Experiential Learning Online – Experiences from Designing and Running a Nordic Course in Agroecology

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Abstract

This paper reports experiences from designing and running the Nordic online course, ‘Ecology of Farming and Food Systems’. The aim was two-fold: 1) to design an online course which uses an explicit experiential learning approach and, 2) to design a structure for online faculty collaboration across institutional and national boundaries. Kolb’s experiential learning cycle was chosen as the basis for the course design as well as for organizing teacher collaboration. Ten teachers from five different institutions and countries collaborated in developing and teaching the course. Six students representing a wide cultural and geographical span participated in the pilot course. Mid-term and final course evaluations indicate that students were generally very satisfied with the course. In particular, the use of a case study as starting point for learning agroecology was highly valued. Teacher collaboration organized around phases of Kolb’s learning cycle received a favourable evaluation from both students and teachers. However, improvements need to be made in terms of continuity when responsibility is transferred from module to module. The experience of using Kolb’s learning cycle to structure course processes and teacher collaboration online may be useful in other contexts, where student-centred learning is the focus and cooperation among instructors across institutions and national borders is a challenge.

Key words: Experiential learning, student-centred learning, teacher collaboration, agroecology, case study.

1 Introduction

In 1995, agricultural and veterinary universities in the Nordic countries established the ‘NOVA University Network’ as a common platform for efficient and innovative Nordic cooperation. In a time of increasing resource constraints at the national level, the aim of this Nordic initiative is to strengthen and develop scientific and educational networking among the different universities. Cooperation of this type, between educational institutions and across national boarders, is becoming more and more necessary in a globally-connected educational world. It also presents many challenges with respect to methods for collaboration and teaching.

Within this context, a group of researchers and teachers dealing with the subject of agroecology formed a network to develop a Nordic program in Agroecology. Through close collaboration among four Nordic universities, a Nordic Master of Science in Agroecology was established in 2000. Agroecology here is defined as the ecology of farming and food systems, in which humans and nature are not separate (Francis et al., 2003). The pedagogical framework of this program, builds on experiential learning theory, while giving priority to the process of developing knowledge, abilities and attitudes. This is an attempt of coming to terms with the concept of student-centred learning. Moreover, while developing the MSc curriculum, it became evident that systems thinking and practice (Checkland, 1981; Wilson and Morren,
1990; Sriskandarajah et al., 1991) was a useful framework to deal with the complexity of agroecological issues, requiring multi-perspective and interdisciplinary approaches (Rickerl and Francis, 2004). Agroecology students need to learn to deal with complex issues as ‘wholes’, which is the crux of systems thinking, rather than reinforcing the disciplinary tendency to reduce systems to their component parts and study these in isolation. The intended design of the Nordic Master of Science in Agroecology, is to accomplish this by involving the students as participants in the process of improving real-life cases, which they are encouraged to consider according to systems theory and practice.

As novel forms of information technology (IT) for creating electronic learning environments in higher education was emerging, the group of researchers and teachers responsible for the Nordic program in Agroecology found it relevant to explore how these new technologies might be utilized to enhance the development of the Agroecology Program. More specifically, the questions were: can we foster at least some degree of student-centred, experiential learning that we have already working in agroecology now in a distance mode? How should such learning be designed in terms of content and process? Given the need for multiple perspectives within agroecology, what are the opportunities for organizing teacher collaboration across disciplinary and institutional boundaries? Is it possible to find a model to facilitate the pursuit of didactic, subject-specific and organisational goals?

2 Objectives

The overall objective of this paper is to report experiences from designing and running an eight-week pilot scale online agroecology course - ‘Ecology of Farming and Food Systems’, where the distance education effort was informed by Kolb’s (1984) experiential learning theory. A full version of this paper has been recently published elsewhere (Lieblein et al., 2005).

3 Kolb’s learning cycle as course design and as tool for teacher collaboration

The group of researchers and teachers responsible for developing the new online course in agroecology brought rich and varied experience with teaching agroecology to the conceptualizing process. Rather new to the group was the use of online learning in a subject where linkages between practice and theory are crucial. Moreover, the group reckoned that a closer collaboration between them was needed to successfully run such a course.

