ENOAT 2020 Workshop -- online from University of Maribor, Slovenia. September 27. 2020
Organized by Martina Bavec, Slovenia September 27, 2020

Proceedings Editors: Dr. Martina Bavec, Prof. Ewa Rembialkowska, Dr. Charles Francis

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Editors' Introduction and Welcome

Our teachers group met this year for the first time in a virtual workshop of the *European Network of Organic Agriculture and Agroecology Teachers*, organized by teachers from University of Maribor, We were all challenged to concentrate on presentations which are different through electronic media. This presented a new situation similar to that facing most of our students in the virtual classroom, where they are not observing the teacher in person nor interacting with classmates in the same spontaneous manner that we observe in the classroom venue. In the country reports we learned of the adaptations and resilience of teachers in each country who are adjusting to this current reality, and as participants pointed out we will benefit from serious reflection on the learning goals of our courses and how to achieve them in new ways.

It is obvious that there are large differences in the impacts of the pandemic on the general population in our twenty different cultures represented in the ENOAT workshop this year. We have learned experientially and personally how countries have responded in unique ways to the challenges of COVID-19, with greatly different results. There are existential questions facing us all about the importance of individual freedoms versus caring for others. What priorities do we place on the long-term 'survival of the herd' -- through wearing masks, distancing, avoiding contact or large meetings -- versus our own short-term desires to avoid the inconvenience of a mask, sit for dinner with friends, give a hug, or attend a celebration as we would in 'normal' times? There will no doubt be exhaustive research after this pandemic by epidemiologists and social scientists who will compare country survival strategies, as well as the roles of government at all levels in serving their citizens well in time of crisis.

The pandemic along with vastly different responses also provide opportunities for us as teachers to explore topics in class such as holistic thinking, individual versus society needs, local versus global food systems, and potentials of organic agriculture in the future. What types of governance in a country, as in planning in the food system and in the classroom, will best serve us in the future? These questions set the stage for our two workshops about testing new approaches to planning in education, with multiple examples from the NEXTFOOD project [first workshop] and with the anticipated future results of research on co-learning [second workshop].

We invite you all to read about these two projects and to attend the ENOAT workshop in 2021 to learn about results and help us evaluate the potential applications of our research in transforming education. Based on the excellent attendance and participation using the on-line venue, we will seriously consider using this type of meeting format in the future, perhaps combined with a traditional 'in-person' meeting that gives opportunity for field excursions, more personal exchange of ideas, and the annual community building to which we are more accustomed. Please send us your opinions on what types of meetings will be most valuable to you in the future.

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Welcomes to ENOAT 2020 Workshop

The first welcome came from *Martina Bavec* in Slovenia to the virtual meeting, from 1230 to 1530 [CET] conducted on the platform, MSTeams. Several long-time participants in ENOAT sent their regrets and best wishes. Peter von Fragstein sends greetings. Paola Migliorini sends greetings and regrets. Darija Bilandzija from Croatia cannot attend but reports that a large number of students are enrolled in organic courses. Christian Vogel is on the train to visit family, and will make a short report. Martina is co-editor of the proceedings.

Welcome from *Ewa Rembialkowska* to our group, noting thanks that all of us are healthy right now. We began the round of reports from country programmes. Ewa is also a co-editor of the proceedings.

Country Reports

Christian Vogel [BOKU] reports that all courses are on line, using Moodle, so that instructors are now accustomed to this platform. Classes will move along as planned, but there will not be excursions due to the pandemic. Some laboratory work needs to be cancelled due to proximity of students to each other. A large number of Erasmus students from Italy, France, Spain, and Scandinavia are enrolled; they had to leave BOKU in March, but all finished the spring semester course by distance.

Alex Wezel [ISARA] reported that all courses went on line in spring, and this fall is a mixed model with some activities on line and some in person, and with cancellation or modification of most field excursions.

Geir Lieblein [NMBU] reports that the government has directed that all courses be offered on line so that students who cannot attend in person can still participate. The distance mode works well for lectures, but does not lend itself to student - teacher - stakeholder interaction. We have built on an existing on-line course with case studies to engage everyone. One challenge is to combine the on-line students in discussion with those in person. The AE team is growing with a number of young people [MSc and Post-doc] joining the research and teaching team.

Franci Bavec [University of Maribor] reports that the new head of study program of Organic Agriculture happens to be an organic farmer herself. Courses in Slovenian language are being offered on line, with some challenges for faculty adapting to the on-line platform with 16 courses of organic farming created in an international project. The teaching team and the chair of organic farming are optimistic due to the growing profile of organic foods and farming, and the support of EU is helpful.

Jan Moudry Jr. reports that organic farming is imbedded in integrated farming, and the courses are well attended in Czechia at the university in Bohemia. Courses are informed by model of the NEXTFOOD Project of EU, and is gaining ideas from the other countries and case studies.

Katarzyna Kucinska [Kasha] [University of Warsaw] reports that there were some difficulties in transition due to the virus problem. The new doctoral programme is in its second year, combining organic farming with food systems and nutrition. There have been challenges due to cancellation of field excursions, but classes were continued on line with adapting of activities. There was some prior experience with teaching on line which helps. In the organic classes there were only half as many in the second year due to visa problems as well; now most students are from Poland and nearby countries.

Ewa Rembialkowska [Warsaw University] has accepted 20 students who will start in October, and moving to on-line courses is based on prior experience. They do not seem to be as successful as in-person courses, where there is much more opportunity for interaction.

Cor Langeveld [WUR, Netherlands] mentions the need to connect to learning goals, even though the platform for on-line courses does not allow for field excursions. Some students have more difficulty than others with the on-line mode of learning. Thesis research and internships have been limited due to virus, and two-year MSc students had to extend their programme to complete their degrees. 85 students are signed up for the semester starting right away.

Liina Talgre [Estonia University of Life Sciences] reports that spring semester was modified due to virus, and they are preparing for alternatives in case of changes in the health situation. Erasmus students had to adjust to the difficult situation.

Magdalena Lacko-Bartosova [Slovakian Agricultural University] is teaching organic farming course during the summer for five weeks, using Moodle, MSTeams and ZOOM. The Education Ministry has helped with materials and support plus training in use of new technologies. The university canceled all excursions, but completed the semester, with difficulties for Erasmus students who were kept in Slovakia due to quarantine, where they could remain safe. This semester will be adapted to strict isolation rules.

