D2.4: Master manual final

WP2 – Action research facilitation

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Executive summary

In this document, you will find specific instructions and practical tips on how to develop a course or an educational programme towards the goals described in the [Review Report of Educational Approaches (D3.1)](). Primarily, this document describes the iterative process of planning, implementing, and reflecting, which is to be followed. Specific instructions are given to each of the three phases. Appendices contain templates related to those instructions as well as examples from project activities in WP2 of the Nextfood project. More detailed examples and other tools for implementation of the Nextfood approach in education, can be found in the [Nextfood Toolbox]().

This final version of the master manual builds further on Master manual draft 2 (D2.3). In that document, the case leaders found specific instructions on how to develop their case towards the educational goals described in the [Review Report of Educational Approaches (D3.1)](), including detailed instructions and updated appendices.

Nextfood was initiated in 2018 as a collaborative project bringing together 19 partners in an international network with the aim of designing a research-based learning strategy for enhancing stakeholders' understanding of complex situations in the transition towards more sustainable agrifood and forestry systems ([www.Nextfood-project.eu]()). Central to the project was action research in twelve educational cases in which transdisciplinary learning was to be implemented in courses and programmes related to food, agriculture and forestry. The cases cover a wide geographical area and different levels of education. The master manual has continually been improved by including lessons learned of case leaders who worked practically with implementing action learning in the cases.

Introduction

By a recent declaration, the European Education Arena 2025, EU-leaders aim to build an inclusive and high-quality education as a part of the Green Deal strategy (European Union 2020). An education including transdisciplinary, learner-centred and challenge-based approaches is particularly mentioned as an important means to foster transversal skills or cross-cutting competences, i.e., those not confined to a specific task within a discipline or depending on a narrow area of knowledge. Skills such as critical systems thinking, entrepreneurship, creativity and civic engagement are especially necessary in situations where interlinked production, environmental, economic and societal issues require not only knowledge but also ability to take informed, responsible action in the pursuit of a more sustainable world.

To improve sustainability in agrifood and forestry systems, a new educational approach that develops the necessary competences—the integration of knowledge, skills and attitudes—amongst learners is paramount ([Review Report of Educational Approaches, D3.1](#)). The fundament of this approach (here termed [the 'Nextfood approach'](#)) is action education. This means that students, teachers and other stakeholders learn and train competences by working together to improve a real situation and by reflecting on their experiences (Lieblein et al., 2004). This contrasts with a conventional education, where teachers tend to transfer knowledge to students in a linear manner and students are regarded largely as passive receivers of knowledge.

In the Nextfood approach, experience is the starting point for learning. Theory on contents of the situation and methodological approaches to its improvement is then integrated when needed (Salomonsson et al., 2005). So are also exercises such as training of competences and methods needed in the fieldwork. Systematic reflection on experiences and theory then potentially contributes to a learning that is transformative (Mezirow, 2003) in the sense that it is phenomenon-, systems-, competence- and change-oriented rather than theory-, discipline- and predominantly knowledge-oriented. The Nextfood approach to action education is characterized by 1) a shift from theory to phenomenon as the starting point for the learning process (experiential learning) and 2) a shift in focus from knowledge transfer to building of competences needed to take informed and responsible action. The approach addresses the complexity and 'wickedness' of sustainability challenges and the gap between knowing and doing, which is often larger than between ignorance and knowledge. Further, the development of core competences—the integration of knowledge, skills and attitudes—required for involving in such inherently participatory and transdisciplinary processes, is emphasised. These competences include [observation](#), [participation](#), [dialogue](#), [visionary thinking](#), [reflection](#), [facilitation](#), and [systems thinking](#).

The transition to such an approach in education implies a paradigm shift that is likely to pose new challenges to all actors involved (students, teachers, stakeholders, and institutions). These may pertain to the mindsets, habits, expectations and competences of both teachers and students, which are often rooted in specific disciplines and a tradition of theory as starting point for learning and, even in education where experience is point of departure, not focussing on training of cross-cutting competences. Educational institutions are usually organised according to disciplines and predominantly use assessment methods that reward only theoretical knowledge. Those may be reluctant to support new education that needs to be transdisciplinary, involve various extra-university stakeholders, and include other assessment methods than written or oral exams. Within this context, there is a need for guidelines about

how to effectively plan, implement and further improve the Nextfood approach to action education for sustainability in agrifood and forestry systems.

The aim of the Nextfood project (2018–2022) has been to produce new knowledge needed to drive a transition from traditional, lecture-based teaching to action education in agrifood and forestry systems (Figure 1).

CONVENTIONAL LINEAR EDUCATION SYSTEM
TRANSFER OF KNOWLEDGE TO PASSIVE RECEIVERS
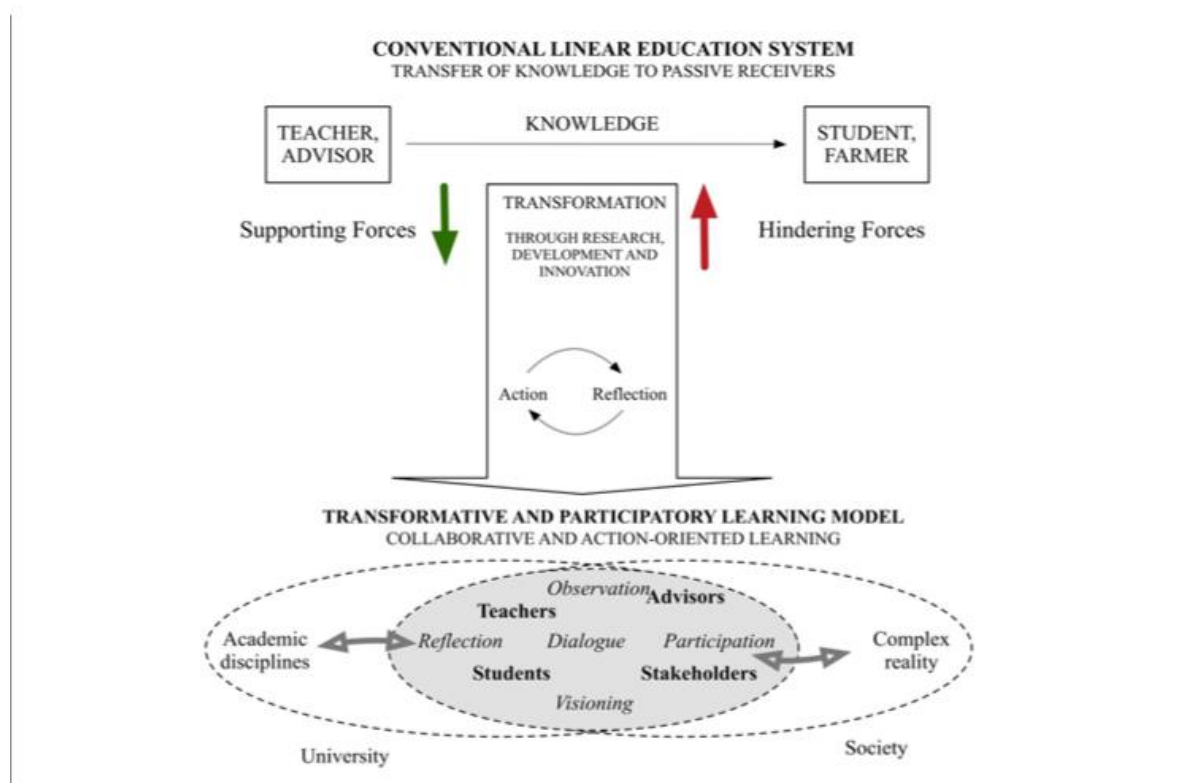
Figure 1: The Nextfood transformation—through iterative cycles of action and reflection—from conventional, linear education to participatory, transformative action education in real situations in society.