An important first step in conceptualizing the learning environment during the planning of the course was specification of the following four learning objectives: 1) understand the key concepts and principles regarding structure and function of farming and food systems, 2) know how to deal with goals and value bases of farmers and other stakeholders involved in such systems, 3) be familiar with methodology, methods, and tools for describing, analysing, and improving farming systems and food systems and, 4) know how to connect theory of learning and theory of farming systems to a practical case through a simulated field experience. A second step in the conceptualizing process was to address the question of how the educational process should be run. On the basis of past experience it was agreed that the inductive learning approach would be compatible with agroecology. In inductive learning, the phenomenon to be studied is the starting point for the learning process. In the context of our work in agroecology, the human activities on the real-life farms and food systems become the key phenomenon studied. The inductive approach to learning is based on several theoretical traditions, where experiential learning has a central position (Kolb, 1984). The roots of experiential learning are found in the theories of John Dewey on learning and experience (Dewey, 1963).

The key question then was how to incorporate the inductive learning approach into an online course. Here it was decided to develop a case based on a real farm that would form the basis for the student-centred learning in the course. A Danish organic dairy farm was chosen, and case development involved collection of farm data as well as quite extensive interviews with the farmer and the farm family. The case study was presented on the course website platform in a rich variety of formats – e.g. text, spreadsheets, farm plans, maps and photographs, and with links to external documents. In developing and designing the case study online, experiences from the ‘WebCase Project’ (Cain and Heath, 2004) were very useful.

Already well acquainted with experiential learning, the teacher group decided to apply Kolb’s (1984) learning cycle, not only as a general perspective on the learning process, but also as a framework for the
design of the course and as the guiding process for the students’ exploration of the case study. The core idea of Kolb’s experiential learning process is that knowledge is created through transformation of experience, and that the transformation consists of the four interrelated activities, divergence (observation), assimilation (thinking), convergence (planning), and accommodation (action). The process takes the learner from the real world of experience into the conceptual world and back to the real world in the action phase. Thus, the learning process involves more than purely cognitive expression. The outcome of the planning of the course is presented in fig. 1.

As seen in fig. 1, the course design consisted of four phases corresponding to the four interrelated learning activities of Kolb, and six modules. Following this cycle, teachers could structure course activities with respect to student learning. In each of the four phases, a key question was supposed to guide student progress.

In **phase 1**, the divergent knowledge phase, the initial question was: what is on the farm and how does the farm function? The task for the student was to get acquainted with a very complex and messy situation (the case study farm). In **module 1** of this phase, students were to become familiar with the course goals and with each other, and to gain an understanding of Kolb’s cycle. In **module 2**, the core activity was the exploration of the case farm via the presentation of it on the course website platform. From this virtual farm visit, students were expected to gather information on the goals and aspirations of the farmer and family, the physical and economic resources, and the current production situation. Learning goals were gaining experience with the construction of a rich picture of a complex situation, and becoming familiar with mind-mapping as one tool for doing this (Buzan and Buzan, 1993).

In **phase 2**, the assimilative knowledge phase, students started to order and make sense of the rich picture of the case farm created during the diverging phase asking the question: what does it mean. In **module 3**, introduction of the concepts of systems thinking and agroecology were important for the understanding process and for the learners to become aware of different scales and hierarchies of systems (Francis et al. 2004). In **module 4**, multi-perspective approaches (Gamble et al. 1996) and goal conflict issues were introduced to further clarify the case. In **phase 3**, the convergent knowledge phase, the key question was: what can we do to make sound recommendations to the farmer? Here it was important to design strategies for action to be taken. To make the shift from analysing the farm in the assimilating phase and to thinking about what can be done to improve it, in **module 5**, students were asked to assume the role of the farmer and had to address questions such as: based on the knowledge you have of the case, what weight and balance would you give to the social, environmental, agronomic and economical perspectives on your farm? Students were divided into groups and asked to consider the goal conflicts of different perspectives, and develop a SWOT-analysis (Bee and Bee, 1998) of the situation. In the accommodative knowledge phase, **phase 4**, the key question was: how can we apply this information and analysis to improve the farm? The crucial task was now to develop solutions for the issues that were identified in the previous module and make a plan of action for the farmer. In the final **module 7**, students were asked to do a final individual
assignment, a document consisting of their personal reflections on the methodology, including methods and tools, and the content of the course.