Maja Manojlovic [University of Novi Sad] reports that numbers of students this year are declining due to the virus, which presented a challenge in the spring and was hard for some students who did not have access to a good internet connection. These students connected through Moodle and other methods. Exams were done on line, and then submitted for evaluation and grading.

Mykola Grabovskyi [Bila Tserkva National Agrarian University, Ukraine] noted the problematic issues of distance learning at his university. The biggest problem was the lack of practical classes and practice for students whose specialty is Agronomy, and also in such disciplines as Plant Growing, Phytopathology, Entomology, Herbology, Plant Protection, Soil Science, and Plant Breeding. Also, field research plans for Master's and PhD students had to be adjusted due to the inability to work in research fields. There is now strict sanitary control and reduction of time for lectures (1 hour). Most classes will be held online.

Roberto Mancinelli [University of Tuscia, Italy] reports that his department of forestry and agricultural science has been selected as a ‘department of excellence’ that will submit a project for five years. Their project is on global change, which has provided stimulation to teachers to develop new materials about sustainability in the principal courses. This is designed to increase the relevance of courses for today’s students, especially for MSc students. A MSc course in English has been added, and the new designation provides opportunities for changing the teaching approach, and there has been adaptation to methods using Moodle. Teaching groups were organized to record lectures to be offered on line; not all students will be able to come to campus, and others will be on line similar to other universities.

Zita Szalai [Dept of Horticulture, Szent Istvan University, Budapest,Hungary] reports a reduction in students due to the virus, and their classes moved to on-line in mid-March. Lectures were recorded and provided on line; there were some technical problems for students to join in each activity. It was difficult to meet learning objectives with this new platform, and there will be more training for teachers to help adjust to the new reality. The options for excursions are very limited, and teachers need to adapt to this situation.

Teresa Briz [Universidad Politecnica de Madrid] met students in the first half of the semester in person, then moved to on line. There is a slight increase in student numbers overall, and it remains to be seen how many will go to Agronomy and how many to Biotechnology in the current enrollment when they make a choice in year two.

Vibeke Langer [Copenhagen University, Denmark] presented slides that showed combined off-campus learning with on-line activities. They actually used ‘virtual excursions’ and students in the field with ‘partner enterprises’. Vibeke filmed a number of ‘virtual case studies’ in the field, interviewing farmers on site, and

these were used in class with videos available to students to view outside of class. The students were surprised by the efficiency of the methods, and group work with virtual white boards turned out to be successful.

Ivan Manolov [University of Plovdiv] started on line in March after all students were sent home, lectures were presented on line for compulsory courses, then continued with elective subjects. The exams were also made online. I prepared questionnaires and students had limited time to answer the questions. I invited a guest lecturer for next year to teach the subject "Mineral Nutrition in Organic Farming" for the Erasmus MSc course in Soil Science. Maja Manojlovich from University of Novi Sad will be this lecturer.

Vasileiios Gkisakis [Agronomist, Hellenic Mediterranean University, Heraklion, Crete, Greece] described the organic farming mandatory course and the optional agroecology course. After March, all courses moved to on-line platforms, and major problems were with laboratory exercises. Completely on-line is difficult for agriculture to develop the competences on a given subject.

Dzidra Kreismane [Latvia Agricultural Univ.] reports that their education program is working with larger farmers, and an organic crops and horticulture course and another in organic animal husbandry. Graduates will often work as advisors in organic cropping and other systems. Erasmus students now have difficulty coming to Latvia, and this year we are planning to start classes on line this coming semester.

Karmen Pežek [vice dean, University of Maribor] greeted the participants and expressed satisfaction that everyone is adapting to the situation of the virus, and then described some details about the numbers of students and the changes in the university. She expressed thanks to the organizers for setting up this virtual meeting as a part of 60th anniversary of Faculty of Agriculture and Life Sciences University of Maribor.

Tadeja Kraner Sumenjak [head of study program Organic Agriculture, University of Maribor] greeted the participants and invited them next year to ENOAT “face-to-face” meeting including visiting their organic farm specialized in wine growing and beekeeping.

Ewa and Martina summarized the presentations and described some of the overall conclusions: wide adaptations of different methods due to the virus, mostly student numbers were maintained, and there is great uncertainty for fall semester and beyond.

Workshop 1 NEXTFOOD
Martin Melin, Swedish Agricultural University, Alnarp is an agronomist and director of the NEXTFOOD Project. [See the slide set for details]. There are nineteen partners in Europe and other countries, mostly universities and some are non-profits and other organizations, and all are involved in education in one form or another. Transforming food systems is most feasible through transforming education, especially through participation of stakeholders, testing and evaluating models for collaboration. A detailed paper is included in the proceedings for us all to learn more about the project [slides available from the author]

Questions and Comments:

Cor Langeveld: What is the stability of the project, after the grant is finished?
Martin: Some of the cases started as short courses, and this was a logical development into the project; also the courses are part of ongoing MSc projects so that develops potential for long-term stability of the courses and activities of the project within their universities or institutes.

Magda: This is especially difficult when students are not accustomed to this concept of participatory learning, and they have been conditioned for one-way learning and traditional roles of listeners for many years of prior experience in our traditional educational systems. We need to start much earlier in the process.

Jan: Group work is one approach that involves students and puts responsibility on them, and encourages teamwork and emergence of leadership within the teams.

Vibeke: This takes courage to adopt new methods, finding colleagues to work with, and small steps with a 'light version' to start with is one way to ease into new methods. 'Trust me' and you will see that it works. It does not have to be all at once.

Ewa: Over the past three years there seems to be a change within the system in Poland, and there is more appreciation by teachers that participation and change are essential. It needs to be an initiative from the teachers, and we need to be pro-active and keep pushing for this major change.

Workshop 2 Co-Learning
Charles Francis, Agroecology Programme, Norwegian University of Life Sciences and University of Nebraska - Lincoln, is an agronomist, plant breeder and futurist involved in teaching and research in agroecology. He is planning a sabbatical leave in 2021 to study the process of inclusive planning involving teachers, students, administrators, and stakeholders in the field - farmers and food systems professionals. The research will focus on countries where NMBU and SLU have mentored and supported new degree or certificate programmes in agroecology as well as programs in the planning stage: Norway, Sweden, France, Italy, India [Univ. Calcutta and Kerala Agricultural University], Ethiopia, Uganda, and Chile. Exploratory surveys and interviews may include Cuba. The project is described in a later paper in the proceedings [see p. 17.