This has been achieved through action research (Levin and Ravn, 2007) in twelve selected cases at various stages in the process of transitioning from conventional to action education. Emphasis has been on the steps required for such a transition to happen, on forces that may hinder or support it, and on ways to build further on supporting forces while minimising the influence of the hindering ones. The action has been guided by a Manual for Case Development, of which the present document is the final version, while the research (data collection and analysis) has been done as described in the Action Research Protocol (D2.1). Each Nextfood educational case has during the project gone through up to four cycles consisting of three major phases, *viz.*, **planning, implementation** and **reflection** (Fig. 2).
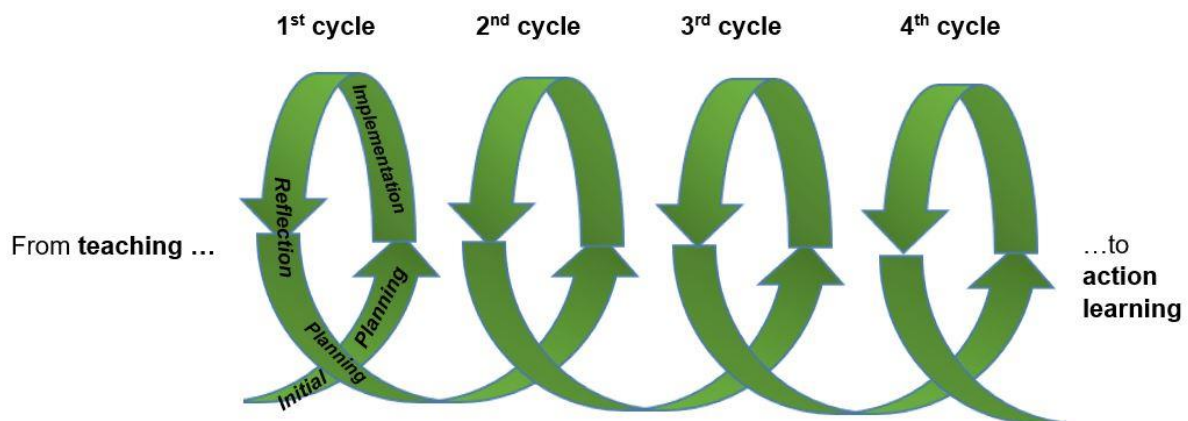
Figure 2: The transition to action education through iterative cycles of planning, implementation and reflection.

The purpose of this document is to provide guidance on the transition to action education in existing or new courses or programmes. Its content is based on our experience from establishing and conducting action education prior to and during the Nextfood project, on new insights obtained from the Nextfood cases—for instance, on what the Nextfood approach to action education requires from teachers, students, and institutions (see the Toolbox)—and on literature on action learning and research. The document will provide general instructions for the transformation process and specific examples of how to take each step.

Instructions for transformation

The steps outlined in this manual can be used as a guideline to transform courses and education programmes into phenomenon-based and action-oriented education. The recurring phases of *planning*, *implementing* and *reflecting* (Figure 2) are paramount for ensuring a continual improvement towards the desired future state of action education.

The planning phase encompasses four distinct steps as described below under "Initial planning" (Figure 3): (1) describe and reflect on the present situation, (2) envision a desired future state, (3) identify the supporting and hindering forces for change and (4) make a plan of action. During the *implementation* of the planned actions, the process and its outcomes should be recorded. After implementation, there is a phase of *reflection* upon the implementation phase. This reflection informs the next cycle of planning, implementation and reflection. Throughout the present document, instructions for how to conduct each phase will be given (see the Toolbox for more resources).

Initial planning

The first phase of developing an educational activity is *planning* (Figure 2), which should start with a workshop to obtain a shared understanding of the current situation and the need for a change, what participatory action education entails and can offer, the shifts needed for transitioning to action learning as defined by the Nextfood approach, and the necessary steps that should be taken to achieve a transition. This workshop should include not only the teachers, but also students and key stakeholders (e.g., resource persons from 'the field', representatives from school or university administration, researchers, and stakeholders with an interest in the education or the competences of the students). The workshop process should guide all participants through individual reflection, group reflection and plenary dialogue around the central topics. The Toolbox contains a template script that can be used as a starting point for designing and scheduling an initial planning workshop and that can be adapted to the needs in each specific case. Additionally, we encourage you to access presentations (pptx-files) in the Nextfood Toolbox that can be used in these workshops.

The workshop and immediate follow-up activities ideally should include the following four distinct steps: (1) describe and reflect on the present situation, (2) envision the desired future state of action education, (3) determine the supporting and hindering forces for change, and (4) make a plan of action for how to get there (Figure 3).
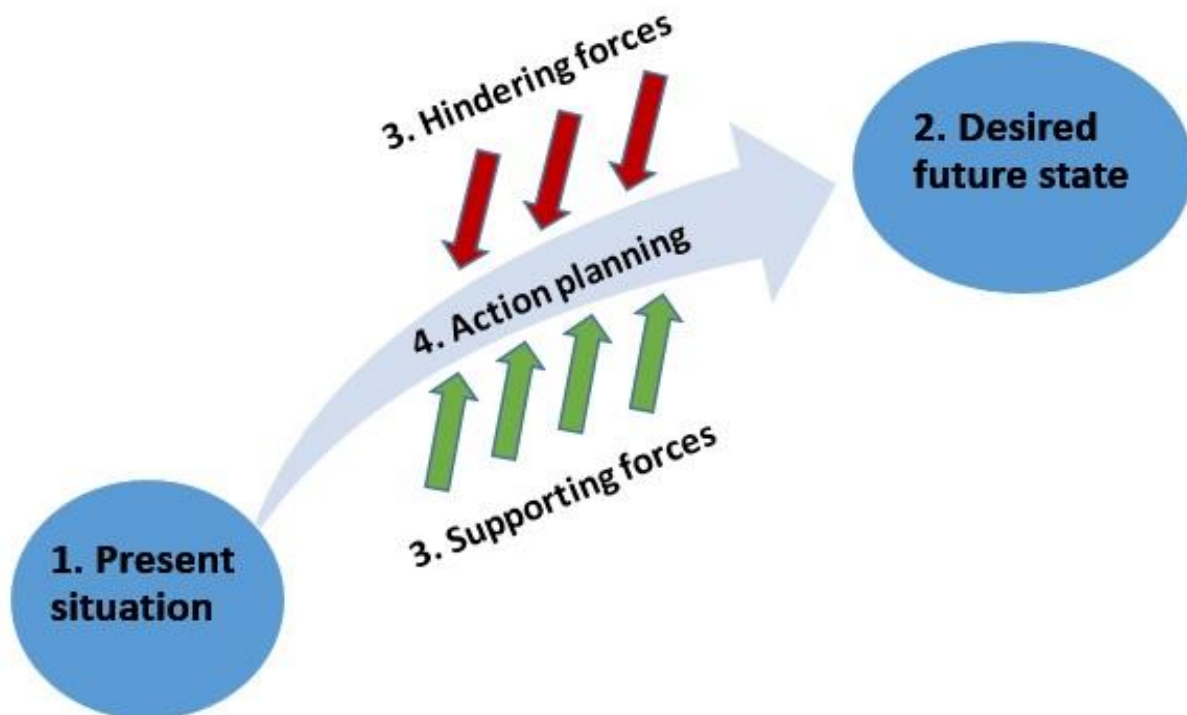
Figure 3: Outline of the process for planning the transition from the current state to action education according to the Nextfood approach

Step 1: Explore the present situation of the education in focus

The objective of the initial step is to establish the best possible understanding of the current situation and why it needs to change, before creating a shared understanding of the desired future situation and deciding on the actions to accomplish the transition. A shared understanding should be established with participation of key stakeholders to include all relevant perspectives and create ownership and commitment. This means that all participants in the exploration of the present situation should be informed about the content of the course or programme in focus (topics, training activities, desirable knowledge and skills etc.). They should also be introduced to the conceptual basis of the Nextfood approach to action education (see section "Introduction" above), first, to put the current situation in perspective and, second, later to be able to envision the desired future situation.

> **Practical tip!**
>
> Rich pictures
>
> Getting an overview of the present situation can pose a great challenge. The technique of drawing rich pictures, described in Rosalind Armson's book, Growing Wings on the Way: Systems Thinking for Messy Situations (2011) is suggested for getting a shared overview of the present situation. You can also read more about it in the Toolbox.

This step is a valuable opportunity to practice the core competences of observation and reflection which have the intentions of an unbiased examination of the current situation and understanding of what it means, respectively. We strongly recommend those who will later be action learning facilitators, to practice as participants the core educational activities during the

entire process of transitioning to action education. This process can be viewed as action learning very much analogous to what is being planned for students, and the argument that action learning is required, applies to students and their teachers alike.