To facilitate awareness of their individual learning process, students were asked to keep a log of their experiences during the different phases. Evaluation and feedback from peers on the different assignments encouraged students to learn from each other. Appropriate readings and tools were provided to support group work and assessment from peers. Further, pertinent readings on the different tools and on agroecology were provided. The virtual linking of students and teachers across the world happened through the course website platform (Fronter) offering the necessary facilities like synchronous (real-time) chat rooms, synchronous (delayed) discussion boards, file archives, some general information and a news bulletin. The course website platform also carried the case study.

Having conceptualized and planned the course, the group of teachers were still left with the issue of how to collaborate while running the course. Although the group members represented a wide range of disciplines, the idea of splitting the responsibilities along conventional disciplinary lines was rejected. To stay closer to the learning cycle used to design the course and strengthen interdisciplinary approach throughout, it was instead decided to place responsibilities according to the phases of the learning cycle. Teachers in groups of two or three would then have the responsibility for one quadrant of the cycle (see fig. 1). Using the learning cycle not only as a tool for course design, but also as a template for teacher collaboration, implied that all teachers would deal with the farm case, but with different aspects of the learning process, according to where in the cycle they had their main responsibilities.

4 Outcomes – student and teacher experiences

How successful was Kolb’s learning cycle for designing and running the online learning course in agroecology? The aim was to develop an online course that would actively involve faculty from five countries and have a focus on student-centred learning. In the following, the outcome is reported by providing results from the mid-term and a final evaluation of the course. This includes student responses to both closed and open-ended questions, and teacher evaluation.

When analysing student responses, it must be kept in mind that only six students participated in the pilot course evaluated. At the same time, these students represented a wide cultural and geographical span: from China, Australia, Finland, Spain and the United States. Overall, these students were very satisfied with the course. The following quotations are typical of the responses from students:

‘What is particularly good about the course is using the case study, getting to see the other students’ ideas and learn from them’.

‘What was particularly good was importance of group work, working with a diversity of individuals and the case study’.

‘I liked working from the Kolb cycle and to have specific tasks that help you to do the work in each stage of the course’.

‘It was really good that we got to process our own ideas about an organic farm and its development’.

‘The interactive process was fundamental to the course, and students are at the same level as the teachers’.

Teachers experienced the students to be active and positively engaged throughout the course. However, when comparing the mid-term and the final evaluations it appeared that student satisfaction had increased during the course. In particular, it appears that students developed a greater appreciation for the learning methods used as the course progressed. The use of a concrete farm case as basis for learning agroecology was clearly valued by the students. Learning from peers at the different stages of the course, and especially during the group work phases, was seen as vital to the success of the course. As such, learning was not only individual, but also a result of a social process. In addition, students took initiative to arrange two chat sessions with a number of the faculty, which added a synchronous dimension to their learning and demonstrated an active involvement by everyone.
The overriding challenges that had to be addressed during the course were related to the large cultural and geographical differences found among the students. Geography played an important role in setting the ‘point of departure’ for students. Students did not start the course with a uniform set of knowledge and experiences and, initially, this caused some frustration among the students. Curiosity and willingness to learn from fellow students began after everyone realised that they would not only be learning from the teachers in this course, but that they could also benefit from each other’s knowledge. In fact, one student experienced that being given the opportunity to learn from fellow students was one of the best aspects of the course. The individual’s knowledge and experiences contributed to a rich learning environment. For example, the main issues of agriculture in China are greatly different from those in Denmark. In China, food security is of utmost priority, and less attention is paid to environmental goals. The opposite is the case in Denmark. There is a challenge for students to be open to different situations, different goals and to the underlying reasons for these goals.

