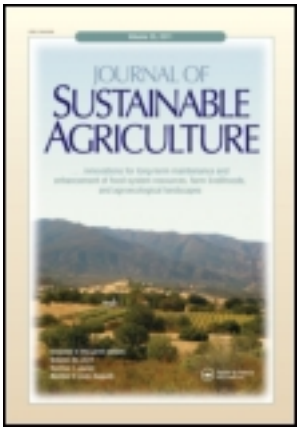


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# Phenomenon-Based Learning in Agroecology: A Prerequisite for Transdisciplinarity and Responsible Action

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# Phenomenon-Based Learning in Agroecology: A Prerequisite for Transdisciplinarity and Responsible Action

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*Phenomenon-based learning in agroecology provides a rationale and platform for bridging academia and society. Learning based on reflective experiences on farms and in communities has provided the foundation and the core of an agroecology course in Norway since 2000. Student teams work with university teachers and stakeholders in 'open-ended cases' to identify key constraints and future possibilities. This learning strategy uses real-world situations on the farm and in the community where solutions are not already known to instructor or clients. Employing natural science and social science methods, the teams examine and evaluate production, economic, environmental, and social dimensions, as integrated into whole systems. The students then design and evaluate future scenarios and work out plans of action. The result has been a strong foundation for responsible action in students' future endeavors in education and development.*

*KEYWORDS phenomenology, open-ended cases, stakeholder involvement, action-oriented learning, transdisciplinarity*

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## INTRODUCTION

The need for transdisciplinarity and for universities to become more relevant for the challenges facing our societies has long been an area of interest and discussion (Klein 1990). In the last decades, the understanding of inter- or transdisciplinarity has advanced considerably. In parallel, van der Ploeg (2003) argues that sectorized knowledge development in agriculture is increasingly dominating, and this knowledge generation has become disconnected from everyday experiences and practices on farms. Agroecology has been put forth as an emerging discipline to study the ecology of food systems (Francis et al. 2003) that can foster transdisciplinarity and action orientation, and thus counter the direction of development described by van der Ploeg (2003) and others.

However, an explicit discussion is largely missing about prerequisites for transdisciplinarity and action orientation and how this strategy can become part of current research and education that deals with agriculture, food, society and the environment. Our paper aims to fill that void.

We start by describing both challenges and changes in current agricultural education. The discussion follows two themes. First, we discuss phenomenology in relation to agroecology education. Then, we describe the phenomenology-based agroecology program in Norway, including its outcomes. In a concluding reflection, we argue that a phenomenon-based approach in agroecology education and research provides a foundation for transdisciplinarity and responsible action.

## RELEVANCE OF PHENOMENOLOGY IN EDUCATION

Phenomenon-based learning in science education has been developed on the foundations and applications of this philosophy by many teachers in different countries over the past decades (Østergaard et al. 2008). The primary nature and value of the phenomenon has always been essential in the master of science program in agroecology started in Norway in 2000 (Østergaard et al. 2010). Such a phenomenological perspective is in accord with the works of John Dewey on learning and experience (Dewey 1961), as it focuses on the need for students to integrate new information with prior knowledge through reflective experience. Compared to practical strategies that promoted holistic learning in that era, specialization of academia into particular disciplines over recent decades has led to training of experts in ever more narrow fields, and to attention to theory often distant from individual life experiences and disconnected from reality in the field.

Much of education in agriculture has moved from practical, hands-on field activities and internships—learning by doing—to focus on theory in

formal learning settings, especially the classroom. Science-based research is highly valued at the expense of incorporating practical experience of farmers into the education process. Agroecologists are concerned that this predominantly theory-based, constricted focus on elements of systems will not prepare future scientists to cope well with broad and complex challenges in farming and food systems. We posit that productive, profitable, resource-conserving, environmentally benign, and socially equitable systems of agriculture will be difficult to develop due to emerging "wicked problems" (Batie 2008) that defy simple analysis and solution. These are problems that involve multiple stakeholders with divergent short- and long-term interests and demands, that recognize competition for limited resources, that require resilience and understanding of complexity, and that are unlikely to be permanently solved by adding yet another layer of new and expensive technology (International Assessment of Agricultural Knowledge, Science and Technology for Development 2009).