Step 2: Envision the educational activity after the implementation of the Nexfood approach

After having obtained a shared understanding of the present situation, the focus should turn to obtaining a shared vision of the course or programme. We recommend to strive for systems thinking about the future state of the course or programme. Ideally, answers to the following questions should be formulated before starting to think about the future:

What is the **course or programme** (e.g., a bachelor's or master's course, a course at high-school level, a vocational training course or an entire programme)?

What is the **situation** in which the students will involve, i.e., the main arena for action learning (e.g., farm, forest or food system-related activity)?

What is the **action** the students are supposed to take on their main learning arena (e.g., a farming, forestry or food system inquiry to facilitate a sustainability improvement)?

Once these questions are answered, one can start focussing on the future through visionary thinking. Pool and Parker (2017, p. 3) described "visionary thinking" as "the process whereby we activate our insight and imagination, connect with our values and sense of purpose, and create mental images of a desired future state relevant to the challenge that is in focus". An introduction to visionary thinking and an example of an exercise in visionary thinking and action planning can be found in the Toolbox.

The vision of a phenomenon-based, action-oriented course or programme should include real situations or cases in society as major learning arenas. Further, the education should be structured according to a cycle of experiential learning such as the one described by Kolb (2015). This cycle addresses the genuine nature and activities of the ideally sequential key phases of an action learning process. Figure 4 illustrates such a cycle with the students placed in the centre. The centre consists of an agrifood or forestry case including a learning community of student peers, teachers and stakeholders within the case and in the external society. The (co-)learning in this community takes place through the inquiry process as guided by Kolb's (2015) cycle and expressed through the corresponding activities on the agrifood or forestry learning arena.

Theory (e.g., literature seminars and lectures about the phenomenon and methods of dealing with it) and educational activities (e.g., training of key competences) should be included and timed according to the needs emerging during the case inquiry process. This is known as "just-in-time education" (Salomonsson et al. 2005), which enhances the relevance of the theory and the likelihood of a fruitful reflection on its links to the student's experiences in the case inquiry. This action learning or system inquiry process is often not tidy and sequential. Nevertheless, an epistemological awareness of the genuine nature of each face or activity, e.g., as description by Kolb (2015) and Checkland and Poulter (2006), is essential to both teachers and students.

Since competences cannot be taught but need to be trained, introduction and initial training of the core competences in the classroom (Figure 4, orange circle) before practicing them in the case inquiry (Figure 4, blue and green bands) is of paramount importance. Literature seminars and reflection sessions (Figure 4, orange circle) should regularly be included, as learning by

doing does not work unless experiences are reflected on, e.g., in relation to relevant theory (Dewey 1916). The reflections should address contents of the case, the processes of case inquiry and their relationship to classroom education (theory and exercises) as illustrated in Figure 4 by the arrows pointing from the student in the centre to the green and yellow bands and the orange circle, respectively.

The outcomes of the case inquiry should end with a document written for the key stakeholder(s) of the agrifood or forestry situation (key client(s); Figure 4, green band). This document should describe the co-learning process, the insights gained and the visions and action plans made. This will hopefully enable the key stakeholder(s) to accommodate an informed change and the students and others to obtain transferrable knowledge. This depends heavily on reflection, which in addition to in classroom sessions on a regular basis, should become manifest in a final reflection document (Figure 4, orange circle) addressing the contents of the case, the process of case inquiry and the process of learning about and through the two (Figure 4, green and blue bands and orange circle, respectively).
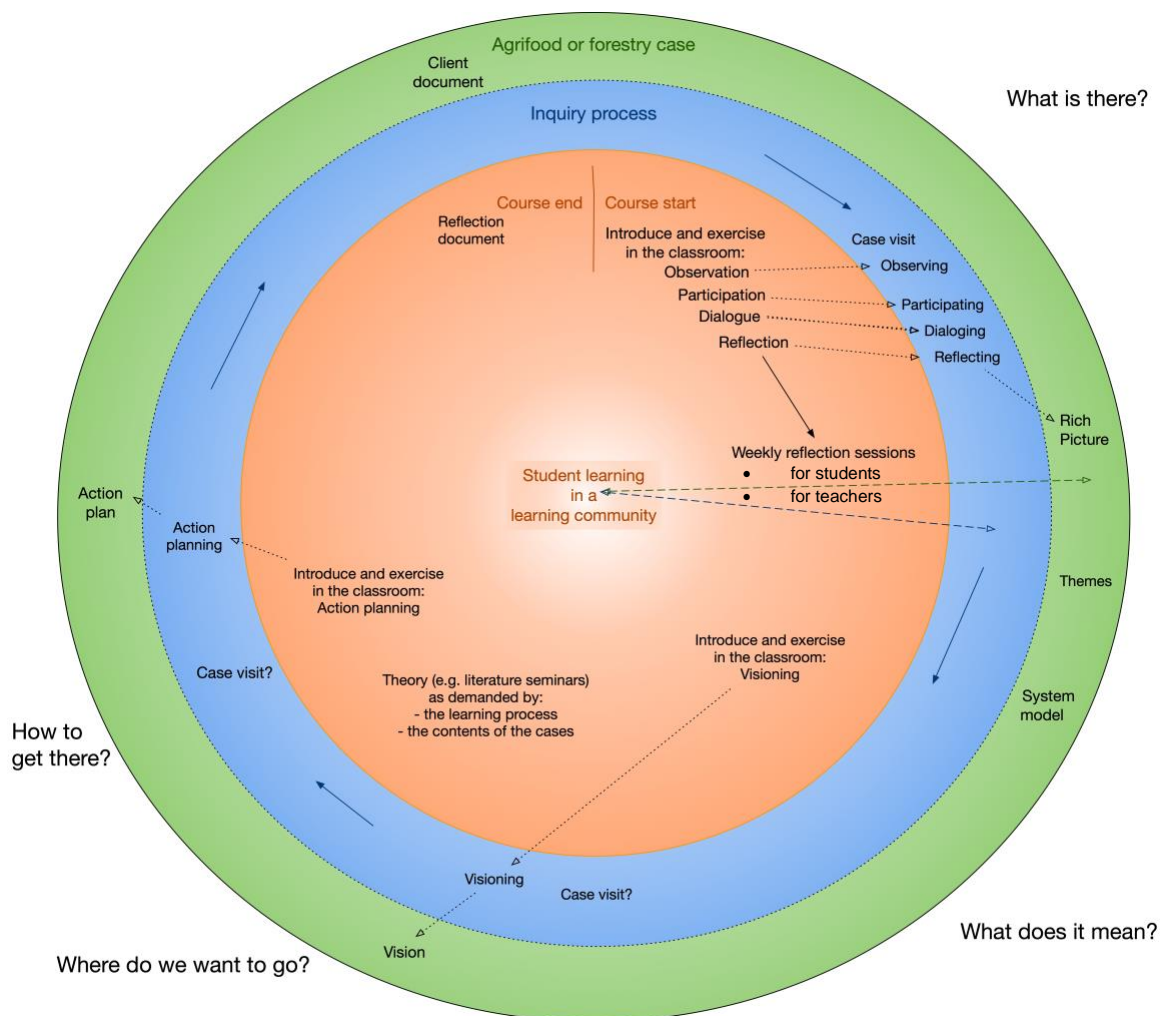
Figure 4: Action learning described as a cycle consisting of characteristic, ideally sequential phases of observing, understanding, visioning, and planning for improvement, and where activities in the course (orange) and in the agrifood or forestry case (blue) result in co-created outputs (green) needed to take informed action for improving the situation. The number of case visits must be adapted to the actual need and the time and resources available

Thus, the implementation of the Nextfood approach implies the following shifts (Edvin Østergaard, oral presentation about the connection between student-active learning and sustainability, the NMBU Learning Festival, January 30, 2018):

From:	The traditional situation	To:	The Nextfood approach
	Lecture hall		A diversity of learning arenas
	Lecturing		Co- and peer learning
	Syllabus		Supporting literature/a diversity of learning sources
	Textbook		A diversity of teaching aids
	Written exam		A diversity of assessment methods
	Lecturer		Learning facilitator

The educational activities are expected to shift over time to using a diversity of learning arenas rather than lecture halls only, applying co- and peer learning rather than lecturing only, drawing on literature supporting the learning process rather than predefining in a syllabus what the learning process should cover, using a diversity of teaching aids rather than a textbook that draws the boundary of what is to be learned, assessing learning through a diversity of assessment methods rather than an exam only, and facilitating learning rather than lecturing only. Likewise, it is important to emphasise the multi-stakeholder approach in education already at this stage, where practitioners (e.g., food producers and agricultural advisers) actively contribute with their interest and knowledge to several phases in the learning process (Posch and Steiner, 2006).

