



CONNECTING SCIENCE-SOCIETY COLLABORATIONS
FOR SUSTAINABILITY INNOVATIONS

ConSus: 543742-TEMPUS-1-AT-TEMPUS-JPHES

Work package 3, Deliverable 3.1

Report of the review of learning materials and teaching methods which support science-society collaborations in the field of sustainable development

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Tempus

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1 Introduction to the review of available learning materials and teaching methods

1.1 Aim of this deliverable

A review of worldwide available teaching resources that focus on fostering the collaboration between higher education and society has been conducted. This review aims at setting the stage for Del. 3.3 and 3.4, the developments of teaching materials and methods for the ConSus project. Hence the review shall provide information about existing teaching resources in the field of science-society collaborations and inspire the partners for the development of own teaching resources.

Based on the review of existing teaching resources, recommendations will be provided about types of resources and methods that will be important for the development of teaching resources that foster science-society collaborations in Albania and Kosovo.

1.2 Methodological approach and involvement of project partners

The review has been conducted by project partners at Leuphana University of Lüneburg (responsible for the coordination of Del. 3.1), University of Limerick and the University of Natural Resources and Life Sciences (BOKU) Vienna. Each partner was asked to identify at least six learning materials and/or teaching methods, which address the science-society interface and take sustainability topics into account. The review took place via desktop and internet research and the results were mapped on the basis of a common template, which was developed in April 2014. The identified teaching resources were then analysed and summarised by partners at the Leuphana University of Lüneburg.

It was intended that the review should also take into account the results of Del.1.1, the analysis of regional science-society collaborations in Albania and Kosovo. Based on this analysis, partners in 3.1 should especially search for teaching resources that address the situation in the partner countries. As Del. 1.1 was still in progress when first searches for Del. 3.1 took place, not all identified resources in 3.1 refer to the specific situation in Albania and Kosovo. Nevertheless some conclusions can be drawn.

1.3 Definition of key terms

A **teaching resource** can be either a learning material or a method or a lecture note or a module. A learning material has to be a combination of the following:

- Teaching tools: such as a text, book, picture, video, computer game, real game, experiment, experimental equipment, measurement device, computer program file, etc.
- Methods: shall help to strengthen the learning effect of the students (World Cafe, ...)
- Teaching instructions (lecture notes) for the lecturer
- Handouts for students.

This report lists **teaching methods** and **learning materials**, which focus on collaborations between higher education and societal actors (such as partners from business, industry, NGOs, governmental institutions, municipalities, regional planning offices, the tourism sector, civil society, educational institutions). The learning materials shall address sustainability topics; the teaching methods have to be appropriate for the use in the interface of science-society collaborations.

2 Description of the identified learning materials and teaching methods

Following learning materials and teaching methods have been identified by partners at Leuphana University of Lüneburg, University of Natural Resources and Life Sciences (BOKU) Vienna and University of Limerick, which are listed in detail in 2.1 and 2.2.

Learning materials		
1	Problem-Based Learning for Environmental Management in Geography	Leuphana University
2	Active learning in environmental and sustainability management through the embedding of 'live' consultancy projects	Leuphana University
3	A Disciplinary Framework for Teaching Environmental Sustainability	University of Limerick
4	Greening the campus through research-to-practice: A case study in experiential education	University of Limerick
5	Sustainability Education: Focusing on Hospitality, Tourism and Travel	University of Limerick
6	Global Change and sustainability and their security relevance	BOKU Vienna
7	Sustainability Challenge	BOKU Vienna
8	Alternative Economic and Monetary Systems - The economy of the future	BOKU Vienna
9	Future Lectures	BOKU Vienna
10	Courage for sustainability	BOKU Vienna
11	Junior Enterprise	BOKU Vienna

Teaching methods		
1	Graz Model for Integrative Development	Leuphana University
2	Simulation game – ecological footprint by “ENSIGA”	Leuphana University
3	Transdisciplinary case study	Leuphana University
4	Module “Responsibility in Science” – focusing on research-based learning and resulting in a conference week	Leuphana University
5	If it pleases the court: Using a simulated trial as the basis for an introduction to sustainability science course	University of Limerick
6	Caitlin Gabel School- A focus on food (Work-shops)	University of Limerick
7	Fieldwork: Using experimental education to expose graduate students to the relevance of case studies in sustainability and innovation	University of Limerick

2.1 Learning materials

Learning material 1	
Name of the learning material	Problem-Based Learning for Environmental Management in Geography
Source/ Web address	http://insight.glos.ac.uk/tli/resources/toolkit/resources/alcs/Pages/PBL.aspx
Name of the author	John Bradbeer School of Education and Continuing Studies, University of Portsmouth, UK
Main topic	Environmental Management in Geography
Intended learning outcome	<ul style="list-style-type: none"> • Experience problem-based learning through the case study approach, which leads to: <ul style="list-style-type: none"> ○ see that each case can be better understood through the use of theoretical and conceptual ideas ○ realise that each case illustrates the working out of theoretical and conceptual ideas in real settings
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input checked="" type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input type="checkbox"/> Student project <input type="checkbox"/> Other, <i>please specify</i> :
Language	English
Methods used	Case study

Brief description of the learning material (regarding contents and methods)
<p>“Problem-Based Learning for Environmental Management in Geography” presents a comprehensive teaching resource, including instructions for the university educator (for a one semester course at the Bachelor level), tips and possible problems, a list of case studies with questions and a student guide, relevant references and background information about problem-based learning.</p> <p>The case studies focus on environmental issues within a geographical context and range from a harbour area in UK, to the Aral Sea, the habitat of a dune system in UK, or tuna fishing in the Atlantic and Pacific oceans.</p>

Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)
<p>Stakeholders are not directly being involved in the learning resource; nevertheless the case studies strongly deal with participation issues and allow students to explore the different roles of stakeholders within the case study topics. E.g. questions deal with how particular stakeholders are being involved, what interests different groups of people might have</p>

related to the topic, what conflicts may arise and how they could be managed, etc.
For the ConSus project it would additionally be recommended to directly involve stakeholders in the development and implementation of the student seminar, which would require case studies with a regional context.

Strengths	<ul style="list-style-type: none"> • The case study approach as a proper method for science-society collaborations. • Background information about problem-based learning • Well documented instructions for the educator • Appropriate content (environmental management and geography) • Societal stakeholders could easily be involved
Weaknesses	<ul style="list-style-type: none"> • Societal stakeholders are not involved yet.

What sustainability issues does the learning material address? (Please briefly explain.)
Different examples of environmental management within a geographical context, addressing social and/or socio-economic issues as well

Which of the following criteria does the learning material include? (Please tick.)

<input checked="" type="checkbox"/> interdisciplinary	<input checked="" type="checkbox"/> student centred teaching approach
<input checked="" type="checkbox"/> related to local challenges/ needs	<input checked="" type="checkbox"/> related to acquiring knowledge
<input checked="" type="checkbox"/> related to global challenges/ needs	<input checked="" type="checkbox"/> related to acquiring skills
<input type="checkbox"/> holistic thinking	<input checked="" type="checkbox"/> strengthens interpersonal competence
<input checked="" type="checkbox"/> systemic thinking	<input type="checkbox"/> strengthens strategic competence
<input checked="" type="checkbox"/> long-term thinking	<input type="checkbox"/> related to building capacity of the stakeholders
<input checked="" type="checkbox"/> application oriented	

Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer handouts for students?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)

<input checked="" type="checkbox"/> Yes	<p>The case study approach presents a proper method for problem-based learning, which requires critical thinking and active engagement by the students.</p> <p>In order to foster science-society collaboration, regional stakeholders from the case studies should be involved in the seminar as well (e.g. via interviews, field trips or workshops). Hence it would be important</p>
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	to develop case studies, which focus on regional topics and where societal stakeholders could be involved.
<input type="checkbox"/> No	

Learning material 2	
Name of the learning material	Active learning in environmental and sustainability management through the embedding of 'live' consultancy projects
Source/ Web address	http://insight.glos.ac.uk/tli/resources/toolkit/resources/Documents/B6.pdf
Name of the author	Alex Steele University of Gloucestershire, UK
Main topic	Sustainability management in businesses
Intended learning outcome	<ul style="list-style-type: none"> • To develop an understanding of the environmental and social impacts of a local medium sized business. • To visit that business, to observe on-site activities and to have the opportunity to interview staff. • To negotiate a scope of work with the business organisation, which provides the business with practical support in relation to the development of an ISO14001 environmental management system. • To get hands-on experience of conducting a sustainability review of company activities (looking at impacts on environment and society), to review the legal and policy context for sustainable development for that organisation, and to provide recommendations in the form of objectives and targets to the organisation.
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input type="checkbox"/> Other, <i>please specify</i> :
Language	English
Methods used	Consultancy exercise, interviews

Brief description of the learning material (regarding contents and methods)
The learning material includes information about active learning opportunities for students on the basis of consultancy projects with businesses, where students have the possibility to engage in real situations, interview staff from the companies and support them in planning their sustainability management (as a preparation for ISO14001). The consultancy project and close collaboration with the businesses present a transdisciplinary approach.