In contrast, we propose an educational strategy that develops a new generation of agroecologists capable of dealing with whole systems as well as competent in demonstrating the integration of biophysical, economic, and social science methods. Important to this broadened approach are farmer experiences as described by Louis Bromfield (1948) from his farm and Robert Rodale (1971) in popularizing alternative farming practices (e.g., *New Farm* magazine and website (http://rodaleinstitute.org/new_farm). Examples of alternative information resources include recent descriptions of experience-based practices from farmer interviews in the Midwest (Janke 2008), from California small farmers (Franceschini and Tucker 2010), as well as from a book written by three partners in Saanich Organics in Victoria, British Columbia (Fisher et al. 2012).

An overview of educational philosophy by David Orr (2004) and the integrative perspective of farming, human goals, and the long-term future by Wendell Berry (1996) provide additional breadth to what students can use to better view the whole picture.

Students in agroecology are then prepared to work with a range of clients in a participatory mode to envision and take concrete steps toward a more desirable future. This could be called an educational foundation for responsible action (Lieblein and Francis 2007), and is closely related to education for sustainable development and its explicit focus on promoting competencies for change (Sterling 2009). Tomich et al. (2011) emphasized the importance of agroecology as an integrative science that can deal with "key challenges of mitigating environmental impacts of agriculture while dramatically increasing global food production, improving livelihoods, and thereby reducing chronic hunger and malnutrition" (193), all of which are essential goals for our graduates to pursue as agents of change.

## CHALLENGES AND CHANGES IN CURRENT AGRICULTURE

An initial step toward facilitating change in agriculture is learning how to study and understand the present challenges. Obvious to all observers of production agriculture are emerging constraints in supply of arable land, fossil fuels, phosphorus and fresh water; serious impacts on environment; growing appreciation of climate change in temperature and predictability; and increasing demand for high quality and safe food. Concentration of land in ever-fewer farms and control by fewer farmers lead to undesirable changes in rural infrastructure and distribution of benefits. One useful perspective to put meaning into the change process is a clear recognition that farming and food sectors comprise many interacting human activity systems, and that any viable change will require communication with and understanding the goals of multiple principal decision makers (Rölling and Wagemakers 2000). These include farmers, processors, marketers, consumers, politicians, bureaucrats, advisors, and educators at all levels in the social and food systems hierarchy. Our premise is that education is an essential foundation for responsible change, and that students can be key catalysts in that process during their study years, even while they are preparing for future careers. Further, responsible action will require learning and testing skills, knowledge, attitudes, and capacity for envisioning future opportunities (Lieblein et al. 2007).

To understand the process of change in both the whole and in the parts of agri-food systems, students themselves need to become more aware and experience the complexity of functions, how these are related to system structure, and how changes in one practice or decision impact the whole. From agroecology can emerge an appreciation of the perspectives of integration and interconnectedness of components, how to view systems from multiple angles across a hierarchy of spatial and temporal scales, and understanding contributions of diversity to system resilience and sustainability (Altieri 1983; Rickerl and Francis 2004; Gliessman 2007; Francis 2009). Courses in crop or natural resource ecology deal primarily with biophysical components of systems at low levels of spatial scale, and this emphasis is reflected in the majority of graduate degrees in agriculture. A study of graduate thesis topics for three years in agricultural universities in Denmark, Canada, and the United States confirms the focus on molecular- and plant-level studies and few projects on whole systems (Langer et al. 2007). Knowledge of biophysical elements and constraints is necessary to understand many systems functions, but not sufficient to understand the complexity introduced in the integrated biophysical and socioeconomic sphere with human managers as a primary driving force in system design and maintenance. For program graduates to become competent participants in development and change they need a respect and understanding for all the actors in farming and food systems and how they interact. As stated

by Kurt Lewin (1948 quoted in Snyder 2009, 225): "If you want to truly understand something, try to change it."