It is important to design a learning process that is meaningful to a variety of learners in order to engage them in long-term collaboration in research and education. The aim must be that everybody involved in education learns and gets something out of participating. Hence, it is important to discuss expectations and intended learning outcomes for everyone involved, not only for the students, who often are the main learner group in focus at schools and universities. By building a long-term relation with actors who are used to work in processes and who have an interest in meeting with students, there is a potential for a broad co-learning process as a means to build ownership in the activity and promote sustainability at the local level.

Furthermore, in the [Toolbox](#) you will find videos from a Nextfood WP2 workshop that give you more detailed guidance on two important aspects of case development: (1) How to bring reflection into your course, and (2) reflection sessions and other examples from the Nextfood cases. At this step, during the Initial planning phase, this presentation as well as tools for reflection which are available in the toolbox, can be a great inspiration for how to build reflection into both your course or programme and your case development process.

Step 3: Determine the forces supporting or hindering change

With a shared understanding of the Nextfood approach to action education and its key elements and, ideally, a vision of the future education, it is now time to explore what implementing the Nextfood approach would require, e.g., from teachers, students, institutions and other stakeholders involved. In essence, this revolves around figuring out which supporting forces to build on and which hindering forces to address. A comparison between the vision and the current situation serves to focus on themes associated with a transition to action learning,

and on forces supporting and hindering the transition. These analyses provide important background for working out action plans. In this step, we especially recommend bringing in the views of all relevant stakeholders.

Step 4: Plan the implementation, particularly the immediate next steps

Having established both the direction of the change needed and what its accomplishment would require, it is now time to decide what implementing the change would mean in practice. Important questions during the action planning are: how to build on the supporting forces and overcome the hindering ones?

To pursue the joint vision, it is necessary to work out a set of interconnected plans for *what* must be done *how*, by *whom* and *when*. To ensure consistency of means and ends, it should also be explicitly stated *why* things will be done. Although not necessary to follow in detail, the principles and suggestions of Checkland and Poulter (2006, pp. 38–54) about planning a change might be useful to consider.

The planning phase must result in an overview of what needs to be done to establish or further develop a course or programme based on the Nextfood approach. The necessary outcome then is a concrete plan for the course or programme and a script for conducting the educational activities.

The selection of cases that will form the student's action learning arena is of utmost importance. Contacts must be made with key stakeholders of these cases at an early stage, and they must be oriented about and motivated for their role in the Nextfood learning landscape.

Teachers and other stakeholder with educational responsibilities should leave the initial planning phase with at least one, preferably several, immediate next steps to be taken as well as a plan that includes short, intermediary, and long-term actions. The steps should be formulated as concrete, straight-forward and not too large tasks. This could, for instance, be "By the end of the week, [name] will have contacted at least three suitable local businesses to explore possible collaborations for moving out of the lecture halls." An obvious early major task is concrete planning of the educational activities and their scheduling according to the principles outlined above in Step 2. Resources and tips such as examples of schedules, reading lists and educational activities are provided in the Toolbox.

Implementation

During the implementation phase of the process, the plans made in the previous phase are to be conducted. The primary task is, of course, running the course or programme, and setting the stage for the students to reach the desired learning goals. In essence, this means following the action plans determined in the initial planning phase. These must include a script for how to conduct the educational activities (e.g., field trips, lectures, group work, presentations, training of competences and evaluations) based on the detailed course or programme plan made in the previous phase. Based on experiences from the twelve Nextfood educational cases, the following activities require particular attention:

Establish an understanding of and motivation for action learning

A shift in mindset among the students and others involved is perhaps one of the most crucial factors for successful implementation of action learning, For most students with a background in propositional teaching, motivation for participating in action learning requires an understanding of its justification. In addition to generic pedagogical reasons, these pertain to the nature of the phenomena in agrifood systems (e.g., complexity, messiness and wickedness of sustainability challenges) and the approaches and competences required to take informed action (Review Report of Educational Approaches, D3.1).

An introductory session on the theory and empirical material upon which action learning rests is necessary but, according to the very same theory and experiences, not sufficient, Therefore, it is highly recommended that an introduction is followed by exercises, e.g., on observation of a real-life situation, presentation of these with emphasis on multiple, systemic perspectives, and reflection on the exercise (contents and process).

Ask students to map their learning and competence development goals

At the beginning of the course or programme, the students might expect and desire a diversity of learning goals to be met. Even though the course or programme has specific learning goals, the students might also have additional desired outcomes or questions that they want to find answers to. Similarly, the students have different levels of understanding and competence. Asking the students to describe their learning and competence goals at the beginning of the course or programme evokes self-awareness among the students. It also allows the teachers to gain insight into the student group and adjust the course's or programme's structure if necessary. Asking the students these questions can be done by handing them out as exercise questions to be answered in a written format, or by conducting individual interviews with each of student. At the end of the course or programme, these questions should then be re-addressed to assist the students in reflecting upon their experiences and learning outcomes. A list of questions can be found in chapter 3 of the Action Research Protocol (D2.1).

Practical tip! - List of questions that was used in the Nextfood approach at the beginning and end of the course or programme:

At the beginning of the course	At the end of the course
What would I like to learn in this course?	What did I learn during this course?
What experiences and competences do I bring to the course to make it a success?	What experiences and competences did I find particularly useful when taking this course?
What characterizes good observation?	What characterizes good observation?
What characterizes good reflection?	What characterizes good reflection?
What is the relationship between observation and reflection?	What is the relationship between observation and reflection?
What are the questions I´d like to find answers to in this course?	What are the questions I'm now asking myself?
Which skills and competences do you want to train/improve in this course?	Which skills and competences did I get the chance to train/improve during the course?

Introduce and train key competences

The Nextfood model includes cross-cutting key competences that are desired learning outcomes in view of the sustainability challenges (Review Report of Educational Approaches, D3.1). A certain mastery of these competences are also prerequisites for obtaining other learning outcomes such as ability of systems thinking and of planning and facilitating informed action. Therefore, these competences must be introduced and, even more important, trained at the stage when needed. Observation, participation, dialogue, and reflection are needed at a very early stage in a case inquiry process, whereas systems thinking and visionary thinking, can be addressed somewhat later.

Conduct competence self-assessment

In the transition from a traditional focus on linear knowledge transfer, to developing the necessary competences and skills, a tool to evaluate the degree of this development is needed. We suggest asking the students to self-assess their own competences at the beginning and end of the course or programme and to then measure their (self-assessed) progress.

Competence self-assessment can serve several purposes. On the one hand, it helps teachers to see how the course or programme functioned: How much competence development happened during the course or programme? On the other hand, students' self-assessments can serve as an aid to help them become clearer about their own learning goals and style of learning. In addition, the ability of assessing oneself is an important skill to develop for the future generation working in sustainable agrifood and forestry systems. Doing this self-evaluation will help students to structure their own reflection about the course or programme and their overall learning experience.

In the Action Research Protocol (D2.1), more specifically in its appendices 6 and 11, you will find a template for a proposed competence self-assessment tool that describes an individual's progression through a series of five levels: *novice*, *advanced beginner*, *competent*, *proficient*, and *expert*. The competences *observation*, *dialogue*, *participation*, *reflection*, and *visionary thinking* can be assessed using this self-assessment tool.

Start the case inquiry

Although properly included in the plan of the course or program, the start of the case inquiry requires particular attention, as the case is the most important arena for action learning. The need to double check the students' and external stakeholders' understanding of their roles and task and the stakeholders' readiness for receiving students should not be underestimated. This should be followed up during the course or programme, and needs for improvised adaptations should be considered. Practicalities such as transportation and lodging associated with case visits requires careful planning and monitoring.

Facilitate student reflection sessions

To accommodate the students' knowledge, skill and competence development through the educational activities, it is important to set aside sufficient time for structured reflection upon the experiences in the educational activities. We suggest that this should be done on a regular basis throughout the course or programme, first led by a teacher, and when the students have become familiar with the process, by groups of students taking turns. We strongly recommend having another look at the tools related to reflection in the Toolbox.