Brief description of the integration of societal stakeholders (*How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.*)

Business companies are involved in the seminar as active partners – students have the possibility to get in direct contact with employees in businesses and experience challenges in implementing sustainability management. The stakeholders from the businesses benefit from the collaboration as well as they receive external, fresh and creative perspectives on their activities by the students and recommendations about their sustainability management processes.

Strengths	<ul style="list-style-type: none"> • Active learning experience for students • Mutual learning for students and business stakeholders
Weaknesses	<ul style="list-style-type: none"> • Maybe not a weakness, but a risk – it is important to work with motivated and well prepared students (otherwise further potential collaboration with the businesses might be threatened) • occasional issues of confidentiality

What sustainability issues does the learning material address? (*Please briefly explain.*)

Sustainability management in businesses, with a focus on environmental management based on ISO 14001.

Which of the following criteria does the learning material include? (*Please tick.*)

<input type="checkbox"/> interdisciplinary	<input checked="" type="checkbox"/> student centred teaching approach
<input checked="" type="checkbox"/> related to local challenges/ needs	<input checked="" type="checkbox"/> related to acquiring knowledge
<input type="checkbox"/> related to global challenges/ needs	<input checked="" type="checkbox"/> related to acquiring skills
<input checked="" type="checkbox"/> holistic thinking	<input checked="" type="checkbox"/> strengthens interpersonal competence
<input checked="" type="checkbox"/> systemic thinking	<input checked="" type="checkbox"/> strengthens strategic competence
<input type="checkbox"/> long-term thinking	<input checked="" type="checkbox"/> related to building capacity of the stakeholders
<input checked="" type="checkbox"/> application oriented	

Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (*Please briefly explain.*)

<input checked="" type="checkbox"/> Yes	The material describes a good opportunity for collaboration and mutual learning between students and businesses in the field of
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	sustainability management and corporate responsibility.
<input type="checkbox"/> No	

Learning material 3	
Name of the learning material	A Disciplinary Framework for Teaching Environmental Sustainability
Source/ Web address	http://www.jsedimensions.org/wordpress/content/a-disciplinary-framework-for-teaching-environmental-sustainability_2013_06/ ; see resource "Limerick_Learning-material 1"
Name of the author	Shelly Koch and Jesse Freedman
Main topic	Energy conservation
Intended learning outcome	To educate the students on how much energy everyday devices use and the consequences energy use patterns have on environmental problems on a global scale
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input checked="" type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input type="checkbox"/> Other, <i>please specify</i> :
Language	English
Methods used	Surveys and interviews

Brief description of the learning material (regarding contents and methods)
<p>This learning material is a case study of a collaborative project that took place between a professor, his students and the energy manager of the University. The main goal of the project was the design, dissemination, and analysis of a survey to measure behaviours, attitudes, and perceptions of energy use on campus. Half of the class designed and implemented a survey while the other half interviewed faculty and staff to get more detailed information about the issues discussed. The survey provided the energy manager with information on the perspective and behaviours of the faculty and students on campus, the students learned research methods and practiced these skills, and the students became familiar with energy use terminology and conservation issues. The project was categorised as community based research as students and faculty undertook a research project in collaboration with community-based organisations to address needs identified by the community. These types of projects better prepare students for making decisions, collaborating and creating systemic solutions which are crucial skills for facilitating sustainable change. This research project can easily be adapted to any university setting.</p>

Brief description of the integration of societal stakeholders (*How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.*)

The stakeholder in this case study was the universities' energy manager. The energy manager represents a community stakeholder in that his mandate is to bring the campus community closer to carbon neutrality by 2036. For the energy manager, the survey provided a baseline for the behaviours and attitudes toward energy conservation on campus, and suggested a direction for further study to determine the best strategies for effecting behaviour change.

Strengths	<ul style="list-style-type: none"> • The survey would provide the energy manager with information on the attitudes and behaviours of the faculty and students on campus • Students would learn research methods and practice these skills, and the students would become familiar with energy use terminology and conservation issues • Should help to make students more thoughtful consumers of energy as well as more aware of the different stages involved in research projects.
Weaknesses	<ul style="list-style-type: none"> • The preparation and analysis of questions for the survey could be very time consuming. • Faculty staff could be very busy and reluctant to take part in interviews and surveys.

What sustainability issues does the learning material address? (*Please briefly explain.*)

This learning material addresses the issue of energy conservation.

Which of the following criteria does the learning material include? (*Please tick.*)

<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders
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Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No

Does the material offer handouts for students?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	It is collaborative, active, student centred, focuses on sustainability.
<input type="checkbox"/> No	

Learning material 4	
Name of the learning material	Greening the campus through research-to-practice: A case study in experiential education
Source/ Web address	http://www.jsedimensions.org/wordpress/wp-content/uploads/2013/06/Pamela-Jean-Driza-and-Maruja-Torres-Antonini-finalproofMay2013.pdf
Name of the authors	Pamela-Jean N. Driza and Maruja Torres-Antonini
Main topic	Energy and water conservation, waste management
Intended learning outcome	To evaluate the energy use, water consumption, waste generation and related resident behaviours within a specific area
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input checked="" type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input type="checkbox"/> Other, <i>please specify</i> .
Language	English
Methods used	Online surveys, tour of buildings and waste management centre, report writing, presentations, interviews

Brief description of the learning material (regarding contents and methods)
<p>This learning material is a case study about a project based learning framework which could be studied and adapted to any University setting. Students were divided into groups to evaluate the energy use, water consumption, waste generation and related resident behaviours within a specific area. The residence area had recently undergone extensive renovations to introduce energy saving HV AC system, insulated window, recycled content countertops and automatic light sensors. Students established partnerships with the Department of Housing and Residence Education (DHRE), University of Florida (UF) Office of Sustainability and Division of Facilities Planning and Construction. Each group developed an action plan for their topic area. Prior to selecting a method for assessing the sustainable strategies in each building, students referred to industry standards and identified successful</p>

instruments such as the Energy Star Portfolio. The students presented a report of their findings and recommendations to the stakeholders involved on completion of the project.

Brief description of the integration of societal stakeholders (*How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.*)

The stakeholders involved are DHRE and US Green Buildings Council (USGBC). The students went to members of the DHRE for advice on the methods they were using and what they should be looking for. For example, the DHRE advised the students to visit the local waste management centre where they learned what exactly can be recycled. This helped the students to distinguish items that had been improperly recycled or misidentified as landfill-bound waste. The finalised report of the investigation and recommended improvements was presented and delivered to DHRE and USGBC. The DHRE and USGBC can consider the recommendations included in the report to implement future sustainable strategies in the area. The USGBC also uploaded the report onto their website to encourage other Universities to carry out similar research projects.

<p>Strengths</p>	<ul style="list-style-type: none"> • First-hand experience in collecting data • Building collegiate partnerships • Thinking critically about interpretation and communication of findings • Learn how to extract material that isn't made too available • Experience challenges that they can expect to face in the work environment • Get to reflect on their own ideas, opinions, exercise voice and choice and making decisions • Students develop good organisational skills; time management and planning • Positive changes in student motivation and attitude toward learning
<p>Weaknesses</p>	<ul style="list-style-type: none"> • It is important when dividing the students into groups that they are divided as equally as possible as it was noted in this research project that a lot of time and effort was required with one particular group that weren't as competent as the other groups to ensure uniform progression of the class. • It is not always easy to access institutional documentation such as resource consumption documents, construction drawings and occupancy data.

What sustainability issues does the learning material address? (*Please briefly explain.*)

The teaching material addresses energy use, water consumption and waste generation.