This complexity in the skill sets needed by students is challenging in itself, but just as important is the educational process by which they can attain competency. Our educational process follows the well-known Kolb Cycle (Kolb 1984) to acquire knowledge about systems through observation of action, then process this information through discussion and reflection, then bring order to what was observed by converging ideas before translating the entire learning endeavor into action. An important part of this educational process is action learning about current issues, and building understanding through meta-reflection to become a better prepared, life-long learner who can adapt to change and apply what has been experienced to new and evolving conditions. Just as farming and food systems need to be resilient and sustainable in the long term, the learners themselves as well as their instructors need a capacity for continuous renewal and growth. Certainly not unique to study of agroecology, these qualities are fostered by the holistic approach to education (Bawden 2007), the application of both biological and social science methods (Checkland 1981; Checkland and Scholes 1990), and the learned capacity to envision and plan for a more desirable future (Lieblein et al. 2011).

A valuable tool for phenomenon-based learning as conceptualized and applied in the Norwegian agroecology semester is *an open-ended case strategy* for study of farms and communities (Francis et al. 2009). In contrast to conventional problem case studies, where the solutions are already known to teachers and stakeholders and the students must be clever enough to discover the solution and its consequences that have already occurred, an open-ended case explores phenomena that are contemporary and complex. Key questions emerge from in-depth conversations by student teams with clients and other stakeholders to determine their long-term goals. Together as a team of students + teachers + stakeholders, the search proceeds to elaborate the issues and develop several potential future scenarios as well as their likely outcomes. In the Nordic program the challenge has been to apply theory from social science to practical challenges in farming and food systems. Several other cases were described by Vellema (2011) in The Netherlands.

This process of open-ended cases underlines the importance of an approach to education that does not follow a menu, but rather the inquiry requires a process of research that includes methods that are diverse, adaptive and combine theory with practice and action, or what Lieblein Francis, and King (2000) called "knowledge-based action." Putting this knowledge to work in the field leads to new experiences and results, including evaluation of successes and failures, and the feedback of this new information into academia could be called "action-based knowledge." This theoretical and practical foundation on which agroecology education is based is further discussed in the following section.

## PHENOMENON-BASED LEARNING IN AGROECOLOGY

In Østergaard et al. (2010) the phenomenological dimension of agroecology is explored, while Lieblein et al. (2012) discuss the specific competencies needed by agroecology graduates to be effective in future careers. (See text box for overview of phenomenology.) Our take on agroecology represents a fundamental shift from the thinking that dominates most other academic disciplines, in the sense that observation and the everyday world perspective should be regarded prior to the theoretical perspective. This is in accordance with views in modern physics (Bohr 1934), who challenged the mechanistic and simplistic explanation for natural sciences and expanded on the importance of complementarity. In terms of its roots in human thinking, this represents a shift from the philosophies of Descartes and Galileo to the thinking of Aristotle. According to Descartes and other leading scientists and

**Phenomenology: A Complext Educational Process Unveiled**
(Ostergaard et al. 2010; Lieblein et al 2012)

STARTING ON THE FARM AND IN THE COMMUNITY

Compared to many university courses that start with the history and principle theories in a specific discipline or subject, our approach to learning starts with current reality on the farm and in the community food system. This strategy allows the system to speak for itself and provides for a maximum expression of diversity and uniqueness of place, important foundations of ecology. In other words, this allows the student as guided by instructor to maximize the value of their observations using all the senses, unconstrained by theory or models derived by others. Theory then grows from experience.

Pioneered by Merleau-Ponty (1962) and Husserl (1970), the phenomenology approach could be considered a contemporary application of the philosophy of John Dewey (1916) who strongly believed that we learn new things by fitting them into what we already know. When we start on the farm, what we learn or develop in theory grows from the context of the farm. Likewise, the student teams begin their study of community food systems by interviewing county officials, teachers, food marketers, cafeteria managers and food buyers, and others involved with food including consumers. From these interactions with farmers and food system stakeholders, students develop a rich picture that includes the many factors and their interactions that revolve around and drive the system.