ENOAT Matters

- Maribor will be the site for the meeting next year, assuming that the situation will allow travel, meeting physically, organize field excursions, and carry on more as normal.
- Martina described how they have support from the Ministry of Agriculture for the organic ag teachers this year and they hope that this will also be available for 2021 to help support the meeting.
- ERASMUS grants for this year will be automatically pushed forward to 2021 so that people will not have to apply again.
- This year included many more participants, with at least 20 universities participating and multiple people from several of the countries. This is a good step, and hopefully we can keep up this momentum in future years. We hope that an in-person meeting next year near the end of August, and it will be useful to plan for priority topics for the workshops.
- One idea is to use case studies on how to deal with emergency situations such as the pandemic, having individual countries report on their specific experiences with the combined in-person and on-line venues. Other ideas include how to conduct virtual field activities, excursions, experiences with stakeholders by virtual contact.
- Power of the on-line format has been demonstrated by the ENOAT meeting this year, and the model on line brings in more people and involves more in the sharing of new ideas. We should consider other approaches, perhaps combine the in-person with on-line approaches as we do in classes? Maybe there could be some sessions on line and others that involve excursions. We have almost 40 people this year in the meeting, a long-term record for attendance, and something we should consider because it can reduce costs for travel, lodging, and especially time involved. Another option is to have thematic meetings at other times in the year. We ourselves need to think outside the box, not just our students.
- Another idea is to summarize this experience and how well it worked, to be able to analyze the model and see if it has potential for building a 'new ENOAT' for this century.
- We need to consider our goals for the organization, and how to best achieve them. This may involve more on-line activities, and even at multiple times during the year. This is how we can maintain relevance as conditions change.
- Thanks to Martina and the team in University of Maribor for their organization and for moderating during the workshop, and to Ewa for her continuing enthusiasm and leadership that has helped to keep ENOAT alive over more than two decades. It would be useful to build on what we have learned this year to expand the availability of the topics and discussion to new players who can be brought into the organization and to the activities, especially with new teaching methods.

NEXTFOOD Workshop: Dr. Martin Melin
Slides:
https://www.dropbox.com/t/A4N5uDkeluR7gVv0

Paper:

NEXTFOOD: transforming education to develop sustainable food systems

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Reference: Melin, M., G. Lieblein, S. Rosenlund Hansen, N.H. Kristensen, and C. Francis. 2020. NEXTFOOD: transforming education to develop sustainable food systems, Proceedings of ENOAT 2020 Workshop [online], M. Bavec, E. Rembialkowska, and C. Francis, editors, Maribor, Slovenia. September 27. P. __ - __.

Abstract

We describe preliminary outcomes of a research project that aims to develop a new approach in education and training to better prepare current and future professionals to work for positive changes in the agriculture, food and forestry sector. In multiple research activities, educational approaches are being developed based on close collaboration among students, teachers, farmers, food industry representatives and citizens. Results to date emphasize the importance of strengthening and making transparent specific learning outcomes that help students deal with complexity, such as holistic thinking, collaboration skills and integrating scientific knowledge with knowledge based on lived experience. We also show how this can be achieved in a student-centred, action-oriented educational setting. Consistent with the principles of agroecology, educational programmes are unique to each institution, culture, language, and terroir. While results are highly positive during the initial experiments with new approaches to education, such a transformation comes with challenges both for students, faculty members, teaching institutions, and stakeholders who are often accustomed to top-down planning. We have associated research in progress to identify both benefits and challenges to achieving this transformation, and welcome creative suggestions from education colleagues in ENOAT.

Introduction

Feeding 10 billion people sustainably by 2050 requires a massive transformation of how food is produced and consumed. The global goal of creating equitable and achievable food systems that include access for all can be

better reached by a broader conversation than singular focus on increasing production. Closing the food gap must be achieved at the same time as cutting down on CO_2 emissions and protecting and restoring natural ecosystems. This means that most increase in food production must be achieved without greatly expanding agricultural land, and farming in the future must rely more on ecological principles and utilization of resources that are recycled on the farm or locally. At the same time, to reduce the need to produce more, it will be necessary to reduce growth in demand for food by a shift towards plant-based diets, a decrease in food loss, focusing on food crops and not industrial raw materials such as maize for biofuels, and regenerative production practices. The transformation of the system is under way at a small-scale level, and initiatives that produce food for the nearby market and support the local economy are growing, also in urban and peri-urban areas. These innovations can increase food sovereignty, reduce travel distance for food, and improve resilience of the system in the face of epidemics and economic uncertainties in the trade arena.

People with appropriate sets of skills and competences will be essential for supporting the green shift in our societies, and higher educational institutions have a unique position and opportunity for preparing students to become lifelong learners and responsible agents of change. As a response to the necessary development of innovation in education, a 12-country intitative "Nextfood" funded by the Horizon 2020 program, European Union, was initiated to bring together teaching practitioners globally to co-create a future roadmap for education in the field of agriculture and foods (www.nextfood-project.eu). Central elements in our roadmap are phenomen-based learning, systems thinking and participation, achieved through the creation of a learning landscape where students, teachers and food system stakeholders create and collaborate in the process of solving complex problems on different levels, on the farm and through the food value chain. In Nextfood, a roadmap for transforming education is being developed, tested and evaluated through a cyclical learning process (figure 1). In this paper we provide a window on the Nextfood curriculum development process and a short summary of results to date. Parallel methods and activities in evaluation of agroecology teaching in multiple countries are described elsewhere in this proceedings (Francis et al., 2020, see p.____).