Which of the following criteria does the learning material include? (Please tick.)	
<input checked="" type="checkbox"/> interdisciplinary	<input checked="" type="checkbox"/> student centred teaching approach
<input checked="" type="checkbox"/> related to local challenges/ needs	<input checked="" type="checkbox"/> related to acquiring knowledge
<input checked="" type="checkbox"/> related to global challenges/ needs	<input checked="" type="checkbox"/> related to acquiring skills
<input checked="" type="checkbox"/> holistic thinking	<input checked="" type="checkbox"/> strengthens interpersonal competence
<input type="checkbox"/> systemic thinking	<input checked="" type="checkbox"/> strengthens strategic competence
<input checked="" type="checkbox"/> long-term thinking	<input checked="" type="checkbox"/> related to building capacity of the stakeholders
<input checked="" type="checkbox"/> application oriented	

Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	Being able to collectively track and understand the connection between behaviour and outcomes from energy consumption allows the researcher to reflect on how to elicit more desirable behaviour.
<input type="checkbox"/> No	

Learning material 5	
Name of the learning material	Sustainability Education: Focusing on Hospitality, Tourism and Travel
Source/ Web address	http://www.isedimensions.org/wordpress/wp-content/uploads/2013/01/CynthiaDeale2Winter2013.pdf
Name of the author	Cynthia S. Deale
Main topic	Sustainability in the hospitality, tourism and travel industry
Intended learning outcome	<ul style="list-style-type: none"> • Students will be able to identify themes in sustainability education in the lodging, meetings and events and food and beverage sectors • Students will learn applications of sustainability practices in hospitality and tourism operations
Type of teaching tool	<input checked="" type="checkbox"/> Information/ booklet/ brochure <input type="checkbox"/> Case study <input type="checkbox"/> Games <input type="checkbox"/> Simulation

	<input type="checkbox"/> Experiment <input type="checkbox"/> Student project <input type="checkbox"/> Other, <i>please specify</i> :
Language	English
Methods used	<ul style="list-style-type: none"> • Factual information • Questioning • Guidelines provided from relevant sources

Brief description of the learning material (regarding contents and methods)	
<p>The learning material is an article that introduces content information related to sustainability that may be helpful for use in hospitality and tourism education. Themes in sustainability education in lodging, meetings and events and food and beverage sectors are identified, applications of sustainability practices in hospitality and tourism operations are introduced and views about the future direction of sustainability education in this field are provided. The article explains what concepts the lecturer should focus on and how to introduce them. The article suggests probing questions that the lecturer can use for his/her students on the different sectors. The article provides guidelines on how hotels and, meetings can go “green” and looks at the main principles that consumers and business operators should follow in order to adopt a sustainable approach to food. Finally, the article offers general conservation tips.</p>	

Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)	
<p>Possible stakeholders that could get involved in the teaching of sustainability in hospitality and tourism are hotel managers, tourist agencies, community councils, recreational and leisure facility managers and organisations that promote sustainable travel, tourism and hospitality in general. The stakeholders could come to the University and discuss their work, what sustainable developments they have undergone in their business in previous years, the economic challenges they are faced with and suggest possible ways the students can help them. They could discuss the different job opportunities that arise from this line of work and the best courses to do in college if interested in this area.</p>	

Strengths	<ul style="list-style-type: none"> • The article explains the importance of tourism and hospitality to an area • Uses easily understood terminology • Discusses the possible careers in this field • Provides the lecturer with probing questions for his/her students • Identifies the key concepts that should be covered in this area of education
Weaknesses	<ul style="list-style-type: none"> • The written text itself doesn’t cater for visual learners, it is very factual based with no images • The article is quite long to hold students attention

What sustainability issues does the learning material address? (Please briefly explain.) The learning material addresses sustainability in the hospitality and tourism industry. The main focus is on areas of lodging, meetings and events and food service segments of the industry. It identifies the importance sustainable development in these areas has on local communities and the country as a whole for example it creates jobs, encourages immigrants and tourists into the country.
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Which of the following criteria does the learning material include? (Please tick.)	
<input type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input type="checkbox"/> related to acquiring skills <input type="checkbox"/> strengthens interpersonal competence <input type="checkbox"/> strengthens strategic competence <input type="checkbox"/> related to building capacity of the stakeholders

Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the material offer handouts for students?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	This material is very informative and useful, for the lecturer for teaching and the student for learning.
<input type="checkbox"/> No	

Learning material 6	
Name of the learning material	Global Change and sustainability and their security relevance
Source/ Web address	http://www.boku.ac.at/lva-detailseite/lva/266808/?cHash=a357b49c1e514eea358e395dcdad3931 or https://online.boku.ac.at/BOKUonline/lv.detail?clvnr=271102&sprache=1
Name of the author	University (BOKU): Wolfgang Kromp, Helga Kromp-Kolb, Martin

	Gerzabek, Waidbacher Herwig Stakeholder (LVAK): Feichtinger Walter, Hainzl Gerald, Pankratz Thomas
Main topic	Paradigm of safety policy – Global change and sustainability and their security relevance
Intended learning outcome	To learn different foci and angles of view on safety concerning global change and sustainability issues; to raise awareness, train personnel power of observation, review and judging concerning global safety issues;
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input checked="" type="checkbox"/> Other, <i>please specify</i> : SEMINAR
Language	German
Methods used	Stimulus lecture, teamwork, discussion

Brief description of the learning material (regarding contents and methods)
<p>Seminar in cooperation of BOKU and Academy of National Defence (LVAK) hosted by the Center of Global Change and Sustainability.</p> <p>Contents: Analysis of different angles of view on and aspects of trouble spots such as resources, environmental change, economy, food, energy, security, migration, political systems, extern stakeholder and others regarding the Austrian and European safety. Every semester changing topic of emphasis (2014: resilience)</p> <p>Lecturers and staff of both LVAK and BOKU hold introduction lectures. Afterwards students work in groups on a specific problem.</p>

Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)
<p>This cooperation of University students and the Austrian armed forces aims to develop criteria for a national strategic concept for the enhancement of safety issues (such as resilience) in a transdisciplinary approach, which enables students to experience different angles of view of the (natural) scientific oriented University and the mainly practical and safety oriented stakeholder.</p>

Strengths	<ul style="list-style-type: none"> • Transdisciplinary approach • Students develop criteria for a national safety concept: Stakeholder benefits from students group work
Weaknesses	<ul style="list-style-type: none"> • To extensive to easily implement in an existing course

What sustainability issues does the learning material address? (Please briefly explain.)
Water availability, food security, social cohesion, resilience, demographic development, renewable energy, migration issues, national safety,...

Which of the following criteria does the learning material include? (Please tick.)	
<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders

Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes (teamwork) <input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> (YES within the seminar) <input type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	The concept is good, but it has to be converted from a seminar to a smaller learning material (student project) that can easily be included (implemented) in a lecture. The animation for interaction of students might be intensified.
<input type="checkbox"/> No	

Learning material 7	
Name of the learning material	Sustainability Challenge
Source/ Web address	http://www.rce-vienna.at/sustainabilitychallenge/
Name of the author	RCE Vienna (Regional Centre of Expertise on Education for Sustainable Development)
Main topic	Social, ecological and economical development; Specific topic is subject of change every semester.
Intended learning outcome	Understanding of social, ecological and economical Sustainable Development.
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input checked="" type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input checked="" type="checkbox"/> Other, <i>please specify</i> : University course
Language	German
Methods used	Community learning, teamwork, conceptual solution design for actual problems and challenges together with selected project partners

Brief description of the learning material (regarding contents and methods)
<p>Inter- and transdisciplinary University course about Sustainable Development, with alternate main topic (e.g. 2014: Smart City – intelligent solutions for urban challenges)</p> <p>Within four course blocks on four different Universities, attending students discuss real problems with stakeholder of economy and science. Through the study of concrete solutions for today's challenges, students and stakeholder collectively create additional value for humans, environment and economy.</p> <p>Topics 2014: Governance and ecological economy; socio-ecological policy; climate change; sustainable building and energy;</p>

Brief description of the integration of societal stakeholders (How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.)
<p>Stakeholder from economy and science introduce problems and challenges and afterwards discuss with students possibilities to find concrete solutions. Suitable stakeholders are selected according to the main topic, which is subject of change every semester.</p>

Strengths	<ul style="list-style-type: none"> • Inter- and transdisciplinary approach • Students learn to find appropriate solutions on the basis of real problems; Economy and society benefits from teamwork of students and stakeholder
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Weaknesses	<ul style="list-style-type: none"> To extensive to easily implement in an existing course
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What sustainability issues does the learning material address? (Please briefly explain.)
Different problems and challenges within social, ecological and economic development.