LINKING PRACTICE TO THEORY

In the first two weeks of the autumn semester in Norway, agroecology students work on farms, do transect walks across agricultural landscapes, and interview farmers. They observe the intact and functioning agroecosystem in all its complexity, and do not try to deconstruct the system into its elements without seeing the whole. Likewise, students walk through communities to observe everything related to food, and interview a range of stakeholders in that community. Their goal is to discover the key players and understand their roles, to quantify food produced locally as well as imported into the community, and to understand the long-term aspirations of local people regarding the food system. Synthesizing their results from these two exercises, students return to campus and structured classes and discussions, and building knowledge that is informed by action and study in the field. They are now ready to use established theories and basic principles from the literature and from instructors to integrate these multiple information sources in a form of "just-in-time learning" (Salomonsson et al. 2005).

philosophers of the scientific revolution, our everyday observations and experiences are something that existed only in the minds of human beings, not in the phenomena themselves (Dahlin 2003). As such these experiences are merely subjective and of a secondary order, in contrast to the measurable, objective properties of things. This scientific approach implies what Harvey (1989) calls an ontological reversal, where mathematical and other kinds of theoretical perspectives are held to be more real than the concrete, lived experience in which they have their ground. The ontological reversal puts intellectual thinking, and theory generation, at the center of learning about the world (Østergaard et al. 2010). This is exactly what characterizes academia, and, thus, many educational programs: the primacy of theoretical knowledge. This perspective implicitly dominates most scientific disciplines within both the natural and social sciences.

In contrast to the theory-centric outcomes of the scientific revolution, our approach to agroecology has its roots in Aristotelian thinking. The ontological reversal has to be *re-reversed* which implies giving the world of lived experiences back its ontological primacy. This implies that "scientific models must be recognized as reductive abstractions not explaining everything about a phenomenon, but only those aspects of it which we, for contingent historical reasons, have chosen to consider essential for our understanding of reality" (Dahlin et al. 2009, 202). The approach was coined "phenomenological" by Husserl (1970). The shift to phenomenology has deep implications for transdisciplinarity and action orientation in agroecology. First, the shift from theory to our everyday knowledge and experiences as being of prime importance lays the foundation for transdisciplinarity, since the formation of disciplines that need to be linked somehow arises from the Cartesian perspective where theoretical concepts are supposed to present a more objective and true reality than what can be viewed though our senses in everyday life. A new paradigm is needed to cross these disciplinary boundaries. Husserl's phenomenological call is to *return to the things themselves* as the starting point for the learning process. Further, our lived experience provides the basic starting point for exploring the spaces between the theoretical disciplines. In agroecology, the phenomenological approach prepares the learners (both students and instructors) for a broad appreciation of the world of experiences, and that realization is important prior to the study's theoretical considerations. As such, a common and primary ground is established, where different or secondary theoretical perspectives that we now call disciplines can interact.

The phenomenological perspective on learning, thus, implies being and acting in the world as prior to generating knowledge about the world. According to Merleau-Ponty (1992), our consciousness is not in the first place a matter of "I think" but of "I can." Merleau-Ponty's emphasis on embodied consciousness and the place of "I think" has led to a more explicit focus on *action* as primary to cognition. As such, an action-orientation in

agroecological education and research is not an elective "add-on" issue, but is part of the core of its conceptual foundation.

## AGROECOLOGY PROGRAM IN NORWAY

The agroecology master of science autumn semester at the Norwegian University of Life Sciences (UMB) was designed after several experiences in week-long, systems-focused doctoral courses in the field that were conducted during the 1990s (Lieblein, Francis, Barth-Eide, et al. 2000). Starting on the farm, student teams interviewed farmers, walked the fields, absorbed the farm context using all their senses, and assessed the current economic, environmental and social realities plus the farmer's long-term philosophy and goals.

An open-ended case approach to learning was developed and applied from the start, and the method was refined by instructors participating in the course (Francis et al. 2009). In this practical farm study strategy, student teams welcome the challenge of in-depth interviews of farmers to explore their farms and natural resources, observe current practices and systems designs, and understand farmers' goals and strategies for the future. In the community food systems segment of the course, the same student teams interview a key client who is often the agricultural officer for the municipality, and continue with interviews of people involved in food procurement for schools, hospitals, municipal canteens, and local grocery stores. With information on both production and consumption in a community, the student teams draw rich pictures to identify key elements and important interactions in the food system in order to understand the current situation, future goals, and key issues. This tool is used to design future visions implying goal achievement, and to elaborate action plans in as close collaboration with the stakeholders as possible. Unlike the decision-case method where solutions are known, in an open-ended case the students, instructors, and clients cooperate to seek potential solutions and recommendations.