Reflection sessions in practice:

Reflection means the ability to link own experiences to theory in sustainable agrifood and forestry systems and to personal development. To do that, a structured reflection session works wonders. A suggested exercise is to focus the session on an experience that recently took place in the course. Thereafter, the process of individual reflection – sharing in small groups – plenary sum-up could be followed.

For instance, first ask the following:

"Looking back at the field visit last week,

1) What did you observe that made you want to look deeper into it, and why?
2) In what ways did the visit inspire you to improve your group work project?"

Instruct the students to think for ten minutes in silence.

Thereafter, arrange the class into groups of 3-5 students and ask them to share what they thought of during their individual reflection.

Lastly, ask the groups to share what they talked about and facilitate connections that the whole class can benefit from hearing. Also, encourage students to keep a logbook with their reflections and regularly reflect individually. Reflection is a competence that, with practice, one can master.

Facilitate literature seminars

As the best of current knowledge and theory is essential in the process of learning from experience, implementation of literature seminars at the time needed in the case inquiry should be given priority.

Have regular meetings with student groups and individual students

Action learning and training of cross-cutting competences involves not only intellectual development but is a process involving more or less the whole personality. Hence, the success of action learning at group and individual levels depends a lot on good group dynamics and individual well-being. Therefore, diversity of student personalities and its role in group dynamics should be addressed at an early stage. It should be revisited in subsequent meetings between student groups and teachers and between individual students and teachers. The individual meetings should also address other issues that might influence the well-being of each student, thus, the student's learning and contribution to the whole learning community.

Facilitate writing of a learning log and a reflection document

Structured reflection throughout the duration of the course or programme is essential for learning from the transformation process. The students should be instructed to write a daily personal log on what happens during various course activities and on immediate perceptions, feelings and thoughts. This log forms the empirical basis for a final individual reflection document, which in addition to being a tool for learning from experience, also documents learning outcomes. The reflection documents

Reflecting on our experiences, exploring ideas, and linking experiences to existing and new knowledge and skills, help us focus on what we need to work on in the future.

should be structured to allow the students to explore what their learning outcomes have been with regards to, respectively the contents of the case, methodological approach to exploring the case and the process of action learning in relation to the learning goals and future career. These documents are well suited to be part of the evaluation of the students' performance in light of the learning goals. A guide to writing reflection documents can be found in the Toolbox.

It is clear from the experiences in the Nextfood case studies, that the students throughout the course need to be encouraged to writing the learning log. Further, the goals and structure of the learning documents must be clearly communicated and repeatedly revisited, as this type of assignment is unusual to most students. In order to get started, is advisable to have the students hand in preliminary drafts for peer and teacher feedback, both on an individual and a plenary basis.

Facilitate writing of a case inquiry document

The action learning aiming at improving a case towards shared vision should result in a document written for involved stakeholders. The purpose is to document the methodological approach to systemic intervention and its outcomes and to support the responsible stakeholders in further action. Therefore, it is important that the students become internalise the fact that the primary purpose of the document is effective communication with these stakeholders, not teachers or other external readers.

Experience from the Nextfood case studies shows that it is important to introduce this assignment at a relatively early stage and, like for the reflection document, revisit its purpose and structure later on by having the students hand in preliminary drafts for peer and teacher feedback.

Organise teacher reflection sessions

The teachers of the course or programme should also on a regular basis reflect upon their experiences during the course or programme, both to document the process from their side and to aid the improvement of the course or programme.

We strongly recommend having another look at videos and other tools related to reflection in the Toolbox.

Evaluate the contents and sub-activities of the course or programme

A frequent and formal individual evaluation will enable the students to express their views on the course or programme and to share their experiences in a format that is different from the informal sharing that might occur during the course or programme (for an example of how this can be done, see Appendix 8 in D2.1 Action research protocol). For a teacher, it is important to know to what extent the goals have been reached and to make improvements in the upcoming parts of the course or programme based on the students' feedback. And for the students, doing this evaluation informs their individual reflections about the course or programme.

This individual feedback gives a unique insight into the students' experiences and combined with other considerations enables the teachers to further develop the course or programme.

Another important step in the implementation is getting feedback from key stakeholders with whom the students will have interacted throughout the course or programme.

Provide formative and summative assessments

Formative feedback from teachers and student peers should be given during the course on oral presentations and on stakeholder and learner document drafts. Moreover, self and peer assessment of the students' participation and competence development should be used as a learning aid.

When it comes to summative assessment, the final assignments such as stakeholder and learner document and oral exam are obvious sources of information. However, it should also be considered whether self and peer assessment could constitute windows on the students' competence development and contributions to the learning community, e.g., when it comes to participation in group work and plenary activities.

A demanding task that requires particular attention is assessing and giving feedback on the students' achievement of multiple learning outcomes, e.g., regarding contents of the studied case, the mastery of the case inquiry process and the individual development of cross-cutting competences. We recommend revisiting learning goals, indicators of their achievement and the weighting of indicators on a regular basis and, particularly, before the final, summative assessment.

Written feedback during and after the course on the students' performance is useful, but particularly when it comes to formative feedback, an oral conversation seems a better alternative, as it offers the opportunity for correcting misunderstandings in the communication and address emerging issues.

Reflect and plan again

At the end of one cycle in the course or programme, it is time for the teachers and other relevant stakeholders (students, institutional representatives etc.) to reflect on the implementation of the initial plans and explore how this reflection can inform the planning of the subsequent cycle. This is best done in a workshop following the same basic principles as the planning workshop. Guidelines on how to conduct such a workshop can be found in Appendix 2.

Before the course or programme reflection workshop, information gathered during implementation needs to be summarised. It is important for the success of the reflection workshop that each participant in this workshop has read through the main findings from the cycle that will be reflected upon. If deemed possible to conduct a comprehensive data collection such as done in the Nextfood educational cases, these raw data needs to be processed in line with the analysis methods described in the Action Research Protocol (D2.1).

The outcome of the reflection should be used to develop a plan for how to improve the course or programme. The workshop should include the following steps:

Step 1: Recapitulate the educational activities

Throughout the implementation of the latest cycle, a lot of information may have been gathered. To be prepared for reflection, it is important to get a good overview of the data that encompasses not only the teachers' but also the students' experiences. While it is not necessary to analyse the data fully at this stage, a first round of analysis (e.g., a first coding of text data) is necessary. When reflecting on the course or programme, identify the most important themes that come forth: "Looking back at the course or programme, what is the main story to tell and what where the most important episodes?"

We strongly recommend having another look at the tools for reflection in the Toolbox at this step.

Step 2: Assess current status of the shifts

After having achieved an overview of the previous cycle of case activities, to reflect on the activities, we suggest revisiting the shifts (see Appendix 2 for instructions).

Assessments of the students' achievement of core learning goals also indicates to which extent the shift has been successful in terms of a new level of competence for improving the sustainability of agrifood and forestry systems, i.e., the "why" of the Nextfood approach. These assessments include those made by the students themselves, teachers, external examiners, and stakeholders involved in the course or programme. It may also involve a reflection on the direct impact and usefulness of the innovations and solutions produced by the students to complex and wicked problems.

Step 3: Determine the supporting and hindering forces

The next step in reflecting upon the case activities is determining what hinders the case from developing towards implementing the Nextfood approach and what supports that development. It is important to spend time reflecting on this before moving into the planning of the next cycle.

> **Focus group interviews for supporting case development**
>
> In Kerala, India, Nextfood organised a focus group interview with 5 academic leaders and faculty members. This was performed as part of the reflection process, which is an important step for learning before initiating the next cycle. The topic for the focus group interview was institutional factors that either support or prohibit the transition to a more participatory and student-centred education. Institutional factors are connected to central values and attitudes of how higher education should function, and how these values are maintained. By identifying these factors, we increased the understanding of the environment in which the case in Kerala operates, which is important for the forthcoming support of the case and for the overall research in Nextfood. The interview touched upon areas such as the structure and the organisation of higher education, leadership of education, as well as gender equality and access to education. The interview was facilitated by a Nextfood researcher involved in the case. It lasted for approximately 1.5 hours, was audio recorded, transcribed, and analysed.