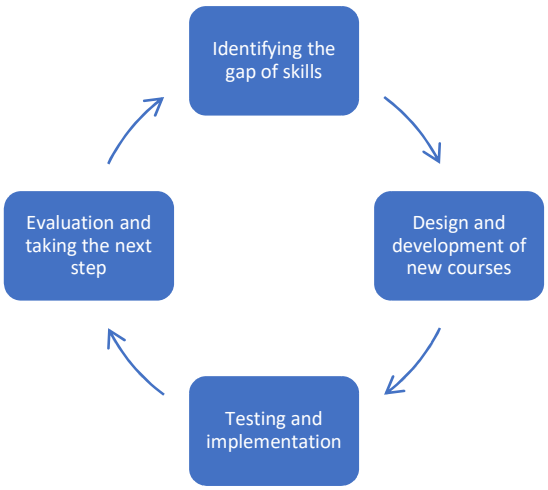

Figure 1. A cyclical and collaborative process for transforming education

Identifying the gap in skills

The initial step in the curriculum development process has been mapping the knowledge, skills and competences needed to support a transition towards more sustainable food production. A common definition of the concepts is that 'knowledge relates to theory' and 'skills are developed through practice', while competence is the bridge between the two. However, in the literature reviewed we found many alternative definitions. Therefore, in the analysis a broad definition of skills was used, that also included phenomena that some would refer to as either competence or knowledge. In the initial step Rosenlund et al. (2019) identified sustainability skills that will be necessary for professionals in the agrifood and forestry chain by surveying peer-reviewed and non-peer reviewed literature and interviewing stakeholders of the agrifood chain. They reported that the most critical skills were related to three main areas: a) skills that promote the ability to deal with complexity, change and wicked problems such as developing an entrepreneurial mindset or a holistic view. b) Skills allowing collaboration with other players in the food system or in the local community; also including the ability to integrate knowledge from different scientific fields with local knowledge and experience, plus the importance of developing circular business models that involve many parts of the food chain. c) Technical skills related to a certain profession, such as how to adopt sustainable farming practices or being able to use digital tools as well as the skills to continuously stay updated on new technology and critically assess its potentials and challenges. The resulting list of skills from this exercise was then compared with the learning goals and educational approaches of existing educational programs in agriculture, agroecology, food studies and forestry in order to identify the gaps in education. The identified gaps will serve as an indication of where change is needed the most in order to make our education better fit future needs and the process of transformation. This analysis is still on-going.

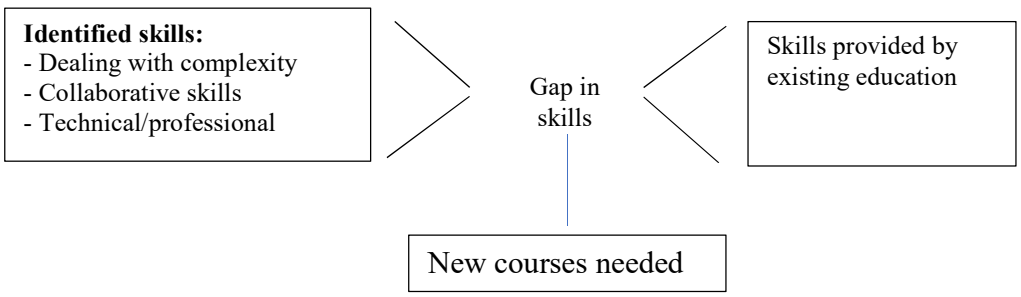

Figure 2. The gap of skills will serve as an input to the development of new courses

Design and development of new courses

Large sustainability challenges call for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity, and linking of formal and informal learning. To meet such a demand, the Nextfood project has explored relevant educational approaches, and built the most relevant strategies and methods into an overall Nextfood approach to education in agrifood and forestry systems. The main elements of the Nextfood approach is illustrated in Figure 3. At the heart of this approach is the design and formation of a learning landscape where students, teachers and food system stakeholders co-develop visions for sustainable systems of the future. This is called phenomenon-based education, where the starting point of the students' learning journey is their own lived experience on farms and in communities, and through the course they continually move back and forth between theory and practice. To deal with a complex and unpredictable future, students are mentored and guided in practice in developing five core competences: observation, dialogue, participation, reflection and visioning.

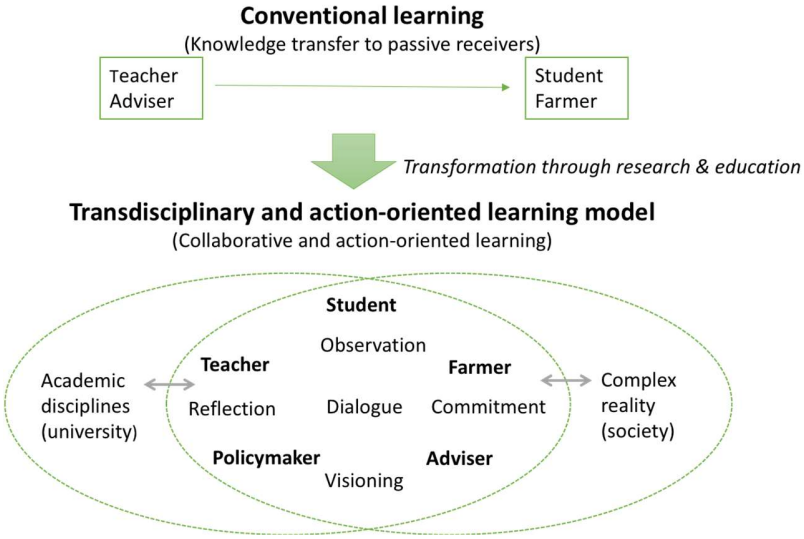

Figure 3. The Nextfood approach to education: The transition towards phenomenon-based learning. (Adapted from Lieblein et al. 2019)

The impact of the new curricula on students' understanding and how they gain competences was evaluated in twelve case studies, by assessing the development of the core competencies. At this stage of the project, several preliminary findings indicate the positive value of phenomenon-based learning in improving students´ abilities for systems thinking and developing core competences that prepare them for taking informed and responsible action in agrifood and forestry systems. Important achievements that we have observed and monitored are 1) in-depth group project work in collaboration with extra-university stakeholders to produce an action-oriented report, 2) an individual document where students reflect on their course experiences, and 3) student self-assessment activities (Lieblein et al. 2019). An expected outcome of this step will be the creation of a European accreditation framework for new curricula in food studies, sustainable agriculture, forestry and other relevant fields. After testing in this project, the framework will be available to others as an assessment tool to measure the quality of future education programs.

