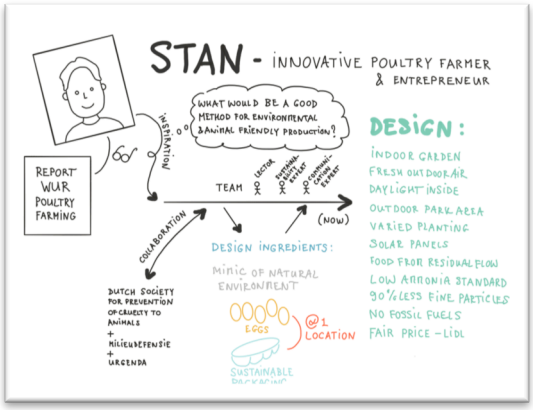
DIGITAL PROOF

SHORT EXERCISES

Co-designing educational modules



In a nutshell

This document provides a workshop format for the co-creation of educational modules with multiple stakeholders.

What for?

Eventually: to train or educate people on food system transformation, by working with a community on transforming the food system.

How long?

The full format takes ± 2 to 3 hours.

For whom?

The primary target group is educators.

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with suggestions and modulations from ECSITE.

Something to share?

Log in to the *platform* and leave us a comment about this tool.
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This tool was developed as part of FIT4FOOD2030 project; see this tool and others on the FIT4FOOD2030 Knowledge Hub.

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What will you gain from this?

Educators that apply the format provided in this document will get (1) a set of competencies that are to be developed among a specific group of learners to support the realization of food system transformation, and (2) a basis for one or a few educational modules that (can) support a specific group of learners in developing this set of competencies.

In addition, the multi-stakeholder co-creation process is also an activity for food system transformation community building.

Participants of the module co-creation process presented here will gain insights in food system transformation, competencies needed for that, views of themselves and other stakeholders on these, and creative energy for the creation of educational modules. Also, they may build new relationships with other, previously unknown stakeholders related to food system transformation.

CO-DESIGNING EDUCATIONAL MODULES

A multifold approach

This document provides a detailed **format** for the co-creation of educational modules with multiple stakeholders. *Part one* of the format can be seen as a preparatory step for module co-creation: it supports educators to involve multiple stakeholders in thinking about *competences* that are needed, among a specific group of learners, to support the realization of food system transformation. *Part two* of the format covers the actual *module co-creation*, in which various tools trigger participants' *out-of-the-box-thinking*. Educators/facilitators can apply both parts together in one workshop, or invite multiple stakeholders for one part and do the other part within the own organization.

In practice[1], certain translation is needed between the outcomes of part one (co-creating competencies) and the input if part two (co-creating out-of-the-box ideas for educational modules). Namely, the list of competencies is ideally converted into (more) specific learning goals as starting point of module co-creation. Additional information for this can be found in this document too. Furthermore, the module(s) as outcome of part two, need(s) to be further detailed and tested after the workshop. In and after that, (multi-)stakeholder commitment needs to be arranged to assure sustainably implementation of the module(s) in the educational system or setting at stake.

Playfulness

To make the format low-threshold and welcoming for a variety of stakeholders that may participate in the educational module co-creation process, the format applies several playfulness principles (cf. Van der Meij et al., 2018). The defining of competencies (part one) includes brainstorming based on a narrative, namely a 'persona': a fictitious character based on real data about food system innovators. The module co-creation (part two) happens through various out-of-the-box-thinking tools for co-creation. Nevertheless, active facilitation is always recommended, to encourage and reward participants' efforts.

[1] This is described in FIT4FOOD2030 Deliverable 6.3, based on reflections of ECSITE on applying this format in several food labs around Europe.

Target audience

This format is designed to be suitable for a variety of stakeholders with certain interest in food system transformation and education: from teachers to civil servants, from students to (innovative) food company owners.

Age of participants

16+

Number of participants

6 people or more (divided in groups of 6 persons)

Number of facilitators

1 facilitator is needed for each 6 participants

Prior knowledge required for participation

It can be helpful if the participants are prepared on food systems and pedagogical thinking; nevertheless the introduction exercise and the various tools embedded in the format help participants to become acquainted with these two types of thinking.

GETTING PREPARED

Set the scene

Before organizing a workshop for educational module co-creation, there must be (a) a clear need for educational modules related to food system transformation in a specific educational setting (e.g. high school, university, professional organization, etc.), (b) multiple stakeholders that can participate in the workshop(s) to help designing the educational module, and (c) an organizer who feels capable to facilitate multi-stakeholder workshops. For the latter, basic skills for the facilitation of co-design sessions or focus groups are useful. Furthermore, ideally, the stakeholders that participate in the workshop are somehow interested to be(come) linked to the institute that is hosting the workshop and/or to the to-be-designed educational module[2]. Knowing the stakes of stakeholders also helps in inviting them to educational module co-creation workshops.

