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UNIVERSITY & RESEARCH

BC TOOLBOX

Examples of assessments for boundary crossing

This document contains examples of assessments of boundary crossing, all hypothetical and for inspiration. They focus on how to make student learning visible. That is, how to explicate/visualise what students have learned and developed regarding boundary crossing and/or their boundary crossing skills.

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Link to BC/place on taxonomy
Learning Materials, Learning mechanisms -general

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Examples of assessments for boundary crossing

<u>Aim on the assessments</u>: All the assessments below are not initially meant to GRADE students. They are meant to make students' learning/development regarding a learning objective visible. This is called *Formative assessment* = assessment to make learning visible and stimulate further learning.

Many activities can be used both as learning activities and as assessment activities. And most activities can offer rich ground for letting students reflect on their BC development (or specific BC learning outcome of the course.

Note. The examples in this document are developed for the programme Environmental Sciences (WUR). The examples of assessment methods can easily be transferred to other educational programmes. You can also find more inspiration on [this padlet](#).

1. Concept mapping

Learning objective (example!)
- being able to view a problem from different disciplinary perspectives and draw different conclusions

<u>Examples of learning objectives of a BSc course in environmental sciences</u>
- analyse environmental problems triggered by the Animal Consumption and Production Chain and the underlying societal trends, using visions, knowledge and methods from different (scientific) disciplines.
- assess and explain how visions, knowledge and methods from different (scientific) disciplines can and should be integrated to analyse, solve and prevent environmental problems.

Assessment assignment
- Start: let students make a concept map of the problem: What do you know of the problem at the start? What concepts and perspectives should be included from discipline A, B and C? Can you identify any conflicting perspectives?
- First individually, then elaborate into a group concept map at the start (use different colours).
- At the middle of the course: Elaborate your concept map with newly gained insights from the different disciplines (use different colours for different disciplines). Can you identity any conflicting perspectives? If so, which ones and what does this mean for a possible solution?
- In the end: Elaborate your concept map with newly gained insights from the different disciplines (use different colours for different disciplines). Can you identify at least two new ideas that you gained in which you see the added value of thinking about this topic from different disciplinary perspectives?

Variations
Many variations of this concept mapping assignment are possible, for example:
- Individual concept map
- Group concept map
- Development of concept map (beginning to end)
- Everybody takes a position of one discipline (or stakeholder) and then draw a concept map from only that perspective. Then bring everything together
- The drawn concept maps allow for different follow up (reflective) questions (e.g. what conflicting perspectives do you see; what additions do the different perspectives bring; what do you need to balance in the solution etc.)

2. Stakeholder analysis

Comparable assignment as above, but then visualizing (or noting) the perspectives of various stakeholders.

Learning objective (Example!)
- being able to view a problem from different perspectives and being able to translate their academic ideas into societal relevant and feasible ideas

Examples of learning objectives of a BSc course in environmental sciences
- o analyse a real-world environmental problem from relevant stakeholder perspectives *(BSc course Sustainable solutions to environmental problems);*
- o Students acquire understanding of the societal context of environmental research and the societal backgrounds of environmental problems (*BSc course Environmental project studies*)

Assessment assignment
- Let students identify the stakeholders they see at the start of the course and write down their perspectives. (individually or in group).
- Let them elaborate their individual ideas in groups
- During the course students elaborate and elaborate these stakeholders and their perspectives.
- Add questions like: What new insights did you get from what stakeholder? Mention some trade-offs you became to realize? What activity helped you in getting stakeholders ideas more clear? etc.

3. Self and peer evaluation

Learning objective (example!)
- is able to recognize and discuss key capabilities of brokering in himself and groupmates

Assessment assignment
Below you see several important capabilities of a broker (i.e. someone who can bridge differences between people from different practices. Check the brokering capabilities of yourself and your groupmates. You are allowed to divide 10 points over all group mates. Who do you give what? And why?