Which of the following criteria does the learning material include? (Please tick.)	
<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders

Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes (teamwork, search for solutions)
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> (YES within the course) No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	The concept of a discussion between students and stakeholder is good. Students are engaged in finding solutions for real problems instead of fictive examples. As in 1.1, this course has to be converted to a smaller learning material (student project) that can easily be included (implemented) in a lecture. The teaching note and handouts have to be produced and/or adapted. The animation for interaction of students should be intensified.
<input type="checkbox"/> No	

Learning material 8	
Name of the learning material	Alternative Economic and Monetary Systems - The economy of the future
Source/ Web address	http://www.inex.org/study-abroad/aems-vienna/
Name of the author	INEX International Network for Educational Exchange, OeAD Österreichischer Austausch Dienst, Economy for the common good, Wachstum im Wandel, Stadt Wien, BOKU Wien, TU Wien, FH Burgenland
Main topic	Alternative economic systems
Intended learning outcome	The summer school enables critical assess proposals for economic and financial reform in regard to current ecological and social developments.
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input checked="" type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input checked="" type="checkbox"/> Other, <i>please specify</i> : Summer School
Language	English
Methods used	Lectures, Discussions, Workshops, Social Events, teamwork

Brief description of the learning material (regarding contents and methods)
<p>Scholars and practitioners will meet during the summertime in Vienna in order to present and discuss the state of art in alternative economic systems – the most promising ideas for our economic and ecologic future. This new academic program is open to students and non-students of all branches and offers a unique approach to the topic: rather than just presenting economic models, AEMS also presents the scientific data needed to critically assess proposals for economic and financial reform in regard to current ecological and social developments and future leeway.</p> <p>Alternative Economic and Monetary Systems is an academic course in two parts:</p> <p>Preparatory phase: In order to maintain a high level of academic quality, participants will be required to prepare themselves using a predetermined list of publications. Participants will also be required to complete a group project.</p> <p>Lecture phase: The lecture phase (August 4-16) will be a mix of lectures, discussions and exercises – regular attendance, active participation and the preparation of a short group presentation will be required to complete the Summer School successfully.</p>

Brief description of the integration of societal stakeholders (*How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.*)

Practitioners from science and society introduce the state of art of alternative economic systems. Afterwards students will deepen their understanding within discussions. In workshops ideas are picked up and solutions are created. Suitable stakeholders are selected according to the main topic, which is subject of change every semester.

Strengths	<ul style="list-style-type: none"> • Inter- and transdisciplinary approach • Students learn alternative economic systems on the basis of existing studies • Students work in groups with real actual scientific data • Economy and society benefits from the teamwork of students and stakeholders
Weaknesses	<ul style="list-style-type: none"> • To extensive to easily implement in an existing course

What sustainability issues does the learning material address? (*Please briefly explain.*)

Economic and financial reform in regard to current ecological and social needs and developments.

Which of the following criteria does the learning material include? (*Please tick.*)

<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders
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Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes (teamwork, work with real scientific data) <input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> (YES within the course) No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	The concept is good in principle: students are engaged in working with real scientific data. As in 1.1 and 1.2, this summer school has to be converted to a smaller learning material (student project) that can easily be included (implemented) in a lecture. The teaching note and handouts have to be produced and/or adapted.
<input type="checkbox"/> No	

Learning material 9	
Name of the learning material	Future Lectures
Source/ Web address	http://www.umweltbildung.at/initiativen/dennis-meadows-future-lectures.html
Name of the author	Forum Umweltbildung, Center for Global Change and Sustainability, Dennis Meadows
Main topic	Sustainability
Intended learning outcome	Actual and interesting subjects in the context of sustainability; organization of a series of lectures; organization of a green event;
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input type="checkbox"/> Other, <i>please specify</i> .
Language	German
Methods used	Teamwork, discussion

Brief description of the learning material (regarding contents and methods)
<p>Universities and colleges can be essential starting points to help shape “the world of tomorrow”. For this reason, the FUTURE LECTURES draw on enthusiastic universities and colleges to initiate a discussion beyond disciplinary boundaries: opportunities, challenges as well as contradictions in the most current fields of research are debated and brought to a broad public audience.</p> <p>Students are animated to do a brainstorm on actual problems and challenges in the context of sustainability and global change, in order to choose a few convenient for a series of lectures with subsequent discussions. The students’ task will be the organization of the events right from the beginning. Experienced lecturers will accompany and help the students organizing the location, creating a schedule, inviting the guest speaker as well as the appropriate audience, and attend the final discussions with audience and speaker. Since the events have to be conducted in a sustainable way, the students also learn the requirements</p>

of “green events”. Last but not least the invited guests (students and stakeholder) are animated to interact, e.g. by showing a red card (if they disagree) or a green card (if they like an aspect very much), or within an interactive questioning (the speaker asks a question and the audience votes via smart phone),...

Brief description of the integration of societal stakeholders (*How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.*)

Stakeholders are invited by students to talk about and discuss an actual problem in the context of sustainability and global change. Stakeholder will bring real problems into the university lecture.

Strengths	<ul style="list-style-type: none"> • Inter- and transdisciplinary approach • Students learn to organize a green event • Students learn actual challenges and real life problems • Students work in groups • Economy and society benefits from the teamwork of students and stakeholders
Weaknesses	<ul style="list-style-type: none"> • To extensive to easily implement in an existing course

What sustainability issues does the learning material address? (*Please briefly explain.*)

Green event; other issues dependent on the topics chosen by the students.

Which of the following criteria does the learning material include? (*Please tick.*)

<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input type="checkbox"/> related to building capacity of the stakeholders
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Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	The material presents a good practice: students are involved from the beginning in organizing a green event. As in 1.1, 1.2 and 1.3, it might be difficult to implement this extensive material into an existing lecture. The teaching note and handouts have to be produced.
<input type="checkbox"/> No	

Learning material 10	
Name of the learning material	Courage for sustainability
Source/ Web address	http://www.umweltbundesamt.at/mutzzurnachhaltigkeit
Name of the author	Center for Global Change and Sustainability, Lebensministerium, Risiko:Dialog, Environmental Agency Vienna, ORF with kind support of the Foundation "Forum for Responsibility Germany"
Main topic	Global and local aspects of sustainable development
Intended learning outcome	how to "live sustainability"
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input checked="" type="checkbox"/> Other, <i>please specify</i> : Discussion series
Language	German
Methods used	Teamwork, student project,

Brief description of the learning material (regarding contents and methods)	
<p>Internationally renowned authors have deliberated their views on some of the most pressing problems and their possible solutions in a 12-book series published by Fischer Verlag (2007/2008) and sponsored by the German Foundation Forum for Responsibility. In this lecture series some of these authors will speak in lectures open to the public.</p> <p>Embedded in the series of lectures, the students will be asked to conduct small projects, where they have to demonstrate courage for sustainability. The students choose the topic and design the project.</p>	

Brief description of the integration of societal stakeholders (*How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.*)

Internationally renowned authors are asked to talk about their books in the context of sustainability issues. The topics they will address will be prepared beforehand and wrapped up afterwards in BOKU internal sessions, based on presentations, discussions, working groups, etc.

Strengths	<ul style="list-style-type: none"> • Inter- and transdisciplinary approach • Students learn to be courageous to “live sustainability” • Students think about their own opportunities and responsibility in the context of global change
Weaknesses	<ul style="list-style-type: none"> • It is dependent on the nature of the project, whether society will benefit from the projects or not; the task has to be modified. Possible modification: as a directive, the projects must be designed in such an extent, that the society somehow can benefit from it. • to extensive to easily implement in an existing course

What sustainability issues does the learning material address? (*Please briefly explain.*)

The major breaks the world is heading for, and how fast they will occur; the major drivers; the strategies to achieve the sustainable development necessary to reduce or ban ecological and socio-economic threats.

Which of the following criteria does the learning material include? (*Please tick.*)

<input checked="" type="checkbox"/> interdisciplinary <input type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input type="checkbox"/> related to building capacity of the stakeholders
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Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No

Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	The material presents a good practice: students are animated to think about their own opportunities and responsibilities in the context of global change, and there are animated to take action. It might be difficult to implement the extensive material (lecture and students project) into an existing lecture. It might be beneficial to reduce the lectures to a minimum, and focus on the student's project. There is no teaching note or hand-out available yet.
<input type="checkbox"/> No	

Learning material 11	
Name of the learning material	Junior Enterprise
Source/ Web address	https://online.boku.ac.at/BOKUonline/lv.detail?clvnr=271253
Name of the author	Dr. Alfred Strigl, Dominik Schmitz MSc.
Main topic	(junior) enterprises in the field of sustainability and social entrepreneurship, start up, leadership, business planning;
Intended learning outcome	<ul style="list-style-type: none"> • financing of start up's • project management • start-up ecosystem of Austria • implementation of a business plan • implementation of a prototype of a Junior Enterprise • development of a financing plan
Type of teaching tool	<input type="checkbox"/> Information/ booklet/ brochure <input checked="" type="checkbox"/> Case study <input type="checkbox"/> Game <input type="checkbox"/> Simulation <input type="checkbox"/> Experiment <input checked="" type="checkbox"/> Student project <input checked="" type="checkbox"/> Other, <i>please specify</i> : lecture course
Language	German
Methods used	Teamwork, student project

Brief description of the learning material (regarding contents and methods)
The course offers students learning how to plan and implement Junior Enterprises (JE) active in the field of sustainability and social entrepreneurship. The aim was both to offer practical teaching about sustainability, leadership, business planning, and to develop a financing and business plan in order to finally implement the prototype JE. Examples of successfully launched JE are:

- CO2 Compensation consulting company
- Solar PV company (50 kWp plant at the roof of the University)
- Junior Enterprise Hub to support the development of JE in terms of a logistic and knowledge service provider
- Development of a Green Bank account for students

After the successful implementation of the first course, the successor course will continue the further development of the previously implemented JE. Practical input on marketing, business development and hands on development of the successful JE are part of the learning outcome of the following courses.