Materials

For an offline workshop:

- Tables, chairs and markers for each participant
- Print of Persona 'Stan' (see Appendix)
- Printed cards about competencies (see Appendix)
- Print of the morphological matrix (see Appendix)
- Blanco paper for brainstorming about modules

For an online workshop:

- A zoom meeting link
- PDFs of the print-materials listed above, and/or
- A Mural or Padlet environment in which the visuals of the print-materials are provided as a starting point for brainstorming.
- Mural or Padlet page with the prioritizing matrix

[2] For example: a food entrepreneur with an interest to hire students who graduate from a particular university track, or a municipality employee looking for local food system solutions.

CO-CREATING COMPETENCIES

DURATION: 1 HOUR

STEP 1 (10 min): **Present a vision of a future proof food system**. This can be a FOOD2030 video or another vision, e.g. created during own workshops on visioning food system transformation[3]. If the vision is 'information dense', facilitate dialogue among participants to commonly (re-)make sense of it.

STEP 2 (2 min): Place participants in **small groups** (3-4 persons), if possible, based on similarities in their targeted module users (e.g. primary or high school pupils, students, or professionals).

STEP 3 (8 min): Present **Persona Stan** (printed or digitally)[4]. Stan is a fictitious person based on real data about an innovative food entrepreneur (see Appendix A, and Figure 1).

STEP 4 (10 min): Ask groups to **brainstorm** about the following question: If your learner (= the targeted educational module user) would undertake the steps that this Persona took for innovation in the food system, what **knowledge and skills** would this learner need to be(come) like this Persona? Ask groups to write each type of knowledge or skill on a separate Post-it, and place this post-it around the visualization of the Persona (printed, or in an online environment, e.g. Mural or Padlet).

STEP 5 (15 min): Provide the groups with **competence-cards** and a rating matrix (printed or in an online environment like Mural or Padlet), see Appendix B, Appendix C and Figure 1. Ask groups to compare their Post-its of STEP 4 with the competence-cards. If a Post-it is similar to a competence-card, it can be stuck next to or on top of the competence card. If a Post-it is not represented in the set of competence-cards, groups can create a new competence card by writing the keywords on a blank card.

STEP 6 (10 min): Ask groups to **'rate' the competence-cards** by means of the **matrix**, see Appendix C and Figure 1.

STEP 7 (10 min): Facilitate a plenary **dialogue about the differences and similarities** in the outcomes of the groups (if there are multiple) and/or reflect on the process with the group(s).

Create a bridge to educational module co-creation: Competences located in the top-right of the matrix need the most attention in educational module design. If the workshop is meant to also include an in-between step to formulate (more specific) learning goals for education, please go to Appendix D for more information on this.

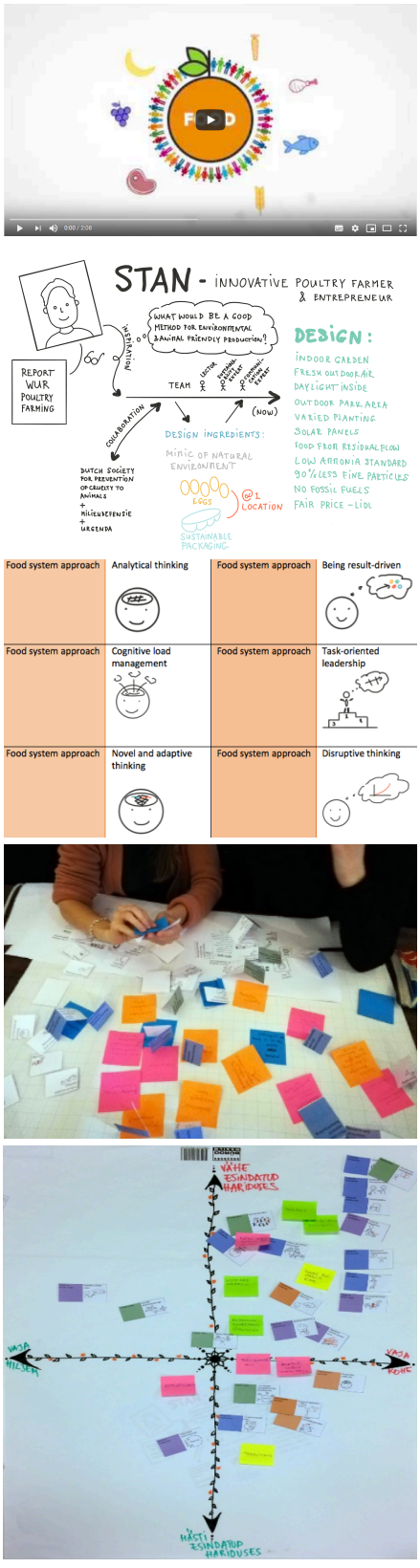


Figure 1
From top to bottom: the FOOD2030 vision-video, Persona Stan, competence cards, brainstorming with the cards, and the matrix-based categorization.