A student who is a good 'boundary crosser':	you	group member 1	group member 2	group member 3	etc.
shows that (s)he is interested in the project not only to pass the course (a good grade) but also to deliver an end result that can be applied in practice and is useful for other people;					
considers what expertise is needed to execute the project successfully and what the limitations and contributions are of his/her own expertise;					
is open to learn from and contacts other people, sees the advantage of using their expertise;					
facilitates and stimulates the collaboration of people involved in the project; empathizes with other people's perspectives / interests / ideas, also when they differ from his/her own;					

	actively searches for ways to learn from others and encourages other people to reflect and to learn as well;

explicates how multiple perspectives, interests and expertise are used and integrated in the project to deliver a better end result;

explicates how the end result can be implemented in practice and which steps need to be taken to do so; shows enthusiasm and effort to be actively involved in follow-up activities.

All kinds of variations are possible here
- Change the BC-capabilities into capabilities relevant and representative of your course.
- Use students' 'scoring' for a group discussion on how they can improve their BC in their group work
- Let students make learning goals based on these results
- Add all kinds of reflective questions / activities for which this overview is input

4. Rubric for evaluating reflection on interdisciplinary boundary crossing (example from a MSc programme in Biobased Sciences)

Learning objectives
- After successful completion of this programme graduates are expected to be able to:
- cooperate in an interdisciplinary team (including planning activities, assuming responsibilities and motivating co-workers) on a biobased-oriented research question, design problem, or development problem; the disciplines originate from biomass production, biorefinery, bioconversion and / or circular and biobased economy.
- assess technological , ethical, societal, and economic consequences of changes in the design of a biobased concept, product, or product process, and integrate these into scientific work within an interdisciplinary and international context;
- create additional value by combining biobased disciplines thus to apply an interdisciplinary approach.

Assessment
- Written portfolio containing at least 4 reflection reports on the value of combining biobased disciplines (parts / aspects that were not yet graded in earlier courses 50%);
- Oral justification of disciplinary boundary crossing development, using the reflections in the portfolio, during an assessment interview (50%).

Rubric 1: assessing disciplinary boundary crossing in the reflection reports
Student can/should use concrete examples from the respective course to discuss and reflect on their interdisciplinary learning and working.

	5	7	9
Team work (only if applicable)	Student does not reflect on the usefulness (or challenges) of interdisciplinary team	Student mainly reflects on challenges of the team work not directly related to different disciplinary backgrounds	Student reflects on the learning opportunities of using the different disciplines in the team
Different disciplinary perspectives	Issue is mainly described and tackled from one disciplinary perspective	At least two disciplines are explicitly integrated	More than two disciplines are integrated

Added value for the project/product	Added value of combining different disciplines is not explicitly reflected upon or remains shallow/not concrete	Student reflects on the added value of different disciplines, mainly describing how different disciplines were used in the project/product	Student gives concrete examples on how different disciplines are integrated to create added value
Added value for personal/professional development	Student does not reflect on how he/she developed his/her (disciplinary) perspective on the issue at hand	Student discusses several new insights gained during the course representing different disciplinary perspectives	Students describes with concrete examples how own ideas changed / were elaborated during the course and how to use / exploit this in the future

Rubric 2: Assessment interview on disciplinary boundary crossing

The interview aims to discuss students *development* throughout the MSc program. The student should use concrete examples from various courses to show / discuss this development