Step 4: Plan how to build on the supporting forces and how to address the hindering ones

Considering the reflections on the previous course or programme cycle, it is now time to start planning the next cycle. The first step in planning the next cycle is deciding how to build on the supporting forces and how to overcome the hindering ones.

Numerous barriers need to be overcome by faculty: institutional pressure to stick to conventional teaching methods, difficulties in explaining this learning model for teaching peers, and resistance among university administration and the need to provide extra time for planning and running such a course.

Teachers sometimes raise the concern that all students may not be ready for this transformation and it is necessary to understand their attitudes toward their own learning. One reason is that students may feel insecure when they are in the field because of a lack of practical experience. Another reason might be that social science skills present a challenge for many students, they are not trained in reflecting on their own learning experience and therefore find these assignments very challenging. To support students, it could be useful to offer them a progression during their academic careers and repeatedly give them opportunities to train the necessary skills throughout the program. For example, students may engage in activities where they work in transdisciplinary teams with students from other fields, faculty members and professionals from outside academia.

Step 5: Plan the next steps

Now it is necessary to work out a set of interconnected plans for *what* must be done *how*, by *whom* and *when*. To ensure consistency of means and ends, it should also be explicitly stated *why* things will be done. Particular attention should be paid to the ideas generated at the previous step about how to make use of supporting forces and overcome the hindering ones.

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Appendices

Appendix 1 Initial planning workshop facilitation guidelines

NEXTFOOD (WP2) INITIAL PLANNING WORKSHOP

Developing transformative education in the agrifood and forestry system

To be extended, shortened – adapted to local needs

One-day initial planning program

Desired outcomes of the workshop

    a) *A shared understanding of the Nextfood approach that we are aiming to achieve*
    b) *A plan of implementation: What, who, when, where*

Participants

Teachers/researchers
Students
Resource persons from 'the field'
Representatives from institutional administration
Stakeholders with an interest in the education or the competence of the students

Facilitator(s)

Case responsible group (in collaboration with NMBU team

08:30 – 08:50	**Arrival and registration**
08:50 – 09:00	**Welcome and opening speech**
09:00 – 09:30	**Background for this workshop**

    1. **The Nextfood Project**
       Aim of the workshop : to explore the shifts needed in order to transition to participatory, experiential and action-oriented learning. Desired outcome: a draft of a plan including which actions and decisions should be given priority for the next 6 months
    2. **The Case** (*7 minutes*)
    3. **Plan for the day**, feedback from participants (*3 minutes*)

Distribute printouts of the participants' programme.

09:30 – 10:00	**Introduction of participants – Who are we?**

Question: Where do you work or study?

What excites you about the work you are currently involved in?

Share in small groups (4-5 at each table, for example, depending on total group size)
Write down the information that you would like to share with the Case responsible group

The Nextfood approach and the intended shift

10:00-10:45   **Part 1:** Overview of the approach *(15 minutes)*
                            Short round of questions to the approach. (*5 minutes*)

What adaptations of the approach are necessary to meet local needs?

Exercise to address this question:
Individual reflection (5 minutes),
followed by a dialogue in small groups (10 minutes) and
a discussion in plenary (10 minutes).
Write on provided sheets (groups) & on flip-over or whiteboard (plenary)

10:45-11:00   **Coffee break**

11:00-12:30   **Part 2:** Overview of what needs to shift in order to comply with the Nextfood approach and what typifies our current practice.

Presentation of the shifts in six areas (*10 minutes)*

The overall shift from teaching to learning and from knowledge to competence implies concrete shifts in the following six areas:

1. From lecture hall to a diversity of learning arenas
2. From lecturing ('vorlesung') to 'nachlesung' and peer learning
3. From syllabus to supporting literature/a variety of learning sources
4. From textbook to a diversity (variety) of teaching aids
5. From written exam to a variety of assessment methods
6. From lecturer to learning facilitator (which includes the introduction of and training in dialogue, visionary thinking, observation and reflection

On a continuum of 1-10, where 1 signifies our current practice and 10 signifies practices consistent with the Nextfood ambitions, where do we stand today? Discussion in group as they try to place a "x" along the continuum for each of the six areas.

Exercise to address this task:

Dialogue in small groups (10 minutes) and
a discussion in plenary (5-10 minutes).
Put slide with six shifts up, write on provided sheets (groups) & on flip-over or whiteboard (plenary)

Explain for the shifts that you rated <u>below 5</u> why they are rated low and what can be improved

Exercise to address this task:
Dialogue in small groups (15 minutes) and
a discussion in plenary (5 minutes).
Put slide with six shifts up, write on provided sheets (groups) & on flip-over or whiteboard (plenary)

Explain for the shifts that you rated <u>above 5</u> why they are rated highly and what can be learned from these as well as how they can be maintained

Exercise to address this task:
Dialogue in small groups (15 minutes) and
a discussion in plenary (5 minutes).
Put slide with six shifts up, write on provided sheets (groups) & on flip-over or whiteboard (plenary)

Come up with at least 2 suggestions for additional shifts.
Follow the guidelines for divergent thinking (brainstorming), stretch your thinking, don't evaluate each other's ideas, suspend judgement, focus on quantity, dare to think out of the box, allow for completely new ideas.

Exercise to address this task:
Dialogue in small groups (10 minutes) and
*a **<u>ranking</u>** of suggestions in plenary (5 minutes).*
Put slide with six shifts up, write on provided sheets (groups) & on flip-over or whiteboard (plenary)

Recapitulation and intro to programme after lunch (*5 minutes*)

12:30 – 14:00　　　　**Lunch**

14:00-15:30　　　　**What would it require from students (students), teachers and institutions to succeed with the Agroecology programme at MU that is based on the Nextfood approach?**

- Review of dialogue guidelines (*15 minutes*)
- Exercise to address the question
Individual reflection (5 minutes), followed by a dialogue in small groups (40 minutes) and a discussion in plenary (30 minutes).
Write on flip-over or whiteboard

15:30-15:45   **Coffee break**

15:45-16:30   **Planning for implementation including the immediate next steps (what, when, who, where)**
- What needs to be done when and by whom to implement the intended transition to action learning in the educational activity?
Who should meet and when?
What should be ready and when?
*(10 min individually, 30 min in small groups **to make a timeline,** Case responsible group members collect written output and will send a summary of that output to participants later). Write on sheets provided.*

16:30 – 17:00   **Wrap-up**
- Reflection and small group discussion after each question below.
(2 min individually, 5 min in small groups. Case responsible group members collect written output and will send a summary of that output to participants later). Write on sheets provided.

  1. Note down three things you liked about this meeting, that you found useful, inspiring, interesting!
  2. If I were to be responsible for the next workshop, what would I do differently?

Further case development (WP2)

Phase 2 Working paper

Version 1.0 on 11 September 2020

1 Background

We are now into the second half of the Nextfood project, which is a good moment in time to look back at our achievements in order to step up our work during the remaining time of the project. In our project description (GA) we state that: "NEXTFOOD will challenge the linear view of knowledge transfer as a top-down process from research to advice and practice, and support the **transition to more learner-centric, participatory, action-based and action-oriented education and learning in agrifood and forestry systems**». The work within the educational cases in WP2 is at the core of that endeavor.

In the project description, we have also emphasised the importance of the **cyclical approach to learning** in the different courses (GA p. 3): "Figure 1 (the Nextfood model) describes a necessary paradigm shift from a linear to a cyclical approach to learning. In agrifood and forestry, it represents a dramatic shift from a conventional, mono-culture mode of education, towards ecosystemic, cyclical and participatory education and training systems."

We further stated (GA part B, p. 11): "It is well known that active, social learning having the **complex reality as point of departure** - with theory in a supporting role - is generally more effective than traditional, theory-based strategies and more suitable when it comes to understanding and handling complex sustainability challenges"

Additionally, we emphasised the importance of **cultivating five core competence** of importance for sustainable development observation, reflection, participation, dialogue, and visionary thinking (GA, part B, p. 11).

In sum, WP2 is key in the Nextfood project to enable a transition to more learner-centric, participatory, action-based and action-oriented education and learning in agrifood and forestry systems. This transition can happen when all WP2 cases take the following core elements at heart: 1) a cyclical approach to learning, 2) complex reality as point of departure, and 3) cultivating five core competences.