[3] An alternative starting point can be a food (system) trend, showcase or breakthrough (if at hand, and contextually relevant).
[4] Many more personas can be created than provided here. Food system innovation showcases can be used as inspiration source for creating other personas. The persona of this workshop is based on the company 'Kipster'.

CO-CREATING (OUT-OF-THE-BOX) MODULES

DURATION: ± 2 HOURS

STEP 1 (10 min): Briefly **present** a recap of the brainstorming on **competences** that done earlier (e.g. the matrix).

STEP 2 (5 min): Group participants in pairs, or in groups of three to four persons. Ask them to **select a** set of competences[5] as topic for their idea generation (depending on the previous workshop outcomes). Ask the groups to familiarize themselves with the selected topic[6].

STEP 3 (10 min): Give the groups a prepared **morphological matrix**[7] (printed, or online e.g. via Mural or Padlet, see Appendix E). Also give each group several blank A4 sheets (in an offline setting), or ask them to take an online white canvas in front of them (in an online workshop setting like Mural).

STEP 4 (5 min): Ask groups to **randomly select one box from each row** of the morphological matrix (see Figure 2). Let them re-draw the selected boxes on top of the A4 sheet in front of them (see Figure 2 for an example).

STEP 5 (5 min): Now the **brainstorming** starts. Stimulate participants to brainstorm about how their topic (e.g. one set of competences) and the randomly selected set of boxes could result into a (rough) module idea. Stimulate them to **sketch** as much as they can on a paper (keywords are ok though, see Figure 2 for an example). Everything is possible: from thinking small (e.g. a mini-workshop) to thinking big (e.g. a full curriculum).

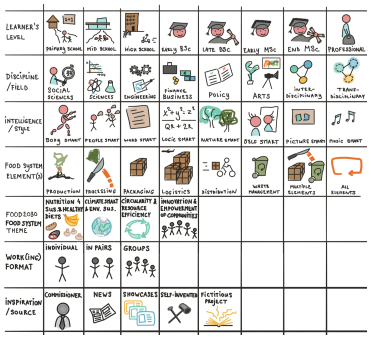
STEP 6 (5 min): If there is time, make groups select **another random set of boxes** from each row of the morphological matrix again, and ask them to engage in brainstorming about this set as well.

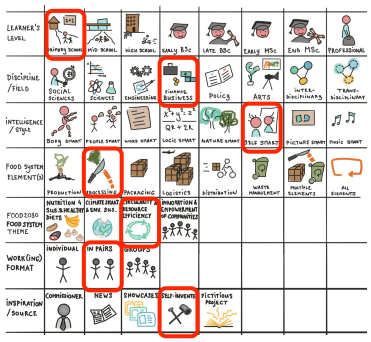
STEP 7 (15 min): Ask groups to collaboratively **select or combine** multiple created ideas (the ones they like the most[8]) into a coherent module concept. Make them draw / sketch this final concept on a flip-over sheet (keywords are ok).

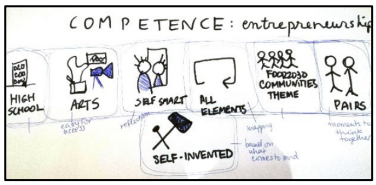
STEP 8 (10 min): Organize a **pitch**, in which the various groups briefly present their created module concept in 1 minute.

STEP 9 (Optional; 30 minutes extra): Seek commonalities and differences in the module concepts and summarize these plenary. Vote together with all workshop participants which module(s) should be

STEP 11: Make appointments with participants about the further design and implementation of the module(s) to assure after-workshop commitment.







School or community garden project for school children

"A whole class is cooperating, but also taking part in smaller interest-based task teams. This project would take the whole summer, a whole semester or a whole year. Children think up themselves what they want to grow, research how to do it, and actually do it. They must divide work, budget their expenses (that will be the basis of funding they get from the school), plan ahead, build necessary greenhouses, lots etc. A teacher organizes class trips to see the actual production of relevant crops. The selling point is that kids could grow or try to grow whatever they want – things that seem unintuitive, impossible or what simply interests them. In a Nordic country it would be challenging to grow grapes, peppers and the sort, but kids could try."

Figure 2
From top to bottom: an 'empty' morphological matrix, the matrix with randomly selected boxes in each row, a drawing for the brainstorm, an example module idea from a workshop in the FIT4FOOD2030 City Lab in Tartu.