To prepare students and teams for their field studies, a variety of pedagogical approaches have been adapted and developed through experience over the past decade. Essential to efficient functioning of student teams and student interactions in each class group is developing and practicing the communication skills needed in a social learning community (Francis et al. 2011). One of the most important tools for building on current knowledge to design for improved farm production or to enhance local food systems is the process of visioning future systems (Lieblein et al. 2011). Additional practical ideas for hands-on learning include transect walks on the farm and through the community, semistructured interviews of stakeholders, mind mapping of current realities and potential future systems, use of metaphors as a device for understanding and communication, and application of various assessment methods such as SWOT (strengths weaknesses, opportunities, threats),

force-field and sustainability analyses. Fact sheets on each of these topics have been published in the *NACTA Journal*.

Evaluation of learning has been based on reactions and feedback from clients in the field, on student team documents delivered to the farmer and the community clients, on individual student reflection documents, on presentations by teams and by individuals, and on performance by recent graduates on thesis projects as well as in the job environment. Further indicators of success are related to the reputation of the program in Norway, and include capacity for recruiting students each year, support by stakeholders of some student project costs, establishment of similar programs based on the participatory model, and teaching awards from university and regional organizations.



## OUTCOMES OF THE NORWAY AGROECOLOGY PROGRAM

One of the best indicators of learning success in this semester of agroecology based on case studies in the field, and involvement with farmers and community members in Norway, is the high level of interest and support from stakeholders with whom students have worked. Many farmers and community leaders have invited the UMB teams to return the next year. Stakeholders in communities are impressed not only with the learning by students but by the practical, action-oriented methodology and results that can be adopted to help them meet their goals. One recent example is a community food festival recommended by the 2010 student team that worked in Tolga in the east-central valley of Norway. The festival was planned for a year, and several students from the 2011 student team participated in an October event that attracted more than 500 people to experience local food, a speaker on nutrition, musical events, and general promotion of local markets and products. Another indicator of success and recognition of responsible action by our student teams has been the client communities paying half the costs of travel and field stays for the past two years. Communities obviously value the contributions of the students, as they have provided substantial resources from their own local funds.

Two student team reports are prepared based on the analyses and visioning of farm systems and of community food systems. These are based on one week stays by the team in the community in September and again in early November. The results of on-the-ground observations, interviews, data gathering, and web searches are used to create a rich picture of the farm and another of the community. From these the teams discuss and identify key interactions among components, most important driving forces both internal and external to the farms and communities, constraints to achieving goals and positive energies that will help, and visions and action plans that can promote an agenda for farmers and communities to reach their goals.

One example of a farmer goal is to introduce livestock into a farm now dependent primarily on crops and to certify the operation as organic to add value to the farmer's labor and resources. Teams come up with several potential scenarios and present these back to the farmer and family for their consideration; this is the "farmer client document" that is also evaluated by instructors as part of the grading process for the course, and a written documentation of student planning for responsible action on the farm.

An example of a community goal is to convert their local public institutions to purchase of 25% local food over the next 5 years. Student teams follow the same procedure of interviews, data collection on local production and demand, in order to determine willingness of farmers to provide the supply, and willingness of food purchasers to switch to local sources. Results lead to analysis and evaluation of how realistic the goals are and how they can best be met. The "client community document" is evaluated by instructors and delivered to the key client in the community for them to consider in future planning. Focus is on responsible action by the student team that will lead to impacts on local community food systems.

Other measures of success are gleaned from the individual student learning documents, where each one summarizes their achievements during the semester, including how they are implementing theory in pursuit of desirable action on the farm and in the community. Both students and teams share their results in oral presentations to the agroecology learning community, comprising the entire class and instructors.