Brief description of the integration of societal stakeholders *(How are stakeholders being involved? Does it target specific stakeholders? Purpose of the stakeholder involvement? Etc.)*

Stakeholders from the Austrian economy, who launched an "ecological enterprise", as well as institutions who foster a start-up enterprise are invited to guest lectures.

Strengths	<ul style="list-style-type: none"> • Inter- and transdisciplinary approach • Students learn to be courageous to "live sustainability" • Students think about their own opportunities and responsibility in the context of global change
Weaknesses	<ul style="list-style-type: none"> • to extensive to easily implement in an existing course

What sustainability issues does the learning material address? *(Please briefly explain.)*

ecological economics, personal responsibility, sustainable entrepreneurship

Which of the following criteria does the learning material include? *(Please tick.)*

<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input type="checkbox"/> related to building capacity of the stakeholders
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Within the material, are students animated to interact in any way?	<input checked="" type="checkbox"/> Yes
	<input type="checkbox"/> No
Does the material offer a teaching note, which describes how it should be used within the lecture/course?	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No
Does the material offer handouts for students?	<input type="checkbox"/> Yes

	<input checked="" type="checkbox"/> No
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Does the material present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	The material presents a good practice: students are animated to think about their own opportunities in the context of ecological economy and global change, and they are animated to take action. This extensive material (lecture course) cannot easily be implemented into an existing course. It might be beneficial to focus on one very simple JE project. No teaching note or students hand-out available yet.
<input type="checkbox"/> No	

2.2 Teaching methods

Teaching method 1	
Name of the teaching method	Graz Model for Integrative Development
Source/ address	Web http://www.sustainicum.at/en/tmethods/view/7.Graz-Model-for-Integrative-Development; Mader, C. (2012) Sustainability process assessment on transformative potentials: the Graz Model for Integrative Development, Journal of Cleaner Production, http://dx.doi.org/10.1016/j.jclepro.2012.08.028
Author	Clemens Mader Leuphana University of Lüneburg, Germany
Intended learning outcome	<ul style="list-style-type: none"> • Students learn to apply the Graz Model for Integrative Development • Reflection on development processes and the role of integrative thinking • Assessment of sustainability processes on the basis of the Graz Model and independent development of problem-solving strategies
Type of method	<input type="checkbox"/> Brainstorming <input type="checkbox"/> Foster collaboration/ discussion <input checked="" type="checkbox"/> Reflection <input checked="" type="checkbox"/> Creative methods <input type="checkbox"/> Systemic methods <input type="checkbox"/> Simulation <input type="checkbox"/> Competition <input type="checkbox"/> Survey/ interview <input type="checkbox"/> Other, <i>please specify</i> :

Language	English, German
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Brief description of the teaching method
<p>The Graz Model for Integrative Development (Mader, C., 2012) assesses development processes on the basis of five principles: Leadership & vision, Social network, Participation, Education & learning, and Research integration.</p> <p>The model presents a tool to holistically and scientifically reflect and evaluate sustainability processes as well as to provide support in the planning and further development of these processes. The model has been applied at businesses (corporate processes), NGOs (social and environmental processes) or regional organizations (regional development processes).</p>

Brief description of the integration of societal stakeholders <i>(How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.)</i>
<p>Students will apply the Graz model in order to plan/ reflect/ assess social/ environmental/ corporate/ or regional processes. This will happen in collaboration with key actors, who play an active role as experts in the field. The assessment on the basis of the Graz model shall support them in understanding their development processes and address recommendations for improvement.</p>

Strengths	<ul style="list-style-type: none"> • Active involvement of societal stakeholders • Comprehensive information about the use of the method in class (including a detailed description, didactic information, handouts, etc.) • Mutual learning between students and stakeholders
Weaknesses	<ul style="list-style-type: none"> • Requires preparation prior to the seminar – to get societal actors engaged • Requires motivated and well prepared students

Which of the following criteria does the teaching method address? <i>(Please tick.)</i>	
<input type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders

Does the method present a good practice that should be considered for developing ConSus teaching resources? <i>(Please briefly explain.)</i>	
<input checked="" type="checkbox"/> Yes	<p>The model describes and assesses development processes. Especially for sustainability projects and processes, holistic planning and evaluation is essential to identify weaknesses and develop</p>

	possible solutions. The method provides an integrative and systemic perspective on the investigated processes.
<input type="checkbox"/> No	

Teaching method 2	
Name of the teaching method	Simulation game – ecological footprint by “ENSIGA”
Source/ Web address	http://www.ensiga.com/html/simulation_game_ecological_foo.html
Author	Christoph Klebel University of Augsburg, Germany
Intended learning outcome	<ul style="list-style-type: none"> • To better understand the ecological footprint • To think in complex systemic relations • To experience human impact on ecosystems and overexploitation • To learn to develop sustainable strategies that are compatible with present and future needs
Type of method	<input type="checkbox"/> Brainstorming <input type="checkbox"/> Foster collaboration/ discussion <input type="checkbox"/> Reflection <input type="checkbox"/> Creative methods <input type="checkbox"/> Systemic methods <input type="checkbox"/> Simulation <input type="checkbox"/> Competition <input type="checkbox"/> Survey/ interview <input checked="" type="checkbox"/> Other, <i>please specify</i> : Simulation game
Language	English, German

Brief description of the teaching method
<p>The simulation game "ENSIGA-footprint" by Dr. Christoph Klebel illustrates the subjects of the ecological footprint and allows the players to learn the anthropogenic causes and consequences of shrinking biotic resources.</p> <p>Each player's goal - as a head of state - is to achieve growth and maximum living standards in his/her country within a game cycle. The students have to deal with the consequences of overexploitation of natural resources and need to develop possible solutions. Aggressive and exploitative strategies will soon lead to the collapse, whereby the solution lies in common sustainability strategies. Participants are challenged to negotiate an acceptable balance between rich and poor countries.</p>

<p>Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)</p>
<p>Stakeholders are not involved so far. Nevertheless there is potential to play the game together with actors from business and/or politics to closely engage in discussions and increase the learning outcomes for both students and stakeholders.</p>

<p>Strengths</p>	<ul style="list-style-type: none"> • The game presents an innovative way to experience the ecological footprint • Detailed instructions for educators, including information about the game rules, preparation, required materials, game instructions, debriefing, resources, optional modifications of the game, introductory PowerPoint slides, handouts and players information
<p>Weaknesses</p>	<ul style="list-style-type: none"> • Societal stakeholders are not involved

<p>Which of the following criteria does the teaching method address? (<i>Please tick.</i>)</p>	
<input type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input type="checkbox"/> related to acquiring skills <input type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input type="checkbox"/> related to building capacity of the stakeholders

<p>Does the method present a good practice that should be considered for developing ConSus teaching resources? (<i>Please briefly explain.</i>)</p>	
<input type="checkbox"/> Yes	
<input checked="" type="checkbox"/> No	<p>Not yet. Simulation games present a good opportunity for interaction and reflective learning, which can be an enriching example for the ConSus teaching and learning resources.</p> <p>As presented above the method does not include transdisciplinary aspects. Hence the participation of stakeholders from business and/or politics in the game would be recommended.</p>

Teaching method 3	
Name of the teaching method	Transdisciplinary case study
Source/ Web address	<p>Scholz, R.W., Lang, D.J., Wiek, A., Walter, A.I., Stauffacher, M. (2006) Transdisciplinary case studies as a means of sustainability learning. International Journal of Sustainability in Higher Education, 7(3), 226-251 https://www1.ethz.ch/uns/people/formerhead/scholzr/publ/UNS_A144.pdf);</p> <p>Scholz, R.W. & Stauffacher, M. (2010) Transdisciplinary Case Studies as means of higher education in sustainable transitions (PowerPoint presentation): http://icss2010.net/download/documents/24-JUNE/Sessione-5_Sustainability-science-education/5_R-W-Scholz-and-M-Stauffacher.pdf</p>
Intended learning outcome	<ul style="list-style-type: none"> • Student will learn to organize a joint problem definition with legitimized decision makers. • Collaborate with case stakeholders and learn to appreciate their knowledge and experiences. • Learn to cope with ill-defined, societally relevant, complex real world problems. • Master complexity: Understand and define relevant aspects of the case utilizing the knowledge of case experts. • Provide scientifically-based assessments of future scenarios. • Reflect potentials and limits of transdisciplinarity.
Type of method	<input type="checkbox"/> Brainstorming <input type="checkbox"/> Foster collaboration/ discussion <input type="checkbox"/> Reflection <input type="checkbox"/> Creative methods <input checked="" type="checkbox"/> Systemic methods <input type="checkbox"/> Simulation <input type="checkbox"/> Competition <input type="checkbox"/> Survey/ interview <input checked="" type="checkbox"/> Other, <i>please specify</i> : Case study
Language	English

Brief description of the teaching method
<p>Transdisciplinary case studies are being held in close collaboration with case stakeholders and deal with solving complex problems. Mutual learning between actors from both science and society is the key for sustainable and socially robust solutions. The case studies very well fit in relation to urban and regional development processes as well as environmental and economic challenges.</p> <p>A transdisciplinary case study framework is composed of five steps: i.e. goal formation, system analysis, scenario construction, multi-criteria assessment, and generation of orientations. It analyses:</p>

- the structure of the system (i.e. a city, company, activity, etc.);
- the dynamics of how the system develops and could be developed;
- the quality aspects of the investigated system with regard to sustainable development.