[5] An alternative option is to use the vision, breakthroughs, showcases or trends as a topic in this step. The starting points of this workshop depend on the workshops organized previously to this one. In the case of City Lab training #3 the previous steps cover visions and competences.
[6] Additional descriptions can be provided if the previous workshop is well summarized, and/or groups can discuss the topic (in this case competences) on the spot to co-create meaning.
[7] A description of this tool (and its usefulness in a design process) can be found in Tassoul, M, and Buijs, J. (2007). Clustering: An Essential Step from Diverging to Converging. Creativity and innovation management 16(1): 16-26. DOI:10.1111/j.1467- 8691.2007.00413.x
[8] In fact, this decision-making can also be done in a semi-structured way, by thinking of requirements for the modules (before generating ideas) and testing each concept on these requirements. This requirement creation (making a design specification) can be done during this workshop as well, as a step after the introduction. The concept that eventually meets most requirements the best, is chosen for further elaboration.

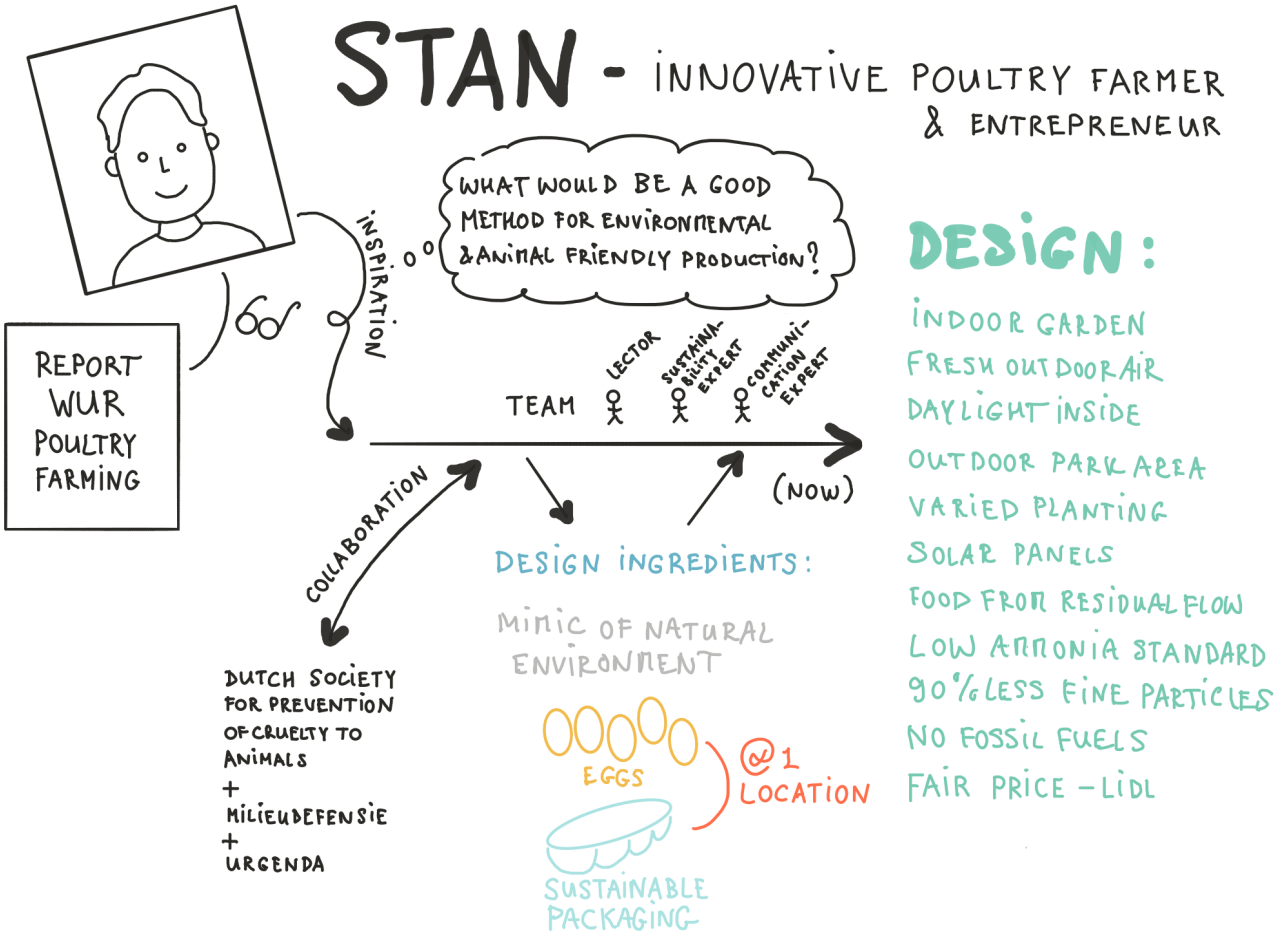
APPENDIX A

Organizers or facilitators of a module co-creation workshop can either use the following Persona for a workshop on thinking about competences (representing a food innovator in poultry[9]), or create (a) new persona(s) e.g. based on a practical (entrepreneurial or researcher) example of innovative food (system) practice(s) from the local context. The following text could be used to introduce the Persona that is included in this format to participants of a workshop (while giving a printed or online copy of the visualization to the participants / groups of participants, see below):