Results of the educational process can be evaluated by examining thesis projects as well as performance on the job by students who have finished the program. Several students who have graduated provide examples of how the phenomenon-based approach in agroecology has led to specific action:

- thesis project by a Canadian student who studied the CRAFT internship program in Ontario, then after graduation helped establish an organic agriculture course of study at Guelph University and also founded and now manages a large CSA operation that continues today.
- thesis project by a student from U.K. that compared organic vegetable production by women and organic cashew production by men in Tanzania, where she measured the impacts on nutrition and incomes of families; she later convened a national workshop in Morogoro at Sokoine University of Agriculture including people from farming, research, education, extension, nongovernmental groups, and federal government to envision the future of organic agriculture.
- thesis project on contributing factors for successful organic farming in Norway led a German student to an appointment as agricultural advisor at the County Governor´s Office in Hordaland on the west coast of Norway; he has been a strong supporter and resource person for the agroecology teams working in his region.

- evaluation by two students of potentials for an irrigation system to be installed on the King's farm near Oslo, with recommendations that the investment not be made but other management alternatives should be implemented; their ideas were followed with success, and one student is now an organic crop inspector in Norway.
- thesis project by a Canadian student on forming a food policy council in Victoria, British Columbia, resulted in the community establishing such a council and holding regular meetings to advise policymakers.
- thesis project by an Argentinian student to use emergy analysis to evaluate the efficiency of the cow/calf grazing system in the Pampas; recommendations emerged that may help inform national subsidies and export policy; she continues in a doctoral program that will evaluate several other crop rotation, crop/animal, and monoculture cropping systems and provide similar recommendations to the government (Rotolo et al 2007), and, in summer 2011, she organized a national workshop on ecosystem services in agriculture.
- thesis study by a Costa Rican student on cacao plantings by small farmers in Panama; results revealed that incomes from the primary crop were only ten percent of the total economic and family benefits that were secured from the highly diverse agroforestry systems they managed, and other products included food crops, coffee, peach palm, medicines, firewood, and high-quality timber; she is currently evaluating information to make recommendations that will lead to cooperative marketing by communities to eliminate the middle man and increase family incomes.



Another indicator of academic advisor and student confidence in the learning available in this agroecology program is the consistent attraction of new students each autumn. Starting with a dozen students in 2000, the course now regularly attracts over 60 applicants for the 25 positions each year. This is one of the most popular offerings of the Department of Plant and Environmental Sciences at UMB. Several courses have been established in other universities based in part on observations of the success of the Norwegian model; these are in Sweden, France, Ethiopia, Uganda, and the United States. Each of these examples that we have described provide clear evidence of responsible action by graduates of the agroecology program, and each year's experience leads to small modifications in the schedule of activities, the resources provided to students, and refinement in the measurement of learning.

We have envisioned the learning process as progressing on a "learning ladder" that leads to responsible action by students in their future careers, as shown in Figure 1 (Lieblein et al. 2007). Rather than starting with memorizing skills and specific knowledge or learning theories about farms and practices, in the lower half of the figure, we begin the course at step 3, where students gain experience with immersion on the farm with practical