Example: *Innovative learning on-line: a team competition*
An example of an innovative course design is the *FoodFactory-4-Us Student Competition Games,* organised by the Nextfood partner ISEKI-Food Association in Austria. In this course student teams in food-related MSc-

programmes find new solutions to a real-life food industry challenge. An advisory board from academia and industry choose the top 10 teams to participate in the 4-month competition. This case shows how training online has to be based on more than lecture-like presentations, often resulting in only few questions from students. Instead, this course incorporates a diversity of learning arenas: 1) *virtual visits* in which a specialist from the food industry presents themselves and their company in a short video; 2) a *project review* in which the teams meet individually with a mentor to discuss the progress of the projects; 3) a s*oft skills workshop* where students have an opportunity to practice oral presentations and get feedback from others. In the transformation of this course from a conventional to a Nextfood-based approach, two elements were vital: 1) The students were urged to locate and work with a real-life case and 2) the course webinars were changed from lecture-based to interactive sessions, that even included visionary thinking activities based on guided imagery.

Testing and implementation

Our unique approach to improved curricula is implemented and tested in 12 case studies, covering a wide geographical area and different types of courses. They include academic graduate- and undergraduate-level courses, certificate programs, and outreach/extension initiatives in Europe, Asia, and Africa. All cases employ a multi-actor approach, as they involve several different types of learners and focus on real problems or opportunities that farmers or food system players are facing. More than 700 learners of different categories (53 farmers; 605 high school and university students; 54 other professionals) have so far been involved in our courses, of whom 52% were female. The implementation of the Nextfood approach comes with a number of challenges for teachers, students and institutions (Lieblein et al. 2019). The approach requires that teachers step out of their comfort zones and transform their identity from being a lecturer to becoming a learning facilitator. For students it may be a new situation where they have to take more active responsibility for their own learning process and be willing to interact with stakeholders in the field. In order to support teachers with an interest in student-centered and phenomenon-based teaching, as a part of the project outcomes we developed a *toolbox for teaching practitioners*. It is a rich source of guides, learning models and teaching materials. It is publicly available on the Nextfood website and will be continually updated during the project.

To promote a necessary institutional change at universities and other educational institutions, an *audit tool* is being developed with the purpose of engaging institutions in reflection over their own role as high-quality and relevant learning organizations within sustainable agrifood and forestry systems education, as well as their relationships with external stakeholders. The audit tool will help universities and other interested organizations to ensure that education and training systems are fit for their intended purposes and permanently updated. The tool therefore consists of two main sections; one where staff, students or other relevant stakeholders answer questions about how the audited educational activity caters for the skills identified in the Nextfood inventory of skills, as well as a section with group exercises designed to support reflection about how to develop the educational activities further.

Example: *Co-learning at farmers' training centers in Ethiopia*
At Mekelle University in Ethiopia, students in the M.Sc. course in Agroecology and Sustainable Development spent 10 days in the field at a farmer's training centre. The idea is that students learn from real life experiences outside the classroom that will help them understand the complexity of the farming and food system. During their field visits the students were involved in conversations with farmers and extension specialists, who also participated in the final seminar and gave feedback on the students' case reports. Inviting extra-university

stakeholders into the learning landscape means that farmers, advisers, industry- and public institution representatives, as well as relevant citizens become both providers of contextual and practical knowledge as well as learning themselves. Initially, a number of barriers have been identified that were related to bringing stakeholders with different aims together in a multi-actor setting. It was foreseen that there may be a cultural barrier when it comes to fostering a dialogue between academics and practitioners due to long-entrenched ideas about their specific roles in education and in society. We find that both teachers and students need to change their attitudes when transforming how teaching is done. Several mentioned a necessary change in attitudes: to listen and respect the other opinions from everyone, to have the courage to dare to question our own assumption (as student, teacher, practitioner), and to be willing to achieve something beyond just creating a position of power. However, the farmers and other stakeholder of the FTC's were positive about being a part of the co-learning process.

Evaluation of student achievement

The impact of the new curricula on student understanding and competence is evaluated as a continuous process. This occurs throughout the courses, and we say that evaluation is continuous and embedded in the learning process. This includes determining levels of student performance, analyzing lessons and assessments, as well as gathering feedback from students, teachers and food system actors. Steiro et al. (2020) reported some intermediary results from the case studies:

a) Students appreciated learning activities taking place in the field and moving away from the standard lecture-type education, and it improved their learning outcomes
b) A shift towards peer-learning is welcomed by the students but is not a time-saver for course facilitators, because it takes more time to plan and follow-up such activities.
c) As an alternative to traditional lectures, many cases developed a variety of teaching aids, such as short presentations and video materials, to explain crucial concepts.
d) Many teachers struggle with their new role as a learning facilitator, to let go of some explicit control and allow students to be more in charge of their own learning.

Example*: A diversity of assessment methods in Greece*
The Nextfood cases have developed a diversity of assessment methods. In the course in farm animal reproduction at the International Hellenic University, the students' learning outcomes was assessed through a written exam in combination with a group project literature review, a group project presentation, and reflection activities. Students were given a percentage of the final mark for filling in reflections and for participating in the group activities and discussions. Feedback by the teacher/facilitator was given frequently to the students throughout the course.

Transforming educational institutions

Several workshops have been organized within the Nextfood consortium to discuss future educational systems, to develop a common understanding for the Nextfood approach among consortium members, and to find solutions to challenges in transforming education. During these workshops, institutional aspects were often mentioned as hindering forces to achieving a real and lasting transformation. Even though all the twelve cases have completed at least one full course cycle and students and facilitators in general are very motivated and excited about introducing learning with real life cases, the institutional readiness for a transformation varies

among different partner organisations. The degree of flexibility allowed by university administration differed between universities when a new course and perhaps a totally new educational concept was introduced. In some situations the organizers experienced a delay in the start-up due to internal bureaucracy and internal rules. On the other hand, other cases have gained a lot of support from upper-level management, which one consortium member emphasized by saying:

"The Nextfood idea is clicking, among farmers, managers and the university administration".