"Meet Stan. Stan is a farmer and entrepreneur. A little while ago, Stan felt an urge to innovate. His poultry farm was not profitable anymore and he was feeling bad about the way it operated. Stan found a report of the Wageningen University (in The Netherlands) on 'poultry farming' and suddenly saw 'the light'. He posed himself the question: 'What would be a good method for poultry farming that is animal and environmental (and human) friendly?' This question was going to be his major inspiration source for innovation.

Therefore, Stan sought for advise from various Dutch animal and environmental NGOs, and teamed-up with a Lector/entrepreneur, a sustainability expert/entrepreneur, and a communication expert. The major design ingredients for the new poultry farm became 'mimicking the natural environment of poultry' (being a forest with food, clean air, lots of variation and shelter), and 'combining egg production and packaging', to reduce one layer of transport usually needed for egg production.

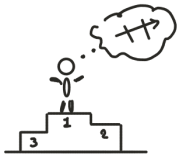
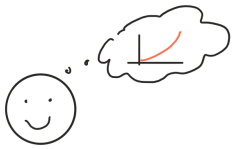
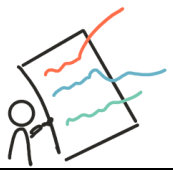
After having found money and designers to actually realize the poultry farm, the end result became innovative (for the food sector and for poultry) in many ways: an indoor garden with fresh outdoor air, daylight inside, and outdoor park area, varied planting, solar panels, food from residual flow, a low ammonia standard, 90% less fine particles, no fossil fuels, a super-sustainable egg package design, and fairly priced eggs (adjusted to LIDL consumers)."



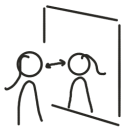
[9] Persona Stan is loosely inspired on the showcase about Kipster

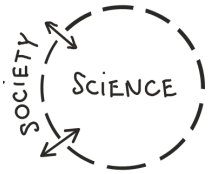
APPENDIX B

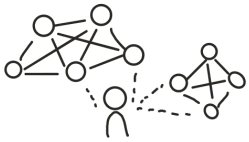
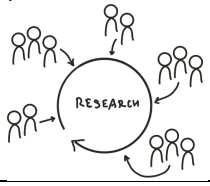
The tables below are competence cards. Either make them digital in an online environment like Mural or Padlet, or print them and cut along the black lines, fold along the colored lines, so that the 'theme' of each competence is visible ('food system approach', 'multi-stakeholder approach / network building', 'Research & Innovation systems', and 'RRI and Open Science'). By folding the cards, they can be placed on a table in a standing position. If necessary, post-its can be stuck on them (e.g. inside the fold). The competences are based on experiences of ECSITE and an EnRRICH project deliverable on competences for RRI (Tassone & Eppink, 2016[10]).

Food system approach	Analytical thinking 	Food system approach	Being result-driven 
Food system approach	Cognitive load management 	Food system approach	Task-oriented leadership 
Food system approach	Novel and adaptive thinking 	Food system approach	Disruptive thinking 
Food system approach	Written expression skills 	Food system approach	Situational awareness 
Food system approach		Food system approach	

[10] See Deliverable 2.3 from the EnRRICH project: https://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/EnRRICH/D2.3_The_EnRRICH_Tool_for_Educators.pdf