Brief description of the integration of societal stakeholders (*How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.*)

Societal stakeholders are actively involved in the seminar and play a crucial role. Their knowledge and expertise regarding the particular case are on the same level as the knowledge and experiences of the researchers. The stakeholders (practitioners) are equally involved in the definition of the research aims and activities.

Strengths	<ul style="list-style-type: none"> • Transdisciplinary case studies present an excellent learning opportunity for both students and stakeholders. • Developing solutions for real problems – in close collaboration with case stakeholders. • Students learn to apply a set of methods, strengthen their interpersonal competence, as well as systemic and strategic thinking.
Weaknesses	<ul style="list-style-type: none"> • Teaching with transdisciplinary case studies is time consuming and needs to be well prepared. • The results are very open and difficult to predict.

Which of the following criteria does the teaching method address? (*Please tick.*)

<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders
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Does the method present a good practice that should be considered for developing ConSus teaching resources? (*Please briefly explain.*)

<input checked="" type="checkbox"/> Yes	<p>Students can profit from being involved in a transdisciplinary case study on multiple levels: bridging science-society gap, 'soft skills', methodologically sound approach to complex, ill-defined problems.</p> <p>It is recommended to use transdisciplinary case studies in classes with Master students, who have (in theory) already learned about transdisciplinarity, participation processes and the methods of system analysis and scenario construction.</p>
<input type="checkbox"/> No	

Teaching method 4	
Name of the teaching method	Module “Responsibility in Science” – focusing on research-based learning and resulting in a conference week
Source/ Web address	http://www.leuphana.de/en/study/bachelor/leuphana-semester/module-responsibility.html ; http://www.leuphana.de/fileadmin/user_upload/uniprojekte/lehrendenportal/Leuphana_Semester/Verantwortung/Huber_Warum_Forschen_des_Lernen_noetig_und_moeglich_ist.pdf (German only)
Intended learning outcome	<ul style="list-style-type: none"> • Explore the responsibility in science already in the first semester of the Bachelor study • Learn to develop, plan and implement own research projects • Learn to organise a research conference, where the results of the project seminars are being presented by the students • Interpersonal competence
Type of method	<input type="checkbox"/> Brainstorming <input type="checkbox"/> Foster collaboration/ discussion <input type="checkbox"/> Reflection <input checked="" type="checkbox"/> Creative methods <input checked="" type="checkbox"/> Systemic methods <input type="checkbox"/> Simulation <input type="checkbox"/> Competition <input type="checkbox"/> Survey/ interview <input type="checkbox"/> Other, <i>please specify</i> :
Language	English, German

Brief description of the teaching method
<p>During the first semester of the Bachelor study program at Leuphana University of Lüneburg all students (independent from their study field) attend the module “responsibility in science”, which is based on research-based learning and results in a conference week at the end of the semester, which is organised by the students themselves and where they present their semester outcomes.</p> <p>The courses are held in interdisciplinary settings and deal with sustainability aspects (e.g. in 2014 it focused on “what is good life”, 2013 dealt with “upheaval, awakening, breakthrough” and 2012 e.g. with “casino global”). During this semester students shall experience a research cycle while developing their own small research projects in cooperation with regional stakeholders and while working in interdisciplinary teams.</p>

Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)
<p>The involvement of stakeholders depends on the different research projects by the students. In many cases stakeholders will act as resource persons (e.g. for interviews), but do not</p>

actively shape the research process.
Stakeholders can participate in the conference, which also helps the university to open up to stakeholders from the region – and stakeholders get to know university activities and projects.

Strengths	<ul style="list-style-type: none"> • Student-centred and problem-based learning on the basis of small research projects. • Educators act as mentors and facilitators of the learning process. The framework topic for the modules is set and within this framework students develop their own research projects. • Students experience a research cycle and become aware of the responsibilities scientists have. • Students tend to be very enthusiastic about “their” conference.
Weaknesses	<ul style="list-style-type: none"> • As it is the first semester, some students might not be familiar with independent work and need specific support. • The conducting of research projects and organisation of the conference week presents a lot of work for the students.

Which of the following criteria does the teaching method address? (Please tick.)	
<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input checked="" type="checkbox"/> systemic thinking <input type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input type="checkbox"/> related to building capacity of the stakeholders

Does the method present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	It presents a good and innovative approach for engaging students in their first research processes. Nevertheless it has to be stated that it presents an innovative format, which cannot be applied in single seminars.
<input type="checkbox"/> No	

Teaching method 5	
Name of the teaching method	If it pleases the court: Using a simulated trial as the basis for an introduction to sustainability science course.
Source/ Web address	http://www.isedimensions.org/wordpress/wp-content/uploads/2013/05/N.-J.-Smith-Sebasto-finalproofMay2013-1.pdf Authors: N.J. Smith- Sebasto
Intended learning outcome	For the students to realise that human activities inflict harsh and often irreversible damage on the environment and on critical resources.
Type of method	<input type="checkbox"/> Brainstorming <input type="checkbox"/> Foster collaboration/ discussion <input checked="" type="checkbox"/> Reflection <input type="checkbox"/> Creative methods <input type="checkbox"/> Systemic methods <input checked="" type="checkbox"/> Simulation <input type="checkbox"/> Competition <input type="checkbox"/> Survey/ interview <input type="checkbox"/> Other, <i>please specify</i> .
Language	English

Brief description of the teaching method
The course mimics a trial from the indictment through an arraignment, pre-trial, trial, verdict, and sentencing with the students acting as both the accused and the jury. The teacher provides the students with readings and documentaries. The assessments for all reading assignments are 10 item pencil and paper instruments that include multiple choice, true/false and short answer response questions. Students are also asked to reflect on the documentaries they watch. At the end of the course the students are asked for their verdict of the trial and are asked to draw conclusions from their readings and reflect on the documentaries watched.

Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)
In this particular report the teacher collaborated with a colleague who was a practicing attorney to help him make the teaching method reasonably resemble how a trial would be carried out in court. Other stakeholders could get involved in this teaching method for example the teacher could invite someone in from the tourism sector to participate in the trial set up to discuss the effect humans behaviour and attitudes can have on tourism, for example littering, pollution etc.

Strengths	<ul style="list-style-type: none"> • This teaching method elicits critical thinking, reflection • Learners are actively engaged in posing questions, problem solving and investigating • Learners are required to take initiative and make decisions. • The course provides both written and electronic media catering for visual learners • Its innovative
Weaknesses	<ul style="list-style-type: none"> - A lot of work is required from the teacher in ensuring the teaching method is used effectively

Which of the following criteria does the teaching method address? (Please tick.)	
<input type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input checked="" type="checkbox"/> strengthens strategic competence <input type="checkbox"/> related to building capacity of the stakeholders

Does the method present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	Very unique and motivational teaching method, students are provided with opportunities to voice and defend their reasoning on different areas of sustainability. They are presented with many written documents and visual media to expand their knowledge and understanding of the topic.
<input type="checkbox"/> No	

Teaching method 6	
Name of the teaching method	Caitlin Gabel School- A focus on food (Work-shops)
Source/ Web address	http://www.jsedimensions.org/wordpress/content/catlin-gabel-school%E2%80%94a-focus-on-food_2010_05/ Authors: Eric Shawn and George Zaninovich
Intended learning outcome	<ul style="list-style-type: none"> • To implement the skills and knowledge gained from engaging workshops in the University, primary and secondary schools and the local community. • To identify the benefits of local organic produce for the consumer and producer
Type of method	<input type="checkbox"/> Brainstorming

	<input checked="" type="checkbox"/> Foster collaboration/ discussion <input checked="" type="checkbox"/> Reflection <input type="checkbox"/> Creative methods <input type="checkbox"/> Systemic methods <input type="checkbox"/> Simulation <input type="checkbox"/> Competition <input type="checkbox"/> Survey/ interview <input type="checkbox"/> Other, <i>please specify</i> :
Language	English