During the first half of the Nextfood project we have kicked off the innovation process towards cyclical learning, and further made initial try-outs of the approach in different settings. In parallel, we have initiated a process of researching such a transition process including the learning outcomes for the students and other learners in our programs. Overall, we have made good progress, but we still have a concern that there are some cases that lack inclusion of some of the above-mentioned core elements of what we have called "The Nextfood approach to education". Our view is therefore that it is time for us to shift gear and step up our activities, to enable a delivery that matches what we have promised, we need to A) support a transition to more learner-centric, participatory, action-based and action-oriented education and learning in agrifood and forestry systems (i.e. taking the three above-mentioned core elements at heart), B) active research on this development process, and C) research into the learning outcomes for those that are involved in the cyclical learning processes. While this document focuses on course development aligned with the transition in education and learning (A), a forthcoming condensed research protocol will deal with (B) and (C).

The aim of this document is thus to provide a base for the necessary step-up of activities. The document will provide a condensed version of how to further develop the Nextfood course(s) through a stepwise planning process (ref. D2.2 Master manual), As such, it should function as a recipe for helping us to deliver what we have committed to do. We further think that this is the best way to achieve good results in the project.

2 Cyclical learning (the Nextfood approach)
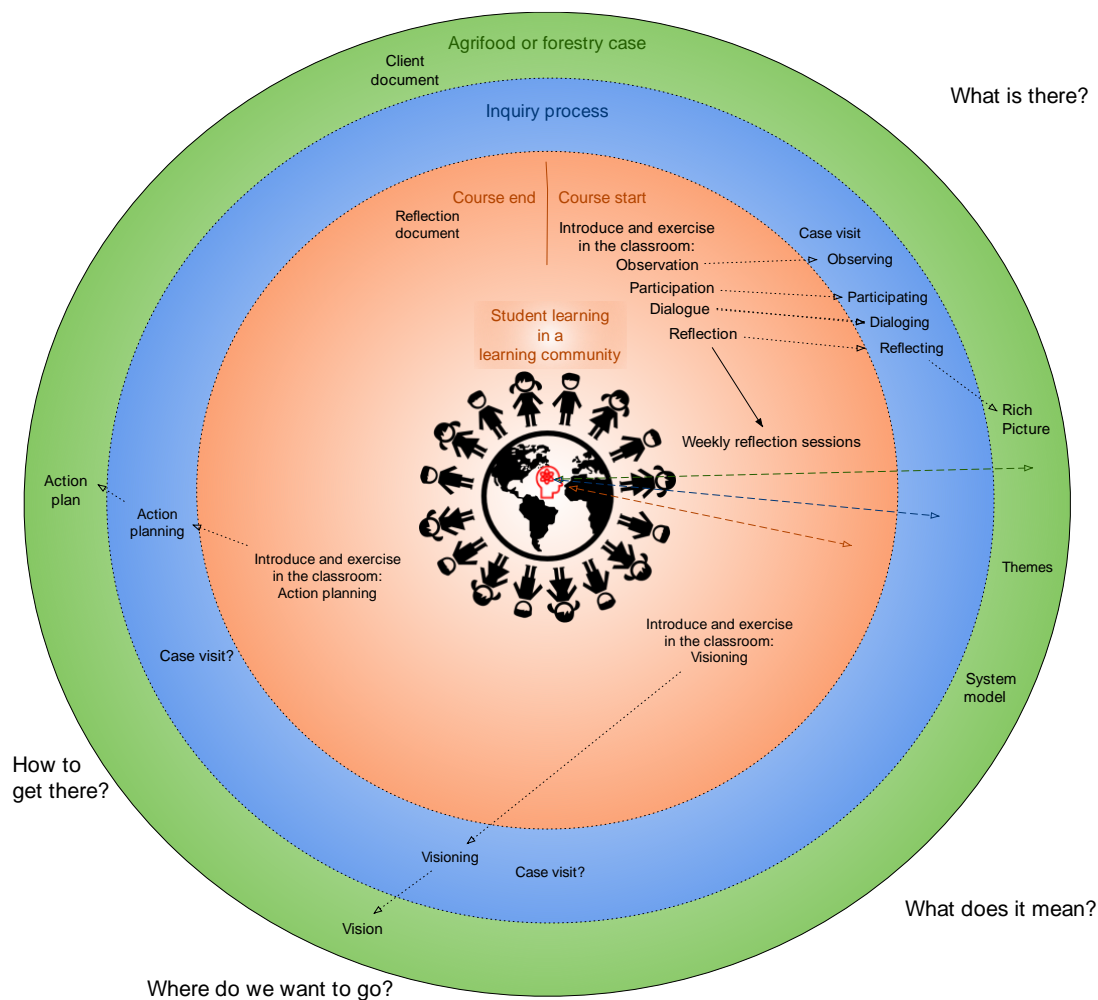
3 Plan and implement the course

3.1 Place the students and their competence development in the center of the planning process

3.2 Let a real-life case be the point of departure for the learning process

3.3 Organise the course in a cyclical manner (a learning cycle)

3.4 Exercise core competences

3.5 Emphasise reflection as a structured activity for learning in the cyclical learning process

3.6 Organise student-led literature seminars

3.7 Include a student reflection document as important output for assessment

3.8 Include a stakeholder document (preferably teamwork) as important output for assessment

3.9 Have teachers write a reflection document as well

We will support the operationalisation of these steps through the toolbox and through direct communication when the toolbox is insufficient, or else when required.

4 Required activities checklist for a Next-food course

Activity	Done ✓	In the case report
Plan & implement the course		
Organize the course as a learning cycle		
Place a real-life case in the centre of the course		
Exercises on all core competences:		
- Reflection sessions		
- Observation		
- Participation		
- Dialogue		
- Visioning		
Literature seminars		
Student reflection documents		
Stakeholder documents		
Teacher reflection documents		
Research the course		
Collect data from:		
- Initial expectations and questions		
- Self assessment: Start of course		
- Final questions		
- Self assessment: End of course		
- Student reflection documents		
- Teacher reflection documents		
Analyse the data		
Write up the results		
Course reflection		

WP2 Mini workshop
Further case development & Reflection
Online, Tuesday September 15, 2020

Facilitation by NMBU

Next FOOD

EDUCATING THE NEXT
GENERATION
OF PROFESSIONALS
IN THE AGRIFOOD SYSTEM

This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement No 771738
The present Deliverable reflects only the author's view and the Research Executive Agency
is not responsible for any use that may be made of the information it contains

Desired outcome: A shared and improved understanding
of the further case development in WP2

Schedule

09:00 – 09:10	Intro 1: The learning cycle diagram (NMBU)
09:10 – 09:15	5 minutes individually
09:15 – 09:40	Feedback (all) Use also chat.
09:40 – 09:45	Intro 2: The checklist (NMBU)
09:45 – 09:50	5 minutes individually
09:50 – 10:15	Feedback (all) Use also chat.
10:15 – 10:25	Break
10:35 – 10:35	Intro 3: On reflection (NMBU)
10:35 – 10:40	5 minutes individually
10:40 – 10:55	Feedback (all) Use also chat.
10:55 – 11:00	Sum-up (NMBU)

Rationale for this meeting

Half-way the project

Final goal: **Transition to a more learner-centric, participatory, action-based and action-oriented education and learning in agrifood and forestry systems.**

And: **Action-research on this development process;**
Research into learning outcomes for those involved in cyclical learning processes.

This means that all Nextfood cases should...
- Have a cyclical approach to learning;
- Take complex reality as point of departure; and
- Cultivate five core competences (observation, participation, dialogue, reflection, visioning)

How to further develop NF cases?

Cyclical learning –
Experiential and action-oriented
(the Nextfood approach)
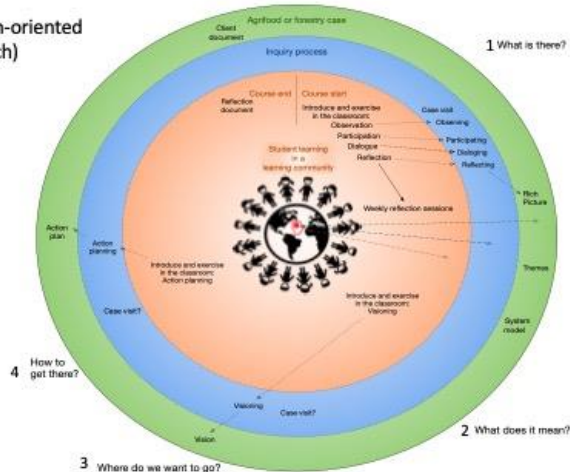
Questions & ideas for improvement

What are the questions I have about the figure?
What ideas do I have for improvements?