The case leaders adapt to each situation and choose to collaborate with those faculty members who are willing to learn a new way of teaching. But the case leaders also say that they want to improve the way they communicate the Nextfood approach to members of their department. In particular educational managers or people in charge of the curriculum are seen as the key target group for this communication. The consortium members believe that capacity building and empowerment is important in order for them to be able to convince their home organisations about a necessary shift in education. The nature of this reluctance as well as overall supportive and hindering forces are currently under study (Francis et al., in review).

Example*: Achieving institutional support for educational transformation*
One successful example of transformation is the establishment of a new Master-programme at the University of Gastronomy Science in Italy (UNISG), which gained a lot of support from internal and external stakeholders. Drawing on the experience from running short courses during several years, and catalysed by their participation in the Nextfood project, UNISG will start the new Master in Agroecology and Food Sovereignty in late September 2020. The one-year Master program was developed with support from Nextfood partners and is based on an action learning approach. Another example of a successful transformation is Kerala University in India, where a certificate program in Agroecology supported by Nextfood partners was established in the new Centre for Agroecology and Public Health, and they have an initial plan for a MSc-program. We conclude that in order to enact change on an institutional level, support from upper management is needed because transformation towards sustainability education may challenge the status quo and established power relations at universities.

Transformation of a global network of partners (the Nextfood community)

The Nextfood community consists of partners from a wide variety of organisations collaborating towards a common goal, despite differences in tradition and culture. To involve the project members in a continual process of meaning making is therefore important. It is our view that the basis for managing the project should reflect the principles we aim to implement in the case work. Hence, we have avoided steering based on hierarchy and control. Instead we employ a democratic management approach, emphasising the alignment of the partners' activities through shared working practices and delegated and participatory task implementation. In a similar way to the students participating in our courses, we let the project members take responsibility for their own "learning", task delivery and decision making. Our task as project coordinators (and teachers) is to facilitate (make easy) such a process. The curriculum development process is in practice separated into several different work packages with separate tasks. A common understanding of the overall process and a buy-in from all project partners in the overall process is important to achieve meaningful results in the end. Similar to the students in our courses, project members have to cultivate an understanding of the "whole" and at the same time acquire expert knowledge on the separate parts.

Example: Institutionalising the Nextfood approaches in PhD-education
A new PhD course on Food Studies and Agroecology, coordinated with Nextfood, are being offered in November 2020 at Roskilde University. This offers the coming generation of teachers and researchers within Agroecology and Food Studies valuable skills for the designing of future educational programmes and participatory processes with both academics, practitioners and decision makers. The aim of this course is also to establish and embed an institutional platform for the dissemination and sharing of the Nextfood learning and research models.

Conclusions and next steps to be taken in Nextfood

In the year to come we will start to draw a roadmap for a new prototype educational system that will ensure that learners develop skills that are crucial for sustainable food production. The road mapping stage will be performed together with an effort to develop educational policies that support the necessary transition of education. In a literature review on the educational policy area, it was concluded in general that there is a lack of policies supporting the innovation in education (Viaggi et al., 2019).

We set the ambitions high, and aim at creating a community of practice for teaching practitioners of a global scale. Central to this is the on-line platform, where experience from cases, teaching tips, and learning materials is disseminated to external teaching practitioners. Until now, the focus has been on developing a framework for the platform, and as we are gaining more experience and new knowledge this framework will be filled with interesting content.

Nextfood offers an approach to co-learning where primary learners (i.e. students or professionals attending a course) and indirect learners (i.e. food system stakeholders involved in a course) interact and build new knowledge together. We clearly recognize that we as teachers also learn through this experience. So far, the assessment has focused on the primary learners and to what extent they have reached the expected learning outcomes. In coming evaluations we plan to also include the secondary learners and we develop methods to assess their learning. This will offer the possibility to look at the learning in the cases from a wider perspective.

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Workshop 2: Co-Learning Strategies in Agroecology **Charles Francis, UNL & NMBU**

We have observed in 20 years of teaching agroecology in Norway and the U.S Midwest that the more students participate in designing activities within the learning agenda, the more responsibility they take for their own learning outcomes. They have been active in the field meeting farmers and in communities meeting food systems specialists, pursuing hands-on learning and stakeholder interviews. They have integrated multiple sources of information into potential scenarios that will help clients meet their goals. We consider people in the field to be educators as well, and we realize that this has created a *co-learning* educational environment.

Time to Evaluate Programmes on Co-Learning in Agroecology
It is time to rigorously evaluate the opinions of teachers, students, clients and administrators about their participation in this learning network, with cooperative learning programs in multiple universities outside Norway and the U.S. Just as agroecology practices and systems are specific to the farming *terroir*, we will learn if educational principles and teaching practices can be applied in other languages, cultures, countries, and agroecozones. Thus the project will assess planning, implementing, and evaluating learning outcomes.

Research Plan for 2021
With a sabbatical leave approved for the second half of 2021, Charles Francis is planning to survey and interview key people in a number of countries: Norway, U.S., Sweden, France, Spain, India, Ethiopia, Uganda, Chile, and perhaps Cuba. Some research activities will be in person, during 2 to 3-week visits to key universities, while others will be conducted by cooperators who are already part of the agroecology teacher network. Surveys and interview questions will be developed and tested with teachers and other participants in U.S. and Norway, and appropriate adjustments made for use in other countries. Research subjects will include 1) agroecology teachers who have been associated with the Norway program from their inception, 2) students who have completed a degree/certificate in agroecology or are currently enrolled in a programme, 3) clients in the field including farmers and food systems professionals in communities, and 4) administrators who are familiar with agroecology teaching programmes and have provided support. Results will be collected and analysed by Francis and colleagues at University of Nebraska [UNL], and returned to cooperators in each country for interpretation. One major output will be a book on co-learning to be published by University of Nebraska Press, with chapters authored by key collaborators in each country. Results will also be prepared for popular distribution in each country, and published in professional education journals. The outcomes will be thoughtful consideration of current teaching methods and the potentials of introducing co-learning activities and planning into agroecology programmes in other countries. An interactive web site on co-learning will be initiated and moderated. Another outcome is knowledge about specific teaching strategies in different academic

institutions, national systems, unique characteristics of agriculture and agroecozones, and how educators are prepared for their teaching responsibilities in each country.