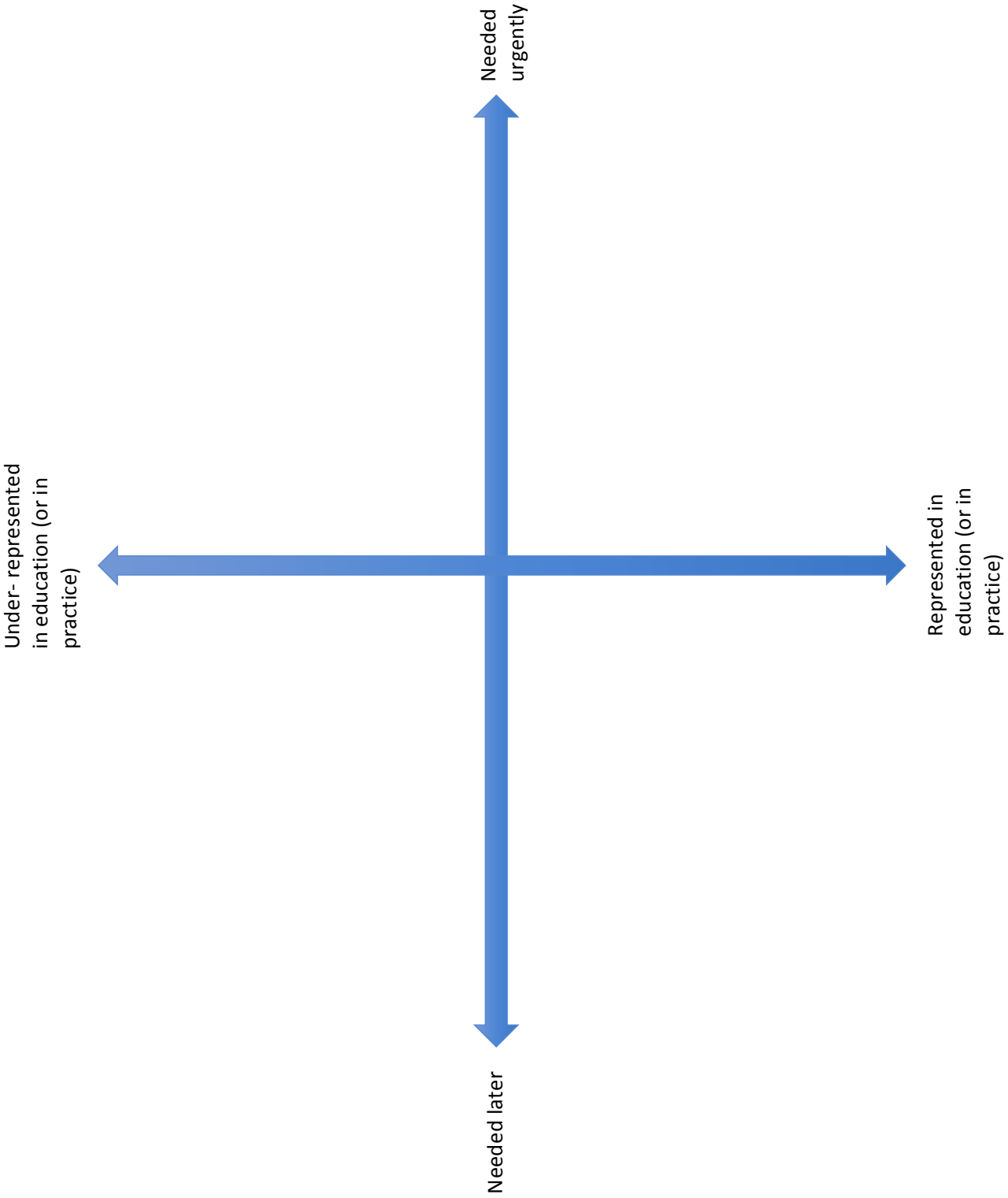
Multi-stakeholder approach/ Network building	Intercultural communication / competency 	Multi-stakeholder approach/ Network building	Social intelligence / awareness 
Multi-stakeholder approach/ Network building	Self-awareness 	Multi-stakeholder approach/ Network building	Virtual collaboration 
Multi-stakeholder approach/ Network building	Conflict handling 	Multi-stakeholder approach/ Network building	Sense-making 
Multi-stakeholder approach/ Network building	Flexibility 	Multi-stakeholder approach/ Network building	Empathy 
Multi-stakeholder approach/ Network building	Multi perspective communication / ability 	Multi-stakeholder approach/ Network building	
Multi-stakeholder approach/ Network building		Multi-stakeholder approach/ Network building	

Research and Innovation System	Navigating complexity or wickedness 	Research and Innovation System	Future-studies abilities 
Research and Innovation System	Openness and transparency 	Research and Innovation System	Agency 
Research and Innovation System	Computational thinking 	Research and Innovation System	Pro-active 
Research and Innovation System	Critical thinking 	Research and Innovation System	Transdisciplinary collaboration 
Research and Innovation System		Research and Innovation System	

Responsible Research and Innovation and Open Science	Working with citizen science platforms 	Responsible Research and Innovation and Open Science	(Future oriented) ethical thinking / abilities 
Responsible Research and Innovation and Open Science	Well-timed engagement 	Responsible Research and Innovation and Open Science	Adaptability 
Responsible Research and Innovation and Open Science	Stakeholder inclusion in research design processes 	Responsible Research and Innovation and Open Science	Researcher attitudes towards open access 
Responsible Research and Innovation and Open Science	Involving stakeholders in research data collection / analysis 	Responsible Research and Innovation and Open Science	Participatory ability 
Responsible Research and Innovation and Open Science		Responsible Research and Innovation and Open Science	