<p>Brief description of the teaching method</p> <p>The teaching method is delivering a series of engaging workshops. The workshops delivered in this particular study were on the socio ecological principles of the natural step framework. Parents, teachers and alumni attended the workshops. The three topics that were explored in relation to food were facilities, service and curriculum. On completion of each workshop the participants went and examined their schools, universities and local community to see what and where they could apply what they had learned in the workshop. This teaching method could easily be adapted in a University setting where the students would be taught through workshops and their assignments could be how they can collaborate with primary and secondary schools as well as the local community to implement what they have learned in the workshop. Stakeholders from the community could be asked to attend workshops or to help in the delivering of workshops, for example an organic farmer. Such stakeholders could be asked to provide local organic food to the school and university canteens.</p> <p>With reference to this reported project the following was discussed:</p> <p>Facilities: Students removed food waste that had been sent to landfill and focused on recycling, composting and purchasing.</p> <p>Food service: The school lunch menu was changed to all locally produced foods, washable dinnerware and students learned to separate food wastes.</p> <p>Curriculum: Teachers started a worm farm and food gardens, farmers came into the different classes to discuss their work and they watched films related to the future of food. Students were given a project to make a dish from scratch using only fresh, local organic ingredients. Students presented their dishes, the sources and their carbon footprint. This again could easily be incorporated into a workshop challenge. Finally, the older students served as scientific advisors to secondary schools for example amending the soil in the school gardens to maximise yield for each crop.</p>

<p>Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)</p> <p>Organic farmers are the main stakeholders involved in this project. They come into the students to discuss their life and work; explore the differences between organic and conventional food. The local farmers provide all the food that is served for lunch in the canteens. Students and teachers also toured a local food co-op and farmers market again to develop awareness among students and to provide an opportunity to the owners to promote</p>
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their produce.

Strengths	<ul style="list-style-type: none"> • Extremely engaging • Caters for all learners • Collaboration between schools, universities and general community • Hands on experiences • Healthier living (obesity is a growing problem at present)
Weaknesses	<ul style="list-style-type: none"> • May be difficult to get farmers to come in and discuss their work as they are very busy during the year. • There may not be funds for equipment and resources to carry out the workshops

Which of the following criteria does the teaching method address? (Please tick.)	
<input checked="" type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders

Does the method present a good practice that should be considered for developing ConSus teaching resources? (Please briefly explain.)	
<input checked="" type="checkbox"/> Yes	It's engaging, motivational and collaborative. University students can learn from their lecturers and stakeholders and use their knowledge and skills to help develop sustainable strategies in schools and the local community.
<input type="checkbox"/> No	

Teaching method 7	
Name of the teaching method	Fieldwork Using experimental education to expose graduate students to the relevance of case studies in sustainability and innovation
Source/ Web address	http://www.isedimensions.org/wordpress/wp-content/uploads/2013/05/Nicole-Vaugeois-and-Patrick-Maher-finalproof-May2013.pdf
Intended learning outcome	<ul style="list-style-type: none"> • To allow students to better understand the complexities of sustainability and innovation at the local/regional level
Type of method	<input type="checkbox"/> Brainstorming

	<input checked="" type="checkbox"/> Foster collaboration/ discussion <input checked="" type="checkbox"/> Reflection <input type="checkbox"/> Creative methods <input type="checkbox"/> Systemic methods <input type="checkbox"/> Simulation <input type="checkbox"/> Competition <input type="checkbox"/> Survey/ interview <input checked="" type="checkbox"/> Other, <i>please specify</i> : Field work
Language	English

Brief description of the teaching method
<p>The teacher selects a course study region that is in close proximity to the University, has sustainability initiatives present and possible challenges. Students are asked to research the context prior to departure, including locating secondary documents such as census profiles, land use plans, official community plans, sustainability initiatives as well as different stakeholder groups. The core output for the students is a research paper and presentation on one aspect of sustainability within the chosen area. Topics that students could choose to look at are social network analysis, how to attract and retain youth in rural areas, the quality of life of the people in the area, food security, health and wellness, business challenges of locals, volunteerism.</p>

Brief description of the integration of societal stakeholders (<i>How are stakeholders being involved? Does it target specific stakeholders? What is the purpose of the stakeholder involvement? Etc.</i>)
<p>In this particular case study students were introduced to a wide range of stakeholders: electoral area directors; business operators working in diverse sectors such as accommodations and arts and culture; farmers; community volunteers; leaders of diverse non-profit organisations; and local sustainability champions. Stakeholders were involved in giving tours of organic farms, walkabouts in newly designated community gardens, formalised boardroom meetings, and gatherings in local restaurants, business establishments and their homes.</p>

Strengths	<ul style="list-style-type: none"> • Allows students to be exposed to new environments in order to increase their depth of understanding • Hands-on experience that is critical for skill development • Links to the theory being studied • Direct involvement and responsibility of their own learning • Encourages students to appreciate diverse landscapes and helps to recognise the importance of conserving and preserving the environment • Enables the knowledge to be truly embedded • Demonstrates relevance
Weaknesses	<ul style="list-style-type: none"> • May be difficult to locate a suitable area close to the University

	<ul style="list-style-type: none"> • Need to have suitable weather conditions • Difficult to work around student timetable, for example if the class are leaving the University for the day it must not affect other lecturers' material that they have to cover
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Which of the following criteria does the teaching method address? <i>(Please tick.)</i>	
<input type="checkbox"/> interdisciplinary <input checked="" type="checkbox"/> related to local challenges/ needs <input checked="" type="checkbox"/> related to global challenges/ needs <input checked="" type="checkbox"/> holistic thinking <input type="checkbox"/> systemic thinking <input checked="" type="checkbox"/> long-term thinking <input checked="" type="checkbox"/> application oriented	<input checked="" type="checkbox"/> student centred teaching approach <input checked="" type="checkbox"/> related to acquiring knowledge <input checked="" type="checkbox"/> related to acquiring skills <input checked="" type="checkbox"/> strengthens interpersonal competence <input type="checkbox"/> strengthens strategic competence <input checked="" type="checkbox"/> related to building capacity of the stakeholders

Does the method present a good practice that should be considered for developing ConSus teaching resources? <i>(Please briefly explain.)</i>	
<input checked="" type="checkbox"/> Yes	Engaging, brings relevance to the material being studied in the classroom, good collaboration between University and local stakeholders
<input type="checkbox"/> No	

2.3 Analysis of the learning materials and teaching methods

As outlined in 2.1 and 2.2 eleven learning materials and seven teaching methods have been identified by the partners.

2.3.1 Main topics and sustainability

Learning materials. All of the mapped learning materials address issues related to sustainable development. Four of the learning materials deal with sustainability topics in general (including global and local aspects of sustainability, global change and security, challenges in social, ecological and economic development), three materials deal with management aspects (sustainability management, alternative economic systems, social entrepreneurship and leadership), two materials deal with geographical topics (economic geography and sustainable tourism), and two materials deal with environmental issues (energy and water conservation, waste management).

2.3.2 Types of learning materials and methods used

Learning materials. To answer this question, partners ticked pre-determined answers, whereby multiple answers have been possible, i.e. information/booklet/brochure, case study, game, simulation, experiment, or student project. In nine cases the materials present student projects, case studies are mentioned six times, one case each describes a summer school and a discussion series, and one case presents an information brochure. Almost all learning materials last up to one semester, hence present comprehensive activities and cannot be applied within a few hours.

The teaching methods, which are described in the learning materials include interviews and surveys, input presentations, teamwork (four mentions each), discussions (two mentions), social events, community learning and consultancy exercises (one mention each).

Teaching methods. The types of teaching methods have also been identified through pre-defined answers, including brainstorming, reflection, creative or systemic methods, simulation, competition, survey/interview or fostering collaboration/discussion. In four out of the seven mapped cases reflection is being applied, in two cases each creative or systemic methods and aspects of collaboration and discussion are used. One case works with simulations, one with a simulation game and another case includes field work as well.

2.3.3 Intended learning outcomes and sustainability criteria

Learning materials. The learning objectives of the materials vary according to their contents. Many of the materials aim at educating students in sustainability issues, which is more effective in real-life settings than only imparting knowledge. Hence the gained knowledge shall be applied in practice through problem-based learning and receiving hands-on experience. In general the materials foster students' understanding of the interplay of social, environmental and economic issues of sustainable development.

A question with pre-defined answers asks for sustainability criteria the materials address. All eleven cases outline that they are related to acquiring knowledge; ten cases each mention that they relate to local challenges and needs, foster holistic thinking and long-term thinking and relate to acquiring skills; nine cases each are interdisciplinary and application-oriented, relate to

global challenges and needs, strengthen systemic thinking and interpersonal competences; eight cases follow a student centred teaching approach and with six mentions strategic competences and building capacity of the stakeholders are being least mentioned.