Five minutes individually
Then a round of feedback (you can also use the chat)

How to plan and implement your course?

- Place the students and their competence development in the center of the planning process
- Let a real-life case be the point of departure for the learning process
- Organise the course in a cyclical manner (a learning cycle)
- Exercise core competences
- Emphasise reflection as a structured activity for learning in the cyclical process: Organise frequesnt reflection sessions in the class-room
- Organise student-led literature seminars
- Include a student reflection document (also as important output for assessment)
- Include a stakeholder document (preferably teamwork) as important output for assessment
- Have teachers write a reflection document as well

Required activities checklist

Activity	Done ✓	In the case report
Plan & implement the course		
Organize the course as a learning cycle		
Place a real-life case in the centre of the course		
Exercises on all core competences:		
- Reflection sessions		
- Observation		
- Participation		
- Dialogue		
- Visioning		
Literature seminars		
Student reflection documents		
Stakeholder documents		
Teacher reflection documents		
Research the course		
Collect data from:		
- Initial expectations and questions		
- Self assessment: Start of course		
- Final questions		
- Self assessment: End of course		
- Student reflection documents		
- Teacher reflection documents		
Analyse the data		
Write up the results		
Course reflection		

Questions & ideas for improvement

What are the questions I have about the figure?
What ideas do I have for improvements?

Five minutes individually + 10 minutes break
Then a round of feedback (you can also use the chat)

Reflection
A crucial competence to develop in cyclical and experiential learning

Experience is transformed to knowledge (learning) through reflection

Learning agroecology: Valuing and connecting observation and reflection

Observation in the outer world

- What is there?
- What can we do to get there?
- Farming systems
- Food systems
- What does it mean?
- What is our desired future?

Observation in the inner world

- Individual development Emancipation
- **Reflecting** on the experiences (observations)
- Existing knowledge
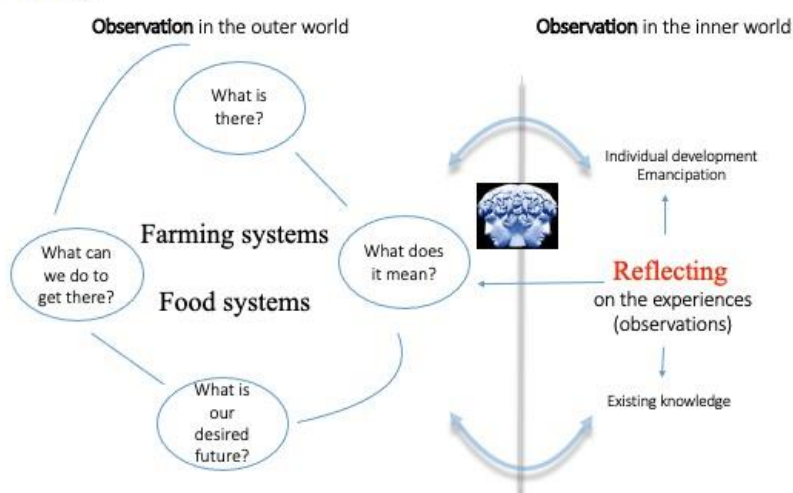
Questions & ideas for improvement

What are the questions I have about the inclusion of a structured approach to reflection in my case?

Five minutes individually
Then a round of feedback (you can also use the chat)

Reflection
How can you bring it into your course?

- Weekly reflection sessions led by course facilitator(s)

- Students write a log
- Final reflection document by students (individual)

- Teachers write a log
- Final reflection document by teachers (individual)

- Student-led reflection sessions

Reflection sessions: Basic principles

Three levels of learning – including their interrelationships
Individual learning
Learning in project groups (4-6 people)
Learning in the whole class setting (all students and 2-3 teachers)

Three depths of learning – including their interrelationships
1 What are the facts? What has happened?
2 What does it mean to content (case or class) and process (systems inquiry or learning)? Interactions among experience, literature and own background/development ➔ Key issues
3 What does it mean to me? Implications for the individual

The double focus of reflection
Reflection about both content and process (issues)
Need for thinking about both issues (point 2 above) and personal learning (point 3 above)

General structure of a reflection session
1 Introduction. What is to be covered, in terms of both content and   process.
2 Formulate/ask questions that demand something.
3 Develop/present an approach for how to do the reflection

Reflection sessions at NMBU

Examples can be found on Teams, one example:

Before lunch the students have been asked to go for long walks to different locations in the landscape, in pairs.
They are asked to emphasize non-judgemental observation, and not talk to each other on the way 'out', only on the way 'back'.

Then they all meet with the teachers after lunch, with the following program:
1. Introduction to reflection and why it is important in the agroecology course.
2. Then two rounds of reflection

1st round of reflection

"You have now returned from the observation walk.
1. Choose an experience from the walk, one that made an impression on you.
2. Try to describe that experience in as much detail as possible.
3. Ask yourself the following question:
 Why is this experience important for me?
PROCESS: 10 minutes individually – IN SILENCE
THEN: 10 minutes in groups of three. Share in the groups.
THEN: 5 more minutes: Ask yourselves:
What are the commonalities between our experiences?"

2nd round of reflection

"Then ask yourselves:
What characterizes a good observer?
PROCESS: 3 minutes individually
THEN: 10 minutes in groups of three. Share in the groups.
And: What characterizes good reflection?
And: what is the relationship between Observation and Reflection?
Plenary session (Mind-maps on the board)"

Log-writing / the learning (reflective) journal

The 3 and 6 steps of log writing

1) What, exactly, did I see and hear? What exactly did happen? What did I experience?
2) What did I feel/think about this?
3) What did I learn from this?

4) What are the questions I am asking myself?
5) What will I do to find the answers?
6) What are the implications for my own development?

The past ← **The present** → **The future**

What did I experience?

What made an impression on me?

What did I think and feel about this?

What did I learn from this? – in terms of both *content* (ontology) and *process* (epistemology)

(Connecting to both experiences (linking) AND relevant literature is necessary + connecting separate experiences)

What are the questions I am asking myself?

What will I do to find the answers?

What are the implications for my own development – for what I will do in the future?

The primacy of the agroecologist (over agroecology).

Writing a reflection document

Learning from experience

Every experience (case) contains something specific
and something generic

Reflect on your own experiences – *reflection* is different
from *description* (should also be included) and *reviewing*.

Be attentive towards both content (ontology) and process (epistemology)

Relate to the course as a whole – both campus and off-campus activities

Be explicit towards yourself regarding how and why you organize the document the way you do

Ideas for how to organize the document

Chronological: f.i. Week by week – select experiences that made an impression
Reply to the 4(-6) questions. Deal with both content (ontology) and process
(epistemology). Needs a summarizing chapter (questions 4 – 6) –
and connecting several experiences.

The course as a learning cycle: A chronological dimension here as well,
but the use of the learning cycle concept represents an add-on.

Core competences and learning goals (ours and yours)

Or another way, based on a solid rationale – use the rich picture approach?

Student-led reflection sessions

Dual purpose:
- To enhance the reflection abilities of the class by handing over responsibility of the question-designing and process to the groups.

- To give members of each case study group the chance to practice facilitation skills by designing the structure of and leading a reflection session as a way to prepare for the participatory case workshop with the farmer and food system stakeholders

Preparatory session:
- what can be learned from reflection?
- what key ingredients make a good reflection?

Sessions take 1 ½ hours, followed by ½ hour feedback on content and process.

Questions & answers

1. Thinking about bringing reflection into your course, what remains unclear?
2. What do you find inspiring about bringing reflection into the core of your course in the next cycle?
3. Will you (be able to) implement this in your case/course?
   - Why (not)?
4. What support do you need to implement this in your case/course?
5. What would you need to learn more about to implement this in your cases/course?
6. What would you need to focus on (first) to implement this in your cases/course?

Following steps in WP2

1. All cases start to work with what they have learned today and contact the NMBU team if they need support

2. NMBU team will contact each case individually for a skype meeting about further case development

1. ...

Dreyfus model of skill acquisition