APPENDIX C

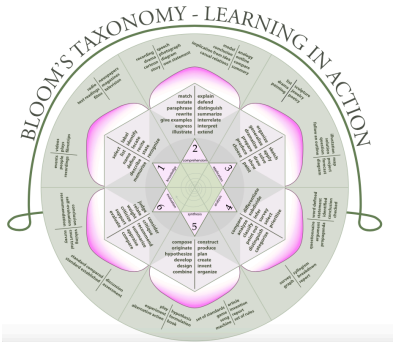
Below the matrix that can be used for competence rating[11]



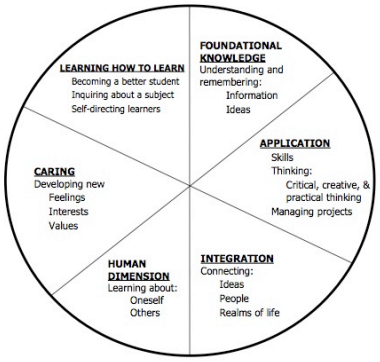
[11] Other dimensions can be put on these axes as well.

APPENDIX D

In this appendix we provide additional information on how to formulate learning goals from a workshop on competences. A learning goal (or a learning outcome) is *"a statement of what a learner knows, understands, values and is able to do at the end of a period of learning"* (Tassone & Eppink, 2016, p 19-20[12]). Mostly, the goal is formulated by means of a phrase starting with *"after this module, the student is able to….."*. This starting phrase (0) is followed by (1) a 'verb' (e.g. *"understand"*, *"connect"* or *"develop"*, etc.) and (2) the object of learning and (e.g. *"principles of transdisciplinarity"*) (3) plus the context (e.g. *"in food transport (research)"*). Depending on one's pedagogical background and preferences, there are various ways to choose which 'verb' to use in the phrase. The easiest way is to use one of the following taxonomies.



(1) A well-known way to choose a verb for a learning goals, and hence define the level of learning that is required, is Bloom's taxonomy[13] (see Figure 3). This taxonomy distinguishes between six levels of learning, from knowledge to comprehension, application, analysis, synthesis, and evaluation. The corresponding 'verbs' are given in the figure below (in the 'flower'), as well as the ways to assess these levels of learning (outer sphere). To illustrate: if learning is required on the level of 'synthesis' (generating something), the verb 'create' could be an appropriate choice.



(2) Another well-known framework for formulating learning goals is Dee Fink's taxonomy of significant learning[14] (see Figure 3). In this taxonomy, 'foundational knowledge' equals Bloom's learning levels 1 and 2, whereas 'application' equals Bloom's levels 3 to 6. In addition, Dee Fink defines four other levels of learning (integration, human dimension, caring, and learning how to learn). These levels could be seen as 'higher orders of learning', more related to 'people' and the learner itself.

(3) Slightly comparable, Krahtwohl[15] came up with a framework for learning in the 'affective domain' (see Figure 3). It introduces the levels 'receiving', 'responding', 'valueing', 'organizing' and 'internalizing'; each with an own set of action verbs (and ways of assessing) that could be used for formulating learning outcomes/goals.

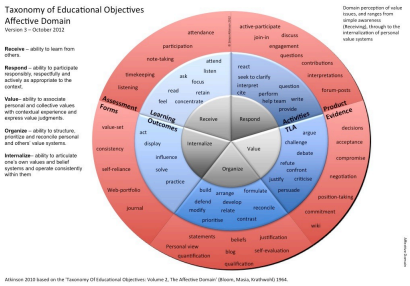


Figure 3
From top to bottom: Bloom's taxonomy, Dee Fink's taxonomy, and Krahtwohl

(4) Last but not least, the EnRRICH project developed a framework for formulating RRI-specific learning outcomes. It partially builds upon the ideas of Krahtwohl (the affective domain), but also uses aspects of Bloom's and Dee Fink's taxonomies, represented in a cognitive domain. Additionally, EnRRICH proposes to adopt a learning level on the psychomotor domain as well. As a result, EnRRICH proposes a framework that distinguishes between three learning domains, plus a scale from low to high order learning (see Figure 4). To illustrate: the action verb 'create' is seen in this framework as a verb suitable for a learning goal on a high order of learning, in the cognitive domain.