In evaluating the backgrounds of students in the course, it became clear that the majority had travelled and experienced agriculture in other countries. For this reason, these students were open-minded, and most did not have difficulties relating to a Danish case study. However, for those who had never experienced European agriculture, the challenge to understand a Danish farming system was much greater. Until students were willing to dig deep, in order to reveal the underlying reasons for the structure and functioning of the particular farming system, they remained confused and often negative. Facilitating improved understanding of alien and often mystifying agricultural systems is generally a hard task in classroom situations. Enabling this in a distributed learning context thus becomes a true challenge for the educators. We believe that engaging the learner in active communication about their home farming systems offers a useful way out of this challenge.

The cultural background of students also plays an important role in their relationship to education, for example, figures of authority, and language. In this online course much of the learning was designed to be derived from the student’s own experiences with the case, sharing of these within small groups, commenting on each other’s work, and in this way co-create knowledge. This is quite different from the usual lecture-based transmission mode of learning, which many students are used to. For example, one student was quite surprised by the approach used in the course, and wondered when the lectures would begin. When students have only been exposed to discipline-based education, dealing with complex and whole systems such as agricultural systems will be confronting, even when working with teachers face-to-face. To add to this difficulty, there is vast difference among even a small group of international students in their ability to question teachers or others in position of ‘authority’. The mentioned student did not feel comfortable voicing personal opinions and ideas, and expected the correct answer from the teachers. Also increasing the students’ skills in constructive criticism towards each other, making them confident enough to go beyond praise, will need some attention.

Half the students had English as a second language. Although native English speakers had a clear advantage in their writing, neither teachers nor the students themselves voiced any problems with carrying out the assignments. In several instances, students used several unusual terms in English and this led to valuable discussions improving learning outcomes.

Using Kolb’s learning cycle as the main template for teacher collaboration proved to be very effective. Ten teachers from five countries and institutions collaborated in running the course during its eight weeks. Using the real-life case as the starting point for the learning processes in the course, and having Kolb’s learning cycle as the model for the course process were vital for the success of the teacher collaboration. When teachers aim at collaborating across institutions and country borders, it is often a challenge to establish a culture for collaboration because of differences in personal and scientific backgrounds, and differences in their pedagogic beliefs. In this course, the teachers were not necessarily responsible for specific disciplinary components of the course, but they had to deal with different phases of a learning process tied to the analysis of a case. As such, the case itself and the learning cycle provided the basis for a ‘common language’ for the ten teachers and a ‘common pathway’ for guiding the students. Clearly, it was also necessary that the teachers valued student-centred learning as an active and social process. The teachers involved in this course, had a history of collaboration with regard to agro-ecological education and adopting student-centred approaches. Besides, many members of the teacher team were familiar with the case study farm, following a visit during the planning phase of the course.

The major challenge with regards to teacher collaboration was to assure continuity when responsibility was transferred from one teacher team to the next (see fig. 1). Teachers could not adequately advise...
students in one module without becoming acquainted with the students and their work in previous modules. This had not been fully anticipated by all teachers in the group. Those who came in as facilitators in the second half of the course had more difficulty allocating the required quality and amount of time to supporting the students in this course, while fulfilling their own regular schedule. Both students and teachers voiced a need to ensure a better continuity between learning phases and faculty responsibilities. One assured form of continuity in the course was the graduate student who acted as the course coordinator. Her dual role as the logistical co-ordinator and facilitator of learning and her timely intervention at important points were valuable to the successful completion of the course.

5 Conclusion

The overall impression from student feedback about the online course, ‘Ecology of Farming and Food Systems’, was that the learning experience was engaging and that it exceeded their expectations. This success can be attributed mainly to the usefulness of Kolb’s learning theory, both as a framework for the learning paradigm adopted and as a methodical template for structuring the course and organising teacher collaboration. Further, the use of a case study as starting point for learning agroecology was highly valued. Thus, of key importance in the online course design was the link between experiential learning and the use of a real-life case farm.

6 References