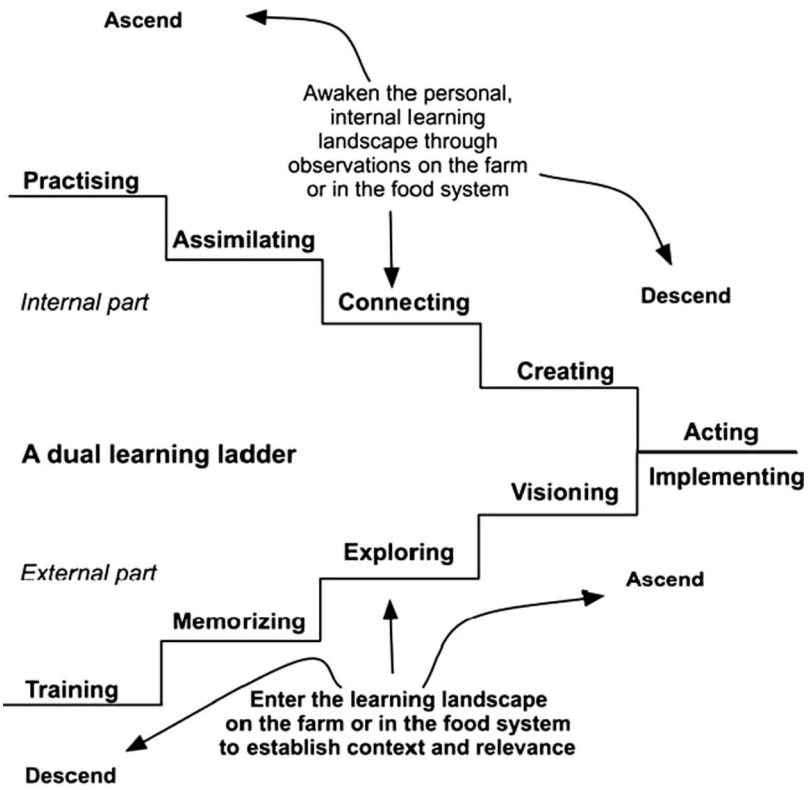


**FIGURE 1** Student learning on external and an internal learning ladders (from Lieblein et al. 2007).



experience. This is *immersion in the phenomenon*. They move back down the ladder to acquire additional information, skills, or theory as this is found essential for understanding the reality of the field. In later stages of the process, they move up the ladder to envision improved systems and to put them into action. The steps in learning and students' progress are observed in the numerous activities listed above in our process of evaluation. Student learning on the internal ladder in the upper part of the figure is more difficult to assess, but we think that evidence from their reflection documents that define their roles in the teams and their improved understanding of personal learning styles reflect progress in their own, internalized appreciation of the learning process. This area needs to be further explored and evaluated.

Additional indicators are awards to the agroecology teacher team that include the NOVA Prize 2007, the Department of Plant and Environmental Sciences Education prize 2009, the UMB Education Award 2011, and a nomination for the Study Quality Prize 2012 from the Norwegian Ministry of Research and Education.

## CONCLUSIONS

The agroecology autumn semester in the Norwegian University of Life Sciences is designed to provide a learning landscape for students to navigate on the way to an enhanced capacity for responsible action. More than 200 students have enrolled in this intense course module over the past 12 years, and most have continued to complete the master of science degree in our university or others. Although we have not yet explicitly studied the links of learning to action, the individual evaluations, the observations of students' activities in the field and in classroom discussions, their written team client documents and individual learner documents, their thesis projects and publications, and the performance of graduates in current positions in government, in academia, and in the development community all indicate that the learning process has been helpful for them. The graduates are engaged in meaningful and responsible work in their current organizations, and demonstrate to us a keen appreciation of seeing things whole.

The core shift we have made in our approach, with implications for transdisciplinarity and action orientation, is one from a traditional academic theory-based approach to one that is phenomenon-based and action-oriented. Our phenomenological take on agroecology prepares students for transdisciplinarity and action-orientation in a two-fold manner (Østergaard et al. 2010). First, it provides a fundamental reorientation from an emphasis on our concepts or theories about the world to a focus on the phenomena as they are and can become, and this becomes the foundation for the learning process. Second, it emphasises that reflection and learning are not merely viewed as cognitive processes but more as vital steps toward acting and participating in the world.

Based on such a perspective, active participation is not a pragmatic add-on to the learning activities, but rather becomes a prerequisite for a full learning about farming and food systems. This necessitates a stakeholder-centric approach in both education and research. Here, the central relationship is between the students and the stakeholders, and the teachers act as facilitators for those meetings. The core contribution from the stakeholders is that they provide students, teachers and researchers with their lived experiences, and encourage students to develop along a wider front than just the academic one (Bleakley and Bligh 2008). As such, in agroecology education it is important to provide the students with what Bleakley and Bligh (2008) call interprofessional rather than multiprofessional experiences, one that we may better call *transprofessional*. The common denominator in transprofessionalism is not a common theory, but a common task. It is that task, or the phenomenon, that holds the capacity of being beyond (trans) the single disciplines, something that cannot be found within the disciplines.

Reversing the ontological reversal in agroecological education and research, making the world of action and experience the starting *and* ending points for the learning process, can bring researchers from different disciplines together around a common task. Such a transdisciplinary approach is the immediate and obvious way to start an effective and multidimensional exploration and change-oriented process. The primacy often given to the theoretical domain should give way to following a new perspective focused on students working in the field with stakeholders as the important first step in building capacities for transdisciplinarity and responsible action. We feel strongly that "learning is not a spectator sport," and also conclude that the learning process is never "done."

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