Teaching methods. The intended learning outcomes of the teaching methods are described in detail and depend on the different methods and contents. To summarise the methods aim at enabling students to apply their theoretical knowledge in practice and hence to better understand complexities of sustainable development at the regional and global level. Students learn to collaborate with stakeholders and appreciate other expertise; they learn to plan, assess, reflect and cope with societally relevant, complex real world problems. In particular the learning outcomes range from identifying benefits of local organic producers, to understanding the ecological footprint, experiencing human impact on ecosystems, or learning to apply specific research methods.

It is hardly surprising that the question concerning sustainability criteria the teaching methods aim to address, results that all seven methods follow a student centred teaching approach and are furthermore related to local challenges and needs. Most of the cases (six mentions each) additionally outline that they aim to foster holistic and long-term thinking, are application-oriented, relate to acquiring knowledge and skills, address global challenges and strengthen the interpersonal competence of the students. Five cases foster the strategic competences of students, four cases aim at capacity building of the stakeholders and only three cases each are either interdisciplinary or foster systemic thinking.

2.3.4 Involvement of stakeholders.

Learning materials. As the ConSus project aims at fostering collaboration between higher education institutions and societal actors, the involvement of stakeholders within the learning materials is of specific interest. Four out of the eleven cases describe the active involvement of stakeholders in the learning process: in one example business institutions are involved and benefit from the collaboration as they receive external, fresh and creative perspectives on their activities by the students and recommendations about their sustainability management processes. In another example a university department and a green building council are involved, which provide advice to the students and in turn receive recommendations for sustainability strategies by the students, in one case the energy manager at the university is involved and in another case armed forces with the aim to discuss security issues and resilience strategies. In further five cases stakeholders from science and society are involved in a way where they provide input statements and discuss specific sustainability topics with the students, but do not actively take part in the learning and development process. In two cases stakeholders are not physically involved, but simulated through focusing on questions of participation. In both cases stakeholders could easily be included in the teaching process.

Teaching methods. In two of the mapped teaching methods stakeholders were actively involved in the research and learning processes. They act as key experts for specific sustainability issues and receive support and recommendations to improve their development processes. In four cases stakeholders act as resource persons (e.g. for interviews, input presentations or support the lecturer in framing the teaching contents), but do not actively shape the learning process. In one case stakeholders have not been involved so far.

2.3.5 Strengths and weaknesses.

Learning materials. Communicated strengths relate to the active and mutual learning experience for the students (eight mentions) as well as benefits for the stakeholders (six mentions). Students would learn research methods and practice these skills, they can experience challenges, learn to deal with complex situations and can train their interpersonal skills. Further six cases see the inter- and transdisciplinary approach as a strength.

Weaknesses or risks address possible difficulties in finding interviewees for surveys and it is noted that lecturers have to rely that engaged and motivated students would take the courses, otherwise stakeholders could be disappointed by the collaboration. Furthermore almost all learning materials might be too extensive to be integrated into existing university courses.

Teaching methods. The benefits of the identified teaching methods especially lie in the active involvement of the stakeholders (four mentions) and consequential opportunities for mutual learning between students and stakeholders (three mentions). Two cases each mention possibilities for critical thinking and reflection, hands-on experience and that students learn to apply a set of methods and can strengthen their interpersonal competence. Two further cases state that the availability for detailed instructions for the lecturers is of value.

Weaknesses address the efforts in teaching a transdisciplinary approach, which is time consuming and needs to be well prepared to ensure the teaching method is used effectively (three mentions). Furthermore it might be a challenge to convince stakeholders to get involved and it requires motivated and well prepared students. As some activities might take a whole day (i.e. field trips) this could affect other courses where students would have to be absent for a session.

2.3.6 Examples of good practice.

Learning materials. The eleven mapped learning materials are recommended as good practice examples. Most of the cases (eight mentions) highlight the active involvement of the students and describe the materials as fostering collaborative and mutual learning, where students are engaged in finding solutions for real problems instead of fictive examples. The sustainability focus or methodological approach is furthermore of value; such as the case study approach, which presents a proper method for problem-based learning and requires critical thinking. On the other hand several cases also mention that although the materials present good concepts, they could be improved in terms of intensifying the engagement of students and/or involvement of stakeholders; in several cases detailed lecture notes and hand-outs for students are missing.

Teaching methods. Six methods are highlighted as good practices for including society into university teaching as they are motivational and engaging and bring relevance to the material being studied in the classroom. Students can profit from being involved in transdisciplinary teaching on multiple levels, like bridging the science-society gap and acquiring soft skills. One case is not presented as a good practice yet, as stakeholders are not directly involved. Nevertheless it is mentioned to be a good opportunity for interaction and reflective learning, but the participation of stakeholders would be recommended.

2.4 Conclusions and outlook

This report aims at providing an overview about online available teaching resources, which focus on sustainability topics and a collaboration with societal and regional stakeholders. Based on this review ConSus partners will develop own teaching materials and methods (forthcoming deliverables 3.3 and 3.4). Hence this overview can be seen as a basis and source of inspiration.

It can be stated that it has not been an easy task to find well explained learning materials and teaching methods, which foster the collaboration between science and society, which in turn demonstrates the relevance of developing such resources in the course of the ConSus project. Especially lecture notes and hand-outs for students are hardly available.

The 18 identified and mapped learning materials and teaching methods show the various possibilities of engaging students and stakeholders in mutual learning processes for sustainable development. The benefits are manifold. Researchers and students receive in-depth insights into local and regional sustainability challenges and have the possibility to apply their knowledge in real-life settings and hence contribute to sustainability within their region. Such activities enable them to strengthen their competences in holistic, systemic and strategic thinking and interpersonal skills. Stakeholders benefit as they receive fresh perspectives on specific issues, become actively engaged and get to know the potentials of applied research. On the other hand lecturers have to be aware that transdisciplinary teaching may require more time resources than 'conventional' lectures and its outcomes are often not predictable.

Considering the results of deliverable 1.1, the analysis of existing science-society collaborations in Albania and Kosovo, the areas of environment, agriculture and socio-economy are prevalent. The identified resources in deliverable 3.1 address a range of topics, including sustainability, geography, management and environment. Hence some overlaps exist, e.g. the learning materials 'Active learning in environmental and sustainability management through the embedding of 'live' consultancy projects', 'A Disciplinary Framework for Teaching Environmental Sustainability', or 'Alternative Economic and Monetary Systems - The economy of the future' could fit very well the identified focus areas in Albania and Kosovo. The teaching methods are more open and can be applied in different contexts and topics, such as transdisciplinary case studies, experiential learning or the Graz Model for Integrative Development. The workshop on food (see method 6) could be carried out with partners from the agricultural field.

So far collaborations between higher education institutions and societal actors in the partner countries are often based on project activities (see Del. 1.1). The teaching resources can provide a good opportunity both to maintain existing co-operations once projects are finalised as well as to build first contacts with new partners. In the case of Albania, where NGOs and development organisations aim at linking vocational trainings with the private sector, the ConSus teaching resources can additionally be of interest and create synergies.

Following suggestions can be made for the development of science-society teaching resources in the ConSus project (Del. 3.3 and 3.4):

- Case studies are a popular method for interactive and application-oriented teaching. When developing case studies, make sure to focus on current regional sustainability topics, where societal stakeholders could easily be involved.
- Many (traditional) methods can be extended to actively involve stakeholders from outside university.

- Distinguish between teaching resources, which especially fit the prerequisites of Bachelor courses and resources at the Master level, which require more advanced knowledge and experience of the students.
- Develop a mix of teaching resources regarding duration and scope – only a few resources should cover one-semester courses and most resources should be applicable for single sessions. Private universities in the partner countries seem to be more flexible than public universities, which might not be able to create new transdisciplinary courses but include small activities into their existing courses.
- Try to create clear benefits for both students and stakeholders. See these teaching resources also as a chance for building capacity and raising awareness for sustainability topics among societal actors.
- Develop learning materials for specific target groups, who you would like to collaborate with and involve in the sustainability processes – i.e. people from rural areas, ethnic minorities or civic society as such, where you might use the network and teaching resources to motivate people for active citizenship and social engagement on a larger scale.
- Develop a mix of teaching resources regarding its topics – some learning materials and teaching methods should in particular fit existing collaborations in the partner countries (esp. socio-economy, environment and agriculture). Nevertheless it should be ensured that further sustainability demands are tackled as well and that the resources comprise a holistic picture of sustainable development, addressing social, environmental and economic topics.
- Make sure to clearly coordinate the development of learning materials and teaching methods among the partners so that a variety of resources, aligned with the sustainability needs in Albania and Kosovo, can be guaranteed.