Timeline for the Project
Dr. Francis will seek approval for the project from the Institutional Review Board, UNL and learn what is needed in each country, seek a contract for publication with University of Nebraska Press, and make key contacts with cooperators in each country in August to December 2020. He will also submit an application for a Fulbright Senior Scholar Fellowship to cover some costs of the project. Final planning will continue in 2021, and the project will be implemented during a sabbatical leave already approved for the second half of 2021. Book publication is projected for late in 2022.

Key Reference: Francis, C.A., A. M. Nicolaysen, G. Lieblein, and T.A. Breland. (2020). Transformative education in agroecology: student, teacher, and client involvement in co-learning. International Journal of Agricultural Science & Natural Resources [in review]

Report from Maribor University

Organic Agriculture Study Programme Development and Teaching Organic Agriculture on University of Maribor Faculty of Agriculture and Life Sciences (FALS)
Martina Bavec, Martina Robačer, Tadeja Kraner Šumenjak, Franc Bavec
ENOAT web - meeting, 27 August 2020
Teaching organic agriculture on FALS
European Network of Organic Agriculture Teachers (ENOAT) established in 2001 and inviting dr. F. Bavec from FALS as a member a year ago, was starting point towards B.Sc. study programme Organic Agriculture in Slovenia. Collaboration of professors of FALS with members of ENOAT, resulted in three successful summer schools "Alternatives in organic crop production" (2003, 2005 and 2007) and in following years teachers and students exchange stared. After including goal "more knowledge and research in organic sector" in the *National action plan for development organic farming towards 2015* resulted in accredited new B.Sc. study programme Organic agriculture and in study year 2006/07 the first students have started. In the first 10 years this study programme was at Faculty of Agriculture and Life Sciences (FALS) University of Maribor one of the most popular program concerning the number of interested students. Each year 5-7 Erasmus students takes Organic Agriculture modules and so it is also nowadays. Also other students of 4 (since study year 2018/19 not anymore on study program Fruit and wine growing) out of 6 B.Sc. study programs have 5 or 3 ECTS course „Basics of organic farming". Majority of students finishing B.Sc. can get basic knowledge about organic farming. There is possibility to continue with study of organic agriculture as module on M.Sc. and Ph.D. level. Students have their practical education on organic part of faculty estate, collaboration in research projects of Institute of organic farming on FALS, one week on certified organic farms, one week in certification body and additionally they can make practical work which could be added in attachment of diploma. Also professional trips to BioFach Nürnberg 2019 (and in the years before, planed in 2021 again) and some foreign organic agriculture events (like it was in Austria on Esterhazy estate in 2018) and visiting organic farms in Austria, Germany and last year 5 days in France including visiting ISARA Lyon in 2019, encourage our students to go in this direction in their career.

Table 1. Interest for study Organic agriculture at FALS University of Maribor

Study year	**New students in the 1st year[1]**	**All students**
2012/13	32	68
2013/14	41	73

2014/15	32	73
2015/16	20	60
2016/17	19	51
2017/18	10	30
2018/19	7	22
2019/20	8	17
2020/21	7[2]	

[1] New students entered to faculty and study Organic agriculture, additionally every year there are some more students (who did not pass previous year)

[2] The first wish, there will second round for applications soon and some additional students are expected

In Budapest in 2017 and also in Warsaw 2019 we reported that due to some personal changes and attitudes of people of the leadership of faculty there is an intention to make several changes into a program without any internal discussion on the Chair for organic agriculture and there is intention for decreasing number of B.Sc. study programs (2-5 out of 7) and further development is uncertain. This idea is still on board. Due to less students they decreased number of study places on 20 for last study year. Development of interest for organic farming study over past years is presented in Table 1, in previous years from the first generation 2006/07 to 2011/12 it was much higher.

But in contrary, organic sector in Slovenia is developing (5% of all farms and 10% of all agriculture area is organic) and sooner or later there will be also on the other faculties or high schools more courses on organic farming. In September 2019 it was also discussion about study program Organic agriculture in the National Council (second dome) and members concluded that organic farming study programme is important for Slovenia and they asked ministry for higher education to take care for it. According to the new EU Green Deal and a goal 25% of agriculture area under organic farming, taking care for biodiversity, reducing use of chemical pesticides etc. also in Slovenia organic agriculture will be part of new Rural development program to 2027. This year in Slovenia a new national Action plan for organic farming up to 2027 is in preparation and in September will be organized some workshops about education, research and knowledge transfer where also our team will attend and try to put some our ideas based also on information's from this ENOAT meeting.

Generally, we expected that interest for studying agriculture (all programmes) will in Slovenia increase after COVID 19 pandemic crisis in this study year, but based on the first cycle of applications has not happened. Perhaps younger generation due to their lower sensibility to this new disease has not been worried so much as the other population in Slovenia where we have seen higher interest for food supply from local farms, for short food supply chains and also home gardening increased among the population.

Due to all this changes in Slovenia, Europe and worldwide, we have positive expectation for further development of organic sector in Slovenia and also for the interest of studying organic agriculture. We noticed that several students from other study programmes take organic agriculture as a topic for their Bachelor, Master and also Doctoral thesis – on our faculty 8 PhD students in Agronomy have done research on organic agriculture and finished their study.

All this changes and expected trends you all can check next year if we could organize a real ENOAT meeting in Maribor in 2021 as we decided via Doodle this summer.

Report from NMBU, Norway, 2020

Agroecology Education and Research at NMBU, Norway; 2020 Report; ENOAT, On-Line, August 27, 2020

Geir Lieblein, Tor Arvid Breland, Anna Marie Nicolaysen, Charles Francis,
Lutgart Laenerts, Asmund Steiro, Vebjorn Stefsang, Petra Bakewell-Stone

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Agroecology Programme: ***Agroecology: Farming and Food Systems.*** **Unique Programme for 2020, the COVID-19 Year**