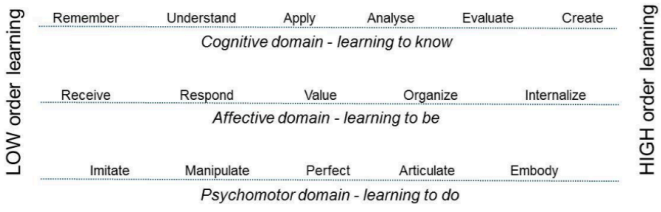


Figure 4
The EnRRICH learning framework

[12] See deliverable 2.3 from the EnRRICH project: https://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/EnRRICH/D2.3_The_EnRRICH_Tool_for_Educators.pdf
[13] See Bloom, B.S., Engelhart, M. D., Furst, E. J., Hill, W. H., Krathwohl, D. R., 1956. Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain. New York, David McKay Company.
[14] Fink, D.L. (2003). Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses. San Francisco: Jossey-Bass.
[15] Krathwohl, D. R., Bloom, B. S., Masia, B. B., 1964. Taxonomy of educational objectives: The classification of educational goals. Handbook II: the affective domain. New York, David McKay Company.

All in all, whichever taxonomy is used, learning modules that stimulate learning in various learning domains are known to be the most motivating for students. In university education, a rule of the thumb is that each ECTS credit needs one learning goal. So a course of 6 EC should have about 6 learning goals.

The following steps could be used, in addition to the format for defining competences described in this document, for a multi-stakeholder workshop on formulating learning goals:

STEP 1 (5 min): Introduce the principles of (formulating) **learning goals**[16], either by using a learning goal taxonomy of Dee Fink, Bloom, Krathwohl, or EnRRICH (or another taxonomy that makes sense to you for educational design).

STEP 2 (5 min): Give the participants a printed copy of a **taxonomy**, and ask them to categorize the competences within the taxonomy. Which competence is more likely to require knowledge, understanding, application, analysis, synthesis or maybe even evaluation? (In case Bloom's taxonomy is used). Or in the case that a competence requires learning goals on multiple levels, which combination is needed?

STEP 3 (10 min): Ask participants to **formulate** (one or more) **learning goals** for each competence (card), by using the words given in the taxonomy. E.g. a learning goal for acquiring a competence on 'level 3: Application' (in Bloom) needs to be formulated with the words *"after this module, the student/learner is able to 'organize' / 'generalize' / 'solve' / 'show' / 'sketch' / etc. … (content), in the context of (context)……."*.

STEP 4 (20 min): Engage in a **plenary discussion** on the identified learning goals:

- In case the participants work in education, can they create links between the learning goals and (their) existing modules? Search for commitment among workshop participants to consciously seek for connections to food system transformation in their existing modules that already work with these learning goals.
- For which learning goals are new educational modules needed? Use the outcome of this discussion for the co-creation of (out-of-the-box) educational modules, described in this document.

[16] Learning goal is seen here as similar to a 'learning outcome'

APPENDIX E

Morphological matrix prepared for module generating[17]. Workshop organizers may choose to create a more contextually suitable version of such a morphological matrix in case the one below is not a good fit. In that case, use the matrix given below merely as a source for inspiration on how to make such a matrix for an educational context.

LEARNER'S LEVEL	PRIMARY SCHOOL	MID SCHOOL	HIGH SCHOOL	EARLY BSc	LATE BSc	EARLY MSc	END MSc	PROFESSIONAL
DISCIPLINE /FIELD	SOCIAL SCIENCES	SCIENCES	ENGINEERING	FINANCE BUSINESS	POLICY	ARTS	INTER-DISCIPLINARY	TRANS-DISCIPLINARY
INTELLIGENCE / STYLE	BODY SMART	PEOPLE SMART	WORD SMART	LOGIC SMART	NATURE SMART	SELF SMART	PICTURE SMART	MUSIC SMART
FOOD SYSTEM ELEMENT(S)	PRODUCTION	PROCESSING	PACKAGING	LOGISTICS	DISTRIBUTION	WASTE MANAGEMENT	MULTIPLE ELEMENTS	ALL ELEMENTS
FOOD 2030 FOOD SYSTEM THEME	NUTRITION & SUS. & HEALTHY DIETS	CLIMATE SMART & ENV. SUS.	CIRCULARITY & RESOURCE EFFICIENCY	INNOVATION & EMPOWERMENT OF COMMUNITIES				
WORK(ING) FORMAT	INDIVIDUAL	IN PAIRS	GROUPS					
INSPIRATION /SOURCE	COMMISSIONER	NEWS	SHOWCASES	SELF-INVENTED	FICTITIOUS PROJECT			
ANOTHER VARIABLE								
.....								

[17] The third row (intelligence style) is rooted in Gardner's multiple intelligences. A module can be created to suite (more or) one of the intelligences. Ideally, module tasks eventually reflect different intelligences, but for sake of brainstorming it can be nice to take only one intelligence as a 'thinking angle', in order to think out-of-the-box.

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