	5	**7** *Relating to concrete examples from previous courses*	**9** *Using concrete examples from previous courses to discuss development Looking towards the future.*
Approach to interdisciplinary project	Student cannot explicate how he/she approaches an interdisciplinary problem	Student explains how he/she approaches an interdisciplinary project. How this approach developed during the MSc programme is not clear	Student explains with concrete examples how he / she improved in approaching interdisciplinary issues during the MSc programme
Added value of interdisciplinary working for dealing with societal issues	Student has difficulties with viewing issues from different perspectives	Student discusses added value of working across disciplines for different projects	Student discusses opportunities for creating added value using an interdisciplinary approach (i.e., how to do this in future projects)
Added value of interdisciplinary working for own personal / professional development	Student has difficulties with relating interdisciplinary experiences to his/her own personal or professional development	Student can give a few small examples of how working on interdisciplinary projects/teams influenced him/herself	Student can give concrete examples on how he/she has grown as a person or professional due to interdisciplinary working and how to exploit this in the future
Working in an interdisciplinary team	Student cannot discuss opportunities of interdisciplinary teamwork Or how he/she stimulated interdisciplinary working in a team	Students gives examples of own team behaviour that stimulated interdisciplinary working (i.e., what did you do/say in the team?)	Student expresses how he/she would approach working in interdisciplinary teams in the future, by building on experiences during the MSc programme.

5. Intercultural group poster market

Learning objective
- being able to view an environmental issue from various cultural perspectives and drawing conclusions on how this impacts possible solutions

Examples of Learning objectives of a BSc course:
- o Evaluate how cultural perspectives influence one's role in the group and one's take on environmental issues *(BSc course ; Sustainable solutions to environmental problems)*

Assessment assignment
- Let students from different cultures make a poster viewing a particular environmental issue from their culture specifically (e.g., norms values, policies in their country). Students can use their own knowledge, but also search for more (on internet).
- Let group members present their posters to each other and collaboratively identify cultural / international differences. What elements of 'culture' do these difference relate to? (norms/values/policy/rules and regulations/traditions, etc?)
- Per element they can discuss how this element influences their environmental issue, and possible solutions for this.

Variants
- Start with a brainstorm in the group to identify themes related to their environmental issue that can be culturally sensitive --> these themes should at least be addressed in the posters.
- Let every individual student write a short reflection on new insights gained from other cultural perspectives
- Let the group make a group poster showing the key cultural elements that they feel impacts their environmental issue and show several routes to deal with these challenges.

6. Scenario (vignettes / situation judgement tests) or Case studies

Learning objective
- being able to view an issue from different (disciplinary/stakeholder) perspectives and identify dilemmas and opportunities for a solution

Examples of learning objectives of a BSc programme in environmental sciences:
- o Synthesize diverse types of knowledge and information to develop transformative sustainable solutions (*BSc course: Sustainable solution to environmental problems*);
- o Assess and explain how visions, knowledge and methods from different (scientific) disciplines can and should be integrated to analyse, solve and prevent environmental problems; (*BSc course: Environmental science and society*);
- o Apply knowledge, methods and tools of environmental sciences in a case study *(BSc course: International study visit).*

Assessment method
Scenario / vignette / case
- Prepare two (or three or four) different problem case descriptions for a relevant environmental problem with open endings and ask students (individually or in groups) to work out/solve this case from two/three/four relevant disciplinary perspectives/stakeholder perspectives relevant to this course.
- After that, ask students / groups to describe what they see as the best solution and explicitly state how the different disciplines (or stakeholder perspectives) (i) contribute to the solution, (ii) what trade-offs they see between the disciplinary/stakeholder perspectives.

- Alternative: Ask students to develop several research questions, one per disciplinary perspective, that fit to the problem case described. You can also ask students to design a study/methodology fitting the respective disciplines.

Situation judgement tests[1] are more closed (Multiple choice- kind of test)
Describe several scenario's (cases) and give 4 answer options (a-b-c-d). The answer options could/should relate to different disciplinary responses or stakeholder perspectives (depending on what you want to assess). Students should answer: What is the best option from this disciplinary/stakeholder perspective (only closed), and/or add why (make it open).

NOTE: if you already work with case studies, simply adding several questions to a case study can already be an answer

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[1] https://www.123test.com/assessment-training/situational-judgement-test/ and Smith, K. J., Flaxman, C., Farland, M. Z., Thomas, A., Buring, S. M., Whalen, K., & Patterson, F. (2020). Development and Validation of a Situational Judgement Test to Assess Professionalism. American Journal of Pharmaceutical Education, 84(7), ajpe7771. doi:10.5688/ajpe7771

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