After twenty successful years of field- and classroom-based learning from 2000 to 2019, the Agroecology MSc programme is being adapted by the teaching team to the reality of the pandemic of COVID-19 for the Autumn Semester of 2020. The course is starting later than normal, with some introductory materials available on line from now until mid September, when we hope most students will be able to enter Norway to participate in person. If this is not possible, there will be adjustments to offer most of the course on line, using recorded case studies. This is an experiment, of course, to see if we can achieve the same course learning objectives with this modified method of on-line presentation, breakout groups that will work as teams on line, and similar evaluation criteria to measure performance on literature reviews, draft project reports for a farm case and a food system case, final reports and presentations by each team, and an individual learning reflection document. These exercises will be evaluated by a designated academic person from outside the teaching team to follow university guidelines for grading. Primary changes have been to maintain the field-based activities using the phenomenology approach and team learning in farming and food systems, even at a distance if necessary. Two field visits by teams in the farm project and again in the food system project represent the core of the normal semester, and we are trying to duplicate these activities to help students become agroecologists by learning and practicing five competences: observation, participation, dialogue, reflection, and visioning. We continue to mentor or collaborate with agroecology programmes in Sweden [SLU, Alnarp], India [universities in Kerala and Kolkatta], Ethiopia [Mekelle University], and Uganda Martyrs University. There is a new program in UNSGI in Pollenzo, Italy, with Dr. Lieblein as the key contact and mentor, and another just starting at University of Chile in Santiago, with Dr. Francis as the key teaching mentor from our agroecology team. These two new programmes are also partners in the NEXTFOOD project funded by EU.

NEXTFOOD: Transitions towards participatory learning in 12 cases [from Asmund]

Diverse education programmes in 10 countries across 3 continents are active in a 4-yr EU-funded research project on driving the transition towards participatory, action-oriented learning. In 12 diverse cases, case leaders are transforming their educational activities towards the Nextfood approach, which is a learning model based on the one developed at NMBU over the previous two decades. The approach is designed to shift the focus away from curriculum, lectures and textbooks to competence development through engaging with a variety of learning arenas, teaching aids and assessment methods. The cases included in this project ranges from an online MSc course, run as a competition from Austria to an applied forest ecology course for forestry machine operators in Sweden. With a common set of criteria for evaluating the learning in the cases, we conduct cross-case comparisons throughout the project and include a number of examples of teaching resources in an open-access teachers' "toolbox" (https://www.nextfood-project.eu/nextfood-platform/). On this project there are contributions from the entire Agroecology Programme team, with major inputs from Dr. Lutgart Lenaerts, MSc. Åsmund Steiro [a MSc graduate from the NMBU Agroecology Programme].

Cultivating Public Spaces: **outreach in urban agriculture** [from Vebjorn]

An interdisciplinary cooperative project including the aspects of public health, landscape architecture, urban planning and agroecology in the study of urban agriculture in public spaces in Oslo. The goal is to assess the potential for urban agriculture as a driving force for sustainability transition in Norwegian cities. Focus is on the social, ecological, and economic dimensions of sustainability, in terms of quality of life and social justice in a

compact city, and how urban agriculture can contribute in Oslo. It is a three-year project funded by the Norwegian Research Council and ending in 2021. In this project we have conducted case studies of urban agriculture initiatives in Oslo to determine their effect on public health and assess the supporting and hindering forces for their success. As a part of this project, the agroecology 1st year master students of 2018 and 2019 have conducted action learning case work on some of the initiatives, contributing to the overall case study development. Outputs from this work are stakeholder documents for the initiative coordinators (2018) and a municipal officer in charge of urban agriculture development in Oslo (2019). Agroecology researchers are currently in the process of writing a paper from this experience, as well as two papers answering the questions of public health impact and assessment of success.

On this project we have agroecology senior researcher Anna Marie Nicolaysen and researcher Vebjørn E. Stafseng. Mr. Stafseng is a MSc graduate from the NMBU Agroecology Programme

ADAPT: Sustainable Adaptation - resilience in urban regeneration [from Vejbjorn]

ADAPT is a three-year project funded by the Norwegian Research Council, started in 2019 and is focused on how reuse of industrial heritage in urban development may contribute to environmental and human wellbeing. NMBU is responsible for a work package on integration of urban agriculture [UA] in two case areas, both former brownfields, to provide insight on how to:
· Facilitate socially sustainable and resilient urban development by integrating urban agriculture
· Assess potential of UA for engaging the wider public by examining the progress in a pilot study in one of the case areas
· Develop a set of policy and process recommendations for implementing UA and regeneration

Here, we are also planning to integrate the 1st year master students of agroecology in the research, with them conducting action learning case work on the two cases in the project. So far, we have conducted interviews and participant observation in one of the case areas as well as document studies. We are also working on an operationalization of the resilience concept to the context of urban development with urban agriculture integrated.

Transforming the Educational Landscape in Agroecology

An evaluation project has been proposed to explore the impacts of the past 20 years of education in the Agroecology MSc Programme at NMBU and in spin-off educational degree or certification programmes listed above. We are planning to research the involvement of students, teachers, administrators, and stakeholders in the field in what we are calling ‘co-learning’ [aprendizaje colaborativo en español]. The project is one activity in a sabbatical leave approved by University of Nebraska for Charles Francis in 2021. In general, this will involve surveys and interviews of people in the four categories of participants listed above, and will include similar research in all of the universities where NMBU has been involved in helping mentor teachers and assisting through planning workshops and inviting teachers to participate in the Norway programme as observers. The project complements the activities of the NEXTFOOD and ADAPT programmes already described. A session in the 2020 on-line ENOAT workshop will describe the objectives and plans for this project.

Future in Transforming Education to Collaborative Learning [Co-Learning]

As we observe students interacting with stakeholders in the field and with each other in team project work, it is obvious that some type of transformation from the traditional one-way delivery is essential for tomorrow's learners. We sense some hesitation to adoption of creative methods due to inertia among the instructors in universities, or to lackof exposure to innovative alternatives that have been shown to work well. Reports in the literature in education, starting with John Dewey a century ago, maintain that students and their learning should be central to the process, and that students need to build new competences on the foundation they already have from prior experiences. We postulate that it will be important to build a series of case studies, such as those in the NEXTFOOD and other current projects, and make these available to teachers for how they might transform their own student learning environments. With the surveys and interviews from the evaluation project described above, we hope to quantify the opinions of instructors, students, administrators, and stakeholders and establish their level of willingness to share in the planning agenda for learning. In academic institutions such as colleges and universities there need to be reward systems that recognize the value of experimentation in learning activities, and even to reward those who attempt change and fall short of expectations. This is part of the institutional learning process. We look forward to feedback from colleagues in ENOAT and elsewhere about these initiatives and to learning from advances elsewhere in agroecology learning landscapes.

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