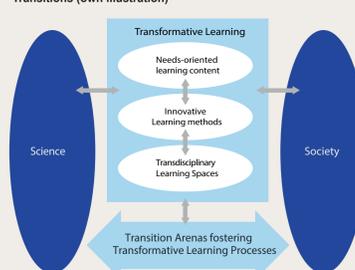
Three Learning Phases constitute the Transition Arena and can be understood as new forms of governance supported through cross-sector partnerships between civil society, (higher) education institutions and businesses.

In the beginning joint problem framing is decisive, followed by co-creation processes towards solutions and finally (re-)integration of knowledge and competencies is key.

Graphic 3: Transition Arena towards transdisciplinary governance processes (own illustration)



Graphic 4: Transformative Learning Processes in Sustainability Transitions (own illustration)



Transformative Learning Processes need structural and institutional embedment at the science-society interface. Sustainability topics need to be integrated into existing learning contexts and curricula. New and innovative methods are demanded such as networking and platform approaches. Transdisciplinary learning spaces such as urban labs focusing on informal learning need to be implemented.